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RAGCO • INDUSTRIAL HOSE, FITTINGS, & ACCESSORIES CATALOG



**INDUSTRIAL**

**HOSE, FITTINGS, & ACCESSORIES**

**RAGCO.COM**

2019





- INDEPENDENCE** RAGCO stores are independently-owned-and-operated small businesses. Our affiliates run their businesses to best suit the customers in their respective markets. They are not beholden to a national sales plan or corporate masters.
- EXPERIENCE** RAGCO stores experience remarkably low turnover thanks to great employee relations. Each store offers individuals with decades of experience in the rubber industry.
- QUALITY** Factory training. Trade organization support. Measurable results. Repeatable success. RAGCO's partners support our members with the most technologically advanced training available, and industry trade organizations such as NAHAD, NIBA, and FSA play an important role in members' systems.
- SERVICE** The forgotten aspect of today marketplace? Not at your local RAGCO location. Our customers always come first. Period.
- RESPONSIVENESS** RAGCO stores offer fast answers, quick turn-around, and prompt service after the sale.
- COMPETITIVENESS** The RAGCO group's purchasing power gives each store, large or small, highly aggressive pricing to ensure competitive solutions for their respective markets.
- FABRICATION** We offer gasket fabrication, waterjet cutting, air-knife cutting, die-press cutting, slitting, CAD, molded and moldless products, vulcanization, extrusion, and much more! RAGCO stores can customize materials per your specifications.
- NETWORKING** RAGCO members meet regularly to exchange ideas, share problems and solutions, and nurture lifelong friendships.
- RELATIONSHIPS** RAGCO holds agreements with the finest manufacturers in the world including Garlock, American Biltrite, Unaflex, Thermoseal, American Braiding, and more...
- TRADITION** Decades and decades of success in the rubber and fluid sealing industry are being reinforced by the people who make RAGCO great. Second and third generations of families continue to strive for excellence in our changing economy.



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# RUBBER HOSE





# GENERAL PURPOSE AIR & WATER HOSE

## LOR GENERAL PURPOSE AIR & WATER HOSE



Available in various colors, this general purpose air and water hose provides job/color coding possibilities for safety and other considerations. A very economical general service air and water hose, it can be used in numerous industrial, agricultural and construction applications where oil is not a factor. It is easy to handle and very flexible due to its multi-spiral layers of durable reinforcing polyester yarn. Available in a wide variety of sizes and working pressures, it has an EPDM tube and cover that resist abrasion, heat and ozone. This hose is not to be used as a steam hose.

|                       |                                     |                      |                       |
|-----------------------|-------------------------------------|----------------------|-----------------------|
| <b>TUBE MATERIAL</b>  | EPDM                                | <b>REINFORCEMENT</b> | Spiral polyester yarn |
| <b>COVER MATERIAL</b> | EPDM                                | <b>TEMPERATURE</b>   | -40° F – 200° F       |
| <b>COVER COLOR</b>    | Red, black, green, yellow, and blue |                      |                       |

**INDUSTRY INTERCHANGE:** Valueflex, Frontier, GST II, AdaptaFlex, Bosflex.

# GENERAL PURPOSE AIR & WATER HOSE CONTINUED

## LOR AIR & WATER HOSE CONTINUED

| NOMINAL I.D.<br>(INCHES) (MM) |       | NOMINAL O.D.<br>(INCHES) (MM) |       | REINFORCEMENT<br>SPIRALS | WORKING PRESSURE<br>(PSI) | MIN. BEND RADIUS<br>(INCHES) (MM) |        | WEIGHT<br>(LB/FT) (KG/M) |      |
|-------------------------------|-------|-------------------------------|-------|--------------------------|---------------------------|-----------------------------------|--------|--------------------------|------|
| 3/16                          | 4.76  | 0.44                          | 11.11 | 2                        | 200                       | N/A                               | N/A    | 0.08                     | 0.12 |
| 1/4                           | 6.35  | 0.49                          | 12.45 | 2                        | 150                       | 1.50                              | 38.10  | 0.08                     | 0.12 |
| 1/4                           | 6.35  | 0.49                          | 12.45 | 2                        | 200                       | 1.50                              | 38.10  | 0.08                     | 0.12 |
| 1/4                           | 6.35  | 0.50                          | 14.22 | 2                        | 250                       | 1.50                              | 38.10  | 0.08                     | 0.12 |
| 1/4                           | 6.35  | 0.50                          | 15.75 | 2                        | 300                       | 1.50                              | 38.10  | 0.08                     | 0.12 |
| 5/16                          | 7.94  | 0.58                          | 14.73 | 2                        | 200                       | 2.00                              | 50.80  | 0.09                     | 0.13 |
| 5/16                          | 7.94  | 0.58                          | 15.75 | 2                        | 300                       | 2.00                              | 50.80  | 0.09                     | 0.13 |
| 3/8                           | 9.53  | 0.69                          | 17.53 | 2                        | 150                       | 2.25                              | 57.15  | 0.15                     | 0.22 |
| 3/8                           | 9.53  | 0.69                          | 17.53 | 2                        | 200                       | 2.25                              | 57.15  | 0.15                     | 0.22 |
| 3/8                           | 9.53  | 0.69                          | 17.53 | 2                        | 250                       | 2.25                              | 57.15  | 0.15                     | 0.22 |
| 3/8                           | 9.53  | 0.69                          | 17.53 | 2                        | 300                       | 2.25                              | 57.15  | 0.15                     | 0.22 |
| 1/2                           | 12.70 | 0.81                          | 20.64 | 2                        | 150                       | 3.00                              | 76.20  | 0.20                     | 0.30 |
| 1/2                           | 12.70 | 0.81                          | 20.64 | 4                        | 200                       | 3.00                              | 76.20  | 0.25                     | 0.37 |
| 1/2                           | 12.70 | 0.84                          | 21.43 | 4                        | 250                       | 3.00                              | 76.20  | 0.25                     | 0.37 |
| 1/2                           | 12.70 | 0.84                          | 21.43 | 4                        | 300                       | 3.00                              | 76.20  | 0.25                     | 0.37 |
| 5/8                           | 15.88 | 0.93                          | 23.62 | 4                        | 150                       | 3.75                              | 95.25  | 0.24                     | 0.36 |
| 5/8                           | 15.88 | 0.93                          | 23.62 | 4                        | 200                       | 3.75                              | 95.25  | 0.30                     | 0.45 |
| 5/8                           | 15.88 | 1.00                          | 25.40 | 4                        | 250                       | 3.75                              | 95.25  | 0.30                     | 0.45 |
| 5/8                           | 15.88 | 1.00                          | 25.40 | 4                        | 300                       | 3.75                              | 95.25  | 0.30                     | 0.45 |
| 3/4                           | 19.05 | 1.12                          | 28.45 | 4                        | 150                       | 4.50                              | 114.30 | 0.34                     | 0.51 |
| 3/4                           | 19.05 | 1.15                          | 29.21 | 4                        | 200                       | 4.50                              | 114.30 | 0.38                     | 0.57 |
| 3/4                           | 19.05 | 1.15                          | 29.21 | 4                        | 250                       | 4.50                              | 114.30 | 0.38                     | 0.57 |
| 3/4                           | 19.05 | 1.15                          | 29.21 | 4                        | 300                       | 4.50                              | 114.30 | 0.41                     | 0.61 |
| 1                             | 25.40 | 1.37                          | 34.80 | 4                        | 150                       | 7.00                              | 177.80 | 0.43                     | 0.64 |
| 1                             | 25.40 | 1.37                          | 34.80 | 4                        | 200                       | 7.00                              | 177.80 | 0.51                     | 0.76 |
| 1                             | 25.40 | 1.43                          | 36.20 | 4                        | 300                       | 7.00                              | 177.80 | 0.51                     | 0.76 |
| 1-1/4                         | 31.75 | 1.75                          | 44.45 | 4                        | 200                       | 8.75                              | 222.25 | 0.81                     | 1.21 |
| 1-1/2                         | 38.10 | 2.00                          | 50.80 | 4                        | 200                       | 10.50                             | 266.70 | 0.89                     | 1.34 |
| 2                             | 50.80 | 2.55                          | 64.77 | 4                        | 200                       | 14.00                             | 355.60 | 1.28                     | 1.90 |





MOR GENERAL PURPOSE AIR & WATER HOSE



This air and multi-purpose hose is designed to handle the oily mists used to lubricate pneumatic tools. Featuring a medium oil-resistant tube with multi-spiral polyester reinforcement, the hose remains flexible even in extreme temperatures. Its durable cover resists abrasion, cracking, weathering and ozone. Not recommended for handling fuels.

|                      |                       |                          |                 |
|----------------------|-----------------------|--------------------------|-----------------|
| <b>COVER COLOR</b>   | Red                   | <b>OIL RESISTANCE</b>    | Medium          |
| <b>TUBE MATERIAL</b> | EPDM, RMA Class C     | <b>COVER MATERIAL</b>    | EPDM            |
| <b>REINFORCEMENT</b> | Spiral polyester yarn | <b>TEMPERATURE RANGE</b> | -40°F to +200°F |

| NOMINAL I.D. (INCHES) | NOMINAL I.D. (MM) | NOMINAL O.D. (INCHES) | NOMINAL O.D. (MM) | REINFORCEMENT SPIRALS | WORKING PRESSURE (PSI) | MIN. BEND RADIUS (INCHES) | MIN. BEND RADIUS (MM) | WEIGHT (LB/FT) | WEIGHT (KG/M) |
|-----------------------|-------------------|-----------------------|-------------------|-----------------------|------------------------|---------------------------|-----------------------|----------------|---------------|
| 1/4                   | 6.35              | 0.50                  | 12.70             | 2                     | 200                    | 1.50                      | 38.10                 | 0.09           | 0.13          |
| 1/4                   | 6.35              | 0.50                  | 12.70             | 2                     | 300                    | 1.50                      | 38.10                 | 0.15           | 0.22          |
| 5/16                  | 7.94              | 0.62                  | 15.75             | 4                     | 300                    | 2.00                      | 50.80                 | 0.14           | 0.21          |
| 3/8                   | 9.53              | 0.69                  | 17.53             | 2                     | 200                    | 2.25                      | 57.15                 | 0.15           | 0.22          |
| 3/8                   | 9.53              | 0.69                  | 17.53             | 2                     | 300                    | 2.25                      | 57.15                 | 0.18           | 0.27          |
| 1/2                   | 12.70             | 0.81                  | 20.64             | 2                     | 200                    | 3.00                      | 76.20                 | 0.19           | 0.28          |
| 1/2                   | 12.70             | 0.84                  | 21.34             | 4                     | 300                    | 3.00                      | 76.20                 | 0.25           | 0.37          |
| 5/8                   | 15.88             | 1.00                  | 25.40             | 4                     | 300                    | 3.75                      | 95.25                 | 0.30           | 0.45          |
| 3/4                   | 19.05             | 1.15                  | 29.21             | 4                     | 250                    | 4.50                      | 114.30                | 0.37           | 0.55          |
| 3/4                   | 19.05             | 1.15                  | 29.21             | 4                     | 250                    | 4.50                      | 114.30                | 0.37           | 0.55          |
| 3/4                   | 19.05             | 1.15                  | 29.21             | 4                     | 300                    | 4.50                      | 114.30                | 0.37           | 0.55          |
| 3/4                   | 19.05             | 1.15                  | 29.21             | 4                     | 300                    | 4.50                      | 114.30                | 0.37           | 0.55          |
| 1                     | 25.40             | 1.37                  | 34.80             | 4                     | 200                    | 7.00                      | 177.80                | 0.42           | 0.62          |
| 1                     | 25.40             | 1.43                  | 36.20             | 4                     | 300                    | 7.00                      | 177.80                | 0.50           | 0.74          |
| 1-1/4                 | 31.75             | 1.75                  | 44.45             | 4                     | 200                    | 8.75                      | 222.25                | 0.81           | 1.21          |
| 1-1/2                 | 38.10             | 2.00                  | 50.80             | 4                     | 200                    | 10.50                     | 266.70                | 0.94           | 1.40          |
| 2                     | 50.80             | 2.55                  | 64.77             | 4                     | 200                    | 14.00                     | 355.60                | 1.12           | 1.67          |

INDUSTRY INTERCHANGE: Mainliner, Ortac, Super-Flex GS

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JACKHAMMER HOSE



Rugged four-spiral, with various psi construction, these assemblies can tackle the job that only a jackhammer can dish out. The EPDM tube and cover handle heat, ozone and weather cracking better than other compounds. These hoses are assembled at the factory, crimped with universal (Chicago, CP) fittings at each end. Durability is built in and this hose is ready for hard work. Also available in yellow.

|                      |                                |                          |                 |
|----------------------|--------------------------------|--------------------------|-----------------|
| <b>COVER COLOR</b>   | Red (also available in yellow) | <b>OIL RESISTANCE</b>    | Limited         |
| <b>TUBE MATERIAL</b> | EPDM                           | <b>COVER MATERIAL</b>    | EPDM            |
| <b>REINFORCEMENT</b> | Spiral polyester yarn          | <b>TEMPERATURE RANGE</b> | -40°F to +200°F |

| NOMINAL I.D. (INCHES) | NOMINAL I.D. (MM) | NOMINAL O.D. (INCHES) | NOMINAL O.D. (MM) | REINFORCEMENT SPIRALS | WORKING PRESSURE (PSI) | MIN. BEND RADIUS (INCHES) | MIN. BEND RADIUS (MM) | WEIGHT (LB/FT) | WEIGHT (KG/M) |
|-----------------------|-------------------|-----------------------|-------------------|-----------------------|------------------------|---------------------------|-----------------------|----------------|---------------|
| 3/4                   | 19.05             | 1.15                  | 29.21             | 4                     | 200                    | 4.50                      | 114.30                | 0.38           | 0.57          |
| 3/4                   | 19.05             | 1.15                  | 29.21             | 4                     | 250                    | 4.50                      | 114.30                | 0.38           | 0.57          |
| 3/4                   | 19.05             | 1.15                  | 29.21             | 4                     | 300                    | 4.50                      | 114.30                | 0.41           | 0.61          |
| 1                     | 25.40             | 1.37                  | 34.80             | 4                     | 200                    | 7                         | 177.80                | 0.51           | 0.76          |

INDUSTRY INTERCHANGE: Air Power, Sledgehammer

AIR TOOL HOSE

This lightweight utility-grade air hose is economically designed for indoor and outdoor applications operating in temperate climate conditions. Pre-assembled in 50-foot sections and coupled with brass 1/4" male pipe thread fitting on each end. Mostly assembled with rubber or PVC hose. Custom lengths available.



|                       |                       |                          |                          |
|-----------------------|-----------------------|--------------------------|--------------------------|
| <b>TUBE MATERIAL</b>  | EPDM or PVC           | <b>FITTINGS</b>          | Brass 1/4" MPT both ends |
| <b>COVER MATERIAL</b> | EPDM or PVC           | <b>STANDARD LENGTH</b>   | 50ft                     |
| <b>REINFORCEMENT</b>  | Spiral polyester yarn | <b>TEMPERATURE RANGE</b> | 14°F to +150°F           |

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## PUSH-ON HOSE



Designed specifically for use with robotic welders and industrial applications requiring an MSHA-approved flame-resistant cover, Push-On Hose is a premium 300 psi, oil-resistant, non-conductive push-on hose that provides safe and reliable performance in oily and harsh conditions. It features an excellent coupling retention and a superior hold created by a unique spiral angle design and polyester reinforcement that firmly grips the fitting and will not give under pressure.

|                       |   |                      |                  |
|-----------------------|---|----------------------|------------------|
| <b>TUBE MATERIAL</b>  | Nitrile, RMA Class A                    | <b>REINFORCEMENT</b> | Spiral polyester |
| <b>COVER MATERIAL</b> | Nitrile/PVC RMA Class A                 | <b>TEMPERATURE</b>   | -30°F to +180°F  |
| <b>OIL RESISTANCE</b> | High                                    | <b>CONSTRUCTION</b>  | Non-conductive   |
| <b>COVER COLORS</b>   | Black, blue, gray, red, green or yellow |                      |                  |

| COLOR  | NOMINAL I.D. |       | NOMINAL O.D. |       | REINFORCEMENT SPIRALS | WORKING PRESSURE (PSI) | MIN. BEND RADIUS |        | WEIGHT  |        |
|--------|--------------|-------|--------------|-------|-----------------------|------------------------|------------------|--------|---------|--------|
|        | (INCHES)     | (MM)  | (INCHES)     | (MM)  |                       |                        | (INCHES)         | (MM)   | (LB/FT) | (KG/M) |
| Black  | 1/4          | 6.35  | 0.50         | 12.70 | 2                     | 300                    | 1.50             | 38.10  | 0.10    | 0.15   |
|        | 3/8          | 9.53  | 0.63         | 15.88 | 2                     | 300                    | 2.25             | 57.15  | 0.13    | 0.19   |
|        | 1/2          | 12.70 | 0.75         | 19.05 | 2                     | 300                    | 3.00             | 76.20  | 0.16    | 0.24   |
|        | 5/8          | 15.88 | 0.91         | 23.02 | 2                     | 300                    | 3.75             | 95.25  | 0.23    | 0.34   |
|        | 3/4          | 19.05 | 1.03         | 26.19 | 2                     | 300                    | 4.50             | 114.30 | 0.26    | 0.39   |
| Blue   | 1/4          | 6.35  | 0.50         | 12.70 | 2                     | 300                    | 1.50             | 38.10  | 0.10    | 0.15   |
|        | 3/8          | 9.53  | 0.63         | 15.88 | 2                     | 300                    | 2.25             | 57.15  | 0.13    | 0.19   |
|        | 1/2          | 12.70 | 0.75         | 19.05 | 2                     | 300                    | 3.00             | 76.20  | 0.16    | 0.24   |
| Gray   | 1/4          | 6.35  | 0.50         | 12.70 | 2                     | 300                    | 1.50             | 38.10  | 0.10    | 0.15   |
|        | 3/8          | 9.53  | 0.63         | 15.88 | 2                     | 300                    | 2.25             | 57.15  | 0.13    | 0.19   |
|        | 1/2          | 12.70 | 0.75         | 19.05 | 2                     | 300                    | 3.00             | 76.20  | 0.16    | 0.24   |
| Red    | 1/4          | 6.35  | 0.50         | 12.70 | 2                     | 300                    | 1.50             | 38.10  | 0.10    | 0.15   |
|        | 3/8          | 9.53  | 0.63         | 15.88 | 2                     | 300                    | 2.25             | 57.15  | 0.13    | 0.19   |
|        | 1/2          | 12.70 | 0.75         | 19.05 | 2                     | 300                    | 3.00             | 76.20  | 0.16    | 0.24   |
| Green  | 1/4          | 6.35  | 0.50         | 12.70 | 2                     | 300                    | 1.50             | 38.10  | 0.10    | 0.15   |
|        | 3/8          | 9.53  | 0.63         | 15.88 | 2                     | 300                    | 2.25             | 57.15  | 0.13    | 0.19   |
|        | 1/2          | 12.70 | 0.75         | 19.05 | 2                     | 300                    | 3.00             | 76.20  | 0.16    | 0.24   |
| Yellow | 3/8          | 9.53  | 0.63         | 15.88 | 2                     | 300                    | 2.25             | 57.15  | 0.13    | 0.19   |

INDUSTRY INTERCHANGE: Flex-Loc, InstaGrip, Super-Lok GS

## NON-CONDUCTIVE GENERAL PURPOSE HOSE



This hose is designed to stand up to the tough working conditions found in shipyards, steel processing automotive plants and construction industries, as well as aluminum reduction and other applications where a high degree of electrical non-conductivity is required. Its spiral, polyester, reinforcing cords provide strength and flexibility even in extreme temperatures, and its NBR tube and synthetic cover can convey oil, diesel, kerosene, fuel oil and other petroleum-based products while resisting oil, solvents, cracking, abrasion and ozone. It provides a constant pressure of either 250 or 300 psi, 1/4" through the 1-1/2" sizes. Not recommended for a variety of unleaded gasoline types.

|                       |                               |                      |                  |
|-----------------------|-------------------------------|----------------------|------------------|
| <b>TUBE MATERIAL</b>  | Nitrile, RMA Class A          | <b>REINFORCEMENT</b> | Spiral polyester |
| <b>COVER MATERIAL</b> | Red. Nitrile/PVC RMA Class A. | <b>TEMPERATURE</b>   | -30°F to +180°F  |
| <b>OIL RESISTANCE</b> | High                          | <b>CONSTRUCTION</b>  | Non-conductive   |

| NOMINAL I.D. | NOMINAL O.D. |      | REINFORCEMENT SPIRALS | WORKING PRESSURE (PSI) | MIN. BEND RADIUS |       | WEIGHT  |        |      |
|--------------|--------------|------|-----------------------|------------------------|------------------|-------|---------|--------|------|
|              | (INCHES)     | (MM) |                       |                        | (INCHES)         | (MM)  | (LB/FT) | (KG/M) |      |
| 1/4          | 6.35         | 0.62 | 15.75                 | 4                      | 300              | 1.50  | 38.10   | 0.16   | 0.24 |
| 3/8          | 9.53         | 0.69 | 17.53                 | 4                      | 300              | 2.25  | 57.15   | 0.18   | 0.27 |
| 1/2          | 12.70        | 0.84 | 21.34                 | 4                      | 300              | 3.00  | 76.20   | 0.25   | 0.37 |
| 3/4          | 19.05        | 1.15 | 29.21                 | 4                      | 300              | 4.50  | 114.30  | 0.42   | 0.62 |
| 1            | 25.40        | 1.43 | 36.20                 | 4                      | 300              | 7.00  | 177.80  | 0.63   | 0.94 |
| 1-1/4        | 31.75        | 1.78 | 45.24                 | 4                      | 250              | 8.75  | 222.25  | 0.81   | 1.21 |
| 1-1/2        | 38.10        | 2.03 | 51.59                 | 4                      | 250              | 10.50 | 266.70  | 0.95   | 1.41 |

INDUSTRY INTERCHANGE: Versicon, Super MPT II



## HEAVY-DUTY YELLOW MULTI-PURPOSE



A highly versatile, multi-purpose hose designed for high pressure applications and extreme temperature environments ranging from -40°F to +212°F. It is ideal for use in rock-drilling, air-hammer and water-jetting applications in heavy construction, mining or quarry operations, as well as the transfer of petroleum or other solvent solutions, and washer operations. This hose is non-conductive and MSHA-approved with a Class A RMA rating, providing a constant 1,000 psi working pressure, with a minimum 4:1 burst safety factor.

|                       |   |                          |                 |
|-----------------------|---|--------------------------|-----------------|
| <b>COVER MATERIAL</b> | Yellow; XNBR, RMA Class A (Pin Pricked)   | <b>OIL RESISTANCE</b>    | High            |
| <b>TUBE MATERIAL</b>  | NBR, RMA Class A  | <b>TEMPERATURE RANGE</b> | -40°F to +212°F |
| <b>REINFORCEMENT</b>  | 4-spiral aramid fiber – 3/4" and 1" sizes      4-spiral polyester yarn – 1/4", 3/8", 1/2" sizes |                          |                 |

| NOMINAL I.D.<br>(INCHES) (MM) |       | NOMINAL O.D.<br>(INCHES) (MM) |       | REINFORCEMENT<br>SPIRALS | WORKING PRESSURE<br>(PSI) | MIN. BEND RADIUS<br>(INCHES) (MM) |        | WEIGHT<br>(LB/FT) (KG/M) |       |
|-------------------------------|-------|-------------------------------|-------|--------------------------|---------------------------|-----------------------------------|--------|--------------------------|-------|
| 1/4                           | 6.35  | 0.63                          | 15.88 |                          |                           | 4                                 | 1000   | 1.50                     | 38.10 |
| 3/8                           | 9.53  | 0.75                          | 19.05 | 4                        | 1000                      | 2.25                              | 57.15  | 0.22                     | 0.33  |
| 1/2                           | 12.70 | 0.94                          | 23.81 | 4                        | 1000                      | 3.00                              | 76.20  | 0.24                     | 0.36  |
| 3/4                           | 19.05 | 1.13                          | 28.58 | 4                        | 1000                      | 4.50                              | 114.30 | 0.35                     | 0.52  |
| 1                             | 25.40 | 1.50                          | 38.10 | 4                        | 1000                      | 7.00                              | 177.80 | 0.47                     | 0.70  |

INDUSTRY INTERCHANGE: Hercules, Fortress

## WHITE WASH-DOWN



This white wash-down hose or "creamery hose" is designed for wash-down service in creameries, dairies, packing houses, canneries and food processing plants. It features an EPDM tube and cover that resist scuffing and cracking, and is color-coded white to indicate wash-down service and cleanliness. This hose handles hot water up to 200°F at 50 psi, and is rated for working pressures up to 250 psi on 1/2" I.D.

|                       |       |                          |                       |
|-----------------------|-------|--------------------------|-----------------------|
| <b>COVER COLOR</b>    | White | <b>OIL RESISTANCE</b>    | High                  |
| <b>COVER MATERIAL</b> | EPDM  | <b>TEMPERATURE RANGE</b> | -40°F to +180°F       |
| <b>TUBE MATERIAL</b>  | EPDM  | <b>REINFORCEMENT</b>     | Spiral polyester yarn |

| NOMINAL I.D.<br>(INCHES) (MM) |       | NOMINAL O.D.<br>(INCHES) (MM) |       | REINFORCEMENT<br>SPIRALS | WORKING PRESSURE<br>(PSI) | MIN. BEND RADIUS<br>(INCHES) (MM) |        | WEIGHT<br>(LB/FT) (KG/M) |       |
|-------------------------------|-------|-------------------------------|-------|--------------------------|---------------------------|-----------------------------------|--------|--------------------------|-------|
| 1/2                           | 12.70 | 0.91                          | 23.02 |                          |                           | 4                                 | 250    | 3.00                     | 76.20 |
| 3/4                           | 19.05 | 1.25                          | 31.75 | 4                        | 200                       | 4.50                              | 114.30 | 0.50                     | 0.74  |

INDUSTRY INTERCHANGE: Dari-Preen, Sani-Wash





## WIRE-BRAIDED AIR HOSE

For heavy-duty air supply in mining, quarries, construction, industrial air placement, sandblasting and heavy-duty equipment rental. Oil mist-resistant tube with high working pressure. Cover is bright yellow and heavy duty for great durability.

|                     |  |                      |                                 |
|---------------------|--|----------------------|---------------------------------|
| <b>CONSTRUCTION</b> | Tube is nitrile blend, smooth and black        | <b>TEMPERATURE</b>   | -25°F (-32°C) to +200°F (+93°C) |
| <b>COVER</b>        | SBR, yellow, fabric impression and pin-pricked | <b>REINFORCEMENT</b> | 2 spiral wires                  |

| ID     | OD    | WP (PSI) | MIN BEND RADIUS | WEIGHT/FT (LBS) |
|--------|-------|----------|-----------------|-----------------|
| 1/2"   | 0.91" | 600      | 5.5"            | 0.36            |
| 3/4"   | 1.22" | 600      | 8.3"            | 0.6             |
| 1"     | 1.49" | 600      | 11"             | 0.8             |
| 1-1/4" | 1.81" | 600      | 13.8"           | 1.05            |
| 1-1/2" | 2.04" | 600      | 16.5"           | 1.24            |
| 2"     | 2.60" | 600      | 22"             | 1.8             |
| 2-1/2" | 3.15" | 600      | 27.5"           | 2.4             |
| 3"     | 3.70" | 600      | 33.1"           | 3.22            |
| 4"     | 4.88" | 600      | 44.1"           | 4.7             |
| 6"     | 6.89" | 600      | 63"             | 6.82            |

**INDUSTRY INTERCHANGE:** Ultrabraid, Thoro-Braid, Air Drill, Contractor's Air



## RUBBER WATER-SUCTION HOSE

A flexible and economical hose for suction, discharge, or gravity flow of water in construction, mining, oil exploration, agriculture and equipment rental. Resistant to water-based AG fertilizers and salt water. Cover is abrasion- and weather-resistant.

|                     |                                      |                      |  |
|---------------------|--------------------------------------|----------------------|--|
| <b>CONSTRUCTION</b> | Tube is EPDM blend, smooth and black | <b>TEMPERATURE</b>   | -25°F (-32°C) to +185°F (+85°C)                          |
| <b>COVER</b>        | EPDM blend with a fabric impression  | <b>REINFORCEMENT</b> | 2-ply or 4-ply synthetic fabric with a double wire helix |

| ID     | OD     | WP (PSI) | VACUUM (HG) | MIN BEND RADIUS | WEIGHT/FT (LBS) |
|--------|--------|----------|-------------|-----------------|-----------------|
| 1"     | 1.42"  | 150      | Full        | 3.75"           | 0.5             |
| 1-1/4" | 1.7"   | 150      | Full        | 6"              | 0.75            |
| 1-1/2" | 1.96"  | 150      | Full        | 6.5"            | 0.8             |
| 2"     | 2.49"  | 150      | Full        | 8"              | 1.11            |
| 2-1/2" | 2.99"  | 150      | Full        | 10"             | 1.75            |
| 3"     | 3.5"   | 150      | Full        | 12"             | 2.24            |
| 4"     | 4.53"  | 150      | Full        | 18"             | 2.79            |
| 5"     | 5.68"  | 150      | Full        | 26"             | 3.25            |
| 6"     | 6.54"  | 150      | Full        | 31"             | 5.75            |
| 8"     | 8.79"  | 150      | Full        | 42"             | 6.59            |
| 10"    | 10.91" | 75       | Full        | 50"             | 10.25           |
| 12"    | 12.91" | 75       | 25          | 60"             | 13.5            |
| 14"    | 15.13" | 75       | 25          | 72"             | 16.75           |

**INDUSTRY INTERCHANGE:** Transporter, Con-Ag, Day-Flo 7257, Barracuda, Otter





# TWO-PLY WATER DISCHARGE HOSE



For medium-duty discharge of water in construction, mining, oil exploration, agriculture, equipment rental, and more. Can be crimped or banded to make assemblies per your specifications.

|                       |                    |                          |  |
|-----------------------|--------------------|--------------------------|--|
| <b>COVER MATERIAL</b> | Wrapped EPDM blend | <b>REINFORCEMENT</b>     | Two-ply, high-tensile fiber cord plies |
| <b>TUBE MATERIAL</b>  | EPDM or EPDM blend | <b>TEMPERATURE RANGE</b> | -40° F to 185° F                       |

| I.D.     | O.D.     | REIN. PLYS | MAX. W.P. AT 68°F | MIN. BEND RADIUS | WEIGHT     |
|----------|----------|------------|-------------------|------------------|------------|
| 1 1/2 in | 1.81 in  | 2          | 150 psi           | 15.00 in         | 0.60 lb/ft |
| 2 in     | 2.31 in  | 2          | 150 psi           | 20.00 in         | 0.84 lb/ft |
| 2 1/2 in | 2.75 in  | 2          | 150 psi           | 25.00 in         | 0.91 lb/ft |
| 3 in     | 3.38 in  | 2          | 150 psi           | 30.00 in         | 1.12 lb/ft |
| 4 in     | 4.37 in  | 2          | 150 psi           | 40.00 in         | 1.25 lb/ft |
| 5 in     | 5.51 in  | 2          | 150 psi           | 50.00 in         | 2.29 lb/ft |
| 6 in     | 6.50 in  | 2          | 150 psi           | 60.00 in         | 3.45 lb/ft |
| 8 in     | 8.50 in  | 2          | 100 psi           | 80.00 in         | 4.30 lb/ft |
| 10 in    | 10.50 in | 2          | 100 psi           | 100.00 in        | 5.40 lb/ft |
| 12 in    | 12.50 in | 2          | 100 psi           | 120.00 in        | 6.75 lb/ft |

INDUSTRY INTERCHANGE: WD-150, Plicord, Day-Flo 7306, Steelhead, Leader

# FOUR-PLY WATER DISCHARGE HOSE



For heavy-duty discharge of water in construction, mining, oil exploration, agriculture, equipment rental, in-plant service and more. Can be crimped or banded to make assemblies per your specifications.

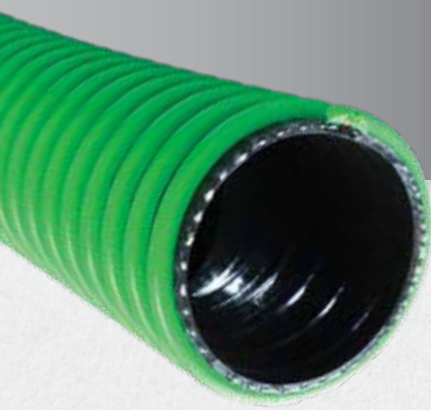
|                       |                    |                          |   |
|-----------------------|--------------------|--------------------------|---|
| <b>COVER MATERIAL</b> | Wrapped EPDM blend | <b>REINFORCEMENT</b>     | Four-ply, high-tensile fiber cord plies |
| <b>TUBE MATERIAL</b>  | EPDM or EPDM blend | <b>TEMPERATURE RANGE</b> | -40° F to 185° F                        |

| I.D.     | O.D.     | REIN. PLYS | MAX. W.P. AT 68°F | MIN. BEND RADIUS | WEIGHT     |
|----------|----------|------------|-------------------|------------------|------------|
| 1 1/2 in | 2.00 in  | 4          | 250 psi           | 15.00 in         | 0.83 lb/ft |
| 2 in     | 2.56 in  | 4          | 250 psi           | 20.00 in         | 1.11 lb/ft |
| 2 1/2 in | 3.07 in  | 4          | 250 psi           | 25.00 in         | 1.24 lb/ft |
| 3 in     | 3.58 in  | 4          | 225 psi           | 30.00 in         | 1.50 lb/ft |
| 4 in     | 4.61 in  | 4          | 200 psi           | 40.00 in         | 1.85 lb/ft |
| 6 in     | 6.57 in  | 4          | 150 psi           | 60.00 in         | 3.90 lb/ft |
| 8 in     | 8.66 in  | 4          | 125 psi           | 80.00 in         | 5.25 lb/ft |
| 10 in    | 10.66 in | 4          | 125 psi           | 100.00 in        | 6.29 lb/ft |
| 12 in    | 12.68 in | 4          | 125 psi           | 120.00 in        | 7.83 lb/ft |

INDUSTRY INTERCHANGE: Plicord HD, SS110







# CORRUGATED EPDM SUCTION HOSE

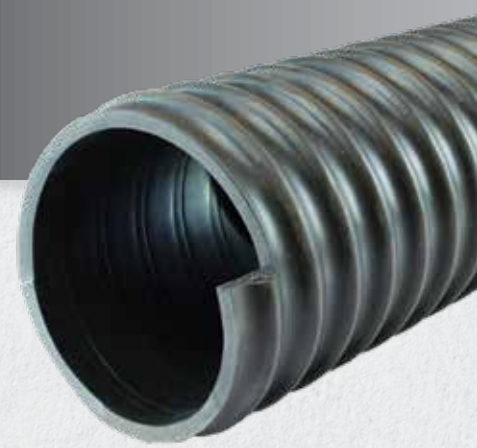
This lightweight, flexible, and durable hose makes for easy handling in irrigation lines, septic service, trash pumps, marine, and irrigation applications. Known as Tigerflex Green or Series 2000. Can be crimped or banded to make assemblies per your specifications.

|                     |                                 |                          |                  |
|---------------------|---------------------------------|--------------------------|------------------|
| <b>CONSTRUCTION</b> | EPDM tube w/ polyethylene helix | <b>TEMPERATURE RANGE</b> | -40° F to 160° F |
|---------------------|---------------------------------|--------------------------|------------------|

| I.D.   | O.D.  | APPROX W.P. @ 140° F (PSI) | APPROX BURST PRESSURE @ 72° F (PSI) | VACUUM RATING (IN/HG) | REC MIN BEND RADIUS @ 72° F (INCH) | APPROX WEIGHT (LBS/FT) |
|--------|-------|----------------------------|-------------------------------------|-----------------------|------------------------------------|------------------------|
| 1"     | 1.34" | 80                         | 240                                 | 28                    | 4                                  | 0.23                   |
| 1 1/4" | 1.61" | 70                         | 210                                 | 28                    | 5                                  | 0.3                    |
| 1 1/2" | 1.96" | 60                         | 180                                 | 28                    | 6                                  | 0.49                   |
| 2"     | 2.49" | 60                         | 180                                 | 28                    | 9                                  | 0.69                   |
| 2 1/2" | 3"    | 50                         | 150                                 | 28                    | 11                                 | 0.91                   |
| 3"     | 3.6"  | 50                         | 150                                 | 28                    | 12                                 | 1.205                  |
| 4"     | 4.69" | 45                         | 135                                 | 28                    | 17                                 | 1.83                   |
| 6"     | 6.86" | 35                         | 105                                 | 20                    | 17                                 | 3.84                   |

INDUSTRY INTERCHANGE: Tiger-Green, Series 2000, Masterflex 300, 300EPDM

# ABRASION-RESISTANT CORRUGATED SBR SUCTION HOSE



Abrasive suction for crushed rock, sand, dry fertilizer, small gravel and powdered cement. Can also be used as a boom hose for catch basin clean-out. Lightweight, heavy-duty abrasion resistance, -40°F cold-weather resistance, sub-zero flexibility, and a ground wire is not needed as the tube-and-cover compound are static-dissipating.

|                          |  |
|--------------------------|--|
| <b>CONSTRUCTION</b>      | Abrasion-resistant SBR tube and cover that are both static-dissipating with a sturdy clockwise helix |
| <b>TEMPERATURE RANGE</b> | -40° F to 160° F   |

| I.D.   | O.D.  | WORKING PRESSURE (PSI) | MINIMUM BEND RADIUS | VACUUM (IN/HG) | WEIGHT/FT (LBS) |
|--------|-------|------------------------|---------------------|----------------|-----------------|
| 1 1/2" | 1.82" | 45                     | 2"                  | 29             | .37             |
| 2"     | 2.35" | 40                     | 2.5"                | 29             | .50             |
| 2 1/2" | 2.95" | 35                     | 2.5"                | 29             | .88             |
| 3"     | 3.51" | 35                     | 3"                  | 29             | 1.1             |
| 4"     | 4.63" | 30                     | 4.5"                | 29             | 1.76            |
| 5"     | 5.75" | 30                     | 5"                  | 28             | 2.47            |
| 6"     | 6.73" | 30                     | 9"                  | 28             | 3.09            |
| 8"     | 9.04" | 30                     | 15"                 | 27             | 5.65            |



# FUEL DROP HOSE

Tank-truck gravity drop hose for such items as gasoline, naphtha, kerosene, light and heavy oil, diesel, and up to 15% ethanol mixture. Not for biodiesel.

|                     |  |
|---------------------|--|
| <b>CONSTRUCTION</b> | Nitrile rubber, rigid PVC helix, synthetic braiding, smooth bore, static grounding wire, corrugated O.D. |
| <b>TEMPERATURE</b>  | -30°F to 140°F   |

| I.D. | O.D.  | PITCH | WORKING PRESSURE (PSI) | MIN. BEND RADIUS | VACUUM RATING (IN/HG) | WEIGHT/FT (LBS) |
|------|-------|-------|------------------------|------------------|-----------------------|-----------------|
| 2"   | 2.68" | .39"  | 65                     | 5"               | 29.8                  | 1.13            |
| 3"   | 3.68" | .59"  | 65                     | 6"               | 29.8                  | 1.37            |
| 4"   | 4.82" | .65"  | 65                     | 8"               | 29.8                  | 2.16            |

INDUSTRY INTERCHANGE: Paladin, SP204, 120LT, Spiralite 5000-00





# RAGCO APOLLO™ TANK TRUCK HOSE



RAGCO Apollo Tank Truck Hose is a top-of-the-line product for use in tank truck and in-plant operations to transfer gasoline, oil, ethanol blends and other petroleum-base products up to 50% aromatic content. It is designed for pressure, gravity flow, or full-suction service.

|                          |   |   |
|--------------------------|---|---|
| <b>CONSTRUCTION TUBE</b> | Nitrile synthetic rubber RMA Class A (High Oil Resistance)                              |   |
| <b>COVER MATERIAL</b>    | Black (red stripe), petroleum, resistant, synthetic rubber smooth cover; wrapped finish |   |
| <b>REINFORCEMENT</b>     | Spiral-plyed synthetic fabric with wire helix   | <b>TEMPERATURE RANGE</b> -35 °F to 200 °F (-37 °C to 93 °C) |

| NOMINAL I.D. (INCHES) | NOMINAL I.D. (MM) | NOMINAL O.D. (INCHES) | NOMINAL O.D. (MM) | WORKING PRESSURE (PSI) | WORKING PRESSURE (MPA) | VACUUM (IN/HG) | MIN. BEND RADIUS (INCHES) | MIN. BEND RADIUS (MM) | WEIGHT (LB/FT) | WEIGHT (KG/M) |
|-----------------------|-------------------|-----------------------|-------------------|------------------------|------------------------|----------------|---------------------------|-----------------------|----------------|---------------|
| 3/4                   | 19.1              | 1.22                  | 31                | 150                    | 1.03                   | 29             | 2                         | 51                    | 0.47           | 0.7           |
| 1                     | 25.4              | 1.5                   | 38.1              | 150                    | 1.03                   | 29             | 2                         | 51                    | 0.63           | 0.94          |
| 1 1/4                 | 31.8              | 1.76                  | 44.7              | 150                    | 1.03                   | 29             | 3                         | 76                    | 0.79           | 1.18          |
| 1 1/2                 | 38.1              | 2.03                  | 51.6              | 150                    | 1.03                   | 29             | 4                         | 102                   | 0.99           | 1.47          |
| 2                     | 50.8              | 2.55                  | 64.8              | 150                    | 1.03                   | 29             | 5                         | 114                   | 1.3            | 1.93          |
| 2 1/2                 | 63.5              | 3.07                  | 78                | 150                    | 1.03                   | 29             | 6                         | 146                   | 1.66           | 2.47          |
| 3                     | 76.2              | 3.57                  | 90.7              | 150                    | 1.03                   | 29             | 7                         | 178                   | 2.03           | 3.02          |
| 4                     | 101.6             | 4.6                   | 116.8             | 150                    | 1.03                   | 29             | 10                        | 254                   | 2.68           | 3.99          |
| 6                     | 152.7             | 6.78                  | 171.9             | 150                    | 1.03                   | 29             | 30                        | 762                   | 5.61           | 8.36          |

**INDUSTRY INTERCHANGE:** Flexwing, Transporter Black, Translite, Longhorn, Puma

# RAGCO ZEUS™ UHMWPE CHEMICAL HOSE



RAGCO Zeus UHMWPE Chemical Hose is a high-end industrial hose for the transfer of corrosive fluids and solvents in suction or discharge applications. It handles the majority of common industrial chemicals.

|                          |  |   |
|--------------------------|--|---|
| <b>CONSTRUCTION TUBE</b> | Ultra-High Molecular Weight Polyethylene (UHMWPE)                        |   |
| <b>COVER MATERIAL</b>    | Corrugated, abrasion-resistant, synthetic rubber. Usually blue or green. |   |
| <b>REINFORCEMENT</b>     | Spiral-plyed synthetic fabric with double wire helix                     | <b>TEMPERATURE RANGE</b> -40°F to 150°F (-40°C to 66°C) |

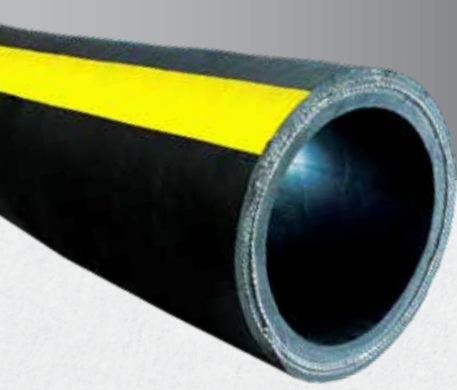
| NOMINAL I.D. (INCHES) | NOMINAL I.D. (MM) | NOMINAL O.D. (INCHES) | NOMINAL O.D. (MM) | WORKING PRESSURE (PSI) | WORKING PRESSURE (MPA) | VACUUM (IN/HG) | MIN. BEND RADIUS (INCHES) | MIN. BEND RADIUS (MM) | WEIGHT (LB/FT) | WEIGHT (KG/M) |
|-----------------------|-------------------|-----------------------|-------------------|------------------------|------------------------|----------------|---------------------------|-----------------------|----------------|---------------|
| 3/4                   | 19.1              | 1.22                  | 31                | 200                    | 1.38                   | 29             | 4                         | 89                    | 0.46           | 0.68          |
| 1                     | 25.4              | 1.47                  | 37.3              | 200                    | 1.38                   | 29             | 4                         | 102                   | 0.6            | 0.89          |
| 1 1/4                 | 31.8              | 1.73                  | 43.9              | 200                    | 1.38                   | 29             | 4                         | 102                   | 0.73           | 1.09          |
| 1 1/2                 | 38.1              | 1.97                  | 50                | 200                    | 1.38                   | 29             | 5                         | 127                   | 0.84           | 1.25          |
| 2                     | 50.8              | 2.55                  | 64.8              | 200                    | 1.38                   | 29             | 6                         | 152                   | 1.22           | 1.92          |
| 2 1/2                 | 63.5              | 3.14                  | 79.8              | 200                    | 1.38                   | 29             | 8                         | 203                   | 1.78           | 2.65          |
| 3                     | 76.2              | 3.63                  | 92.2              | 200                    | 1.38                   | 29             | 9                         | 229                   | 2.11           | 3.14          |
| 4                     | 101.6             | 4.67                  | 118.6             | 200                    | 1.38                   | 29             | 10                        | 254                   | 2.81           | 4.18          |

**INDUSTRY INTERCHANGE:** FabChem, Ultra-Chem, Blue Thunder, Chem-Cat, Renegade





# RAGCO POSEIDON™ OILFIELD SUCTION HOSE



RAGCO Poseidon Oilfield Suction Hose is an exceptional product for use in transfer hose service, cleaning sediment from oil storage tanks, and other general service applications. The tube is an oil-resistant synthetic rubber. Do not use with gasoline or other refined products with aromatic content that exceeds 35%.

|              |   |                      |   |
|--------------|---|----------------------|---|
| <b>TUBE</b>  | Synthetic rubber                          | <b>REINFORCEMENT</b> | Spiral-ply synthetic fabric with wire helix |
| <b>COVER</b> | Black SBR synthetic rubber (smooth cover) | <b>TEMPERATURE</b>   | -25°F to 180°F (-32°C to 82°C)              |

| NOMINAL I.D. (INCHES) | NOMINAL I.D. (MM) | NOMINAL O.D. (INCHES) | NOMINAL O.D. (MM) | WORKING PRESSURE (PSI) | WORKING PRESSURE (MPA) | VACUUM (IN/HG) | MIN. BEND RADIUS (INCHES) | MIN. BEND RADIUS (MM) | WEIGHT (LB/FT) | WEIGHT (KG/M) |
|-----------------------|-------------------|-----------------------|-------------------|------------------------|------------------------|----------------|---------------------------|-----------------------|----------------|---------------|
| 1                     | 25.4              | 1.49                  | 37.8              | 150                    | 1.03                   | 29             | 3                         | 75                    | 0.64           | 0.95          |
| 1 1/4                 | 31.75             | 1.74                  | 44.2              | 150                    | 1.03                   | 29             | 3                         | 75                    | 0.77           | 1.14          |
| 1 1/2                 | 38.1              | 1.99                  | 50.6              | 150                    | 1.03                   | 29             | 4                         | 102                   | 0.91           | 1.36          |
| 2                     | 50.8              | 2.49                  | 63.2              | 150                    | 1.03                   | 29             | 4.5                       | 114                   | 1.71           | 1.74          |
| 2 1/2                 | 63.5              | 3.1                   | 76.4              | 150                    | 1.03                   | 29             | 5.75                      | 146                   | 1.48           | 2.2           |
| 3                     | 76.2              | 3.54                  | 89.9              | 150                    | 1.03                   | 29             | 7                         | 178                   | 1.91           | 3.96          |
| 4                     | 101.6             | 4.59                  | 116.5             | 150                    | 1.03                   | 29             | 10                        | 254                   | 2.82           | 4.19          |

# HOT TAR & ASPHALT HOSE



Hot Tar & Asphalt Hose is an industrial suction and discharge hose designed to handle high-temperature materials such as hot asphalt, glue, oil, tar and wax to 300°F continuous and 350°F intermittent (149°C/177°C). The hose also handles refined fuels such as biodiesel (to B100 in dedicated service), diesel, ethanol and gasoline. The hose construction incorporates a dual wire helix that provides full suction capability, kink resistance and a path to conduct a static electrical charge to ground. The cover is resistant to abrasion, heat, oil and weathering.

|                      |               |                      |  |
|----------------------|---------------|----------------------|--|
| <b>TUBE MATERIAL</b> | Black nitrile | <b>REINFORCEMENT</b> | Two textile plies with dual wire helix |
| <b>COVER</b>         | Wrapped       | <b>TEMPERATURE</b>   | -20°F to 350°F                         |

| I.D. | O.D.  | WORKING PRESSURE (PSI) | VACUUM (IN/HG) | MINIMUM BEND RADIUS | WEIGHT / FT |
|------|-------|------------------------|----------------|---------------------|-------------|
| 2"   | 2.72" | 150                    | 29             | 10"                 | 1.8 lbs     |
| 3"   | 3.78" | 150                    | 29             | 15"                 | 2.94 lbs    |
| 4"   | 4.80" | 150                    | 29             | 20"                 | 3.89 lbs    |

INDUSTRY INTERCHANGE: Pyroflex, SS387





# FOOD SUCTION HOSE

## BULK FOOD SUCTION HOSE



For suction of flour, sugar, syrup, grains, or similar products. FDA-grade, white, natural-rubber tube. All sizes rated for full vacuum.

|                     |  |
|---------------------|--|
| <b>CONSTRUCTION</b> | Tube is white natural rubber, FDA grade. Cover is natural rubber. Two-ply reinforcement with a steel wire helix. |
| <b>TEMPERATURE</b>  | -40°F (-40°C) to +150°F (+66°C)  |

| I.D.   | O.D.   | WORKING PRESSURE (PSI) | VACUUM (HG) | MIN. BEND RADIUS | WEIGHT/FT (LBS) |
|--------|--------|------------------------|-------------|------------------|-----------------|
| 1"     | 1.49"  | 150                    | 29          | 4 1/2"           | .69             |
| 1-1/2" | 2.05"  | 150                    | 29          | 5"               | .98             |
| 2"     | 2.66"  | 150                    | 29          | 6"               | 1.37            |
| 2-1/2" | 3.07"  | 150                    | 29          | 8"               | 1.67            |
| 3"     | 3.62"  | 150                    | 29          | 10"              | 2.14            |
| 3-1/2" | 4.21"  | 150                    | 29          | 12"              | 2.6             |
| 4"     | 4.72"  | 150                    | 29          | 20"              | 3.14            |
| 4-1/2" | 5.27"  | 150                    | 29          | 22"              | 3.94            |
| 5"     | 5.71"  | 150                    | 29          | 24"              | 4.67            |
| 6"     | 6.77"  | 150                    | 29          | 26"              | 5.98            |
| 8"     | 8.78"  | 150                    | 29          | 32"              | 9.36            |
| 10"    | 10.83" | 125                    | 29          | 44"              | 11.57           |
| 12"    | 12.83" | 100                    | 29          | 60"              | 15.27           |

INDUSTRY INTERCHANGE: Tan Flextra, Type 96, 690S

# FOOD SUCTION HOSE CONTINUED

## LIQUID FOOD SUCTION HOSE



For suction of liquid food products. Tube resists oily material.

|                     |   |
|---------------------|---|
| <b>CONSTRUCTION</b> | Tube is white nitrile rubber, FDA grade. Cover is nitrile. Two-ply reinforcement with a steel wire helix. |
| <b>TEMPERATURE</b>  | -25°F (-32°C) to +200°F (+93°C)   |

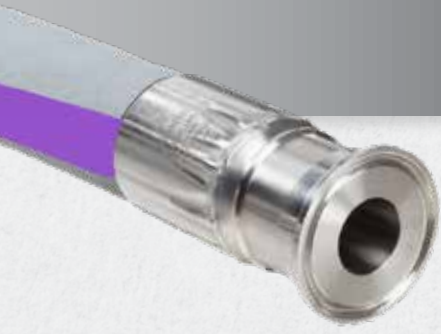
| I.D.   | O.D.  | WORKING PRESSURE (PSI) | VACUUM (HG) | MIN. BEND RADIUS | WEIGHT/FT (LBS) |
|--------|-------|------------------------|-------------|------------------|-----------------|
| 3/4"   | 1.10" | 150                    | 29          | 2 1/2"           | .34             |
| 1"     | 1.49" | 150                    | 29          | 3 1/8"           | .45             |
| 1-1/2" | 2.05" | 150                    | 29          | 4"               | 1.06            |
| 2"     | 2.66" | 150                    | 29          | 5"               | 1.35            |
| 3"     | 3.62" | 150                    | 29          | 6"               | 2.08            |
| 4"     | 4.72" | 150                    | 29          | 8"               | 3.21            |

INDUSTRY INTERCHANGE: Plicord, Gray Shadow, SW432





# BREWERY/WINERY HOSE



A state-of-the-art designed rubber hose based on the specific requirements of the modern-day brewery or winery. Rugged but flexible construction with a super smooth white hose tube, this hose is for non-oily applications, is microbe-resistant, and has an EPDM cover that resists dirt scuffs and is easily cleaned. Built on stainless steel mandrels for cleanliness and meets FDA, USDA and 3-A (certificate #1376) requirements.

|                      |  |                       |      |
|----------------------|--|-----------------------|------|
| <b>TUBE MATERIAL</b> | White chlorobutyl (non-oily applications)  | <b>COVER MATERIAL</b> | EPDM |
| <b>REINFORCEMENT</b> | Multiple plies of polyester tire cord, dual monofilament helix rods                    |                       |      |
| <b>TEMPERATURE</b>   | -40°F (-40°C) to +240°F (+116°C) (Can be open-end steam-cleaned) CIP to 248°F (+120°C) |                       |      |

| I.D.   | O.D.  | W.P. (PSI) | MIN BEND RADIUS | VACUUM (HG) | WEIGHT/FT (LBS) |
|--------|-------|------------|-----------------|-------------|-----------------|
| 3/4"   | 1.41" | 250        | 4"              | Full        | 0.33            |
| 1"     | 1.64" | 250        | 4"              | Full        | 0.48            |
| 1 1/2" | 2.14" | 250        | 5"              | Full        | 0.65            |
| 2"     | 2.77" | 250        | 7"              | Full        | 1.26            |
| 2 1/2" | 3.29" | 250        | 13"             | Full        | 1.54            |

INDUSTRY INTERCHANGE: NovaBrew, Vintner

# STEAM HOSE



Rugged wire-braided steam hose recommended for saturated and super-heated steam applications. Used in shipyards, manufacturing, chemical and petroleum plants, food, lumber, pulp, and processing industries. Cover is weather- and ozone-resistant. Available with chlorobutyl tube.

|              |      |                      |                  |
|--------------|------|----------------------|------------------|
| <b>TUBE</b>  | EPDM | <b>REINFORCEMENT</b> | Steel wire plies |
| <b>COVER</b> | EPDM | <b>TEMPERATURE</b>   | -40°F to 450°F   |

| ID     | O.D.  | WORKING PRESSURE (PSI) | VACUUM (IN/HG) | MIN. BEND RADIUS | WEIGHT/FT (LBS) |
|--------|-------|------------------------|----------------|------------------|-----------------|
| 1/2"   | 1.00" | 250                    | N/A            | 5.9"             | 0.4             |
| 3/4"   | 1.25" | 250                    | N/A            | 8.3"             | 0.51            |
| 1"     | 1.5"  | 250                    | N/A            | 11"              | 0.67            |
| 1 1/4" | 1.81" | 250                    | N/A            | 14"              | 0.87            |
| 1 1/2" | 2.13" | 250                    | N/A            | 16.5"            | 1.11            |
| 2"     | 2.64" | 250                    | N/A            | 22"              | 1.8             |
| 3"     | 3.81" | 250                    | N/A            | 30"              | 3.17            |

INDUSTRY INTERCHANGE: Plicord Steam, BurstProof, Steam-Lance, Steam King, Concord







# SANDBLAST HOSE

Used with grit, aluminum oxide, glass beads, etc., and is ideal for rugged use in shipyards and construction sites.

|                       |  |                      |                              |
|-----------------------|--|----------------------|------------------------------|
| <b>SAFETY FACTOR</b>  | 4:1  | <b>REINFORCEMENT</b> | High tensile tire cord plies |
| <b>COVER MATERIAL</b> | Black, SBR (pin-pricked)                                     | <b>TEMPERATURE</b>   | -40°F to 190°F               |
| <b>TUBE MATERIAL</b>  | Black, SBR/GUM, wear-resistant, static-dissipating materials |                      |                              |

| I.D.   | O.D.   | WORKING PRESSURE (PSI) | REINFORCEMENT PLYS | WEIGHT/FT |
|--------|--------|------------------------|--------------------|-----------|
| 1/2"   | 1 1/8" | 150                    | 2                  | .4 lbs    |
| 3/4"   | 1 1/2" | 150                    | 4                  | .57 lbs   |
| 1"     | 1 7/8" | 150                    | 4                  | .94 lbs   |
| 1 1/4" | 2 1/8" | 150                    | 4                  | 1.18 lbs  |
| 1 1/2" | 2 3/8" | 150                    | 4                  | 1.35 lbs  |

**INDUSTRY INTERCHANGE:** Plicord Blast, Blast-Flex, Sand Blast 7245, Concord

# MATERIAL SUCTION HOSE

Hard-wall hose designed with a high abrasion-resistant tube. Ideal for applications where suction and/or discharge of abrasive media is required. Can be crimped or banded to make assemblies per your specifications.



|              |                                |                      |                                |
|--------------|--------------------------------|----------------------|--------------------------------|
| <b>TUBE</b>  | Gum rubber or gum rubber blend | <b>REINFORCEMENT</b> | Fiber cord plies, helical wire |
| <b>COVER</b> | SBR                            | <b>TEMPERATURE</b>   | -40°F to 185°F                 |

| I.D.   | O.D.  | WORKING PRESSURE (PSI) | VACCUM (IN/HG) | MIN. BEND RADIUS | WEIGHT/FT (LBS) |
|--------|-------|------------------------|----------------|------------------|-----------------|
| 1 1/4" | 1.81" | 75                     | 29             | 4"               | 0.77            |
| 1 1/2" | 2.1"  | 75                     | 29             | 4"               | 1.11            |
| 2"     | 2.6"  | 75                     | 29             | 12"              | 1.3             |
| 2 1/2" | 3.11" | 75                     | 29             | 17"              | 1.65            |
| 3"     | 3.66" | 75                     | 29             | 18"              | 2.25            |
| 4"     | 4.69" | 75                     | 29             | 24"              | 2.93            |
| 5"     | 5.7"  | 75                     | 29             | 30"              | 3.83            |
| 6"     | 6.73" | 75                     | 29             | 32"              | 5               |
| 8"     | 9.13" | 60                     | 29             | 40"              | 10.05           |

# MATERIAL DISCHARGE HOSE

Soft-wall hose designed with a high abrasion-resistant tube. Ideal for applications where discharging of abrasive media is required. Can be crimped or banded to make assemblies per your specifications. Available in 1/8" 3/16" and 1/4" tube.



|              |                                       |                      |                  |
|--------------|---------------------------------------|----------------------|------------------|
| <b>TUBE</b>  | Nitrile/SBR blend, static dissipating | <b>REINFORCEMENT</b> | Fiber cord plies |
| <b>COVER</b> | SBR                                   | <b>TEMPERATURE</b>   | -40°F to 185°F   |

| I.D. | O.D.  | WORKING PRESSURE (PSI) | VACCUM (IN/HG) | MIN. BEND RADIUS | WEIGHT/FT (LBS) |
|------|-------|------------------------|----------------|------------------|-----------------|
| 4"   | 4.68" | 75                     | N/A            | 40"              | 2.42            |
| 5"   | 5.68" | 75                     | N/A            | 50"              | 2.92            |

\* 3/16" thick tube shown.

**INDUSTRY INTERCHANGE:** Black Softwall, SS147, 609W, Lynx







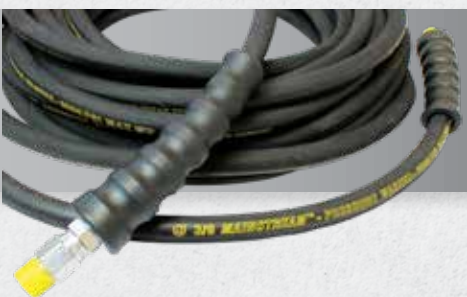
# HOT AIR BLOWER HOSE

Premium level hose for connecting blower to flow lines on dry-bulk trailers. The tube of this hose is designed to handle the heat from the air blower supply, and the cover is designed to handle the effects of weather and ozone. Can be crimped or banded to make assemblies per your specifications.

|              |            |                      |  |
|--------------|------------|----------------------|--|
| <b>TUBE</b>  | EPDM       | <b>REINFORCEMENT</b> | High tensile fiber cord plies, metal helix |
| <b>COVER</b> | Brown EPDM | <b>TEMPERATURE</b>   | -40°F to 225°F (350°F intermittent)        |

| I.D. | O.D.    | REIN. PLYS | MAX. W.P. AT 68°F | MIN. BEND RADIUS | WEIGHT     |
|------|---------|------------|-------------------|------------------|------------|
| 3 in | 3.56 in | 2          | 50 psi            | 5.50 in          | 1.93 lb/ft |
| 4 in | 4.60 in | 2          | 50 psi            | 7.00 in          | 2.65 lb/ft |

**INDUSTRY INTERCHANGE:** Pyroflex, Transporter, Dragon Breath, Wildcat



# PRESSURE WASHER HOSE

This wire-reinforced hose is rated for 3,000 psi to 5,000 psi service. It's coupled with 3/8" MPT swivel X 3/8" MPT stationary fittings with ergonomic bend restrictors at each end. It can be used with hot or cold water and mild detergents, but is not recommended for steam service. Good to 212°F.

|                 |                                       |             |                 |
|-----------------|---------------------------------------|-------------|-----------------|
| <b>COLOR</b>    | Black                                 | <b>SIZE</b> | 3/8" I.D. x 50' |
| <b>FITTINGS</b> | 3/8" MPT Swivel X 3/8" MPT Stationary |             |                 |

\*Available in custom sizes, lengths, and configurations.

| STANDARD LENGTHS | COUPLING  | I.D. X LENGTH | MAX. W.P. | WEIGHT      |
|------------------|---|---------------|-----------|-------------|
| 50 ft            | 3/8" MNPT x 3/8" MSPT with Ergonomic Bend Restrictor Each End | 3/8" x 50'    | 3000 psi  | 10.02 lb/ft |

\*Tables display most prevalent versions of material. Unlisted durometers and manipulations to these specification can be custom manufactured.

# CHLORINE/BROMINE HOSE

Chlorine transfer is recognized as one of the most challenging and potentially hazardous hose applications. Aware of the clear need for safety, reliability and performance, Titeflex has engineered a unique product to meet the demands of this critical application. Titeflex S818XX chlorine hoses are internationally accepted and recognized for providing many years of unparalleled safety and performance.



## APPLICATION ADVANTAGES:

- No Phthalate. Titeflex only uses 100% PTFE in the liner that remains flexible and does not leach.
- Engineered specifically to meet the critical application conditions of chlorine transfer
- Used worldwide by major chemical producers
- Meets or exceeds the Chlorine Institute guidelines, Pamphlet 6, Appendix A
- S818XX assemblies are more flexible and resilient than metal hose. The PTFE innercore is virtually stress-free in continuous flexing installations. The convolutions of Titeflex chlorine hose are shallow and helical, rather than annular as in metal hose, to facilitate draining and cleaning, and reduce transfer time cycles.
- Titeflex chlorine transfer hose is currently available in 1/2" and 1" IDs. It offers full-flow characteristics for faster loading and unloading, and are supplied directly from the Titeflex plant in lengths from one to 30 feet.
- For quality assurance and traceability, each factory-made and tested assembly is serialized and recorded at Titeflex, along with the installation location and date. The assembly is also clearly tagged with its pressure and temperature ratings.

## APPLICATIONS:

- Titeflex 1/2" chlorine hose for replacing copper whips at chlorine repackaging plants filling one-ton containers and 100/150-lb. cylinders
- Size 1" chlorine hose for rail car loading and unloading

## HOSE CONSTRUCTION:

- Convolute PTFE core with a double layer of PVDF braid
- 1" hoses are covered with a CPE jacket for abrasion protection
- Optional heavy-duty, high-density polyethylene spiral wrap available
- Schedule 80 monel male pipe fittings
- Monel schedule MSS type A stub ends available for 1" size
- 1/2" size males have a press-fit liner/insert to prevent erosion
- S818XX hose's innercore is thermally treated to enhance hose performance in extreme applications.

## TEMPERATURE RANGE:

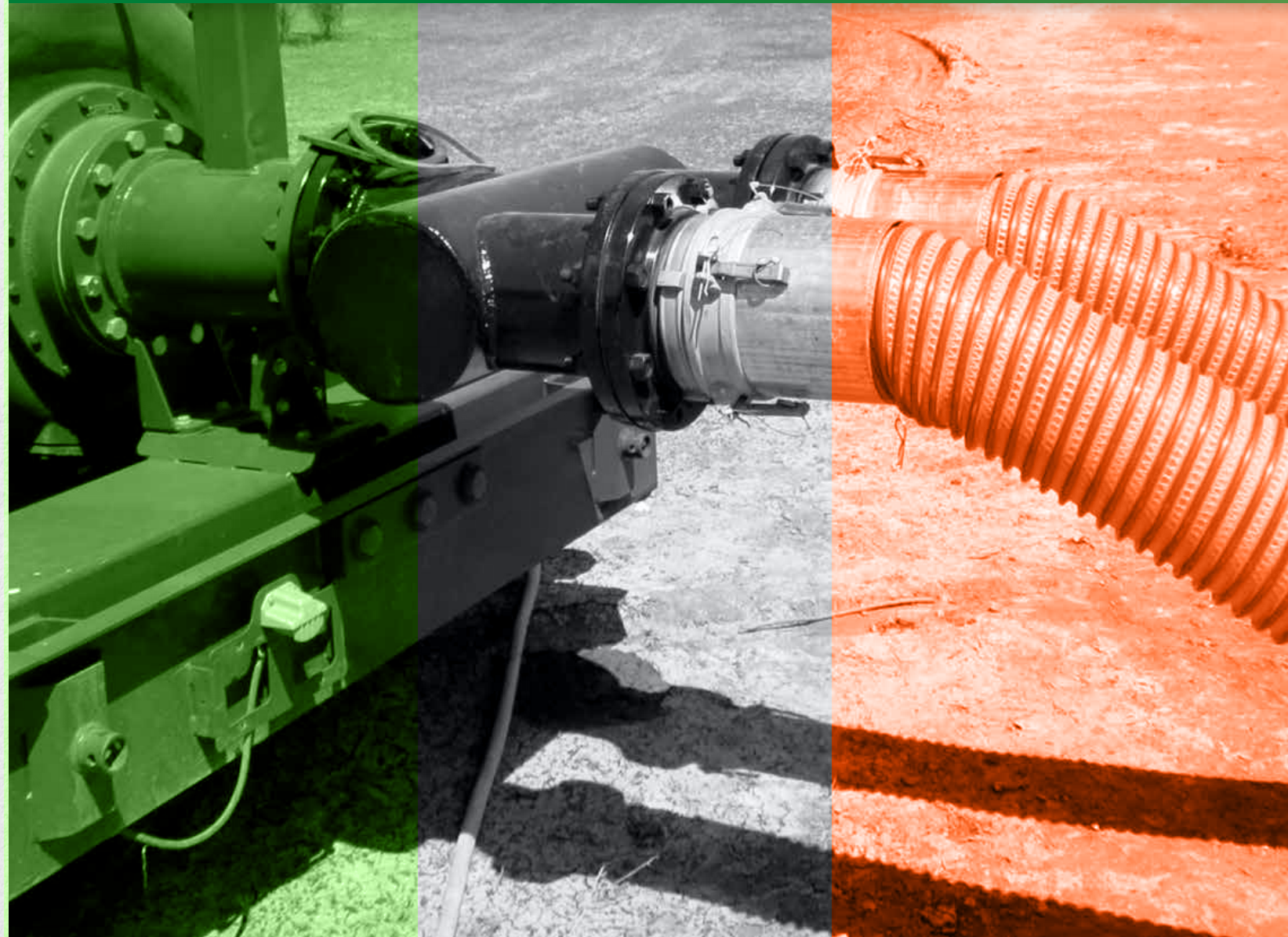
- -40°F to 120°F (-40°C to 49°C)







# PLASTIC HOSE





# GREEN PVC SUCTION HOSE



Economical suction hose for water and light chemical applications. Can be crimped or banded to make assemblies per your specifications.

|                          |                                |
|--------------------------|--------------------------------|
| <b>CONSTRUCTION</b>      | Green PVC w/ white helix       |
| <b>TEMPERATURE RANGE</b> | -10°F to 130°F / -32°C to 85°C |

| I.D.   | O.D.   | REC W.P. @ 72° F (PSI) | APPROX W.P. @ 140° F (PSI) | VACUUM RATING (IN/ HG) | REC MIN BEND RADIUS @ 72° F (INCH) | APPROX BURST PRESSURE @ 72° F (PSI) | APPROX WEIGHT (LBS/ FT) |
|--------|--------|------------------------|----------------------------|------------------------|------------------------------------|-------------------------------------|-------------------------|
| 3/4"   | 1.01"  | 100                    | 42                         | 28                     | 2                                  | 300                                 | 0.2                     |
| 1"     | 1.27"  | 90                     | 42                         | 28                     | 3                                  | 300                                 | 0.27                    |
| 1 1/4" | 1.53"  | 90                     | 42                         | 28                     | 4                                  | 270                                 | 0.36                    |
| 1 1/2" | 1.82"  | 90                     | 42                         | 28                     | 5                                  | 270                                 | 0.47                    |
| 2"     | 2.36"  | 70                     | 37                         | 28                     | 6                                  | 210                                 | 0.636                   |
| 2 1/2" | 2.98"  | 65                     | 32                         | 28                     | 8                                  | 195                                 | 0.92                    |
| 3"     | 3.44"  | 55                     | 28                         | 28                     | 9                                  | 165                                 | 1.2                     |
| 4"     | 4.52"  | 50                     | 28                         | 28                     | 13                                 | 150                                 | 1.87                    |
| 5"     | 5.65"  | 45                     | CALL                       | 28                     | 21                                 | 135                                 | 3                       |
| 6"     | 6.8"   | 45                     | CALL                       | 28                     | 24                                 | 135                                 | 4.56                    |
| 8"     | 8.95"  | 40                     | CALL                       | 28                     | 35                                 | 120                                 | 7.05                    |
| 10"    | 11.34" | 40                     | CALL                       | 28                     | 41                                 | 120                                 | 12.37                   |
| 12"    | 13.39" | 35                     | CALL                       | 26                     | 53                                 | 105                                 | 15.66                   |

# CLEAR PVC SUCTION HOSE



Economical suction hose for water and light chemical applications where inspection of material flow is necessary. Available in FDA food grade.

|                          |                                |
|--------------------------|--------------------------------|
| <b>CONSTRUCTION</b>      | Clear PVC w/ white helix       |
| <b>TEMPERATURE RANGE</b> | -10°F to 130°F / -32°C to 85°C |

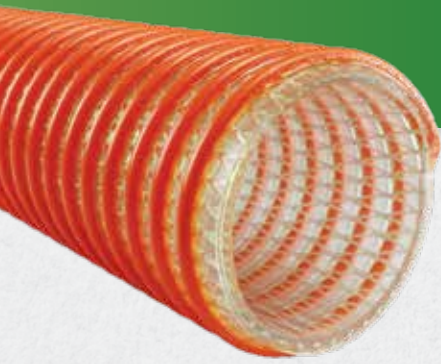
| I.D.   | O.D.   | REC W.P. @ 72° F (PSI) | W.P. @ 149 | VACUUM RATING (IN/ HG) | REC MIN BEND RADIUS @ 72° F (INCH) | APPROX BURST PRESSURE @ 72° F (PSI) | APPROX WEIGHT (LBS/ FT) |
|--------|--------|------------------------|------------|------------------------|------------------------------------|-------------------------------------|-------------------------|
| 3/4"   | 1.02"  | 100                    | 42         | 28                     | 2                                  | 300                                 | 0.21                    |
| 1"     | 1.29"  | 90                     | 42         | 28                     | 3                                  | 300                                 | 0.29                    |
| 1 1/4" | 1.84"  | 90                     | 42         | 28                     | 4                                  | 270                                 | 0.38                    |
| 1 1/2" | 1.84"  | 90                     | 42         | 28                     | 4                                  | 270                                 | 0.49                    |
| 2"     | 2.39"  | 70                     | 37         | 28                     | 5                                  | 210                                 | 0.71                    |
| 1 1/2" | 2.92"  | 65                     | 32         | 28                     | 7                                  | 195                                 | 0.98                    |
| 3"     | 3.46"  | 55                     | 28         | 28                     | 8                                  | 165                                 | 1.28                    |
| 4"     | 4.56"  | 50                     | 28         | 28                     | 12                                 | 150                                 | 2.02                    |
| 5"     | 5.65"  | 45                     | CALL       | 28                     | 20                                 | 135                                 | 2.97                    |
| 6"     | 6.8"   | 45                     | CALL       | 28                     | 23                                 | 135                                 | 4.39                    |
| 8"     | 8.95"  | 40                     | CALL       | 28                     | 34                                 | 120                                 | 6.79                    |
| 10"    | 11.34" | 40                     | CALL       | 28                     | 40                                 | 120                                 | 11.88                   |
| 12"    | 13.19" | 35                     | CALL       | 28                     | 50                                 | 105                                 | 15.07                   |





# CORRUGATED PVC SUCTION HOSE

## HEAVY DUTY



Heavy-duty suction and discharge hose for use in a variety of industries, such as rental pumping equipment and applications where the hose needs to slide easily, or visual confirmation of material flow is necessary.

|                       |  |                      |                         |
|-----------------------|--|----------------------|-------------------------|
| <b>TUBE AND COVER</b> | Clear, flexible PVC with synthetic yarn braiding | <b>REINFORCEMENT</b> | Orange, rigid PVC helix |
| <b>SAFETY FACTOR</b>  | 3:1  | <b>TEMPERATURE</b>   | -4°F to +150°F          |

| I.D.   | O.D.   | RECOM. REC W.P. @ 72° F (PSI) | APPROX BURST PRESSURE @ 72° F (PSI) | VACUUM RATING @ 72° F (IN/HG) | REC MIN BEND RADIUS @ 72° F (INCH) | APPROX WEIGHT (LBS/FT) |
|--------|--------|-------------------------------|-------------------------------------|-------------------------------|------------------------------------|------------------------|
| 1"     | 1.38"  | 100                           | 400                                 | 28                            | 3                                  | 0.27                   |
| 1 1/4" | 1.66"  | 100                           | 400                                 | 28                            | 3                                  | 0.33                   |
| 1 1/2" | 1.89"  | 100                           | 280                                 | 28                            | 4                                  | 0.36                   |
| 2"     | 2.45"  | 100                           | 280                                 | 28                            | 5                                  | 0.54                   |
| 3"     | 3.61"  | 100                           | 280                                 | 28                            | 7                                  | 1.07                   |
| 4"     | 4.73"  | 75                            | 200                                 | 28                            | 8                                  | 1.74                   |
| 6"     | 7.13"  | 70                            | 180                                 | 28                            | 12                                 | 3.81                   |
| 8"     | 9.3"   | 50                            | 150                                 | 28                            | 30                                 | 5                      |
| 10"    | 11.5"  | 35                            | 105                                 | 28                            | 44                                 | 7.48                   |
| 12"    | 13.77" | 30                            | 100                                 | 25                            | 80                                 | 11.25                  |

# BLUE PVC LAY-FLAT DISCHARGE HOSE

## AND ASSEMBLIES



Economical, lightweight, lay-flat hose for light-duty discharge applications. Tube and cover are simultaneously extruded for maximum possible bonding during manufacturing. Can be crimped or banded to make assemblies per your specifications.

|                     |                                |                          |               |
|---------------------|--------------------------------|--------------------------|---------------|
| <b>CONSTRUCTION</b> | Blue PVC, 3-ply polyester yarn | <b>TEMPERATURE RANGE</b> | -5°F to 170°F |
|---------------------|--------------------------------|--------------------------|---------------|

### HOSE CHART

| I.D.   | I.D.   | APPROX. WALL | MAX. W.P. AT 70°F PSI | DESIGN B.P. PSI | APPROX. WEIGHT/FT |
|--------|--------|--------------|-----------------------|-----------------|-------------------|
| 3/4"   | 0.79"  | 0.048"       | 140 psi               | 425             | .08 lbs           |
| 1"     | 1.04"  | 0.052"       | 110 psi               | 340             | .11 lbs           |
| 1 1/4" | 1.30"  | 0.056"       | 80 psi                | 255             | .14 lbs           |
| 1 1/2" | 1.61"  | 0.059"       | 80 psi                | 240             | .19 lbs           |
| 2"     | 2.09"  | 0.059"       | 80 psi                | 240             | .25 lbs           |
| 2 1/2" | 2.56"  | 0.059"       | 65 psi                | 200             | .30 lbs           |
| 3"     | 3.07"  | 0.063"       | 80 psi                | 240             | .36 lbs           |
| 4"     | 4.13"  | 0.067"       | 70 psi                | 210             | .53 lbs           |
| 5"     | 5.07"  | 0.071"       | 40 psi                | 130             | .64 lbs           |
| 6"     | 6.16"  | 0.075"       | 60 psi                | 200             | .87 lbs           |
| 8"     | 8.15"  | 0.087"       | 35 psi                | 100             | 1.30 lbs          |
| 10"    | 10.20" | 0.111"       | 35 psi                | 100             | 1.88 lbs          |
| 12"    | 12.13" | 0.118"       | 35 psi                | 100             | 2.44 lbs          |
| 14"    | 14.14" | 0.118"       | 30 psi                | 85              | 2.70 lbs          |
| 16"    | 16.14" | 0.118"       | 30 psi                | 85              | 3.08 lbs          |





# BLUE PVC LAY-FLAT DISCHARGE HOSE CONTINUED

Pre-coupled, 50' sections coiled for convenient transportation and storage. Available in multiple configurations. Doubled-banded at each end.

## ASSEMBLY CHART

| COUPLING                             | I.D. X LENGTH | MAX. W.P. AT 68°F  | WEIGHT (EA.) |
|--------------------------------------|---------------|--------------------|--------------|
| 1 1/2" Pin Lug (M x F)               | 1 1/2" x 50'  | 85 psi<br>5.86 bar | 9 lbs        |
| 1 1/2" Alum Cam Lock (C x E)         | 1 1/2" x 50'  | 85 psi<br>5.86 bar | 9 lbs        |
| 1-1/2 polypropylene Cam Lock (C x E) | 1-1/2" x 50'  | 85 psi<br>5.86 bar | 9 lbs        |
| 2" Pin Lug (M x F)                   | 2" x 50'      | 85 psi<br>5.86 bar | 12 lbs       |
| 2" Alum Cam Lock (C x E)             | 2" x 50'      | 85 psi<br>5.86 bar | 12 lbs       |
| 2" Polypropylene Cam Lock (C x E)    | 2" x 50'      | 85 psi<br>5.86 bar | 12 lbs       |
| 3" Pin Lug (M x F)                   | 3" x 50'      | 70 psi<br>4.83 bar | 22 lbs       |
| 3" Alum Cam Lock (C x E)             | 3" x 50'      | 70 psi<br>4.83 bar | 22 lbs       |
| 3" Polypropylene Cam Lock (C x E)    | 3" x 50'      | 70 psi<br>4.83 bar | 22 lbs       |

### DISCHARGE HOSE WITH CAM & GROOVE ASSEMBLY



### DISCHARGE HOSE WITH PIN LUG ASSEMBLY



# RED PVC LAY-FLAT DISCHARGE HOSE

A heavy-duty PVC lay-flat hose designed for higher pressure applications. Considered a "step up" from the standard blue PVC lay-flat hose. An ideal hose for pump discharge, tank cleaning, dewatering, irrigation and wash-down applications.



|                       |                             |                      |                             |
|-----------------------|-----------------------------|----------------------|-----------------------------|
| <b>TUBE AND COVER</b> | Red, homogeneous virgin PVC | <b>REINFORCEMENT</b> | High-tensile polyester yarn |
| <b>SAFETY FACTOR</b>  | 3:1                         | <b>TEMPERATURE</b>   | -10°F to +120°F             |

| I.D.   | O.D.  | APPROX. WALL | MAX. W.P. AT 70°F (PSI) | APPROX. WT. 300FT (USA) |
|--------|-------|--------------|-------------------------|-------------------------|
| 1-1/2" | 1.61" | 0.079"       | 150 psi                 | 80 lbs.                 |
| 2"     | 2.09" | 0.087"       | 150 psi                 | 103 lbs                 |
| 2-1/2" | 2.56" | 0.091"       | 150 psi                 | 124 lbs                 |
| 3"     | 3.07" | 0.095"       | 150 psi                 | 164 lbs                 |
| 4"     | 4.13" | 0.102"       | 150 psi                 | 254 lbs                 |
| 6"     | 6.18" | 0.119"       | 150 psi                 | 400lbs                  |
| 8"     | 8.19" | 0.134"       | 115 psi                 | CALL                    |



# NITRILE/PVC LAY-FLAT DISCHARGE HOSE

YELLOW & BLACK

For the transfer of water, wash-down, jetting and irrigation. Oil-resistant tube and cover. Resists heat and cold, abrasion, ozone and UV. This hose is lightweight and flexible. For use in industrial wash-down, irrigation, general dewatering, pump discharge and drainage.

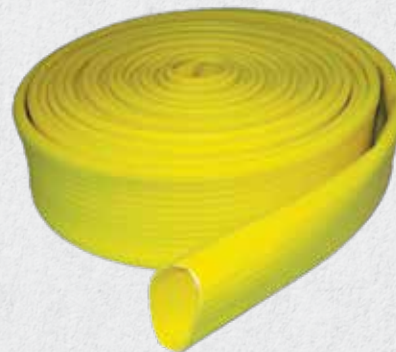
|                       |                             |
|-----------------------|-----------------------------|
| <b>TUBE AND COVER</b> | Black or yellow PVC/Nitrile |
| <b>REINFORCEMENT</b>  | Polyester                   |
| <b>TEMPERATURE</b>    | -20°F to +176°F             |

| I.D.     | WALL THICKNESS | MAX. W.P. AT 68°F | BURST PRESSURE | WEIGHT     |
|----------|----------------|-------------------|----------------|------------|
| 3/4 in   | 0.110 in       | 250 psi           | 800 psi        | 0.10 lb/ft |
| 1 in     | 0.110 in       | 250 psi           | 800 psi        | 0.14 lb/ft |
| 1 1/2 in | 0.110 in       | 250 psi           | 800 psi        | 0.26 lb/ft |
| 2 in     | 0.110 in       | 250 psi           | 800 psi        | 0.34 lb/ft |
| 2 1/2 in | 0.110 in       | 250 psi           | 800 psi        | 0.47 lb/ft |
| 3 in     | 0.110 in       | 250 psi           | 750 psi        | 0.65 lb/ft |
| 4 in     | 0.110 in       | 200 psi           | 600 psi        | 0.83 lb/ft |
| 6 in     | 0.110 in       | 150 psi           | 450 psi        | 1.60 lb/ft |

## BLACK DISCHARGE HOSE



## YELLOW DISCHARGE HOSE



# CLEAR BRAIDED PVC TUBING

Food-grade, clear hose with textile braided reinforcement for added strength. For water and light chemical transfer applications where visual inspection of material flow is necessary. FDA layline. Often used in food processing. Can be crimped or banded to make assemblies per your specifications.

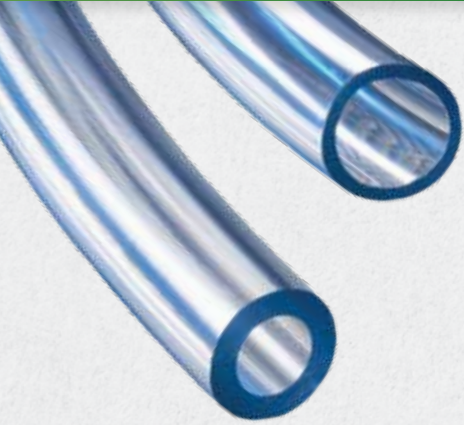


|                          |                               |
|--------------------------|-------------------------------|
| <b>CONSTRUCTION</b>      | Clear PVC tube, textile braid |
| <b>TEMPERATURE RANGE</b> | -10°F to 130°F                |

| I.D.   | O.D.   | MAX WORKING PRESSURE @ 72° F (PSI) | DESIGN BURST PRESSURE @ 72° F (PSI) | APPROX WEIGHT (LBS/ FT) |
|--------|--------|------------------------------------|-------------------------------------|-------------------------|
| 3/16"  | .41"   | 250                                | 1,000                               | 0.044                   |
| 1/4"   | .47"   | 250                                | 1,000                               | 0.057                   |
| 5/16"  | .54"   | 200                                | 1,000                               | 0.08                    |
| 3/8"   | .625"  | 200                                | 800                                 | 0.09                    |
| 1/2"   | .75"   | 200                                | 800                                 | 0.14                    |
| 5/8"   | .88"   | 200                                | 800                                 | 0.18                    |
| 3/4"   | 1.03"  | 175                                | 600                                 | 0.22                    |
| 1"     | 1.32"  | 125                                | 500                                 | 0.30                    |
| 1 1/4" | 1.75"  | 100                                | 400                                 | 0.46                    |
| 1 1/2" | 2"     | 75                                 | 300                                 | 0.64                    |
| 2"     | 2 1/2" | 75                                 | 300                                 | 0.94                    |



# CLEAR PVC TUBING



Food-grade, clear hose for water and light chemical transfer applications where visual inspection of material flow is necessary. Available in various wall thicknesses in certain sizes. FDA approved. Can be crimped or banded to make assemblies per your specifications.

|                          |                |
|--------------------------|----------------|
| <b>CONSTRUCTION</b>      | Clear PVC tube |
| <b>TEMPERATURE RANGE</b> | -10°F to 130°F |

| I.D.   | O.D.   | WALL THICKNESS (INCH) | MAX W.P. @ 72° F (PSI) | APPROX WEIGHT (LBS/ FT) |
|--------|--------|-----------------------|------------------------|-------------------------|
| 1/8"   | 1/4"   | 1/16"                 | 70                     | 0.02                    |
| 3/16"  | 5/16"  | 1/16"                 | 70                     | 0.027                   |
| 1/4"   | 3/8"   | 1/16"                 | 60                     | 0.034                   |
| 1/4"   | 7/16"  | 3/32"                 | 60                     | 0.055                   |
| 1/4"   | 1/2"   | 1/8"                  | 70                     | 0.08                    |
| 5/16"  | 7/16"  | 1/16"                 | 50                     | 0.04                    |
| 5/16"  | 1/2"   | 3/32"                 | 60                     | 0.065                   |
| 3/8"   | 1/2"   | 1/16"                 | 50                     | 0.047                   |
| 3/8"   | 9/16"  | 3/32"                 | 55                     | 0.075                   |
| 3/8"   | 5/8"   | 1/8"                  | 60                     | 0.107                   |
| 1/2"   | 5/8"   | 1/16"                 | 40                     | 0.06                    |
| 1/2"   | 3/4"   | 1/8"                  | 50                     | 0.134                   |
| 9/16"  | 7/8"   | 5/32"                 | 45                     | 0.161                   |
| 5/8"   | 7/8"   | 5/32"                 | 45                     | 0.161                   |
| 3/4"   | 1"     | 1/8"                  | 35                     | 0.188                   |
| 7/8"   | 1 1/8" | 1/8"                  | 35                     | 0.218                   |
| 1"     | 1 1/4" | 1/8"                  | 30                     | 0.241                   |
| 1 1/4" | 1 3/4" | 1/4"                  | 50                     | 0.322                   |
| 1 1/2" | 2"     | 1/4"                  | 40                     | 0.375                   |
| 2"     | 2 3/8" | 3/16"                 | 25                     | 0.482                   |

# SPRING WIRE PVC HOSE



Food grade, clear hose with steel spring-wire reinforcement suitable for vacuum service. For water, food and beverage dispensing, deionized water systems, and light chemical transfer applications where visual inspection of material flow is necessary. FDA approved. Can be crimped or banded to make assemblies per your specifications.

|                          |  |
|--------------------------|--|
| <b>CONSTRUCTION</b>      | Clear PVC tube, electro-galvanized steel spring wire |
| <b>TEMPERATURE RANGE</b> | -10°F to 140°F                                       |

| I.D.   | O.D.   | MAX. W.P. AT 70°F (PSI) | APPROX. WT. (LBS/FT) |
|--------|--------|-------------------------|----------------------|
| 1/4"   | 1/2"   | 210                     | .09                  |
| 3/8"   | 5/8"   | 180                     | .12                  |
| 1/2"   | 13/16" | 150                     | .21                  |
| 5/8"   | 1"     | 100                     | .32                  |
| 3/4"   | 1-1/8" | 100                     | .36                  |
| 1"     | 1-3/8" | 84                      | .47                  |
| 1-1/4" | 1-3/4" | 84                      | .78                  |
| 1-1/2" | 2"     | 84                      | .86                  |
| 2"     | 2-1/2" | 70                      | 1.12                 |





# FIRE & MILL HOSE





# FIRE HOSE



all be of superior quality and workmanship. The hose shall withstand of front-line firefighting, and other discharge applications.

## SYNTHETIC, ALL-POLYESTER DOUBLE JACKET

### MILDEW RESISTANT

### HEAVY-WALL EPDM RUBBER LINER OR POLYURETHANE LINER, NSF-61 COMPLIANT

### AVAILABLE IN WHITE, BLUE, AND ORANGE

**Jacket Construction:** Double-jacket hose manufactured to this specification shall be tightly woven with filament polyester yarn in the filler and ring-spun polyester yarn in the warp of both the inside and outside jackets. The hose shall be resistant to most chemicals and petrol products, and resist deterioration due to exposure to UV-rays and ozone. It shall not be affected by rot or mildew. The inside and outside jackets shall be manufactured with a minimum pick count of 9.5 picks per inch for increased strength and abrasion resistance. The inside jacket shall be manufactured using a reverse-twill process to reduce friction loss. The inside jacket shall be manufactured on a circular loom in a clockwise direction and the outside jacket in a counter-clockwise direction. The hose must be of sufficient body and weight to meet the demands of heavy-duty firefighting usage.

**Abrasion Impregnation:** Hose assemblies shall be available with the special polyurethane-based polymer impregnation for added abrasion resistance and ease in identification.

**Lining:** The liner shall be a single-ply, synthetic, high-tensile EPDM rubber or a polyether-based urethane. The liner shall be free from dirt, blisters, and other imperfections. Inside surface shall be smooth and free from corrugations. The adhesion between the liner and the jacket shall be such that the rate of separation of a 1.50" strip of lining, transversely cut, shall not be greater than 1" per minute under a 12-pound weight.

**Performance:** The minimum burst test pressure on all diameters shall be 900 PSI/62 Bar.

**Couplings:** Unless otherwise specified, each length of hose shall be fitted with a set of cast or forged brass couplings.

| I.D.   | SERVICE TEST | PROOF TEST | BURST TEST | BOWL SIZE | WEIGHT / FT |
|--------|--------------|------------|------------|-----------|-------------|
| 1 1/2" | 300 psi      | 600 psi    | 900 psi    | 1 15/16"  | .34 lbs     |
| 1 3/4" | 300 psi      | 600 psi    | 900 psi    | 2 1/8"    | .38 lbs     |
| 2 1/2" | 300 psi      | 600 psi    | 900 psi    | 3"        | .54 lbs     |
| 4"     | 300 psi      | 600 psi    | 900 psi    | 4 1/2"    | 1.0 lbs     |

# DJ MILL HOSE & ASSEMBLIES



## BULK HOSE

A double covered, lightweight, and flexible discharge hose for municipal washdown, hydrant water supply lines, equipment & pump rental, shipyard washdown, and other various discharge applications. Increased abrasion resistance and pressure rating. This economical hose rolls up flat for easy storage and transfer.

|              |                               |                          |                                |
|--------------|-------------------------------|--------------------------|--------------------------------|
| <b>TUBE</b>  | SBR                           | <b>TEMPERATURE RANGE</b> | -25°F (-32°C) to 185°F (+85°C) |
| <b>COVER</b> | Double jacket white polyester | <b>STANDARD LENGTHS</b>  | 50', 100'                      |

## HOSE CHART

| I.D.     | SERV. PRESS. | TEST PRESS. | WEIGHT     |
|----------|--------------|-------------|------------|
| 1 1/2 in | 300 psi      | 600 psi     | 0.26 lb/ft |
| 38.10 mm | 20.68 bar    | 41.36 bar   | 0.39 kg/m  |
| 2 in     | 300 psi      | 600 psi     | 0.33 lb/ft |
| 50.80 mm | 20.68 bar    | 41.36 bar   | 0.49 kg/m  |
| 2 1/2 in | 300 psi      | 600 psi     | 0.45 lb/ft |
| 63.50 mm | 20.68 bar    | 41.36 bar   | 0.67 kg/m  |

## ASSEMBLIES

All of the same great features and benefits as our bulk hose, and now with the added benefit of coupled assemblies. Couplings are internally expanded, aluminum, hard-coated NPS or NST Male x Female rocker lug. For the transfer of water, wash-down, jetting and irrigation.

## ASSEMBLIES CHART

| I.D.     | STD LENGTH | THREAD TYPE | WEIGHT      |
|----------|------------|-------------|-------------|
| 1 1/2 in | 50 ft      | NPS         | 15.00 lb/ft |
| 1 1/2 in | 50 ft      | NST         | 15.00 lb/ft |
| 2 in     | 50 ft      | NPS         | 20.00 lb/ft |
| 2 1/2 in | 50 ft      | NPS         | 25.00 lb/ft |
| 2 1/2 in | 50 ft      | NST         | 25.00 lb/ft |





# SJ HOSE & ASSEMBLIES



Heavy-duty, but lightweight synthetic cover for better abrasion resistance and abuse. Higher working pressures. For water discharge service in rental yards, fleet service, municipal wash-down, utility dewatering. Available in bulk hose, standard and custom assemblies.

|              |                        |                          |                |
|--------------|------------------------|--------------------------|----------------|
| <b>TUBE</b>  | SBR                    | <b>TEMPERATURE RANGE</b> | -25°F to 185°F |
| <b>COVER</b> | White polyester jacket | <b>STANDARD LENGTHS</b>  | 50', 100'      |

## HOSE CHART

| I.D.     | CPLNG. BOWL | SERV. PRESS. | WEIGHT     |
|----------|-------------|--------------|------------|
| 1 1/2 in | 1.81 in     | 230 psi      | 0.23 lb/ft |
| 2 in     | 2.31 in     | 230 psi      | 0.28 lb/ft |
| 2 1/2 in | 2.81 in     | 200 psi      | 0.39 lb/ft |
| 3 in     | 3.38 in     | 200 psi      | 0.50 lb/ft |
| 4 in     | 4.38 in     | 200 psi      | 0.66 lb/ft |

## ASSEMBLIES CHART

| I.D.     | LENGTH | COUPLING | WEIGHT |
|----------|--------|----------|--------|
| 1 1/2 in | 50FT   | Pin Lug  | 15 lbs |
| 1 1/2 in | 50FT   | C x E    | 15 lbs |
| 2 in     | 50FT   | Pin Lug  | 19 lbs |
| 2 in     | 50FT   | C x E    | 19 lbs |
| 3 in     | 50FT   | Pin Lug  | 22 lbs |
| 3 in     | 50FT   | C x E    | 22 lbs |

### PIN LUG ASSEMBLY



### CAMLOCK ASSEMBLY



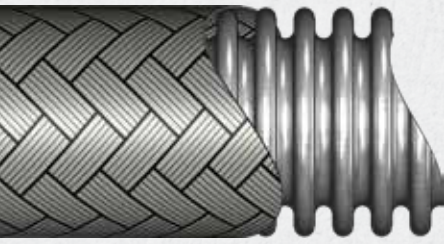




# METAL HOSE







Annuflex is the standard of Hose Master's extensive line of high-performance, annular-corrugated, stainless-steel hoses. Proprietary technology ensures the excellent life cycle of the hose, with minimum effort to flex or bend the hose.

| INSIDE DIAMETER (IN) | NUMBER OF BRAIDS (#) | OUTSIDE DIAMETER (IN) | STATIC MIN. BEND RADIUS (IN) | DYNAMIC MIN. BEND RADIUS (IN) | MAXIMUM WORKING PRESSURE (PSI) | BURST PRESSURE (PSI) | WEIGHT PER FOOT (LBS) |
|----------------------|----------------------|-----------------------|------------------------------|-------------------------------|--------------------------------|----------------------|-----------------------|
| 1/4                  | 0                    | 0.41                  | 1.0                          | 4.5                           | 90                             | n/a                  | 0.04                  |
|                      | 1                    | 0.47                  |                              |                               | 1800                           | 7233                 | 0.11                  |
|                      | 2                    | 0.53                  |                              |                               | 2700                           | 9100                 | 0.18                  |
| 3/8                  | 0                    | 0.65                  | 1.2                          | 5.0                           | 70                             | n/a                  | 0.10                  |
|                      | 1                    | 0.71                  |                              |                               | 1558                           | 6230                 | 0.20                  |
|                      | 2                    | 0.77                  |                              |                               | 2336                           | 9345                 | 0.30                  |
| 1/2                  | 0                    | 0.77                  | 1.5                          | 5.5                           | 70                             | n/a                  | 0.11                  |
|                      | 1                    | 0.83                  |                              |                               | 1186                           | 4743                 | 0.22                  |
|                      | 2                    | 0.89                  |                              |                               | 1779                           | 7115                 | 0.33                  |
| 5/8                  | 0                    | 0.96                  | 1.8                          | 7.0                           | 57                             | n/a                  | 0.17                  |
|                      | 1                    | 1.02                  |                              |                               | 1205                           | 4820                 | 0.33                  |
|                      | 2                    | 1.08                  |                              |                               | 1808                           | 7230                 | 0.49                  |
| 3/4                  | 0                    | 1.16                  | 2.1                          | 8.0                           | 43                             | n/a                  | 0.19                  |
|                      | 1                    | 1.22                  |                              |                               | 898                            | 3591                 | 0.37                  |
|                      | 2                    | 1.28                  |                              |                               | 1347                           | 5387                 | 0.55                  |
| 1                    | 0                    | 1.47                  | 2.7                          | 9.0                           | 43                             | n/a                  | 0.26                  |
|                      | 1                    | 1.53                  |                              |                               | 718                            | 2872                 | 0.50                  |
|                      | 2                    | 1.59                  |                              |                               | 1077                           | 4308                 | 0.74                  |
| 1 1/4                | 0                    | 1.75                  | 3.1                          | 10.0                          | 43                             | n/a                  | 0.29                  |
|                      | 1                    | 1.83                  |                              |                               | 645                            | 2581                 | 0.61                  |
|                      | 2                    | 1.91                  |                              |                               | 968                            | 3872                 | 0.93                  |
| 1 1/2                | 0                    | 2.08                  | 3.9                          | 11.0                          | 28                             | n/a                  | 0.47                  |
|                      | 1                    | 2.16                  |                              |                               | 531                            | 2125                 | 0.85                  |
|                      | 2                    | 2.24                  |                              |                               | 797                            | 3188                 | 1.23                  |
| 2                    | 0                    | 2.61                  | 5.1                          | 13.0                          | 14                             | n/a                  | 0.59                  |
|                      | 1                    | 2.69                  |                              |                               | 449                            | 1797                 | 1.11                  |
|                      | 2                    | 2.77                  |                              |                               | 674                            | 2696                 | 1.63                  |

| INSIDE DIAMETER (IN) | NUMBER OF BRAIDS (#) | OUTSIDE DIAMETER (IN) | STATIC MIN. BEND RADIUS (IN) | DYNAMIC MIN. BEND RADIUS (IN) | MAXIMUM WORKING PRESSURE (PSI) | BURST PRESSURE (PSI) | WEIGHT PER FOOT (LBS) |
|----------------------|----------------------|-----------------------|------------------------------|-------------------------------|--------------------------------|----------------------|-----------------------|
| 2 1/2                | 0                    | 3.40                  | 6.8                          | 16.0                          | 14                             | n/a                  | 0.84                  |
|                      | 1                    | 3.50                  |                              |                               | 417                            | 1669                 | 1.64                  |
|                      | 2                    | 3.60                  |                              |                               | 626                            | 2504                 | 2.44                  |
| 3                    | 0                    | 3.88                  | 7.8                          | 18.0                          | 14                             | n/a                  | 1.18                  |
|                      | 1                    | 3.98                  |                              |                               | 346                            | 1384                 | 2.06                  |
|                      | 2                    | 4.08                  |                              |                               | 519                            | 2076                 | 2.94                  |
| 4                    | 0                    | 4.96                  | 9.8                          | 22.0                          | 14                             | n/a                  | 1.41                  |
|                      | 1                    | 5.06                  |                              |                               | 299                            | 1194                 | 2.69                  |
|                      | 2                    | 5.16                  |                              |                               | 448                            | 1791                 | 3.97                  |
| 5                    | 0                    | 6.00                  | 12.8                         | 28.0                          | 14                             | n/a                  | 2.18                  |
|                      | 1                    | 6.12                  |                              |                               | 275                            | 1099                 | 3.61                  |
|                      | 2                    | 6.24                  |                              |                               | 412                            | 1649                 | 5.04                  |
| 6                    | 0                    | 7.01                  | 14.8                         | 32.0                          | 11                             | n/a                  | 2.69                  |
|                      | 1                    | 7.13                  |                              |                               | 210                            | 839                  | 4.44                  |
|                      | 2                    | 7.25                  |                              |                               | 315                            | 1259                 | 6.19                  |
| 8*                   | 0                    | 9.04                  | 18.0                         | 29.0                          | 3                              | n/a                  | 4.88                  |
|                      | 1                    | 9.32                  |                              |                               | 250                            | 1000                 | 8.21                  |
|                      | 2                    | 9.60                  |                              |                               | 360                            | 1446                 | 11.53                 |
| 10*                  | 0                    | 11.34                 | 21.0                         | 34.0                          | 4                              | n/a                  | 7.42                  |
|                      | 1                    | 11.56                 |                              |                               | 175                            | 700                  | 11.05                 |
|                      | 2                    | 11.78                 |                              |                               | 310                            | 1247                 | 14.67                 |
| 12*                  | 0                    | 13.45                 | 27.0                         | 44.0                          | 3                              | n/a                  | 11.04                 |
|                      | 1                    | 13.73                 |                              |                               | 185                            | 745                  | 16.71                 |
|                      | 2                    | 14.00                 |                              |                               | 325                            | 1308                 | 22.38                 |

\*8", 10" and 12" diameters are supplied with braided braid.

**Notes:** The minimum bend radius is measured from the centerline of the hose. The working pressure decreases with temperature – see derating factor. For rapid pressure fluctuations, consult the factory.

\*The specifications listed represent Hose Master LLC products only and do not represent any other manufacturer's products.



# MASTERFLEX HIGH-FLEXIBILITY METAL HOSE



Masterflex is manufactured using the same high-quality process used to make Annuflex hose, but the number of corrugations per foot is increased to allow for greater flexibility.

| INSIDE DIAMETER (IN) | NUMBER OF BRAIDS (#) | OUTSIDE DIAMETER (IN) | STATIC MIN. BEND RADIUS (IN) | DYNAMIC MIN. BEND RADIUS (IN) | MAXIMUM WORKING PRESSURE (PSI) | BURST PRESSURE (PSI) | WEIGHT PER FOOT (LBS) |
|----------------------|----------------------|-----------------------|------------------------------|-------------------------------|--------------------------------|----------------------|-----------------------|
| 1/4                  | 0                    | 0.42                  | 0.9                          | 3.7                           | 90                             | n/a                  | 0.07                  |
|                      | 1                    | 0.48                  |                              |                               | 1800                           | 7233                 | 0.14                  |
|                      | 2                    | 0.54                  |                              |                               | 2700                           | 9100                 | 0.20                  |
| 3/8                  | 0                    | 0.65                  | 1                            | 4                             | 70                             | n/a                  | 0.15                  |
|                      | 1                    | 0.71                  |                              |                               | 1558                           | 6230                 | 0.25                  |
|                      | 2                    | 0.77                  |                              |                               | 2336                           | 9345                 | 0.36                  |
| 1/2                  | 0                    | 0.77                  | 1.2                          | 4.4                           | 70                             | n/a                  | 0.18                  |
|                      | 1                    | 0.83                  |                              |                               | 1186                           | 4743                 | 0.32                  |
|                      | 2                    | 0.89                  |                              |                               | 1779                           | 7115                 | 0.47                  |
| 5/8                  | 0                    | 0.96                  | 1.4                          | 5.6                           | 57                             | n/a                  | 0.19                  |
|                      | 1                    | 1.02                  |                              |                               | 1205                           | 4820                 | 0.37                  |
|                      | 2                    | 1.08                  |                              |                               | 1808                           | 7230                 | 0.54                  |
| 3/4                  | 0                    | 1.16                  | 1.7                          | 6.4                           | 43                             | n/a                  | 0.31                  |
|                      | 1                    | 1.22                  |                              |                               | 898                            | 3591                 | 0.53                  |
|                      | 2                    | 1.28                  |                              |                               | 1347                           | 5387                 | 0.74                  |
| 1                    | 0                    | 1.47                  | 2.1                          | 7.1                           | 43                             | n/a                  | 0.41                  |
|                      | 1                    | 1.53                  |                              |                               | 718                            | 2872                 | 0.76                  |
|                      | 2                    | 1.63                  |                              |                               | 1077                           | 4308                 | 1.11                  |
| 1 1/4                | 0                    | 1.75                  | 2.5                          | 7.9                           | 43                             | n/a                  | 0.63                  |
|                      | 1                    | 1.83                  |                              |                               | 645                            | 2581                 | 1.00                  |
|                      | 2                    | 1.91                  |                              |                               | 968                            | 3872                 | 1.37                  |
| 1 1/2                | 0                    | 2.08                  | 3.1                          | 8.7                           | 28                             | n/a                  | 0.70                  |
|                      | 1                    | 2.16                  |                              |                               | 531                            | 2125                 | 1.16                  |
|                      | 2                    | 2.24                  |                              |                               | 797                            | 3188                 | 1.63                  |
| 2                    | 0                    | 2.61                  | 4                            | 10.3                          | 14                             | n/a                  | 0.88                  |
|                      | 1                    | 2.69                  |                              |                               | 449                            | 1797                 | 1.44                  |
|                      | 2                    | 2.77                  |                              |                               | 674                            | 2696                 | 1.99                  |
| 2 1/2                | 0                    | 3.40                  | 5.4                          | 12.8                          | 14                             | n/a                  | 1.36                  |
|                      | 1                    | 3.50                  |                              |                               | 417                            | 1669                 | 2.16                  |
|                      | 2                    | 3.60                  |                              |                               | 626                            | 2504                 | 2.96                  |
| 3                    | 0                    | 3.88                  | 6.3                          | 14.5                          | 14                             | n/a                  | 1.63                  |
|                      | 1                    | 3.98                  |                              |                               | 346                            | 1384                 | 2.50                  |
|                      | 2                    | 4.08                  |                              |                               | 519                            | 2076                 | 3.37                  |
| 4                    | 0                    | 4.96                  | 7.7                          | 17.4                          | 14                             | n/a                  | 2.53                  |
|                      | 1                    | 5.06                  |                              |                               | 299                            | 1194                 | 3.90                  |
|                      | 2                    | 5.16                  |                              |                               | 448                            | 1791                 | 5.29                  |
| 5                    | 0                    | 6.00                  | 10                           | 21.9                          | 14                             | n/a                  | 4.07                  |
|                      | 1                    | 6.12                  |                              |                               | 275                            | 1099                 | 5.53                  |
|                      | 2                    | 6.24                  |                              |                               | 412                            | 1649                 | 6.99                  |
| 6                    | 0                    | 7.01                  | 11.6                         | 25                            | 11                             | n/a                  | 4.46                  |
|                      | 1                    | 7.13                  |                              |                               | 210                            | 839                  | 6.34                  |
|                      | 2                    | 7.25                  |                              |                               | 315                            | 1259                 | 8.22                  |

**Notes:** The minimum bend radius is measured from the centerline of the hose. The working pressure decreases with temperature – see derating factor. For rapid pressure fluctuations, consult the factory.

The specifications listed represent Hose Master LLC products only and do not represent any other manufacturer's products.

# PRESSUREFLEX HP® HIGH-PRESSURE METAL HOSE



Pressureflex HP® is Hose Master's high-pressure, annular-corrugated metal hose. Pressureflex HP is made from heavy-wall stainless steel, and offers flexibility and dependability when higher pressures are a factor.

| INSIDE DIAMETER (IN) | NUMBER OF BRAIDS (#) | OUTSIDE DIAMETER (IN) | STATIC MIN. BEND RADIUS (IN) | DYNAMIC MIN. BEND RADIUS (IN) | MAXIMUM WORKING PRESSURE (PSI) | BURST PRESSURE (PSI) | WEIGHT PER FOOT (LBS) |
|----------------------|----------------------|-----------------------|------------------------------|-------------------------------|--------------------------------|----------------------|-----------------------|
| 1/4                  | 0                    | 0.423                 | 1                            | 5.5                           | 450                            | n/a                  | 0.08                  |
|                      | 1                    | 0.483                 |                              |                               | 3000                           | 12000                | 0.15                  |
|                      | 2                    | 0.543                 |                              |                               | 4000                           | 16000                | 0.22                  |
| 3/8                  | 0                    | 0.655                 | 1.5                          | 8.5                           | 400                            | n/a                  | 0.12                  |
|                      | 1                    | 0.735                 |                              |                               | 2400                           | 9600                 | 0.31                  |
|                      | 2                    | 0.815                 |                              |                               | 3300                           | 14000                | 0.48                  |
| 1/2                  | 0                    | 0.774                 | 2.5                          | 10                            | 400                            | n/a                  | 0.24                  |
|                      | 1                    | 0.854                 |                              |                               | 2400                           | 9600                 | 0.40                  |
|                      | 2                    | 0.934                 |                              |                               | 3200                           | 12800                | 0.57                  |
| 3/4                  | 0                    | 1.13                  | 4                            | 8                             | 220                            | n/a                  | 0.41                  |
|                      | 1                    | 1.19                  |                              |                               | 1100                           | 4430                 | 0.58                  |
|                      | 2                    | 1.25                  |                              |                               | 1650                           | 6696                 | 0.76                  |
| 1                    | 0                    | 1.43                  | 5                            | 9                             | 190                            | n/a                  | 0.52                  |
|                      | 1                    | 1.49                  |                              |                               | 1000                           | 4187                 | 0.76                  |
|                      | 2                    | 1.55                  |                              |                               | 1400                           | 5837                 | 0.99                  |
| 1 1/4                | 0                    | 1.74                  | 6.5                          | 12                            | 200                            | n/a                  | 0.76                  |
|                      | 1                    | 1.82                  |                              |                               | 900                            | 3758                 | 1.13                  |
|                      | 2                    | 1.90                  |                              |                               | 1350                           | 5494                 | 1.50                  |
| 1 1/2                | 0                    | 2.10                  | 7.5                          | 13                            | 90                             | n/a                  | 1.13                  |
|                      | 1                    | 2.18                  |                              |                               | 750                            | 3070                 | 1.54                  |
|                      | 2                    | 2.26                  |                              |                               | 1200                           | 4842                 | 1.96                  |
| 2                    | 0                    | 2.55                  | 9                            | 15                            | 105                            | n/a                  | 1.10                  |
|                      | 1                    | 2.68                  |                              |                               | 800                            | 3304                 | 2.29                  |
|                      | 2                    | 2.80                  |                              |                               | 1150                           | 4738                 | 3.47                  |
| 2 1/2                | 0                    | 3.35                  | 10.5                         | 17                            | 46                             | n/a                  | 1.75                  |
|                      | 1                    | 3.48                  |                              |                               | 575                            | 2461                 | 3.05                  |
|                      | 2                    | 3.60                  |                              |                               | 900                            | 3857                 | 4.35                  |
| 3                    | 0                    | 3.67                  | 12                           | 20                            | 36                             | n/a                  | 1.92                  |
|                      | 1                    | 3.79                  |                              |                               | 550                            | 2252                 | 3.18                  |
|                      | 2                    | 3.92                  |                              |                               | 800                            | 3254                 | 4.46                  |
| 4                    | 0                    | 4.92                  | 9.8                          | 25                            | 23                             | n/a                  | 2.29                  |
|                      | 1                    | 5.04                  |                              |                               | 425                            | 1754                 | 4.12                  |
|                      | 2                    | 5.16                  |                              |                               | 575                            | 2350                 | 5.98                  |
| 5*                   | 0                    | 5.96                  | 12.8                         | 34                            | 28                             | n/a                  | 3.03                  |
|                      | 1                    | 6.13                  |                              |                               | 331                            | 1324                 | 5.14                  |
| 6*                   | 0                    | 6.97                  | 14.8                         | 40                            | 23                             | n/a                  | 3.74                  |
|                      | 1                    | 7.22                  |                              |                               | 285                            | 1140                 | 6.44                  |

\*5-inch and 6-inch diameters are supplied with braided braid

**Notes:** Some hose material and braid code combinations may be unavailable. Contact Hose Master Customer Service at 800-221-2319 for available combinations of hose material and braid alloys by hose size. The minimum bend radius is measured from the centerline of the hose. The working pressure decreases with temperature – see derating factor. For rapid pressure fluctuations, consult the factory.

The specifications listed represent Hose Master LLC products only and do not represent any other manufacturer's products.







ChemKing™ is Hose Master's chemical transfer hose. ChemKing offers excellent corrosion resistance to many of the most severe applications found in chemical processing.

| INSIDE DIAMETER (IN) | NUMBER OF BRAIDS (#) | OUTSIDE DIAMETER (IN) | STATIC MIN. BEND RADIUS (IN) | DYNAMIC MIN. BEND RADIUS (IN) | MAXIMUM WORKING PRESSURE (PSI) | BURST PRESSURE (PSI) | WEIGHT PER FOOT (LBS) |
|----------------------|----------------------|-----------------------|------------------------------|-------------------------------|--------------------------------|----------------------|-----------------------|
| 1/2                  | 0                    | 0.77                  | 1.5                          | 5.5                           | 70                             | n/a                  | 0.11                  |
|                      | 1                    | 0.83                  |                              |                               | 1186                           | 4743                 | 0.22                  |
|                      | 2                    | 0.89                  |                              |                               | 1779                           | 7115                 | 0.33                  |
| 3/4                  | 0                    | 1.16                  | 2.1                          | 8                             | 43                             | n/a                  | 0.19                  |
|                      | 1                    | 1.22                  |                              |                               | 898                            | 3591                 | 0.37                  |
|                      | 2                    | 1.28                  |                              |                               | 1347                           | 5387                 | 0.55                  |
| 1                    | 0                    | 1.47                  | 2.7                          | 9                             | 43                             | n/a                  | 0.26                  |
|                      | 1                    | 1.53                  |                              |                               | 718                            | 2872                 | 0.50                  |
|                      | 2                    | 1.59                  |                              |                               | 1077                           | 4308                 | 0.74                  |
| 1 1/2                | 0                    | 2.08                  | 3.9                          | 11                            | 28                             | n/a                  | 0.47                  |
|                      | 1                    | 2.16                  |                              |                               | 531                            | 2125                 | 0.85                  |
|                      | 2                    | 2.24                  |                              |                               | 797                            | 3188                 | 1.23                  |
| 2                    | 0                    | 2.61                  | 5.1                          | 13                            | 14                             | n/a                  | 0.59                  |
|                      | 1                    | 2.69                  |                              |                               | 449                            | 1797                 | 1.11                  |
|                      | 2                    | 2.77                  |                              |                               | 674                            | 2696                 | 1.63                  |
| 3                    | 0                    | 3.88                  | 7.8                          | 18                            | 14                             | n/a                  | 1.18                  |
|                      | 1                    | 3.98                  |                              |                               | 346                            | 1384                 | 2.06                  |
|                      | 2                    | 4.08                  |                              |                               | 519                            | 2076                 | 2.94                  |
| 4*                   | 0                    | 4.96                  | 9.8                          | 22                            | 14                             | n/a                  | 1.41                  |
|                      | 1                    | 5.06                  |                              |                               | 299                            | 1194                 | 2.47                  |
|                      | 2                    | 5.16                  |                              |                               | 448                            | 1791                 | 3.53                  |
| 5*                   | 0                    | 6.00                  | 12.8                         | 28                            | 14                             | n/a                  | 2.18                  |
|                      | 1                    | 6.12                  |                              |                               | 275                            | 1099                 | 3.61                  |
|                      | 2                    | 6.24                  |                              |                               | 412                            | 1646                 | 5.04                  |
| 6*                   | 0                    | 7.01                  | 14.8                         | 32                            | 11                             | n/a                  | 2.69                  |
|                      | 1                    | 7.13                  |                              |                               | 210                            | 839                  | 4.44                  |
|                      | 2                    | 7.25                  |                              |                               | 315                            | 1259                 | 6.19                  |

\*4", 5", and 6" diameters; consult factory for delivery.

**Notes:** The minimum bend radius is measured from the centerline of the hose. The working pressure decreases with temperature – see derating factor. For rapid pressure fluctuations, consult the factory. Braid is T316 stainless steel. Monel braid is available upon request. When Monel braid is used, stated pressure ratings need to be reduced by 0.75. Part numbers for Monel braid are AF6780 (single braid), and AF6788 (double braid).

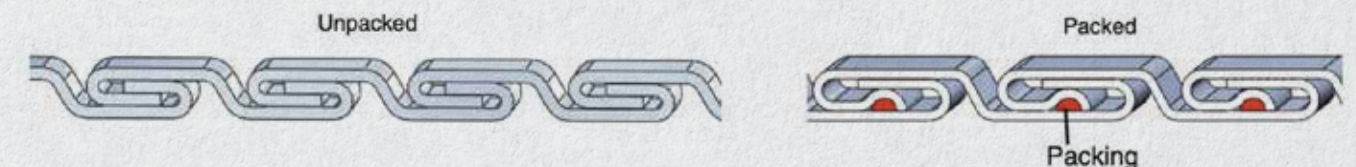
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INTERFLEX (Roughbore) is Hose Master's high-quality, general-purpose hose, constructed from a single strip of metal that is profiled and locked onto itself. The interlocked, or overlapping, sections of strip are able to slide back and forth, providing the ability to flex.

| INSIDE DIAMETER (IN) | IN 10 (GS,SS)     |                        | IN 15 (GS,SS,16,20) |                        | IN 18 (GS,SS,16,20) |                        | IN 25 (GS,SS,20)  |                        | IN 30 (GS,SS)     |                        | IN 20 AL          |                        |
|----------------------|-------------------|------------------------|---------------------|------------------------|---------------------|------------------------|-------------------|------------------------|-------------------|------------------------|-------------------|------------------------|
|                      | WT. PER FT. (LBS) | MIN. BEND RADIUS (IN.) | WT. PER FT. (LBS)   | MIN. BEND RADIUS (IN.) | WT. PER FT. (LBS)   | MIN. BEND RADIUS (IN.) | WT. PER FT. (LBS) | MIN. BEND RADIUS (IN.) | WT. PER FT. (LBS) | MIN. BEND RADIUS (IN.) | WT. PER FT. (LBS) | MIN. BEND RADIUS (IN.) |
| 1 3/8                |                   |                        | 0.7                 | 7                      | 0.8                 | 7                      |                   |                        |                   |                        |                   |                        |
| 1 1/2                | 0.5               | 6                      | 0.7                 | 6                      | 0.9                 | 6                      | 1.3               | 7                      |                   |                        |                   |                        |
| 2*                   | 0.7               | 8                      | 1                   | 8                      | 1.1                 | 8                      | 1.7               | 9                      | 2.0*              | 11                     |                   |                        |
| 2 1/2*               | 0.8               | 10                     | 1.2                 | 10                     | 1.4                 | 10                     | 2.1               | 11                     | 2.5*              | 13                     |                   |                        |
| 3                    | 1                 | 11                     | 1.4                 | 12                     | 1.6                 | 12                     | 2.5               | 13                     | 2.9               | 14                     | 0.7               | 14                     |
| 3 1/2                | 1.1               | 13                     | 1.6                 | 14                     | 1.9                 | 14                     | 2.8               | 15                     | 3.4               | 16                     | 0.8               | 16                     |
| 4                    | 1.2               | 14                     | 1.8                 | 16                     | 2.2                 | 16                     | 3.2               | 17                     | 3.8               | 18                     | 0.9               | 18                     |
| 4 1/2                | 1.4               | 17                     | 2                   | 17                     | 2.4                 | 17                     | 3.6               | 19                     | 4.3               | 20                     | 1                 | 20                     |
| 5                    | 1.5               | 18                     | 2.2                 | 19                     | 2.7                 | 19                     | 4                 | 21                     | 4.7               | 22                     | 1.1               | 22                     |
| 6                    | 1.8               | 21                     | 2.7                 | 23                     | 3.2                 | 23                     | 4.7               | 25                     | 5.6               | 26                     | 1.3               | 26                     |
| 7                    |                   |                        | 3.1                 | 27                     | 3.7                 | 27                     | 5.5               | 29                     | 6.5               | 30                     | 1.5               | 30                     |
| 8                    |                   |                        | 3.5                 | 30                     | 4.2                 | 30                     | 6.2               | 33                     | 7.4               | 34                     | 1.8               | 34                     |
| 9                    |                   |                        | 3.9                 | 34                     | 4.7                 | 34                     | 7                 | 37                     | 8.3               | 38                     | 2                 | 38                     |
| 10                   |                   |                        | 4.4                 | 38                     | 5.2                 | 38                     | 7.7               | 41                     | 9.2               | 42                     | 2.2               | 42                     |
| 11                   |                   |                        |                     |                        | 5.7                 | 42                     | 8.5               | 45                     | 10.1              | 46                     | 2.4               | 46                     |
| 12                   |                   |                        |                     |                        | 6.2                 | 45                     | 9.3               | 49                     | 11                | 50                     | 2.6               | 50                     |
| 13                   |                   |                        |                     |                        | 6.7                 | 49                     | 10                | 53                     | 11.9              | 54                     | 2.8               | 54                     |
| 14                   |                   |                        |                     |                        | 7.2                 | 53                     | 10.8              | 56                     | 12.8              | 57                     | 3                 | 57                     |
| 15                   |                   |                        |                     |                        | 7.7                 | 56                     | 11.5              | 60                     | 13.7              | 61                     | 3.2               | 61                     |
| 16                   |                   |                        |                     |                        | 8.2                 | 60                     | 12.3              | 64                     | 14.6              | 65                     | 3.4               | 64                     |

\*2" & 2 1/2" diameters: 30 available in Galvanize only.

**Notes:** Other diameters are available upon request. For packed hose, add 10% to both weight per foot and minimum bend radius. Minimum bend radius is measured from the centerline of the hose.



### AVAILABLE PACKINGS

| PACKING TYPE          | FEATURES                | MAX TEMP.        |
|-----------------------|-------------------------|------------------|
| Low-Temp Elastomeric  | Max Pressure and Vacuum | 200° F           |
| High-Temp Elastomeric | Max Pressure and Vacuum | 500° F           |
| Low-temp Fiber        | Economical              | 180° F           |
| High-Temp Fiber       | Elevated Temperature    | 1000° F          |
| Metal                 | Extreme Temp.           | 800° F – 1200° F |

### WHEN TO CONSIDER PACKING:

Interlocked metal hose, by the nature of its construction, is not pressure tight. However, pressure and media infiltration through the interlocked wall can be minimized by the insertion of one of a variety of packings into the wall during hose manufacturing. Packing consists of a continuous cord or strand of elastomer, or other material that is locked into a special channel between the interlocked hose-wall layers. The choice of packing material is tailored to the demands of the specific application.

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# SMOOTH BORE PTFE LINED HOSE (R115)



Applications centering on the transfer of fluids or gases under demanding conditions in harsh environments are opportunities for the user to realize the value of Titeflex.

## STANDARDS

- Meets or exceeds requirements of SAE 100R14
- PTFE meets FDA 21 CFR 177.1550

## VACUUM SERVICE

- Sizes -4 through -10 are rated for full vacuum
- Larger sizes -12 and above can be reinforced with an internal support spring for full vacuum service

## HOSE CONSTRUCTION

- Innercore vertically extruded to maintain highest quality of concentricity
- Manufactured from fine powder PTFE
- 304 stainless steel wire braid reinforcement

| HOSE SIZE    | NOMINAL SIZE (IN) | ID INCHES AVERAGE (IN) | OD INCHES AVERAGE (IN) | WORKING PSI | BURST PSI | MIN BEND RADIUS (IN) | PTFE WALL THICKNESS (IN) | WEIGHT (LB/FT) |
|--------------|-------------------|------------------------|------------------------|-------------|-----------|----------------------|--------------------------|----------------|
| R115/R105-3  | 0.1875            | 0.139                  | 0.258                  | 3,000       | 12,000    | 2                    | 0.037                    | 0.05           |
| R115/R105-4  | 0.25              | 0.188                  | 0.301                  | 3,000       | 12,000    | 2                    | 0.03                     | 0.07           |
| R115/R105-5  | 0.3125            | 0.25                   | 0.365                  | 3,000       | 12,000    | 3                    | 0.03                     | 0.1            |
| R115/R105-6  | 0.375             | 0.313                  | 0.433                  | 2,500       | 10,000    | 4                    | 0.03                     | 0.11           |
| R115/R105-8  | 0.5               | 0.41                   | 0.524                  | 2,000       | 8,000     | 5.25                 | 0.031                    | 0.13           |
| R115/R105-10 | 0.625             | 0.504                  | 0.633                  | 1,500       | 6,000     | 6.5                  | 0.031                    | 0.15           |
| R115/R105-11 | 0.6875            | 0.607                  | 0.724                  | 1,250       | 5,000     | 7.75                 | 0.031                    | 0.17           |
| R115/R105-12 | 0.75              | 0.636                  | 0.763                  | 1,200       | 4,800     | 7.75                 | 0.036                    | 0.17           |
| R115/R105-16 | 1                 | 0.875                  | 1.01                   | 800         | 3,200     | 9                    | 0.04                     | 0.27           |
| R115/R105-20 | 1.25              | 1.125                  | 1.315                  | 800         | 3,200     | 16                   | 0.052                    | 0.54           |

# CONVOLUTED BORE PTFE LINED HOSE (R272)



Unmatched engineering and technical experience in the application of convoluted PTFE hose products has allowed users to consistently rely on Titeflex for dependable performance and value every time.

## HOSE CONSTRUCTION

A white non-conductive PTFE liner, externally reinforced with PTFE impregnated fiberglass and a single steel wire braid.

| HOSE SIZE    | NOMINAL SIZE (IN) | NOMINAL OD | MAWP PSI (PSI) | BURST PSI (PSI) | MIN BEND RADIUS (IN) | WEIGHT (LB/FT) |
|--------------|-------------------|------------|----------------|-----------------|----------------------|----------------|
| R272/R276-8  | 0.5               | 0.785      | 1,000          | 4,000           | 1                    | 0.22           |
| R272/R276-12 | 0.75              | 1.06       | 1,000          | 4,000           | 2                    | 0.29           |
| R272/R276-16 | 1                 | 1.28       | 1,000          | 4,000           | 3                    | 0.41           |
| R272/R276-20 | 1.25              | 1.525      | 1,000          | 3,600           | 6.25                 | 0.5            |
| R272/R276-24 | 1.5               | 1.802      | 750.00         | 3,000           | 7.5                  | 0.62           |
| R272/R276-32 | 2                 | 2.305      | 750            | 2000            | 10                   | 0.97           |



# HOSE FITTINGS





A cam and groove coupling, also called a "camlock" fitting, is a form of hose coupling popular because it is a simple and reliable means of connecting and disconnecting quickly and without tools.

The cams at the end of each lever on the female end align with a circumferential groove on the male end. When the levers are rotated to the locked position, they pull the male end into the female socket, creating a tight seal up against a gasket. The arms lock into position using an over-center arrangement, preventing accidental decoupling. Because the groove is cut all the way around the male end, there is no specific alignment necessary to couple as there would be with threaded connectors, and there is no opportunity for cross-threading. This results in an error-resistant, faster coupling operation. Because the compression between the two fittings is limited by the size of the cams on the end of the levers and the rotation of the levers themselves, there is also no possibility of over- or under-tightening the fitting; the pressure against the sealing gasket is effectively constant from one coupling operation to the next, reducing possibility of leaks.

Because there are no threads to become fouled, cam and groove couplings are popular in moderately dirty environments, such as septic tank pump trucks and chemical / fuel tanker trucks.

A cam and groove fitting can be used in a system where rapid filling of chemical drums takes place. It can be used by factories that have needs of dye, paint and ink medium transfers. It is used where frequent changes of hoses are required to find the right mix. It is also suitable for petroleum trucks, etc.

**Note:** Cam and groove couplings are not recommended for any type of compressed gas service, including steam.

## GENERAL SPEAKING, THE MOST COMMON TYPES OF CAM AND GROOVE COUPLING ARE THESE:

- **TYPE A:** adapter (male camlock) X female thread
- **TYPE B:** coupler (female camlock) X male thread
- **TYPE C:** coupler (female camlock) X shank
- **TYPE D:** coupler (female camlock) X female thread
- **TYPE E:** adapter (male camlock) X shank
- **TYPE F:** adapter (male camlock) X male thread
- **DUST CAP:** covers & seals adapter (male camlock) end
- **DUST PLUG:** covers & seals coupler (female camlock) end

Additional materials (hardcoat aluminum, carbon steel, food grade, nylon, and more) are also available. Additional configuration can be custom made. Please call regarding any item or spare part not seen here.

Parts denoted with an \* may be welded.

Drawings and pressure chart follow part listings.

## BASIC FITTINGS & DIMENSIONS PART A

### PART A - ADAPTER X FEMALE THREAD

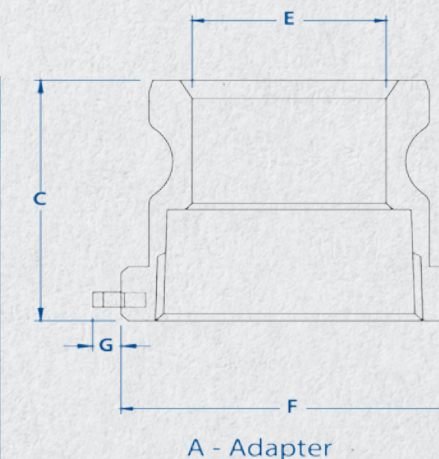


### GENERAL DIMENSIONS

| REF | DESCRIPTION              | E05  | 5    | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"   | 2 1/2" | 3"   | 4"   | 5"   | 6"   | 8"    | 10"   | 12"   |
|-----|--------------------------|------|------|------|------|--------|--------|------|--------|------|------|------|------|-------|-------|-------|
| C   | COUPLER OR ADAPTER SIZE  | 0.5  | 0.75 | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4    | 5    | 6    | 8     | 10    | 12    |
|     | THREAD SIZE              | 0.5  | 0.5  | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4    | 5    | 6    | 8     | 10    | 12    |
| E   | OVERALL LENGTH (in)      | 1.6  | 1.62 | 1.62 | 1.91 | 2.16   | 2.29-  | 2.54 | 2.75   | 2.84 | 3.16 | 3.22 | 3.35 | 4.5   | 4.5   | 4.38  |
| F   | INSIDE DIAMETER (in)     | 0.53 | 0.66 | 0.75 | 0.88 | 1.04   | 1.35-  | 1.72 | 2.14   | 2.8  | 3.78 | 4.79 | 5.99 | 7.8   | 10.1  | 12    |
| G   | ACROSS CORNERS (in)      | 1.12 | 1.49 | 1.49 | 1.76 | 2.19   | 2.44   | 2.92 | 3.49   | 4.22 | 5.41 | 6.49 | 7.7  | 10.23 | 12.79 | 14.75 |
| G   | CHAIN LUG EXTENSION (in) | N/A  | N/A  | N/A  | 0.34 | 0.34   | 0.33   | 0.31 | 0.27   | 0.44 | 0.39 | 0.35 | 0.6  | 0.6   | 0.6   | 0.6   |

### STANDARD PARTS

| SIZE        | PART NAME | ALUMINUM<br>ITEM # | BRASS<br>ITEM # | STAINLESS STEEL<br>ITEM # | POLYPROPYLENE<br>ITEM # |
|-------------|-----------|--------------------|-----------------|---------------------------|-------------------------|
| 1/2"        | E05A      | 1000101            | 1200101         | 1400101                   | CALL                    |
| 3/4" x 1/2" | 1/2A      | 1000105            | 1200105         | 1400105                   | CALL                    |
| 3/4"        | 07A       | 1000107            | 1200107         | 1400107                   | 2700107                 |
| 1"          | 10A       | 1000110            | 1200110         | 1400110                   | 2700110                 |
| 1 1/4"      | 12A       | 1000112            | 1200112         | 1400112                   | 2700112                 |
| 1 1/2"      | 15A       | 1000115            | 1200115         | 1400115                   | 2700115                 |
| 2"          | 20A       | 1000120            | 1200120         | 1400120                   | 2700120                 |
| 2 1/2"      | 25A       | 1000125            | 1200125         | 1400125                   | CALL                    |
| 3"          | 30A       | 1000130            | 1200130         | 1400130                   | 2700130                 |
| 4"          | 40A       | 1000140            | 1200140         | 1400140                   | 2700140                 |
| 5"          | 50A       | 1000150            | 1200150         | 1400150                   | CALL                    |
| 6"          | 60A       | 1000160            | 1200160         | 1400160                   | CALL                    |
| 8"          | 80A       | 1000180            | 1200180         | 1400180                   | CALL                    |
| 10"         | 100A      | 1000190            | 1200190         | 1400190                   | CALL                    |
| 12"         | 120A      | 1000192            | CALL            | 1400192                   | CALL                    |





## BASIC FITTINGS & DIMENSIONS PART B

### PART B - COUPLER X MALE THREAD

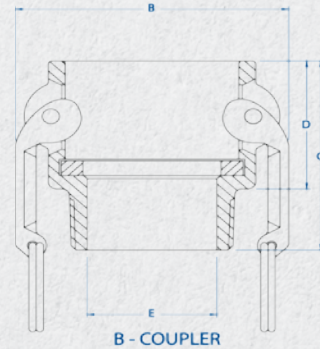


#### GENERAL DIMENSIONS

| REF | DESCRIPTION                    | E05  | 5    | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"   | 2 1/2" | 3"   | 4"    | 5"    | 6"    | 8"    | 10"   | 12"   |
|-----|--------------------------------|------|------|------|------|--------|--------|------|--------|------|-------|-------|-------|-------|-------|-------|
| A   | COUPLER OR ADAPTER SIZE        | 0.5  | 0.75 | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4     | 5     | 6     | 8     | 10    | 12    |
|     | THREAD SIZE                    | 0.5  | 0.5  | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4     | 5     | 6     | 8     | 10    | 12    |
|     | O.D. WITH CAM ARMS EXTENDED in | 4.21 | 4.51 | 4.51 | 5.1  | 6.86   | 7.16   | 7.54 | 8.03   | 9.56 | 10.66 | 11.67 | 16.26 | 18.23 | 20.66 | 22.72 |
| B   | OUTSIDE DIAMETER in            | 1.82 | 2.11 | 2.11 | 2.44 | 3.26   | 3.56   | 3.94 | 4.43   | 5.46 | 6.56  | 7.57  | 10.16 | 12.13 | 14.56 | 16.62 |
| C   | OVERALL LENGTH in              | 2.1  | 2.1  | 2.1  | 2.5  | 2.89   | 2.93   | 3.2  | 3.63   | 3.82 | 4     | 4.2   | 4.52  | 4.8   | 5.5   | 5.7   |
| D   | EXPOSED LENGTH in              | 1.25 | 1.25 | 1.25 | 1.56 | 1.84   | 1.88   | 2.15 | 2.18   | 2.27 | 2.34  | 2.44  | 2.62  | 2.72  | 3.2   | 3.2   |
| E   | INSIDE DIAMETER in             | 0.56 | 0.56 | 0.78 | 0.97 | 1.25   | 1.5    | 1.88 | 2.38   | 2.88 | 3.6   | 4.5   | 5.6   | 7.5   | 9.4   | 11.4  |

#### STANDARD PARTS

| SIZE        | PART NAME | ALUMINUM/<br>STAINLESS<br>HANDLES | ALUMINUM/<br>BRASS<br>HANDLES | BRASS/<br>STAINLESS<br>HANDLES | BRASS/<br>BRASS<br>HANDLES | STAINLESS<br>STEEL | POLYPROPYLENE |
|-------------|-----------|-----------------------------------|-------------------------------|--------------------------------|----------------------------|--------------------|---------------|
| 1/2"        | E05B      | 1000201                           | 1070201                       | 1290201                        | 1200201                    | 1400201            | CALL          |
| 3/4" x 1/2" | 1/2B      | 1000205                           | 1070205                       | 1290205                        | 1200205                    | 1400205            | CALL          |
| 3/4"        | 07B       | 1000207                           | 1070207                       | 1290207                        | 1200207                    | 1400207            | 2700207       |
| 1"          | 10B       | 1000210                           | 1070210                       | 1290210                        | 1200210                    | 1400210            | 2700210       |
| 1 1/4"      | 12B       | 1000212                           | 1070212                       | 1290212                        | 1200212                    | 1400212            | 2700212       |
| 1 1/2"      | 15B       | 1000215                           | 1070215                       | 1290215                        | 1200215                    | 1400215            | 2700215       |
| 2"          | 20B       | 1000220                           | 1070220                       | 1290220                        | 1200220                    | 1400220            | 2700220       |
| 2 1/2"      | 25B       | 1000225                           | 1070225                       | 1290225                        | 1200225                    | 1400225            | CALL          |
| 3"          | 30B       | 1000230                           | 1070230                       | 1290230                        | 1200230                    | 1400230            | 2700230       |
| 4"          | 40B       | 1000240                           | 1070240                       | 1290240                        | 1200240                    | 1400240            | CALL          |
| 5"          | 50B       | 1000250                           | 1070250                       | 1290250                        | 1200250                    | 1400250            | CALL          |
| 6"          | 60B       | 1000260                           | 1070260                       | CALL                           | 1200260                    | 1400260            | CALL          |
| 8"          | 80B       | 1000280                           | 1070280                       | CALL                           | 1200280                    | 1400280            | CALL          |
| 10"         | 100B      | 1000290                           | 1070290                       | CALL                           | 1200290                    | CALL               | CALL          |
| 12"         | 120B      | 1000292                           | 1070292                       | CALL                           | CALL                       | CALL               | CALL          |



B - COUPLER

## BASIC FITTINGS & DIMENSIONS PART C

### PART C - COUPLER X HOSE SHANK

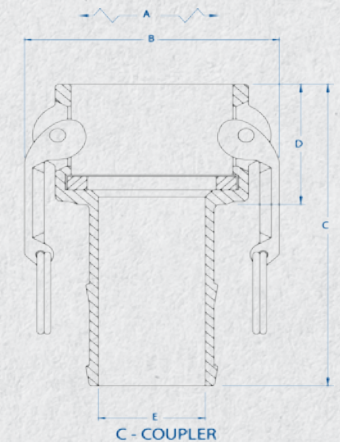


#### GENERAL DIMENSIONS

| REF | DESCRIPTION                    | E05  | 5    | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"   | 2 1/2" | 3"   | 4"    | 5"    | 6"    | 8"    | 10"   | 12"   |
|-----|--------------------------------|------|------|------|------|--------|--------|------|--------|------|-------|-------|-------|-------|-------|-------|
| A   | COUPLER OR ADAPTER SIZE        | 0.5  | 0.75 | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4     | 5     | 6     | 8     | 10    | 12    |
|     | HOSE SHANK SIZE                | 0.5  | 0.5  | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4     | 5     | 6     | 8     | 10    | 12    |
|     | O.D. WITH CAM ARMS EXTENDED in | 4.21 | 4.51 | 4.51 | 5.1  | 6.86   | 7.16   | 7.54 | 8.03   | 9.56 | 10.66 | 11.67 | 16.26 | 18.23 | 20.66 | 22.72 |
| B   | OUTSIDE DIAMETER in            | 1.82 | 2.11 | 2.11 | 2.44 | 3.26   | 3.56   | 3.94 | 4.43   | 5.46 | 6.56  | 7.57  | 10.16 | 12.13 | 14.56 | 16.62 |
| C   | OVERALL LENGTH in              | 2.69 | 2.7  | 3.55 | 4.06 | 4.44   | 4.82   | 5.53 | 5.93   | 6.32 | 6.64  | 7.24  | 9.5   | 9.5   | 12    | 12    |
| D   | EXPOSED LENGTH in              | 1.25 | 1.25 | 1.25 | 1.56 | 1.84   | 1.88   | 2.15 | 2.18   | 2.27 | 2.34  | 2.44  | 2.7   | 2.72  | 3.2   | 3.3   |
| E   | INSIDE DIAMETER in             | 0.38 | 0.38 | 0.53 | 0.78 | 0.97   | 1.22   | 1.71 | 2.16   | 2.65 | 3.53  | 4.53  | 5.53  | 7.53  | 9.4   | 11.4  |

#### STANDARD PARTS

| SIZE        | PART NAME | ALUMINUM/<br>STAINLESS<br>STEEL<br>HANDLES | ALUMINUM/<br>BRASS<br>HANDLES | BRASS/<br>STAINLESS<br>STEEL<br>HANDLES | BRASS/<br>BRASS<br>HANDLES | STAINLESS<br>STEEL | POLYPROPYLENE |
|-------------|-----------|--|-------------------------------|---|----------------------------|--------------------|---------------|
| 1/2"        | E05C      | 1000301                                    | 1070301                       | 1290301                                 | 1200301                    | 1400301            | CALL          |
| 3/4" x 1/2" | 1/2C      | 1000305                                    | 1070305                       | CALL                                    | 1200305                    | CALL               | CALL          |
| 3/4"        | 07C       | 1000307                                    | 1070307                       | 1290307                                 | 1200307                    | 1400307            | 2700307       |
| 1"          | 10C       | 1000310                                    | 1070310                       | 1290310                                 | 1200310                    | 1400310            | 2700310       |
| 1 1/4"      | 12C       | 1000312                                    | 1070312                       | 1290312                                 | 1200312                    | 1400312            | 2700312       |
| 1 1/2"      | 15C       | 1000315                                    | 1070315                       | 1290315                                 | 1200315                    | 1400315            | 2700315       |
| 2"          | 20C       | 1000320                                    | 1070320                       | 1290320                                 | 1200320                    | 1400320            | 2700320       |
| 2 1/2"      | 25C       | 1000325                                    | 1070325                       | 1290325                                 | 1200325                    | 1400325            | CALL          |
| 3"          | 30C       | 1000330                                    | 1070330                       | 1290330                                 | 1200330                    | 1400330            | 2700330       |
| 4"          | 40C       | 1000340                                    | 1070340                       | 1290340                                 | 1200340                    | 1400340            | 2700340       |
| 5"          | 50C       | 1000350                                    | 1070350                       | 1290350                                 | 1200350                    | 1400350            | CALL          |
| 6"          | 60C       | 1000360                                    | 1070360                       | CALL                                    | 1200360                    | 1400360            | CALL          |
| 8"          | 80C       | 1000380                                    | 1070380                       | CALL                                    | 1200380                    | 1400380            | CALL          |
| 10"         | 100C      | 1000390                                    | 1070390                       | CALL                                    | 1200390                    | 1400390            | CALL          |
| 12"         | 120C      | 1000392                                    | 1070392                       | CALL                                    | CALL                       | 1400392            | CALL          |



C - COUPLER



## BASIC FITTINGS & DIMENSIONS PART D

### PART D - COUPLER X FEMALE THREAD

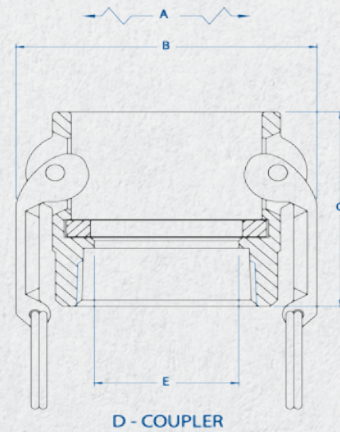


#### GENERAL DIMENSIONS

| REF | DESCRIPTION                    | E05                 | 5    | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"   | 2 1/2" | 3"   | 4"    | 5"    | 6"    | 8"    | 10"   | 12"   |       |
|-----|--------------------------------|---------------------|------|------|------|--------|--------|------|--------|------|-------|-------|-------|-------|-------|-------|-------|
| A   | COUPLER OR ADAPTER SIZE        | 0.5                 | 0.75 | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4     | 5     | 6     | 8     | 10    | 12    |       |
|     | THREAD SIZE                    | 0.5                 | 0.5  | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4     | 5     | 6     | 8     | 10    | 12    |       |
|     | O.D. WITH CAM ARMS EXTENDED in | 4.21                | 4.51 | 4.51 | 5.1  | 6.86   | 7.16   | 7.54 | 8.03   | 9.56 | 10.66 | 11.67 | 16.26 | 18.23 | 20.66 | 22.72 |       |
|     | B                              | OUTSIDE DIAMETER in | 1.82 | 2.11 | 2.11 | 2.44   | 3.26   | 3.56 | 3.94   | 4.43 | 5.46  | 6.56  | 7.57  | 10.16 | 12.13 | 14.56 | 16.62 |
|     | C                              | OVERALL LENGTH in   | 2    | 2.1  | 2.1  | 2.5    | 2.7    | 2.8  | 3.1    | 3.4  | 3.5   | 3.9   | 4.1   | 4.4   | 4.8   | 5.5   | 5.7   |
| E   | INSIDE DIAMETER in             | 0.67                | 0.67 | 0.88 | 0.97 | 1.25   | 1.5    | 1.88 | 2.38   | 2.88 | 3.6   | 4.5   | 5.5   | 7.5   | 9.4   | 11.4  |       |

#### STANDARD PARTS

| SIZE        | PART NAME | ALUMINUM/STAINLESS STEEL HANDLES | ALUMINUM/BRASS HANDLES | BRASS/STAINLESS STEEL HANDLES | BRASS/BRASS HANDLES | STAINLESS STEEL | POLYPROPYLENE |
|-------------|-----------|----------------------------------|------------------------|-------------------------------|---------------------|-----------------|---------------|
| SIZE        | PART NAME | ITEM #                           | ITEM #                 | ITEM #                        | ITEM #              | ITEM #          | ITEM #        |
| 1/2"        | E05D      | 1000401                          | 1070401                | 1290401                       | 1200401             | 1400401         | CALL          |
| 3/4" x 1/2" | 1/2D      | 1000405                          | 1070405                | 1290405                       | 1200405             | 1400405         | CALL          |
| 3/4"        | 07D       | 1000407                          | 1070407                | 1290407                       | 1200407             | 1400407         | 2700407       |
| 1"          | 10D       | 1000410                          | 1070410                | 1290410                       | 1200410             | 1400410         | 2700410       |
| 1 1/4"      | 12D       | 1000412                          | 1070412                | 1290412                       | 1200412             | 1400412         | 2700412       |
| 1 1/2"      | 15D       | 1000415                          | 1070415                | 1290415                       | 1200415             | 1400415         | 2700415       |
| 2"          | 20D       | 1000420                          | 1070420                | 1290420                       | 1200420             | 1400420         | 2700420       |
| 2 1/2"      | 25D       | 1000425                          | 1070425                | 1290425                       | 1200425             | 1400425         | CALL          |
| 3"          | 30D       | 1000430                          | 1070430                | 1290430                       | 1200430             | 1400430         | 2700430       |
| 4"          | 40D       | 1000440                          | 1070440                | 1290440                       | 1200440             | 1400440         | CALL          |
| 5"          | 50D       | 1000450                          | 1070450                | 1290450                       | 1200450             | 1400450         | CALL          |
| 6"          | 60D       | 1000460                          | 1070460                | CALL                          | 1200460             | 1400460         | CALL          |
| 8"          | 80D       | 1000480                          | 1070480                | CALL                          | 1200480             | 1400480         | CALL          |
| 10"         | 100D      | 1000490                          | 1070490                | CALL                          | 1200490             | 1400490         | CALL          |
| 12"         | 120D      | 1000492                          | 1070492                | CALL                          | CALL                | 1400492         | CALL          |



## BASIC FITTINGS & DIMENSIONS PART E

### PART E - ADAPTER X HOSE SHANK

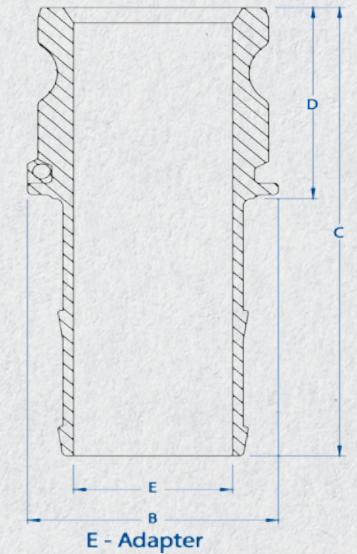


#### GENERAL DIMENSIONS

| REF | DESCRIPTION             | E05  | 5    | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"   | 2 1/2" | 3"   | 4"   | 5"   | 6"   | 8"   | 10"   | 12"   |
|-----|-------------------------|------|------|------|------|--------|--------|------|--------|------|------|------|------|------|-------|-------|
| A   | COUPLER OR ADAPTER SIZE | 0.5  | 0.75 | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3.00 | 4    | 5    | 6    | 8    | 10    | 12    |
|     | HOSE SHANK SIZE         | 0.5  | 0.5  | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4    | 5    | 6    | 8    | 10    | 12    |
| B   | OUTSIDE DIAMETER in     | 0.96 | 1.26 | 1.26 | 1.63 | 2      | 2.14   | 2.64 | 3.07   | 3.7  | 4.71 | 6.56 | 7.1  | 9.1  | 11.37 | 13.46 |
| C   | OVERALL LENGTH in       | 2.56 | 3.21 | 3.78 | 4.3  | 4.9    | 5.1    | 5.75 | 6.63   | 6.88 | 7.2  | 7.56 | 10.1 | 10.1 | 11.7  | 11.7  |
| D   | EXPOSED LENGTH in       | 1.11 | 1.46 | 1.46 | 1.8  | 2.36   | 2.15   | 2.4  | 2.47   | 2.53 | 2.6  | 2.81 | 3.3  | 3.3  | 2.88  | 2.88  |
| E   | INSIDE DIAMETER in      | 0.38 | 0.35 | 0.53 | 0.88 | 0.97   | 1.19   | 1.68 | 2.13   | 2.62 | 3.5  | 4.53 | 5.53 | 7.53 | 9.4   | 11.4  |

#### STANDARD PARTS

| SIZE        | PART NAME | ALUMINUM | BRASS   | STAINLESS STEEL | POLYPROPYLENE |
|-------------|-----------|----------|---------|-----------------|---------------|
| SIZE        | PART NAME | ITEM #   | ITEM #  | ITEM #          | ITEM #        |
| 1/2"        | E05E      | 1000501  | 1200501 | 1400501         | CALL          |
| 3/4" x 1/2" | 1/2E      | CALL     | 1200505 | 1400505         | CALL          |
| 3/4"        | 07E       | 1000507  | 1200507 | 1400507         | 2700507       |
| 1"          | 10E       | 1000510  | 1200510 | 1400510         | 2700510       |
| 1 1/4"      | 12E       | 1000512  | 1200512 | 1400512         | 2700512       |
| 1 1/2"      | 15E       | 1000515  | 1200515 | 1400515         | 2700515       |
| 2"          | 20E       | 1000520  | 1200520 | 1400520         | 2700520       |
| 2 1/2"      | 25E       | 1000525  | 1200525 | 1400525         | CALL          |
| 3"          | 30E       | 1000530  | 1200530 | 1400530         | 2700530       |
| 4"          | 40E       | 1000540  | 1200540 | 1400540         | 2700540       |
| 5"          | 50E       | 1000550  | 1200550 | 1400550         | CALL          |
| 6"          | 60E       | 1000560  | 1200560 | 1400560         | CALL          |
| 8"          | 80E       | 1000580  | 1200580 | 1400580         | CALL          |
| 10"         | 100E      | 1000590  | CALL    | 1400590         | CALL          |
| 12"         | 120E      | 1000592  | CALL    | CALL            | CALL          |





## BASIC FITTINGS & DIMENSIONS PART F

### PART F - ADAPTER X MALE THREAD

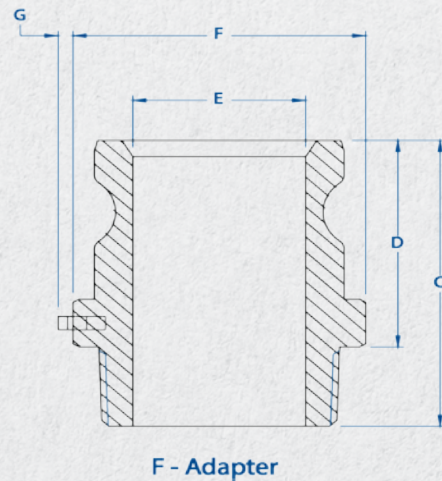


#### GENERAL DIMENSIONS

| REF | DESCRIPTION             | E05  | 5    | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"   | 2 1/2" | 3"   | 4"   | 5"   | 6"   | 8"  | 10"   | 12"  |
|-----|-------------------------|------|------|------|------|--------|--------|------|--------|------|------|------|------|-----|-------|------|
| C   | COUPLER OR ADAPTER SIZE | 0.5  | 0.75 | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4    | 5    | 6    | 8   | 10    | 12   |
|     | THREAD SIZE             | 0.5  | 0.5  | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4    | 5    | 6    | 8   | 10    | 12   |
| D   | OVERALL LENGTH in       | 1.96 | 2.47 | 2.47 | 2.89 | 3.23   | 3.29   | 3.57 | 4.18   | 4.37 | 4.79 | 4.91 | 5.2  | 5.9 | 6.75  | 7.2  |
| E   | EXPOSED LENGTH in       | 1.26 | 1.67 | 1.67 | 1.99 | 2.23   | 2.31   | 2.57 | 2.78   | 2.87 | 3.19 | 3.21 | 3.4  | 3.9 | 4.38  | 4.8  |
| F   | INSIDE DIAMETER in      | 0.53 | 0.56 | 0.75 | 0.85 | 1.04   | 1.34   | 1.72 | 2.14   | 2.8  | 3.78 | 4.79 | 5.84 | 7.8 | 9.88  | 12   |
| G   | MAX. ACROSS CORNERS in  | 1.12 | 1.42 | 1.42 | 1.75 | 2.16   | 2.44   | 2.84 | 3.45   | 4.07 | 5.27 | 6.39 | 7.7  | 10  | 11.87 | 14.1 |
| G   | CHAIN LUG EXTENSION in  | N/A  | N/A  | N/A  | 0.34 | 0.34   | 0.3    | 0.28 | 0.29   | 0.44 | 0.4  | 0.16 | 0.6  | 0.6 | 0.6   | 0.6  |

#### STANDARD PARTS

| SIZE        | PART NAME | ALUMINUM | BRASS   | STAINLESS STEEL | POLYPROPYLENE |
|-------------|-----------|----------|---------|-----------------|---------------|
| 1/2"        | E05F      | 1000601  | 1200601 | 1400601         | CALL          |
| 3/4" x 1/2" | 1/2F      | 1000605  | 1200605 | 1400605         | CALL          |
| 3/4"        | 07F       | 1000607  | 1200607 | 1400607         | 2700607       |
| 1"          | 10F       | 1000610  | 1200610 | 1400610         | 2700610       |
| 1 1/4"      | 12F       | 1000612  | 1200612 | 1400612         | 2700612       |
| 1 1/2"      | 15F       | 1000615  | 1200615 | 1400615         | 2700615       |
| 2"          | 20F       | 1000620  | 1200620 | 1400620         | 2700620       |
| 2 1/2"      | 25F       | 1000625  | 1200625 | 1400625         | CALL          |
| 3"          | 30F       | 1000630  | 1200630 | 1400630         | 2700630       |
| 4"          | 40F       | 1000640  | 1200640 | 1400640         | CALL          |
| 5"          | 50F       | 1000650  | 1200650 | 1400650         | CALL          |
| 6"          | 60F       | 1000660  | 1200660 | 1400660         | CALL          |
| 8"          | 80F       | 1000680  | 1200680 | 1400680         | CALL          |
| 10"         | 100F      | 1000690  | 1200690 | 1400690         | CALL          |
| 12"         | 120F      | 1000692  | CALL    | 1400692         | CALL          |



## BASIC FITTINGS & DIMENSIONS PART V

### PART V - DUST CAP

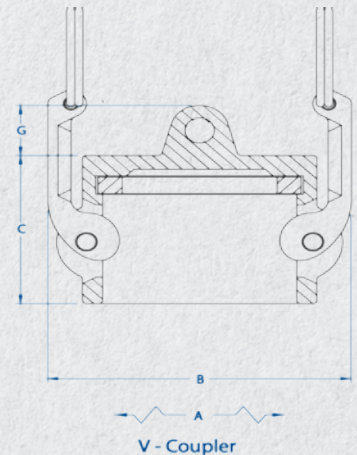


#### GENERAL DIMENSIONS

| REF | DESCRIPTION                    | E05  | 5   | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"   | 2 1/2" | 3"   | 4"    | 5"    | 6"    | 8"    | 10"   | 12"   |
|-----|--------------------------------|------|-----|------|------|--------|--------|------|--------|------|-------|-------|-------|-------|-------|-------|
| A   | COUPLER OR ADAPTER SIZE        | 0.5  | N/A | 0.75 | 1    | 1.25   | 1.5    | 2    | 2.5    | 3    | 4     | 5     | 6     | 8     | 10    | 12    |
|     | O.D. WITH CAM ARMS EXTENDED in | 4.21 | N/A | 4.51 | 5.1  | 6.86   | 7.16   | 7.54 | 8.03   | 9.56 | 10.66 | 11.67 | 16.26 | 18.23 | 20.66 | 22.72 |
| B   | OUTSIDE DIAMETER in            | 1.82 | N/A | 2.11 | 2.44 | 3.26   | 3.56   | 3.94 | 4.43   | 5.46 | 6.56  | 7.57  | 10.16 | 12.13 | 14.56 | 16.62 |
| C   | OVERALL LENGTH in              | 1.3  | N/A | 1.35 | 1.6  | 1.89   | 1.96   | 2.25 | 2.28   | 2.27 | 2.34  | 2.44  | 2.76  | 2.72  | 3.3   | 3.5   |
| G   | CHAIN LUG EXTENSION in         | 0.5  | N/A | 0.5  | 0.62 | 0.6    | 0.86   | 0.76 | 0.9    | 1.03 | 0.99  | 1.15  | 1.14  | 1.18  | 1.3   | 1.3   |

#### STANDARD PARTS

| SIZE   | PART NAME | ALUMINUM/<br>STAINLESS<br>STEEL<br>HANDLES | ALUMINUM/<br>BRASS<br>HANDLES | BRASS/<br>STAINLESS<br>STEEL<br>HANDLES | BRASS/<br>BRASS<br>HANDLES | STAINLESS<br>STEEL | POLYPROPYLENE |
|--------|-----------|--|-------------------------------|---|----------------------------|--------------------|---------------|
| 1/2"   | E05V      | 1001101                                    | 1071101                       | 1291101                                 | 1201101                    | 1401101            | CALL          |
| 3/4"   | 07V       | 1001107                                    | 1071107                       | 1291107                                 | 1201107                    | 1401107            | CALL          |
| 1"     | 10V       | 1001110                                    | 1071110                       | 1291110                                 | 1201110                    | 1401110            | 2701107       |
| 1 1/4" | 12V       | 1001112                                    | 1071112                       | 1291112                                 | 1201112                    | 1401112            | 2701110       |
| 1 1/2" | 15V       | 1001115                                    | 1071115                       | 1291115                                 | 1201115                    | 1401115            | 2701112       |
| 2"     | 20V       | 1001120                                    | 1071120                       | 1291120                                 | 1201120                    | 1401120            | 2701115       |
| 2 1/2" | 25V       | 1001125                                    | 1071125                       | 1291125                                 | 1201125                    | 1401125            | CALL          |
| 3"     | 30V       | 1001130                                    | 1071130                       | 1291130                                 | 1201130                    | 1401130            | 2701120       |
| 4"     | 40V       | 1001140                                    | 1071140                       | 1291140                                 | 1201140                    | 1401140            | 2701130       |
| 5"     | 50V       | 1001150                                    | 1071150                       | CALL                                    | 1201150                    | 1401150            | 2701140       |
| 6"     | 60V       | 1001160                                    | 1071160                       | CALL                                    | 1201160                    | 1401160            | CALL          |
| 8"     | 80V       | 1001180                                    | 1071180                       | CALL                                    | 1201180                    | 1401180            | CALL          |
| 10"    | 100V      | 1001190                                    | 1071190                       | CALL                                    | 1201190                    | 1401190            | CALL          |
| 12"    | 120V      | 1001192                                    | 1071192                       | CALL                                    | 1201192                    | 1401192            | CALL          |
| 12"    | 120C      | 1000392                                    | 1070392                       | CALL                                    | CALL                       | 1400392            | CALL          |





## BASIC FITTINGS & DIMENSIONS PART W

## PRESSURE RATING CHART

### PART W - DUST PLUG

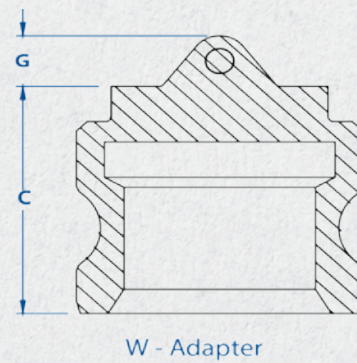


#### GENERAL DIMENSIONS

| REF | DESCRIPTION             | E05  | 5   | 3/4" | 1"   | 1 1/4" | 1 1/2" | 2"  | 2 1/2" | 3"   | 4"  | 5"   | 6"   | 8"   | 10" | 12"  |
|-----|-------------------------|------|-----|------|------|--------|--------|-----|--------|------|-----|------|------|------|-----|------|
| C   | COUPLER OR ADAPTER SIZE | 0.5  | N/A | 0.75 | 1    | 1.25   | 1.5    | 2   | 2.5    | 3    | 4   | 5    | 6    | 8    | 10  | 12   |
|     | OVERALL LENGTH in       | 1.06 | N/A | 1.41 | 1.35 | 1.94   | 2.06   | 1.9 | 2.44   | 2.03 | 2.1 | 2.63 | 2.28 | 2.28 | 3   | 2.88 |
| G   | CHAIN LUG EXTENSION in  | 0.5  | N/A | 0.59 | 0.96 | 0.62   | 0.5    | 0.7 | 0.81   | 1    | 1   | 0.85 | 1    | 1.18 | 0.9 | 0.5  |

#### STANDARD PARTS

| SIZE   | PART NAME | ALUMINUM<br>ITEM # | BRASS<br>ITEM # | STAINLESS STEEL<br>ITEM # | POLYPROPYLENE<br>ITEM # |
|--------|-----------|--------------------|-----------------|---------------------------|-------------------------|
| 1/2"   | E05W      | 1001201            | 1201201         | 1401201                   | CALL                    |
| 3/4"   | 07W       | 1001207            | 1201207         | 1401207                   | CALL                    |
| 1"     | 10W       | 1001210            | 1201210         | 1401210                   | 2701207                 |
| 1 1/4" | 12W       | 1001212            | 1201212         | 1401212                   | 2701210                 |
| 1 1/2" | 15W       | 1001215            | 1201215         | 1401215                   | 2701212                 |
| 2"     | 20W       | 1001220            | 1201220         | 1401220                   | 2701215                 |
| 2 1/2" | 25W       | 1001225            | 1201225         | 1401225                   | CALL                    |
| 3"     | 30W       | 1001230            | 1201230         | 1401230                   | 2701220                 |
| 4"     | 40W       | 1001240            | 1201240         | 1401240                   | 2701230                 |
| 5"     | 50W       | 1001250            | 1201250         | 1401250                   | 2701240                 |
| 6"     | 60W       | 1001260            | 1201260         | 1401260                   | CALL                    |
| 8"     | 80W       | 1001280            | 1201280         | 1401280                   | CALL                    |
| 10"    | 100W      | 1001290            | 1201290         | 1401290                   | CALL                    |
| 12"    | 120W      | 1001292            | CALL            | CALL                      | CALL                    |



| MATERIAL  | GASKET   | SIZE  | MAX. ALLOWABLE WORKING PRESSURE (PSI) |
|-----------|--|---|---------------------------------------|
| Metal     | Standard gaskets are Buna; any variation must be specified | 1/2", 3/4", 1/2", 3/4", 1",<br>1 1/4", 1 1/2", 2" | 250                                   |
|           |  | 2 1/2", 3"  | 200                                   |
|           |  | 4"  | 150                                   |
|           |  | 5", 6"  | 75                                    |
|           |  | 8", 10", 12"                                      | 50                                    |
| Non-Metal | Standard gaskets are Buna; any variation must be specified | 3/4", 1", 1 1/4", 1 1/2", 2"                      | 100                                   |
|           |  | 3", 4"  | 50                                    |



## 45- & 90-DEGREE FITTINGS

## 45- & 90-DEGREE FITTINGS CONTINUED

### 90-DEGREE PART A

| ADAPTER X FEMALE NPT THREAD |           | ALUMINUM | BRASS    | STAINLESS STEEL | POLYPROPYLENE |
|-----------------------------|-----------|----------|----------|-----------------|---------------|
| SIZE                        | PART NAME | ITEM #   | ITEM #   | ITEM #          | ITEM #        |
| 1-1/4"                      | 12LA      | CALL     | 62491200 | CALL            | CALL          |
| 1-1/2"                      | 15LA      | 60491500 | 62491500 | CALL            | 67491500      |
| 2"                          | 20LA      | 60492000 | CALL     | CALL            | 67492000      |
| 3"                          | 30LA      | 60493000 | CALL     | 64493000        | CALL          |



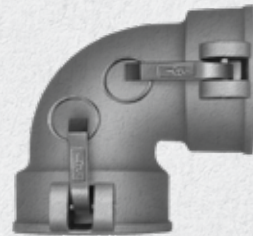
### 45- & 90-DEGREE COUPLER X ADAPTER

| COUPLER X ADAPTER |                | ALUMINUM/HBS | ALUMINUM/HB | BRASS    | STAINLESS STEEL |
|-------------------|----------------|--------------|-------------|----------|-----------------|
| SIZE              | PART NAME      | ITEM #       | ITEM #      | ITEM #   | ITEM #          |
| 2"                | 20CAL - 90 Deg | 60502120     | CALL        | 62502120 | 64504120        |
| 3"                | 30CAL - 90 Deg | 60503130     | 6050000066  | 62503130 | 64503130        |
| 3"                | 30CAL - 45 Deg | 6050313045   | 6050313046  | 62503131 | 64504130        |
| 4"                | 40CAL - 90 Deg | 60504140     | 6050000068  | 62504140 | 64504140        |
| 4"                | 40CAL - 45 Deg | 60504145     | 60504147    | 62504141 | 64505153        |
| 8"                | 80CAL - 90 Deg | CALL         | 60504181H*  | CALL     | CALL            |



### 45- & 90-DEGREE COUPLER X COUPLER

| COUPLER X COUPLER |                   | ALUMINUM/STAINLESS STEEL HANDLES | ALUMINUM/BRASS HANDLES | BRASS    | STAINLESS STEEL |
|-------------------|-------------------|----------------------------------|------------------------|----------|-----------------|
| SIZE              | PART NAME         | ITEM #                           | ITEM #                 | ITEM #   | ITEM #          |
| 2"                | 20DDL - 90 Deg    | 60502220*                        | CALL                   | CALL     | CALL            |
| 3"                | 30DDL - 90 Deg    | 60503230*                        | CALL                   | CALL     | 64503230        |
| 4"                | 40DDL - 90 Deg    | 60504240                         | 6050000069             | 62504240 | 64504240        |
| 4" x 3"           | 40X30DDL - 90 Deg | CALL                             | CALL                   | CALL     | 64504230        |
| 6" X 3"           | 60X30DDL-90 Deg   | 60506230*                        | CALL                   | CALL     | 64506260*       |
| 6"                | 60DDLHD - 90 Deg  | 60506260                         | CALL                   | CALL     | CALL            |



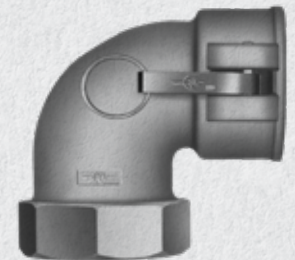
### 90-DEGREE PART C

| COUPLER X HOSE SHANK |           | ALUMINUM/STAINLESS STEEL HANDLES | ALUMINUM/BRASS HANDLES | BRASS    | STAINLESS STEEL | POLYPROPYLENE |
|----------------------|-----------|----------------------------------|------------------------|----------|-----------------|---------------|
| SIZE                 | PART NAME | ITEM #                           | ITEM #                 | ITEM #   | ITEM #          | ITEM #        |
| 1"                   | 10CL      | 60501000                         | 6050000061             | 62501000 | 64501000        | CALL          |
| 1-1/4"               | 12CL      | 60501200                         | 6050000062             | 62501200 | 64501200        | CALL          |
| 1-1/4" x 1-1/2"      | 12X15CL   | CALL                             | CALL                   | 62501215 | CALL            | CALL          |
| 1-1/2"               | 15CL      | 60501500                         | 6050000063             | 62501500 | 64501500        | 67501500      |
| 2"                   | 20CL      | 60502000                         | 6050000064             | 62502000 | 64502000        | 67502000      |
| 2-1/2"               | 25CL      | CALL                             | CALL                   | 62502500 | CALL            | CALL          |
| 3"                   | 30CL      | 60503000                         | 6050000065             | 62503000 | 64503000        | CALL          |
| 4"                   | 40CL      | 60504000                         | 6050000067             | 62504000 | 64504000        | CALL          |
| 6"                   | 60CL      | CALL                             | 60506000               | 62506000 | 64506000        | CALL          |



### 45- & 90-DEGREE PART D

| COUPLER X FEMALE NPT THREAD |               | ALUMINUM/STAINLESS STEEL HANDLES | ALUMINUM/BRASS HANDLES | BRASS    | STAINLESS STEEL | POLYPROPYLENE |
|-----------------------------|---------------|----------------------------------|------------------------|----------|-----------------|---------------|
| SIZE                        | PART NAME     | ITEM #                           | ITEM #                 | ITEM #   | ITEM #          | ITEM #        |
| 1"                          | 10LD          | 60481000                         | 6048000062             | 62481000 | 64481000        | CALL          |
| 1-1/4"                      | 12LD          | CALL                             | CALL                   | 62481200 | CALL            | CALL          |
| 1-1/2"                      | 15LD          | 60481500                         | 6048000063             | 62481500 | 64481500        | 67481500      |
| 2"                          | 20LD          | 60482000                         | 6048000005             | 62482000 | 64482000        | 67482000      |
| 2-1/2"                      | 25LD          | 60482500                         | 6048000103             | 62482500 | CALL            | CALL          |
| 3"                          | 30LD          | 60483000                         | 6048000060             | 62483000 | 64483000        | CALL          |
| 3" w/45°                    | 30LD - 45 Deg | 60483000SP                       | CALL                   | CALL     | CALL            | CALL          |
| 4"                          | 40LD          | 60484000                         | 6048000061             | 62484000 | 64484000        | CALL          |
| 6"                          | 60LD          | 60486000                         | CALL                   | 62486000 | 64486000        | CALL          |
| 10"                         | 100LD         | CALL                             | CALL                   | CALL     | 64481090        | CALL          |





## REDUCER FITTINGS

## REDUCER FITTINGS CONTINUED

### PART A REDUCER

| SIZE            | PART NAME | ALUMINUM  | BRASS    | STAINLESS STEEL |
|-----------------|-----------|-----------|----------|-----------------|
|                 |           | ITEM #    | ITEM #   | ITEM #          |
| 3/4" x 1"       | 07X10A    | 60220710  | CALL     | CALL            |
| 1" x 1/2"       | 10X05A    | CALL      | CALL     | 64141001        |
| 1" x 1-1/2"     | 10X15A    | 60141015  | CALL     | 64141015        |
| 1-1/2" x 1"     | 15X10A    | 60141510  | 62141510 | 64141510        |
| 1-1/2" x 1-1/4" | 15X12A    | CALL      | 62141512 | 64141512        |
| 1-1/2" x 2"     | 15X20A    | 60141520  | 62141520 | 64141520        |
| 2" x 1-1/4"     | 20X12A    | 60142012* | CALL     | CALL            |
| 2" x 1-1/2"     | 20X15A    | 60142015  | 62142015 | 64142015        |
| 2" x 2-1/2"     | 20X25A    | 60142025  | 62142025 | 64142025        |
| 2" x 3"         | 20X30A    | 60142030  | 62142030 | 64142030        |
| 2" x 4"         | 20X40A    | 60142040* | CALL     | 64142040*       |
| 2-1/2" x 1-1/2" | 25X15A    | 60142515  | CALL     | CALL            |
| 2-1/2" x 2"     | 25X20A    | 60142520  | 62142520 | 64142520        |
| 2-1/2" x 3"     | 25X30A    | 60142530  | 62142530 | 64142530        |
| 2-1/2" x 4"     | 25X40A    | 60142540  | 62142540 | CALL            |
| 3" x 1"         | 30X10A    | CALL      | CALL     | CALL            |
| 3" x 2"         | 30X20A    | 60143020  | 62143020 | 64143020        |
| 3" x 2-1/2"     | 30X25A    | 60143025  | 62143025 | CALL            |
| 3" x 4"         | 30X40A    | 60143040  | 62143040 | 64143040        |
| 4" x 2"         | 40X20A    | CALL      | CALL     | 64144020*       |
| 4" x 2-1/2"     | 40X25A    | 60144025  | 62144025 | CALL            |
| 4" x 3"         | 40X30A    | 60144030  | 62144030 | 64144030        |
| 4" x 5"         | 40X50A    | 60144050  | CALL     | 64144050        |
| 5" x 3"         | 50X30A    | 60145030  | CALL     | 64145030        |

### PART B REDUCER

| SIZE        | PART NAME | ALUMINUM  | BRASS    |
|-------------|-----------|-----------|----------|
|             |           | ITEM #    | ITEM #   |
| 1" x 2"     | 10X20B    | 60181020  | CALL     |
| 1-1/2" x 1" | 15X10B    | 60181510  | 62181510 |
| 1-1/2" x 2" | 15X20B    | 60181520  | CALL     |
| 2" x 1"     | 20X10B    | CALL      | 62182010 |
| 2" x 1-1/2" | 20X15B    | 60182015  | 62182015 |
| 2" x 2-1/2" | 20X25B    | 60182025* | CALL     |
| 2" x 3"     | 20X30B    | 60182030  | CALL     |
| 2-1/2" x 2" | 25X20B    | 60182520  | 62182520 |
| 2-1/2" x 3" | 25X30B    | 60182530  | CALL     |
| 3" x 2"     | 30X20B    | 60183020  | 62183020 |
| 3" x 2-1/2" | 30X25B    | 60183025  | 62183025 |
| 3" x 4"     | 30X40B    | 60183040  | 62183040 |
| 4" x 2"     | 40X20B    | 60184020  | CALL     |
| 4" x 2-1/2" | 40X25B    | 60184025  | 62184025 |
| 4" x 3"     | 40X30B    | 60184030  | 62184030 |
| 5" x 3"     | 50X30B    | 60185030* | CALL     |
| 5" x 4"     | 50X40B    | 60185040* | CALL     |
| 8" x 6"     | 80X60B    | 60188060* | CALL     |
| 8" x 10"    | 80X100B   | CALL      | CALL     |
| 10" x 8"    | 100X80B   | CALL      | CALL     |

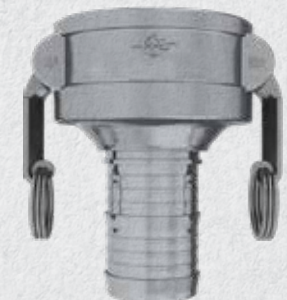
| SIZE        | PART NAME | STAINLESS STEEL |
|-------------|-----------|-----------------|
|             |           | ITEM #          |
| 1" x 3/4"   | 10X07B    | 64181007        |
| 1" x 1-1/2" | 10X15B    | 64181015*       |
| 1" x 2"     | 10X20B    | CALL            |
| 1-1/2" x 1" | 15X10B    | 64181510*       |
| 2" x 1"     | 20X10B    | 64182010*       |
| 2" x 1-1/2" | 20X15B    | 64182015        |
| 2" x 3"     | 20X30B    | 64182030*       |
| 2-1/2" x 2" | 25X20B    | 64182520        |
| 2-1/2" x 3" | 25X30B    | 64182530        |
| 3" x 2"     | 30X20B    | 64183020        |
| 3" x 2-1/2" | 30X25B    | 64183025        |
| 3" x 4"     | 30X40B    | 64183040*       |
| 4" x 2"     | 40X20B    | 64184020*       |
| 4" x 3"     | 40X30B    | 64184030        |
| 5" x 3"     | 50X30B    | CALL            |



### PART C REDUCER

| COUPLER X HOSE SHANK | PART NAME | ALUMINUM  | BRASS    |
|----------------------|-----------|-----------|----------|
|                      |           | ITEM #    | ITEM #   |
| 1/2" x 3/4"          | 05X07C    | CALL      | 62220107 |
| 1" x 3/4"            | 10X07C    | CALL      | CALL     |
| 1-1/4" x 1-1/2"      | 12X15C    | CALL      | 62221215 |
| 1-1/2" x 1"          | 15X10C    | 60221510  | 62221510 |
| 1-1/2" x 2"          | 15X20C    | 60221520  | 62221520 |
| 2" x 1-1/2"          | 20X15C    | 60222015  | 62222015 |
| 2" x 2-1/2"          | 20X25C    | 60222025  | 62222025 |
| 2-1/2" x 1-1/2"      | 25X15C    | 60222515  | CALL     |
| 2-1/2" x 2"          | 25X20C    | 60222520  | CALL     |
| 3" x 1"              | 30X10C    | 60223010  | CALL     |
| 3" x 1-1/2"          | 30X15C    | 60223015* | CALL     |
| 3" x 2"              | 30X20C    | 60223020  | 62223020 |
| 3" x 2-1/2"          | 30X25C    | 60223025  | 62223025 |
| 3" x 4"              | 30X40C    | 60223040* | CALL     |
| 3" x 5"              | 30X50C    | 60223050  | CALL     |
| 4" x 2"              | 40X20C    | 60224020  | 62224020 |
| 4" x 2-1/2"          | 40X25C    | 60224025* | 62224025 |
| 4" x 3"              | 40X30C    | 60224030  | 62224030 |
| 4" x 5"              | 40X50C    | 60224050  | CALL     |
| 5" x 3"              | 50X30C    | 60225030* | CALL     |
| 5" x 4"              | 50X40C    | 60225040* | CALL     |
| 6" x 3"              | 60X30C    | 60226030  | CALL     |
| 6" x 4"              | 60X40C    | CALL      | CALL     |
| 6" x 5"              | 60X50C    | CALL      | CALL     |
| 8" x 6"              | 80X60C    | CALL      | CALL     |
| 8" x 10"             | 80X100C   | 60228090* | CALL     |
| 10" x 8"             | 100X80C   | 60229080  | CALL     |

| COUPLER X HOSE SHANK | PART NAME | STAINLESS STEEL |
|----------------------|-----------|-----------------|
|                      |           | ITEM #          |
| 3/4" x 1/2"          | 07X05C    | 64220705        |
| 3/4" x 1"            | 07X10C    | 64220710        |
| 1" x 3/4"            | 10X07C    | 64221007*       |
| 1" x 1-1/2"          | 10X15C    | 64221015        |
| 1-1/2" x 1"          | 15X10C    | 64221510        |
| 1-1/2" x 2"          | 15X20C    | 64221520*       |
| 2" x 1"              | 20X10C    | 64222010*       |
| 2" x 1-1/2"          | 20X15C    | 64222015        |
| 2" x 2-1/2"          | 20X25C    | 64222025*       |
| 2-1/2" x 2"          | 25X20C    | 64222520*       |
| 3" x 2"              | 30X20C    | 64223020        |
| 3" x 2-1/2"          | 30X25C    | 64223025        |
| 3" x 4"              | 30X40C    | 64223040*       |
| 4" x 2"              | 40X20C    | 64224020*       |
| 4" x 3"              | 40X30C    | 64224030        |
| 4" x 5"              | 40X50C    | 64224050*       |
| 6" x 4"              | 60X40C    | 64226040        |
| 6" x 5"              | 60X50C    | 64226050*       |
| 8" x 6"              | 80X60C    | 64228060*       |





## REDUCER FITTINGS CONTINUED

## REDUCER FITTINGS CONTINUED

### PART D REDUCER

| COUPLER X FEMALE NPT THREAD |           | ALUMINUM/HBS | BRASS    | STAINLESS STEEL |
|-----------------------------|-----------|--------------|----------|-----------------|
| SIZE                        | PART NAME | ITEM #       | ITEM #   | ITEM #          |
| 1-1/2" x 1"                 | 15X10D    | 60201510     | 62201510 | 64201510        |
| 1-1/2" x 1-1/4"             | 15X12D    | CALL         | 62201512 | 64201512        |
| 1-1/2" x 2"                 | 15X20D    | 60201520     | CALL     | CALL            |
| 2" x 1"                     | 20X10D    | 60202010*    | CALL     | CALL            |
| 2" x 1-1/2"                 | 20X15D    | 60202015     | 62202015 | 64202015        |
| 2-1/2" x 1"                 | 25X10D    | 60202510     | CALL     | CALL            |
| 2-1/2" x 2"                 | 25X20D    | 60202520     | 62202520 | 64202520*       |
| 2-1/2" x 3"                 | 25X30D    | 60202530     | CALL     | CALL            |
| 3" x 1"                     | 30X10D    | 60203010*    | CALL     | CALL            |
| 3" x 2"                     | 30X20D    | 60203020     | 62203020 | 64203020        |
| 3" x 2-1/2"                 | 30X25D    | 60203025     | 62203025 | 64203025        |
| 3" x 4"                     | 30X40D    | 60203040*    | CALL     | 64203040*       |
| 4" x 3"                     | 40X30D    | 60204030     | 62204030 | 64204030        |
| 5" x 4"                     | 50X40D    | 60205040*    | CALL     | 64205040*       |
| 8" x 6"                     | 80X60D    | CALL         | CALL     | CALL            |



### PART E REDUCER

| ADAPTER X HOSE SHANK |           | ALUMINUM  | BRASS    | STAINLESS STEEL | HARD COAT ALUM |
|----------------------|-----------|-----------|----------|-----------------|----------------|
| SIZE                 | PART NAME | ITEM #    | ITEM #   | ITEM #          | ITEM #         |
| 1" x 1/2"            | 10X05E    | CALL      | CALL     | 64241005*       | CALL           |
| 1" x 3/4"            | 10X07E    | 60241007  | CALL     | CALL            | CALL           |
| 1" x 1-1/2"          | 10X15E    | CALL      | CALL     | 64241015        | CALL           |
| 1-1/2" x 1"          | 15X10E    | 60241510  | CALL     | CALL            | CALL           |
| 2" x 1"              | 20X10E    | 60242010* | CALL     | CALL            | CALL           |
| 2" x 1-1/2"          | 20X15E    | 60242015  | 62242015 | 64242015*       | 70242015       |
| 2" x 2-1/2"          | 20X25E    | 60242025  | 62242025 | 64242025*       | CALL           |
| 3" x 2"              | 30X20E    | 60243020  | 62243020 | 64243020        | 70243020       |
| 3" x 2-1/2"          | 30X25E    | 60243025  | 62243025 | 64243025        | CALL           |
| 4" x 3"              | 40X30E    | 60244030  | 62244030 | 64244030        | 70244030       |
| 4" x 5"              | 40X50E    | 60244050  | CALL     | CALL            | CALL           |
| 5" x 4"              | 50X40E    | 60245040* | CALL     | CALL            | CALL           |
| 6" x 4"              | 60X40E    | 60246040* | CALL     | 64246040*       | CALL           |
| 6" x 5"              | 60X50E    | 60246050* | CALL     | CALL            | CALL           |
| 8" x 6"              | 80X60E    | 60248060* | CALL     | CALL            | CALL           |
| 10" x 8"             | 100X80E   | 60249080* | CALL     | CALL            | CALL           |



### PART F REDUCER

| ADAPTER X MALE NPT THREAD |           | ALUMINUM | BRASS    | STAINLESS STEEL |
|---------------------------|-----------|----------|----------|-----------------|
| SIZE                      | PART NAME | ITEM #   | ITEM #   | ITEM #          |
| 1" x 3/4"                 | 10X07F    | CALL     | 62161007 | 64341007        |
| 1" x 1-1/2"               | 10X15F    | 60161015 | 62161015 | CALL            |
| 1" x 2"                   | 10X20F    | 60161020 | 62161020 | 64161020        |
| 1 1/4" x 1-1/2"           | 12X15F    | 60161215 | CALL     | CALL            |
| 1-1/2" x 1"               | 15X10F    | 60161510 | 62161510 | 64161510        |
| 1-1/2" x 1-1/4"           | 15X12F    | CALL     | 62161512 | 64161512        |
| 1-1/2" x 2"               | 15X20F    | 60161520 | 62161520 | 64161520        |
| 2" x 1"                   | 20X10F    | CALL     | CALL     | 64162010*       |
| 2" x 1-1/2"               | 20X15F    | 60162015 | 62162015 | 64162015        |
| 2" x 2-1/2"               | 20X25F    | 60162025 | CALL     | 64162025*       |
| 2" x 3"                   | 20X30F    | 60162030 | 62162030 | 64162030        |
| 2-1/2" x 3"               | 25X30F    | 60162530 | 62162530 | 64162530*       |
| 2-1/2" x 4"               | 25X40F    | CALL     | 62162540 | CALL            |
| 3" x 1-1/2"               | 30X15F    | 60163015 | 62163015 | 64163015        |
| 3" x 2"                   | 30X20F    | 60163020 | 62163020 | 64163020        |
| 3" x 2-1/2"               | 30X25F    | 60163025 | 62163025 | 64163025*       |
| 3" x 4"                   | 30X40F    | 60163040 | 62163040 | 64163040        |
| 4" x 2"                   | 40X20F    | 60164020 | 62164020 | 64164020*       |
| 4" x 2-1/2"               | 40X25F    | 60164025 | 62164025 | CALL            |
| 4" x 3"                   | 40X30F    | 60164030 | 62164030 | 64164030        |
| 5" x 4"                   | 50X40F    | 60165040 | 62165040 | CALL            |



### COUPLER X ADAPTER REDUCER

| COUPLER X ADAPTER |              | BRASS     | STAINLESS STEEL |
|-------------------|--------------|-----------|-----------------|
| SIZE              | PART NAME    | ITEM #    | ITEM #          |
| 3/4" X 2"         | 07CX20A LONG | CALL      | 64260720        |
| 1" x 3/4"         | 10CX07A LONG | CALL      | 64261007*       |
| 1" x 1-1/2"       | 10CX15A LONG | 62261015  | 64261015*       |
| 1" x 2"           | 10CX20A LONG | CALL      | 64261020*       |
| 1" x 3"           | 10CX30A LONG | CALL      | 64261030*       |
| 1-1/2" X 1"       | 15CX10A LONG | 62261510  | 64261510        |
| 1-1/2" x 2"       | 15CX20A LONG | 62261520  | 64261520        |
| 1-1/2" x 3"       | 15CX30A LONG | CALL      | 64261530*       |
| 1-1/2" x 4"       | 15CX40A LONG | 62261540  | CALL            |
| 2" x 3/4"         | 20CX07A LONG | CALL      | 64262007*       |
| 2" x 1"           | 20CX10A LONG | 62262010  | CALL            |
| 2" x 1-1/4"       | 20CX12A LONG | CALL      | 64262012        |
| 2" x 1-1/2"       | 20CX15A LONG | 62262015  | 64262015        |
| 2" x 2"           | 20CX20A LONG | CALL      | 64262020*       |
| 2" x 2-1/2"       | 20CX25A LONG | CALL      | 64262025*       |
| 2" x 3"           | 20CX30A LONG | 62262030  | 64262030        |
| 2" x 4"           | 20CX40A LONG | CALL      | 64262040*       |
| 2-1/2" x 2"       | 25CX20A LONG | 62262520  | 64262520*       |
| 2-1/2" x 3"       | 25CX30A LONG | CALL      | 64262530*       |
| 2-1/2" x 4"       | 25CX40A LONG | 62262540  | 64262540*       |
| 3" x 1"           | 30CX10A LONG | CALL      | 64263010*       |
| 3" x 1-1/2"       | 30CX15A LONG | 62263015  | CALL            |
| 3" x 2"           | 30CX20A LONG | 62263020G | 64263020        |
| 3" x 2-1/2"       | 30CX25A LONG | 62263025  | CALL            |
| 3" x 4"           | 30CX40A LONG | 62263040  | 64263040        |
| 3" x 6"           | 30CX60A LONG | CALL      | CALL            |
| 4" x 2-1/2"       | 40CX25A LONG | 62264025  | CALL            |
| 4" x 3"           | 40CX30A LONG | 62264030G | 64264030        |
| 4" x 5"           | 40CX50A LONG | 62264050  | 64264050*       |
| 4" x 6"           | 40CX60A LONG | CALL      | 64264060*       |
| 5" x 4"           | 50CX40A LONG | 62265040  | 64265040        |
| 5" X 6"           | 50CX60A LONG | CALL      | 64265060*       |
| 6" x 1-1/2"       | 60CX15A LONG | CALL      | CALL            |
| 6" x 2"           | 60CX20A LONG | CALL      | 64266020*       |
| 6" x 3"           | 60CX30A LONG | CALL      | 64266030*       |
| 6" x 4"           | 60CX40A LONG | CALL      | 64266040        |
| 6" x 5"           | 60CX50A LONG | CALL      | 64266050        |
| 8" x 4"           | 80CX40A LONG | CALL      | 64268040*       |
| 8" x 6"           | 80CX60A LONG | CALL      | 64268060*       |



## REDUCER FITTINGS CONTINUED

## REDUCER FITTINGS CONTINUED

### COUPLER X ADAPTER REDUCER (CONTINUED)

| COUPLER X ADAPTER |              | ALUMINUM  |
|-------------------|--------------|-----------|
| SIZE              | PART NAME    | ITEM #    |
| 1" x 3/4"         | 10CX07A LONG | 60261007* |
| 1" x 1-1/2"       | 10CX15A LONG | 60261015  |
| 1-1/4" x 1-1/2"   | 12CX15A LONG | 60261215  |
| 1-1/4" x 2"       | 12CX20A LONG | 60261220* |
| 1-1/2" x 1"       | 15CX10A LONG | 60261510  |
| 1-1/2" x 1-1/4"   | 15CX12A LONG | 60261512* |
| 1-1/2" x 2"       | 15CX20A LONG | 60261520  |
| 1-1/2" x 2-1/2"   | 15CX25A LONG | 60261525* |
| 1-1/2" x 3"       | 15CX30A LONG | 60261530  |
| 1-1/2" x 4"       | 15CX40A LONG | 60261540* |
| 2" x 3/4"         | 20CX07A LONG | 60262007  |
| 2" x 1"           | 20CX10A LONG | 60262010  |
| 2" x 1-1/4"       | 20CX12A LONG | 60262012  |
| 2" x 1-1/2"       | 20CX15A LONG | 60262015  |
| 2" x 2-1/2"       | 20CX25A LONG | 60262025* |
| 2" x 3"           | 20CX30A LONG | 60262030  |
| 2" x 4"           | 20CX40A LONG | 60262040  |
| 2-1/2" x 2"       | 25CX20A LONG | 60262520  |
| 2-1/2" x 2-1/2"   | 25CX25A LONG | 60262525  |
| 2-1/2" x 3"       | 25CX30A LONG | 60262530* |
| 2-1/2" x 4"       | 25CX40A LONG | 60262540  |
| 3" x 1-1/2"       | 30CX15A LONG | 60263015  |

| COUPLER X ADAPTER |               | ALUMINUM   |
|-------------------|---------------|------------|
| SIZE              | PART NAME     | ITEM #     |
| 3" x 2"           | 30CX20A LONG  | 60263020G  |
| 6" x 3"           | 60CX30A LONG  | CALL       |
| 6" x 4"           | 60CX40A LONG  | CALL       |
| 6" x 5"           | 60CX50A LONG  | CALL       |
| 6" x 8"           | 60CX80A LONG  | 60266080*  |
| 8" x 4"           | 80CX40A LONG  | 60268040*  |
| 8" x 6"           | 80CX60A LONG  | 60268060G* |
| 12" x 6"          | 120CX60A LONG | CALL       |
| 3" x 2-1/2"       | 30CX25A LONG  | 60263025   |
| 3" x 4"           | 30CX40A LONG  | 60263040   |
| 3" x 5"           | 30CX50A LONG  | 60263050   |
| 3" x 6"           | 30CX60A LONG  | 60263060*  |
| 4" x 1-1/2"       | 40CX15A LONG  | 60264015   |
| 4" x 2"           | 40CX20A LONG  | 60264020G  |
| 4" x 2-1/2"       | 40CX25A LONG  | 60264025   |
| 4" x 3"           | 40CX30A LONG  | CALL       |
| 4" x 4"           | 40CX40A LONG  | 60264040   |
| 4" x 5"           | 40CX50A LONG  | 60264050   |
| 4" x 6"           | 40CX60A LONG  | 60264060   |
| 5" x 4"           | 50CX40A LONG  | 60265040   |
| 5" x 6"           | 50CX60A LONG  | 60265060*  |
| 6" x 2"           | 60CX20A LONG  | CALL       |

### COUPLER X COUPLER

| COUPLER X COUPLER |           | ALUMINUM  | BRASS    | STAINLESS STEEL |
|-------------------|-----------|-----------|----------|-----------------|
| SIZE              | PART NAME | ITEM #    | ITEM #   | ITEM #          |
| 1" x 1"           | 10CX10C   | 60271010  | 62271010 | 64271010        |
| 1-1/4" x 1-1/4"   | 12CX12C   | 60271212  | CALL     | 64271220*       |
| 1-1/2" x 1-1/2"   | 15CX15C   | 60271515  | 62271515 | 64271515        |
| 2" x 1-1/2"       | 20CX15C   | 60272015* | CALL     | 64272015*       |
| 2" x 2"           | 20CX20C   | 60272020  | 62272020 | 64272020        |
| 2-1/2" x 2"       | 25CX20C   | 60272520* | CALL     | CALL            |
| 2-1/2" x 2-1/2"   | 25CX25C   | 60272525  | 62272525 | 64272525*       |
| 3" x 2"           | 30CX20C   | 60273020  | 62273020 | 64273020        |
| 3" x 2-1/2"       | 30CX25C   | 60272530  | CALL     | 64272530*       |
| 3" x 3"           | 30CX30C   | 60273030  | 62273030 | 64273030        |
| 4" x 2"           | 40CX20C   | 60274020  | CALL     | 64274020        |
| 4" x 3"           | 40CX30C   | 60274030  | 62274030 | 64273040        |
| 4" x 4"           | 40CX40C   | 60274040  | 62274040 | 64274040        |
| 5" x 4"           | 50CX40C   | 60275040* | CALL     | 64275040*       |
| 5" x 5"           | 50CX50C   | 60275050* | CALL     | CALL            |
| 6" x 2"           | 60CX20C   | 60276020* | CALL     | CALL            |
| 6" x 4"           | 60CX40C   | 60276040* | CALL     | CALL            |
| 6" x 5"           | 60CX50C   | 60276050* | CALL     | CALL            |
| 8" x 4"           | 80CX40C   | 60278040* | CALL     | CALL            |
| 8" x 6"           | 80CX60C   | 60278060  | CALL     | CALL            |
| 8" x 8"           | 80CX80C   | 60278080  | CALL     | CALL            |



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## REDUCER FITTINGS CONTINUED

### SA SPOOL ADAPTER - ADAPTER X ADAPTER

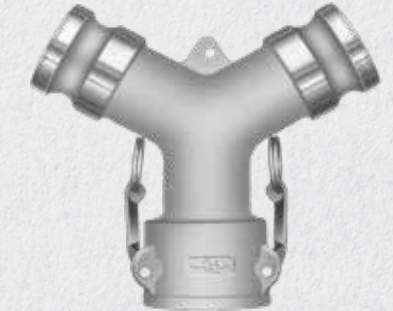
| ADAPTER X ADAPTER |           | ALUMINUM  | BRASS    | STAINLESS STEEL | DUCTILE IRON | HARD COAT ALUM |
|-------------------|-----------|-----------|----------|-----------------|--------------|----------------|
| SIZE              | PART NAME | ITEM #    | ITEM #   | ITEM #          | ITEM #       | ITEM #         |
| 1/2" x 1/2"       | SAE05XE05 | 60280101  | 62280101 | 64280101        | CALL         | CALL           |
| 3/4" x 3/4"       | SA07X07   | 60280707  | 62280707 | 64280707        | CALL         | 70280707       |
| 1" x 3/4"         | SA10X07   | 60281007  | 62281007 | CALL            | CALL         | CALL           |
| 1" x 1"           | SA10X10   | 60281010  | 62281010 | 64281010        | 68281010     | 70281010       |
| 1" x 1 1/2"       | SA10X15   | 60281015  | 62281015 | 64281015*       | CALL         | 70281015       |
| 1" x 2"           | SA10X20   | CALL      | 62281020 | 64281020*       | CALL         | CALL           |
| 1" x 3"           | SA10X30   | CALL      | 62281030 | CALL            | CALL         | CALL           |
| 1-1/4" x 1-1/4"   | SA12X12   | 60281212  | 62281212 | 64281212        | CALL         | 70281212       |
| 1-1/4" x 1-1/2"   | SA12X15   | 60281215  | 62281215 | 64281215        | CALL         | CALL           |
| 1-1/2" x 1-1/2"   | SA15X15   | 60281515  | 62281515 | 64281515        | 68281515     | 70281515       |
| 1-1/2" x 2"       | SA15X20   | 60281520  | 62281520 | 64281520        | 68281520     | 70281520       |
| 1-1/2" x 4"       | SA15X40   | 60281540  | 62281540 | CALL            | CALL         | CALL           |
| 2" x 3/4"         | SA20X07   | 60282007  | CALL     | CALL            | CALL         | CALL           |
| 2" x 2"           | SA20X20   | 60282020  | 62282020 | 64282020        | 68282020     | 70282020       |
| 2" x 2-1/2"       | SA20X25   | 60282025  | 62282025 | CALL            | CALL         | 70282025       |
| 2" x 3"           | SA20X30   | 60282030  | 62282030 | 64282030        | 68282030     | 70282030       |
| 2-1/2" x 2"       | SA25X20   | CALL      | CALL     | 64282520*       | CALL         | CALL           |
| 2-1/2" x 2-1/2"   | SA25X25   | 60282525  | 62282525 | 64282525        | 68282525     | CALL           |
| 2-1/2" x 3"       | SA25X30   | 60282530  | 62282530 | 64282530        | 68282530     | 70282530       |
| 3" x 1-1/2"       | SA30X15   | 60283015  | 62283015 | 64283015*       | CALL         | 70283015       |
| 3" x 3"           | SA30X30   | 60283030  | 62283030 | 64283030        | 68283030     | 70283030       |
| 3" x 4"           | SA30X40   | 60283040  | 62283040 | 64283040        | 68283040     | 70283040       |
| 4" x 2"           | SA40X20   | 60284020  | 62284020 | 64284020        | CALL         | 70284020       |
| 4" x 4"           | SA40X40   | 60284040  | 62284040 | 64284040        | 68284040     | 70284040       |
| 5" x 4"           | SA50X40   | 60285040  | CALL     | 64285040*       | 68285040     | CALL           |
| 5" x 5"           | SA50X50   | 60285050  | 62285050 | 64285050        | 68285050     | CALL           |
| 6" x 3"           | SA60X30   | 60286030  | CALL     | 64286030*       | CALL         | 70286030       |
| 6" x 4"           | SA60X40   | 60286040  | 62286040 | 64286040*       | 68286040     | 70286040       |
| 6" x 5"           | SA60X50   | 60286050* | CALL     | CALL            | CALL         | CALL           |
| 6" x 6"           | SA60X60   | 60286060  | 62286060 | 64286060*       | CALL         | 70286060       |
| 6" x 8"           | SA60X80   | 60286080* | CALL     | CALL            | CALL         | CALL           |
| 8" x 4"           | SA80X40   | 60288040* | CALL     | CALL            | CALL         | CALL           |
| 10" x 6"          | SA100X60  | 60289060* | CALL     | CALL            | CALL         | CALL           |
| 10" x 8"          | SA100X80  | 60289080* | CALL     | CALL            | CALL         | CALL           |



## Y & T FITTINGS

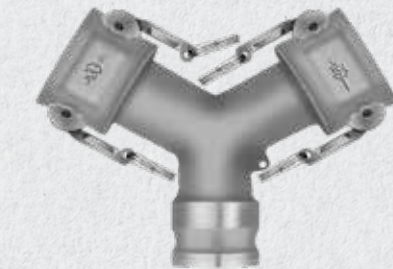
### COUPLER X ADAPTER X ADAPTER "Y" FITTING

|              |                | ALUMINUM  | BRASS    | STAINLESS STEEL |
|--------------|----------------|-----------|----------|-----------------|
| SIZE         | PART NAME      | ITEM #    | ITEM #   | ITEM #          |
| 2"           | 20CX20AY       | 60592020  | 62592020 | 64592020        |
| 3" x 2"      | 30CX20AY       | CALL      | CALL     | 64593020*       |
| 3"           | 30CX30AY       | CALL      | CALL     | 64593030*       |
| 4"           | 40CX40AY       | 60594040* | CALL     | CALL            |
| 6"           | 60CX60AYHD     | 60596060  | CALL     | CALL            |
| 6" x 6" x 4" | 60CX60AX40AYHD | 60596064  | CALL     | CALL            |



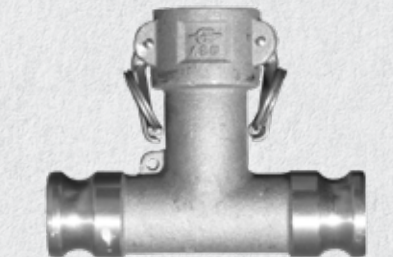
### COUPLER X COUPLER X ADAPTER "Y" FITTING

|         |            | ALUMINUM | BRASS    |
|---------|------------|----------|----------|
| SIZE    | PART NAME  | ITEM #   | ITEM #   |
| 2"      | 20AX20CY   | 60312020 | 62312020 |
| 4"      | 40AX40CY   | 60594140 | CALL     |
| 6" x 4" | 60AX40CYHD | 60596041 | CALL     |
| 6"      | 60AX60CYHD | 60596061 | CALL     |



### COUPLER X ADAPTER X ADAPTER "T" FITTING

|        |              | ALUMINUM |
|--------|--------------|----------|
| SIZE   | PART NAME    | ITEM #   |
| 1-1/2" | 15AX15AX15CT | 60591515 |
| 2"     | 2AX20AX20CT  | CALL     |
| 3"     | 30AX30AX30CT | CALL     |





## FITTING X FLANGE

### COUPLER X FLANGE

|             |           | ALUMINUM/<br>BRASS HANDLES | ALUMINUM/<br>STAINLESS<br>STEEL HANDLES | BRASS    | STAINLESS<br>STEEL |
|-------------|-----------|----------------------------|---|----------|--------------------|
| SIZE        | PART NAME | ITEM #                     | ITEM #                                  | ITEM #   | ITEM #             |
| 3/4" X 1"   | PF07X10C  | CALL                       | CALL                                    | CALL     | 64540710           |
| 1"          | PF10C*    | CALL                       | 60541000*                               | CALL     | 64541000           |
| 1-1/2"      | PF15C     | CALL                       | 60541500                                | 62541500 | 64541500           |
| 1-1/2" X 2" | PF15X20C  | CALL                       | CALL                                    | CALL     | 64541520           |
| 2"          | PF20C     | 6054000070                 | 60542000                                | 62542000 | 64542000           |
| 2" X 3"     | PF20X30C  | CALL                       | CALL                                    | CALL     | 64542030*          |
| 2-1/2"      | PF25C     | CALL                       | 60542500                                | 62542500 | 64542500*          |
| 2-1/2" X 3" | PF25X30C  | CALL                       | CALL                                    | 62542530 | CALL               |
| 2-1/2" X 4" | PF25X40C  | CALL                       | CALL                                    | 62542540 | 64542540           |
| 3"          | PF30C     | 6054000071                 | 60543000                                | 62543000 | 64543000           |
| 3" x 2"     | PF30X20C  | CALL                       | CALL                                    | CALL     | 64543020*          |
| 3" x 4"     | PF30X40C  | CALL                       | CALL                                    | CALL     | 64543040*          |
| 3" x 6"     | PF30X60C  | 60543060*                  | CALL                                    | CALL     | CALL               |
| 4"          | PF40C     | 6054000072                 | 60544000                                | 62544000 | 64544000           |
| 4" x 3"     | PF40X30C  | 6054030                    | CALL                                    | CALL     | CALL               |
| 4" x 6"     | PF40X60C  | 6054060                    | 6054060                                 | CALL     | CALL               |
| 5"          | PF50C     | CALL                       | 60545000*                               | CALL     | 64545000           |
| 6"          | PF60C     | 60546000                   | CALL                                    | 62546000 | 64546000           |
| 6" x 8"     | PF60X80C  | CALL                       | CALL                                    | CALL     | CALL               |
| 8"          | PF80C     | 6054000073                 | 60548000                                | 62548000 | 64548000           |
| 8" x 12"    | PF80X120C | 605408092                  | CALL                                    | CALL     | CALL               |
| 10"         | PF100C    | 60549000                   | CALL                                    | CALL     | 64549000           |
| 12"         | PF120C    | 60549200                   | 60549201                                | CALL     | CALL               |



## FITTING X FLANGE CONTINUED

### ADAPTER X FLANGE

|                 |            | ALUMINUM  | BRASS    | STAINLESS<br>STEEL |
|-----------------|------------|-----------|----------|--------------------|
| SIZE            | PART NAME  | ITEM #    | ITEM #   | ITEM #             |
| 3/4"            | PF07A      | CALL      | CALL     | 64520700*          |
| 1"              | PF10A      | 60521000  | CALL     | 64521000           |
| 1" x 2"         | PF10X20A   | CALL      | CALL     | 64521020           |
| 1-1/4" X 1-1/2" | PF12X25A   | CALL      | CALL     | 64521215*          |
| 1-1/2"          | PF15A      | 60521500  | 62521500 | 64521500           |
| 1-1/2" x 2"     | PF15X20A   | CALL      | CALL     | 64521520*          |
| 1-1/2" x 3"     | PF15X30A   | CALL      | CALL     | 64521530*          |
| 2"              | PF20A      | 60522000  | 62522000 | 64522000           |
| 2" x 1-1/2"     | PF20X15A   | CALL      | CALL     | 64522015*          |
| 2" x 2-1/2"     | PF20X25A   | CALL      | CALL     | 64522025           |
| 2" x 3"         | PF20X30A   | CALL      | CALL     | 64522030*          |
| 2" x 4"         | PF20X40A   | CALL      | CALL     | 64522040           |
| 2-1/2"          | PF25A      | 60522500  | 62522500 | 64522500           |
| 2-1/2" x 4"     | PF25X40A   | 60522540  | CALL     | 64522540           |
| 3"              | PF30A      | 60523000  | 62523000 | 64523000           |
| 3" x 2"         | PF30X20A   | CALL      | CALL     | 64523020           |
| 3" x 4"         | PF30X40A   | 60523040  | 62523040 | 64523040*          |
| 3" x 6"         | PF30X60A   | 60523060* | CALL     | CALL               |
| 4"              | PF40A      | 60524009  | 62524000 | 64524000           |
| 4" x 3"         | PF40x30A   | 60524030  | CALL     | 64524030*          |
| 4" x 6"         | PF40X60A   | 60524060  | CALL     | 64524060           |
| 4" x 8"         | PF40X80A   | 60524080  | CALL     | CALL               |
| 5"              | PF50A      | 60525000  | 62525000 | 64525000           |
| 6"              | PF60A      | 60526000  | 62526000 | 64526000           |
| 6" x 8"         | PF60X80A   | 60526080  | CALL     | CALL               |
| 8"              | PF80A      | 60528000  | 62528000 | 64528000           |
| 8" x 4"         | PF80X40A   | 60528040* | CALL     | CALL               |
| 10"             | PF100A     | 60529000  | 62529000 | 64529000           |
| 10" x 12"       | PF100X120A | CALL      | CALL     | 64529092*          |
| 12"             | PF120A     | 60529200  | 62529200 | 64529200           |



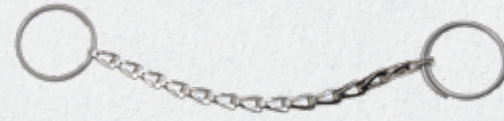


## FITTING ACCESSORIES

## CAMLOCK GASKETS

### SECURITY CHAINS

|        |           | SS CHAINW/SS HOOKS | SS CHAIN W/SS RINGS |
|--------|-----------|--------------------|---------------------|
| LENGTH | PART NAME | ITEM #             | ITEM #              |
| 6"     | S56       | 5101060A           | 5101061A            |
| 8"     | S51       | 5101080A           | 5101081A            |
| 12"    | S52       | 5101092A           | 5101093A            |



|        |           | BRASS CHAIN W/SS HOOKS | BRASS CHAIN W/ZINC RINGS |
|--------|-----------|------------------------|--------------------------|
| LENGTH | PART NAME | ITEM #                 | ITEM #                   |
| 6"     | C51       | 5100560A               | 5100560B                 |
| 12"    | C52       | 5100592A               | 5100592A                 |



### STANDARD CAM ARM SETS

|                |            | BRASS    |             | 300 SERIES STAINLESS STEEL |        |
|----------------|------------|----------|-------------|----------------------------|--------|
| COUPLER SIZE   | PART NAME  | ITEM #   | PART NAME   | ITEM #                     | ITEM # |
| 1/2 & 3/4"     | HB10       | 5000505S | HBS10       | 5001505S                   |        |
| 1"             | HB11       | 5000510S | HBS11       | 5001510S                   |        |
| 1-1/4"         | HB12       | 5000512S | HBS12       | 5001512S                   |        |
| 1-1/2"         | HB15       | 5000515S | HBS15       | 5001515S                   |        |
| 2 & 2-1/2"     | HB20/25    | 5000520S | HBS20/25    | 5001520S                   |        |
| 3, 4, & 5"     | HB30/40/50 | 5000530S | HBS30/40/50 | 5001530S                   |        |
| 6, 8, 10 & 12" | HB60/80    | 5000560S | HBS60/80    | CALL                       |        |



### CAM ARM RINGS

|                           | STAINLESS STEEL | ZINC PLATED STEEL | BRASS CHAIN W/ ZINC RINGS |
|---------------------------|-----------------|-------------------|---------------------------|
| SIZE                      | ITEM #          | ITEM #            | ITEM #                    |
| 1/2" - 2-1/2" Small Rings | 5201005         | 5201505           | 5100560B                  |
| 3" - 12" Large Rings      | 5201030         | 5201530           | 5100592A                  |



### REPLACEMENT GASKETS

|        |           | STANDARD BUNA |           | EXTRA FUEL RESISTANT BUNA |           | NEOPRENE |           | VITON   |           | SILICONE |  |
|--------|-----------|---------------|-----------|---------------------------|-----------|----------|-----------|---------|-----------|----------|--|
| SIZE   | PART NAME | ITEM #        | PART NAME | ITEM #                    | PART NAME | ITEM #   | PART NAME | ITEM #  | PART NAME | ITEM #   |  |
| 1/2"   | B05Y      | 5500205       | CALL      | CALL                      | N05Y      | 5500405  | V05Y      | 5500805 | S05Y      | 5502205  |  |
| 3/4"   | B01       | 5500207       | B01F      | 5500207F                  | N01       | 5500407  | V01       | 5500807 | S01       | 5502207  |  |
| 1"     | B02       | 5500210       | B02F      | 5500210F                  | N02       | 5500410  | V02       | 5500810 | S02       | 5502210  |  |
| 1-1/4" | B03       | 5500212       | B03F      | 5500212F                  | N03       | 5500412  | V03       | 5500812 | S03       | 5502212  |  |
| 1-1/2" | B04       | 5500215       | B04F      | 5500215F                  | N04       | 5500415  | V04       | 5500815 | S04       | 5502215  |  |
| 2"     | B05       | 5500220       | B05F      | 5500220F                  | N05Y      | 5500420  | V05Y      | 5500820 | S05       | 5502220  |  |
| 2-1/2" | B06       | 5500225       | B06F      | 5500225F                  | N06       | 5500425  | V06       | 5500825 | S06       | 5502225  |  |
| 3"     | B07       | 5500230       | B07F      | 5500230F                  | N07       | 5500430  | V07       | 5500830 | S07       | 5502230  |  |
| 4"     | B08       | 5500240       | B08F      | 5500240F                  | N08       | 5500440  | V08       | 5500840 | S08       | 5502240  |  |
| 5"     | B09       | 5500250       | B09F      | 5500250F                  | N09       | 5500450  | V09       | 5500850 | S011      | 5502280  |  |
| 6"     | B010      | 5500260       | B010F     | 5500260F                  | N010      | 5500460  | V010      | 5500860 | CALL      | CALL     |  |
| 8"     | B011      | 5500280       | CALL      | CALL                      | N011      | 5500480  | V011      | 5500880 | CALL      | CALL     |  |
| 10"    | B012      | 5500290       | CALL      | CALL                      | CALL      | CALL     | V012      | 5500890 | CALL      | CALL     |  |
| 12"    | B013      | 5500292       | CALL      | CALL                      | CALL      | CALL     | CALL      | CALL    | CALL      | CALL     |  |



Other materials including silicone, PTFE enveloped, EPDM, food grade, etc. are available. Contact your Ragco location for more info.



# PIN-LUG COUPLINGS

Also called "suction hose couplings," these are threaded couplings used for suction or discharge of water or other fluids. Standard threading is NPSM (National Pipe Straight Mechanical). 1-1/2" and 2-1/2" are available in NST thread (American National Fire Hose Straight Thread). NST does not interchange. Pin lugs are on all sizes of the female end. Sizes 2-1/2" through 6" also have pin lugs on the male end. Fittings seal on a washer that sits in the female end. Replacement washers are available.

## PIN-LUG COUPLING SETS

| SIZE   | THREAD | ALUMINUM W/ BRASS SWIVEL | BRASS W/ BRASS SWIVEL |
|--------|--------|--------------------------|-----------------------|
| 1 1/2" | NPSM   | AB150                    | BR150                 |
| 1 1/2" | NST    | AB150NST                 | BR150NST              |
| 2"     | NPSM   | AB200                    | BR200                 |
| 2 1/2" | NPSM   | AB250                    | BR250                 |
| 2 1/2" | NST    | AB250NST                 | BR250NST              |
| 3"     | NPSM   | AB300                    | BR300                 |
| 4"     | NPSM   | AB400                    | BR400                 |
| 6"     | NPSM   | AB600                    | BR600                 |



## WASHERS FOR PIN LUGS

| SIZE       | PART #   |
|------------|----------|
| 1 1/2"     | RW150    |
| 1 1/2" NST | RW150NST |
| 2"         | RW200    |
| 2 1/2"     | RW250    |
| 2 1/2" NST | RW250NST |
| 3"         | RW300    |
| 4"         | RW400    |
| 6"         | RW600    |



# COMBINATION HOSE NIPPLES

Combination hose nipples are used in a variety of fluid applications. They are available in unplated steel, plated steel, polypropylene, and stainless steel. End (male) threads are NPT (will mate with foot valves, strainers, cam- and-groove part A, D etc.) and are the same size as shanks. Jump sizes and reducers are also available.

## PLATED



## POLYPROPYLENE



## STAINLESS



| SIZE   | UNPLATED STEEL PART # | PLATED STEEL PART # | STAINLESS STEEL PART # | POLYPROPYLENE PART # |
|--------|-----------------------|---------------------|------------------------|----------------------|
| 1/2"   | CN050                 | CN050P              | CN050S                 | CN050PP              |
| 3/4"   | CN075                 | CN075P              | CN075S                 | CN075PP              |
| 1"     | CN100                 | CN100P              | CN100S                 | CN100PP              |
| 1 1/4" | CN125                 | CN125P              | CN125S                 | CN125PP              |
| 1 1/2" | CN150                 | CN150P              | CN150S                 | CN150PP              |
| 2"     | CN200                 | CN200P              | CN200S                 | CN200PP              |
| 2 1/2" | CN250                 | CN250P              | CN250S                 | CN250PP              |
| 3"     | CN300                 | CN300P              | CN300S                 | CN300PP              |
| 4"     | CN400                 | CN400P              | CN400S                 | CN400PP              |
| 5"     | CN500                 | CN500P              | CN500S                 | CN500PP              |
| 6"     | CN600                 | CN600P              | CN600S                 | CN600PP              |
| 8"     | CN800                 | CN800P              | CN800S                 | CN800PP              |
| 10"    | CN1000                | CN1000P             | CN1000S                | CN1000PP             |
| 12"    | CN1200                | CN1200P             | CN1200S                | CN1200PP             |



# UNIVERSAL AIR COUPLINGS 2-LUG & 4-LUG

Also called "Chicago," "CP," or "Crow's Foot" couplings. Used to connect air lines from compressors or other air sources to all types of pneumatic tools and equipment. All 2-lug head connections are of one size for easy interchange. Hose shank or threaded end is coupling size. Male and female threads are NPT. Malleable iron plated. (European style universals are available by special order.) Universal crowfoot couplings are recommended to be used in the transfer of air and/or water.

2-LUG FEMALE END



4-LUG FEMALE END



2-LUG DEAD END



3-WAY CONNECTOR



2-LUG HOSE END



4-LUG HOSE END



2-LUG MALE DEAD END



WASHERS UG2 & UG4



The application should be in an open system where the air or water is in motion (dynamic) and not in a closed, pressurized (static) condition. This dynamic application involves continuous flow; therefore, back pressure would be relieved by the very nature of the application. The applicable system should contain pressure relief valves to relieve any excess pressure. Safety clips and safety cables should be installed on either side of the coupling connection. The rated, maximum working pressure of Universal Crowfoot Air Hose Couplings is 150 psi (at ambient temperature - 70°F) for all parts. Standard parts are iron; parts are available made of other metals.

**2-lug:** for connections 1/4" - 1"

**4-lug:** for connections 1 1/4" - 2"

**WARNING:** Universal Air Hose Couplings should NEVER be used for steam service.

## MALE END

| MALE END SIZE | LUG | PART # |
|---------------|-----|--------|
| 1/4"          | 2   | ME-25  |
| 3/8"          | 2   | ME-38  |
| 1/2"          | 2   | ME-50  |
| 3/4"          | 2   | ME-75  |
| 1"            | 2   | ME-100 |
| 1 1/4"        | 4   | -      |
| 1 1/2"        | 4   | -      |
| 2"            | 4   | -      |

## FEMALE END

| MALE END SIZE | LUG | PART # |
|---------------|-----|--------|
| 1/4"          | 2   | FE-25  |
| 3/8"          | 2   | FE-38  |
| 1/2"          | 2   | FE-50  |
| 3/4"          | 2   | FE-75  |
| 1"            | 2   | FE-100 |
| 1 1/4"        | 4   | FE-125 |
| 1 1/2"        | 4   | FE-150 |
| 2"            | 4   | FE-200 |

## HOSE END

| HOSE END SIZE | LUG | PART # |
|---------------|-----|--------|
| 1/4"          | 2   | HE-25  |
| 3/8"          | 2   | HE-38  |
| 1/2"          | 2   | HE-50  |
| 3/4"          | 2   | HE-75  |
| 1"            | 2   | HE-100 |
| 1 1/4"        | 4   | HE-125 |
| 1 1/2"        | 4   | HE-150 |
| 2"            | 4   | HE-200 |

## ACCESSORIES

| ACCESSORIES          | PART # |
|----------------------|--------|
| Washer for 2-Lug     | UG2    |
| Washer for 4-Lug     | UG4    |
| 3-Way Connector      | TWC    |
| Dead End             | BEC    |
| Safety Pin & Lanyard | SPL    |

# GROUND JOINT COUPLINGS

An all-purpose coupling, the female ground joint consists of a **MALE STEM**, **WING NUT** and **FEMALE SPUD**. The female spud has NPT threads to accept the NPT threads of a rigid connection or male NPT nipple. Widely used for air, water or steam, the ground joint is secured with an interlocking clamp or ferrule. By replacing the female spud of a ground joint coupling with a double or male spud, hose-to-hose ground joint connections or hose-to-rigid connections are simplified. Double spuds for hose-to-hose connections are threaded **NPS MALE X NPS MALE**. (GJ wing nut is also NPS). For hose-to-rigid connection, the male spud is threaded **NPS MALE X NPT MALE**.

FEMALE SPUD



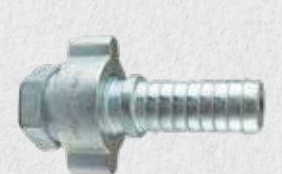
MALE SPUD



DOUBLE SPUD



FEMALE GROUND JOINT



| SIZE   | PART # |
|--------|--------|
| 1/2"   | GFS050 |
| 3/4"   | GFS075 |
| 1"     | GFS100 |
| 1 1/4" | GFS125 |
| 1 1/2" | GFS150 |
| 2"     | GFS200 |
| 2 1/2" | GFS250 |
| 3"     | GFS300 |
| 4"     | GFS400 |

| SIZE   | PART # |
|--------|--------|
| 1/2"   | GMS050 |
| 3/4"   | GMS075 |
| 1"     | GMS100 |
| 1 1/4" | GMS125 |
| 1 1/2" | GMS150 |
| 2"     | GMS200 |
| 2 1/2" | GMS250 |
| 3"     | GMS300 |
| 4"     | GMS400 |

| SIZE   | PART #  |
|--------|---------|
| 1/2"   | GDS050  |
| 3/4"   | GDS075  |
| 1"     | GDS100  |
| 1 1/4" | GDS125  |
| 1 1/2" | GDS1'50 |
| 2"     | GDS200  |
| 2 1/2" | GDS250  |
| 3"     | GDS300  |
| 4"     | GDS400  |

| SIZE   | PART # |
|--------|--------|
| 1/2"   | GJF050 |
| 3/4"   | GJF075 |
| 1"     | GJF100 |
| 1 1/4" | GJF125 |
| 1 1/2" | GJF150 |
| 2"     | GJF200 |
| 2 1/2" | GJF250 |
| 3"     | GJF300 |
| 4"     | GJF400 |

## MALE STEM HEX HOSE NIPPLES

For air or many other applications, MS nipples are economical and reusable. The MS nipple accepts bands or clamps. However, each MS is especially designed with a collar behind the hex to engage the gripping fingers of an interlocking clamp. MS threads are NPT. Steel plated. Use also as companion end of female ground joint.

| HOSE SIZE | THREAD SIZE | PART # |
|-----------|-------------|--------|
| 1/4"      | 1/4"        | MS4-4  |
| 1/4"      | 3/8"        | MS4-6  |
| 3/8"      | 1/4"        | MS6-4  |
| 3/8"      | 3/8"        | MS6-6  |
| 3/8"      | 1/2"        | MS6-8  |
| 1/2"      | 1/4"        | MS8-4  |
| 1/2"      | 3/8"        | MS8-6  |
| 1/2"      | 1/2"        | MS8-8  |
| 1/2"      | 3/4"        | MS8-12 |
| 3/4"      | 1/2"        | MS12-8 |

| HOSE SIZE | THREAD SIZE | PART #   |
|-----------|-------------|----------|
| 3/4"      | 3/4"        | MS12-12  |
| 3/4"      | 1"          | MS12-16  |
| 1"        | 3/4"        | MS16-12  |
| 1"        | 1"          | MS-16-16 |
| 1 1/4"    | 1 1/4"      | MS20-20  |
| 1 1/2"    | 1 1/2"      | MS24-24  |
| 2"        | 2"          | MS32-32  |
| 2 1/2"    | 2 1/2"      | MS40-40  |
| 3"        | 3"          | MS48-48  |
| 4"        | 4"          | MS64-64  |





# SANDBLAST COUPLINGS

There are three active sandblast system couplings: **NOZZLE HOLDERS** that accept the male threaded end of a sandblast nozzle, the **THREADED POT END** that is connected to the combination air and abrasive mix from the sandblast pot, and **HOSE ENDS** that are used to make hose-to-hose connections or hose-to-blast pot connections. All three are available in aluminum or brass. Hose ends are also available in iron.

## NOZZLE HOLDERS

Nozzle Holders are sleeve type couplings, secured to the hose with wood screws and have the same features as the sandblast hose end. The exception is that the end of the nozzle holder is NPT threaded to accept the sandblasting nozzle.

| SIZE   | ALUMINUM | BRASS |
|--------|----------|-------|
| 3/4"   | NH1A     | MH1B  |
| 1"     | NH2A     | NH2B  |
| 1 1/4" | NH3A     | NH3B  |
| 1 1/2" | NH4A     | NH4B  |



## THREADED POT ENDS

Threaded Pot Ends do not fit the hose, but rather are threaded (NPT or NPS) onto the sandblast pot. Once properly threaded to the discharge pipe on the pot, the 2-lug crowfoot design can now be connected to the 2-lug crowfoot design of the hose end. Now the pot can supply mix to the operator by way of the hose to the sandblast nozzle.

| SIZE   | TYPE | ALUMINUM | BRASS |
|--------|------|----------|-------|
| 1 1/4" | NPT  | SB1A     | SB1B  |
| 1 1/4" | NPS  | SB10A    | SB10B |
| 1 1/2" | NPT  | SB2A     | SB2B  |
| 1 1/2" | NPS  | SB20A    | SB20B |



## HOSE ENDS

Hose Ends are sleeve type couplings that fit over the OD of the sandblast hose. They are secured to the hose with wood screws. Countersunk holes on the hose end ensure that the screws fit correctly and will not be snagged while the hose is in operation. Within the ID of the hose end is a corkscrew ridge that helps to twist the coupling onto the hose and, more importantly, helps to minimize the force of blow-back. Hose-to-hose or hose-to-pot connections are made by the 2-lug crowfoot design. No matter what the hose size, the 2-lug hose ends interchange for common connections.

| SIZE   | ALUMINUM | BRASS |
|--------|----------|-------|
| 3/4"   | Q1A      | Q1B   |
| 1"     | Q2A      | Q2B   |
| 1 1/4" | Q3A      | Q3B   |
| 1 1/2" | Q4A      | Q4B   |



# HOSE MENDERS

Hose menders repair hoses up to and including IDs of 12". After cutting out the damaged hose portion, insert each end of the mender (shanks) into the remaining good ends of the hose. Secure the mender with bands or DB double bolt clamps. Each end will accommodate two or more bands or two clamps for an economical and efficient return to service. Typically plated steel.

| SIZE   | PART # |
|--------|--------|
| 1/2"   | SM050  |
| 3/4"   | SM075  |
| 1"     | SM100  |
| 1 1/4" | SM125  |
| 1 1/2" | SM150  |
| 2"     | SM200  |
| 2 1/2" | SM250  |

| SIZE | PART # |
|------|--------|
| 3"   | SM300  |
| 4"   | SM400  |
| 5"   | SM500  |
| 6"   | SM600  |
| 8"   | SM800  |
| 10"  | SM1000 |
| 12"  | SM1200 |





# PUSH-ON FITTINGS

Brass Push-On Fittings are specially manufactured for use with push-on hoses in low pressure applications. No clamp or ferrule is required if properly inserted. The barb will secure itself to the tube of the hose. Females also available in a swivel.

## MALE THREADS



## FEMALE THREADS



## PUSH-ON MENDERS



## MALE THREADS

| HOSE SIZE | THREAD SIZE | PART #   |
|-----------|-------------|----------|
| 1/4"      | 1/8"        | BMP-0402 |
| 1/4"      | 1/4"        | BMP-0404 |
| 1/4"      | 3/8"        | BMP-0406 |
| 5/16"     | 1/4"        | BMP-0504 |
| 3/8"      | 1/8"        | BMP-0602 |
| 3/8"      | 1/4"        | BMP-0604 |
| 3/8"      | 3/8"        | BMP-0606 |
| 3/8"      | 1/2"        | BMP-0608 |
| 1/2"      | 1/4"        | BMP-0804 |
| 1/2"      | 3/8"        | BMP-0806 |
| 1/2"      | 1/2"        | BMP-0808 |
| 1/2"      | 3/4"        | BMP-0812 |
| 5/8"      | 3/8"        | BMP1008  |
| 5/8"      | 1/2"        | BMP-1012 |
| 3/4"      | 1/2"        | BMP-1208 |
| 3/4"      | 3/4"        | BMP-1212 |

## FEMALE THREADS

| HOSE SIZE | THREAD SIZE | PART #   |
|-----------|-------------|----------|
| 1/4"      | 1/8"        | BFP-0402 |
| 1/4"      | 1/4"        | BFP-0404 |
| 5/16"     | 1/4"        | BFP-0504 |
| 3/8"      | 1/4"        | BFP-0604 |
| 3/8"      | 3/8"        | BFP-0606 |
| 1/2"      | 3/8"        | BFP-0806 |
| 1/2"      | 1/2"        | BFP-0808 |

## PUSH-ON MENDERS

| HOSE SIZE | PART #   |
|-----------|----------|
| 1/4"      | BHP-0404 |
| 5/16"     | BHP-0505 |
| 3/8"      | BHP-0606 |
| 1/2"      | BHP-0808 |
| 5/8"      | BHP-1010 |
| 3/4"      | BHP-1212 |

# BRASS THREADED HOSE FITTINGS

Recommended for low pressure air and water applications. Attachable with ferrules or hose clamps. Also available in stainless steel.

## MALE NPT



## FEMALE NPT



## FEMALE NPSM SWIVEL (BALL SEAT)



| HOSE SIZE X NPT | PART #  |
|-----------------|---------|
| 1/4 x 1/8       | BM-0402 |
| 1/4 x 1/4       | BM-0404 |
| 1/4 x 3/8       | BM-0406 |
| 5/16 x 1/8      | BM-0502 |
| 5/16 x 1/4      | BM-0504 |
| 3/8 x 1/8       | BM-0602 |
| 3/8 x 1/4       | BM-0604 |
| 3/8 x 3/8       | BM-0606 |
| 3/8 x 1/2       | BM-0608 |
| 1/2 x 1/4       | BM-0804 |
| 1/2 x 3/8       | BM-0806 |
| 1/2 x 1/2       | BM-0808 |
| 1/2 x 3/4       | BM-0812 |
| 5/8 x 3/8       | BM-1006 |
| 5/8 x 1/2       | BM-1008 |
| 5/8 x 3/4       | BM-1012 |
| 3/4 x 1/2       | BM-1208 |
| 3/4 x 3/4       | BM-1212 |
| 1 x 3/4         | BM-1612 |
| 1 x 1           | BM-1616 |
| 1-1/4 x 1       | BM-2016 |

| HOSE SIZE X NPT | PART #  |
|-----------------|---------|
| 1/4 x 1/8       | BF-0402 |
| 1/4 x 1/4       | BF-0404 |
| 5/16 x 1/4      | BF-0504 |
| 3/8 x 1/4       | BF-0604 |
| 3/8 x 3/8       | BF-0606 |
| 1/2 x 3/8       | BF-0806 |
| 1/2 x 1/2       | BF-0808 |

| HOSE SIZE X NPSM | PART #   |
|------------------|----------|
| 1/4 x 1/4        | BFS-0404 |
| 5/16 x 1/4       | BFS-0504 |
| 3/8 x 1/4        | BFS-0604 |
| 3/8 x 3/8        | BFS-0606 |
| 1/2 x 3/8        | BFS-0806 |
| 1/2 x 1/2        | BFS-0808 |
| 3/4 x 3/4        | BFS-1212 |



# GARDEN HOSE FITTINGS

Brass fittings with standard garden hose thread (GHT) for general purpose use. The female end swivels for easy connection. Many adapters are available for making the connection to the pipe thread.

## GARDEN HOSE FITTING SET

| HOSE SIZE | PART # |
|-----------|--------|
| 3/8"      | GHS-06 |
| 1/2"      | GHS-08 |
| 5/8"      | GHS-10 |
| 3/4"      | GHS-12 |

## GARDEN HOSE MALE

| HOSE SIZE | PART # |
|-----------|--------|
| 3/8"      | GHM-06 |
| 1/2"      | GHM-08 |
| 5/8"      | GHM-10 |
| 3/4"      | GHM-12 |

## GARDEN HOSE FEMALE

| HOSE SIZE | PART # |
|-----------|--------|
| 3/8"      | GHF-06 |
| 1/2"      | GHF08  |
| 5/8"      | GHF-10 |
| 3/4"      | GHF-12 |



# LOCKING LEVER COUPLINGS

For use with water pumps and irrigation. Locking lever fittings are galvanized quick couplings, each with a double-pin locking lever for smooth closing. Not recommended for use with toxic chemicals. O-Ring is included in all female parts.

**FULL VACUUM RATED**  
**30° ARTICULATION**  
**TYPE B INDUSTRIAL**  
**NBR O-RING**

**LOCK PIN LEVER**  
**INTERCHANGEABLE**  
**GALVANIZED**  
**QUICK AND EASY CONNECTIONS**

## MALE X FEMALE ASSEMBLY

| SIZE | PART # |
|------|--------|
| 2"   | BGA200 |
| 3"   | BGA300 |
| 4"   | BGA400 |
| 6"   | BGA600 |
| 8"   | BGA800 |

## MALE X HOSE SHANK

| SIZE | PART # |
|------|--------|
| 2"   | BMS200 |
| 3"   | BMS300 |
| 4"   | BMS400 |
| 6"   | BMS600 |
| 8"   | BMS800 |

## FEMALE X HOSE SHANK

| SIZE | PART # |
|------|--------|
| 2"   | BFS200 |
| 3"   | BFS300 |
| 4"   | BFS400 |
| 6"   | BFS600 |
| 8"   | BFS800 |





# LOCKING LEVER COUPLINGS CONTINUED

## MALE X MALE THREAD

| SIZE | PART # |
|------|--------|
| 2"   | BMT200 |
| 3"   | BMT300 |
| 4"   | BMT400 |
| 6"   | BMT600 |
| 8"   | BMT800 |



## FEMALE X MALE THREAD

| SIZE | PART # |
|------|--------|
| 2"   | BFT200 |
| 3"   | BFT300 |
| 4"   | BFT400 |
| 6"   | BFT600 |
| 8"   | BGT800 |



## MALE X 150# FLANGE

| SIZE | PART # |
|------|--------|
| 4"   | BMF400 |
| 6"   | BMF600 |
| 8"   | BMF800 |



## FEMALE X 150# FLANGE

| SIZE | PART # |
|------|--------|
| 4"   | BFF400 |
| 6"   | BFF600 |
| 8"   | BFF800 |



## LOCKING LEVER

| SIZE | PART # |
|------|--------|
| 2"   | BLR200 |
| 3"   | BLR300 |
| 4"   | BLR400 |
| 6"   | BLR600 |
| 8"   | BLR800 |



## O-RING

| SIZE | PART # |
|------|--------|
| 2"   | BOR200 |
| 3"   | BOR300 |
| 4"   | BOR400 |
| 6"   | BOR600 |
| 8"   | BOR800 |





# QUICK DISCONNECT FITTINGS

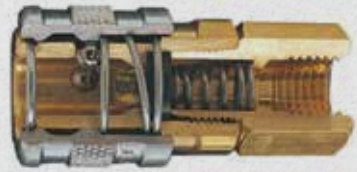




# QUICK DETACHABLE COUPLERS

**HOW TO SELECT:** Proper coupler selection is important because of the variety of media for which they are used. Four basic factors should be considered to assure proper selection: **type – operation – flow – media**

**TYPE:** All couplers consist of two basic components – a socket and a plug. The type of coupler varies by the valving arrangements in these two components.



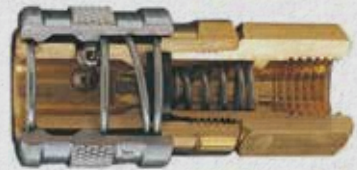
**MANUAL SOCKETS** require manual retraction of the sleeve to both connect and disconnect the plug. Ball Lock (BL) is an optional feature available on manual sockets. After connection, the sleeve is rotated locking the coupler against accidental disconnect.



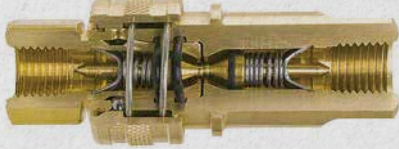
**AUTOMATIC SOCKETS** accept the plug by simple insertion into the socket and do not require retraction of the sleeve to connect. Sleeve Lock (SL) is an optional feature on automatic sockets to prevent accidental disconnect. It is functionally the same as the Ball Lock (BL) on manual sockets.



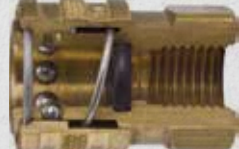
**SAFETY SOCKETS** are a variation of automatic operation. The socket accepts the plug by insertion. The sleeve is moved straight forward to lock and turn on the air. The sleeve is moved back by rotating first to the left and then to the right. This shuts off the supply line, exhausts the downstream line, and then releases the plug.



**ONE-WAY SHUT-OFFS** are the only sockets that have valving to shut off the flow when disconnected; they are, therefore, installed on the pressure side of the line. The plug has no valving and exhausts the downstream line at disconnect.



**TWO-WAY SHUT-OFFS** provide valving in both the socket and the plug, thereby shutting off flow at both of the disconnected ends. Originally developed for hydraulic lines, they are suitable for many other media because of the variety of metals and seal compounds offered.



**STRAIGHT-THRU** couplers, as the name implies, do not have valving in either the socket or the plug. Therefore, both ends of the line are exhausted at disconnect.

**OPERATION:** Operation refers to the action required to connect and disconnect a coupler. Operation is a function of sockets only and does not vary for plugs.

**FLOW:** The most important factor in properly sizing couplers is flow. Flow data is given throughout the catalog for industrial interchange design couplers, as well as many of Ragco's interchanges for competitors' non-standard designs. Where flow information is not shown, it is the same as the originating competitors' non-standard design. Most one-way shut-off non-standard couplers have the same flow as the same basic size industrial interchange design. All flows shown are for FPT couplers.

**MEDIA:** The media flowing through the coupler will usually determine the type. Compressed air, many other gasses, and some liquids can be handled by one-way shut-off couplers. Hydraulic fluids as well as many other liquids and some gasses require two-way shut-off. Straight-thru couplers are suitable where there is no pressure in the line at connect or disconnect, and loss of media at disconnect does not matter.

# ONE-WAY SHUT-OFF SERIES 3 THRU 6

Ragco 3 thru 6 Series couplers are designed for rigid mounting that allows a simple push-to-connect operation, constructed of a solid brass body and a steel valve. The "FM" Series are mechanically interchangeable with similar industrial interchange couplings made by other manufacturers and accept plugs that conform to MIL-C4109-F. Plugs used with the "FM" Series are the Industrial Interchange plugs. FM Series 3 and 5 couplers comply with A-A-59439.

## SLEEVE-LOCK OPTION

Sleeve-Lock feature locks automatic socket against accidental disconnect. To connect, align ball with slot. After connection, rotate sleeve to lock. To disconnect, realign ball with slot and retract sleeve. Sizes available with sleeve lock are shown in the tables on following pages.



| SPECIFICATIONS                | BODY SIZE                  |         |         |         |
|-------------------------------|----------------------------|---------|---------|---------|
|                               | 1/4"                       | 3/8"    | 1/2"    | 3/4"    |
| Rated Pressure (psi)          | 300 PSIG; vacuum to 26" Hg |         |         |         |
| Temperature Range (std seals) | -40° to +250° F            |         |         |         |
| Locking Device                | 3 pawls                    | 4 pawls | 5 pawls | 6 pawls |
| <b>Vacuum Data</b>            |                            |         |         |         |
| Disconnected (coupler only)   | Not Recommended            |         |         |         |
| Connected                     | 27.4 inches Hg             |         |         |         |
| Approximate CFM at 100 (psi)  | 37                         | 70      | 150     |         |

## OPTIONAL SEAL [ORDERING]:

Buna-N seal is standard. Alternate seals are specified by the appropriate suffix on the catalog number. For example, 3003 socket with Heat Adder is 3003H.

| SERVICE                   | CONSTRUCTION  | SEAL   | TEMPERATURE    | SUFFIX |
|---------------------------|---------------|--------|----------------|--------|
| Air, Vacuum, Grease & Oil | Brass & Steel | Buna-N | 40° to +250°F  | none   |
| Water                     | Brass & S/S   | Buna-N | +32° to +100°F | W      |
| Hot Water                 | Brass & S/S   | Viton  | -40° to +400°F | HW     |
| Steam                     | Brass & S/S   | EPDM   | -40° to +250°F | S      |
| Heat                      | Brass & Steel | Viton  | -40° to +400°F | H      |
| Less Valve                | Brass & Steel | Buna-N | -40° to +250°F | LV     |

Note: Temperatures shown are seal compatibility. Consult factory for operational characteristics.



# ONE-WAY SHUT-OFF SERIES 2 THRU 6

## FEATURES:

- High flow metal valves.
- Precision molded seals form a "bubble-tight" seal for reliable operation within rated working pressures. Nitrile (Buna-N) seals are standard. EPDM, Viton and Neoprene seals are available as options.
- Proven ball-locking mechanism with large numbers of stainless-steel locking balls evenly distribute the load to resist wear and provide positive connections, and allow a swiveling action to reduce hose torque.
- Integral sleeve guard protects the sleeve and resists accidental disconnects for the "SG" series.
- Knurling and/or grooves on the sleeve provide a gripping surface for ease of operation.
- Wide range of body sizes, materials, options and end terminations are available to meet specific needs.
- Accepts Industrial Interchange Plug.



**OPERATION:** Sleeve-type couplings are widely used to connect air and low-pressure fluid lines. Their compact and economical design uses a ball-locking mechanism consisting of captive stainless-steel balls that engage the locking groove on the mating plug. The sliding spring-loaded sleeve on the socket must be manually retracted in order to connect or disconnect the plug.

**MATERIAL:** Brass body and socket end, zinc-plated steel sleeve

**WORKING PRESSURE:** 300 PSIG; vacuum to 26" Hg

**INTERCHANGEABILITY:** Complies with ANSI/NFPA T3.20.14-1990 & ISO 6150-B

| SPECIFICATIONS                 | BODY SIZE             |      |      |
|--------------------------------|-----------------------|------|------|
|                                | 1/4"                  | 3/8" | 1/2" |
| Rated Pressure (psi)           | 300                   | 300  | 300  |
| Temp. Range (Buna-N Seal)      | -40° to +250° F       |      |      |
| Locking Device                 | Stainless Steel Balls |      |      |
| Vacuum Data (inches Hg)        |                       |      |      |
| -- Disconnected (coupler only) | Not Recommended       |      |      |
| -- Connected                   | 27.4                  | 27.4 | 27.4 |
| Approximate CFM at 100 (psi)   | 37                    | 70   | 150  |

# ONE-WAY SHUT-OFF 2 SERIES

## 2 SERIES 1/8" SOCKETS

| PLASTIC AND METAL TUBING |               | PART NO. | SIZE         | DESCRIPTION             |
|--------------------------|---------------|----------|--------------|-------------------------|
|                          |               | SJ8-2    | .170" x 1/4" | Plastic                 |
|                          |               | BLSJ8-2  |              | Ball Lock, 1/4" Plastic |
|                          |               | SJ8-2M   | 1/4"         | Soft Metal              |
|                          |               | BLSJ8-2M |              | Ball Lock, Soft Metal   |
| SJ8-2S/S                 | 303 Stainless |          |              |                         |

| PLASTIC & METAL TUBING |                       | PART NO. | SIZE         | DESCRIPTION           |
|------------------------|-----------------------|----------|--------------|-----------------------|
|                        |                       | SJ8P-2   | .170" x 1/4" | Plastic               |
|                        |                       | BLSJ8P-2 |              | Ball Lock, Plastic    |
|                        |                       | SJ8P-2HW |              | Plastic for Hot Water |
|                        |                       | SJ8P-2W  | 1/4"         | Plastic, for Water    |
|                        |                       | SJ8P-2M  |              | Soft Metal            |
| BLSJ8P-2M              | Ball Lock, Soft Metal |          |              |                       |

| MALE THREAD |                      | PART NO.  | MPT  | DESCRIPTION                      |
|-------------|----------------------|-----------|------|----------------------------------|
|             |                      | 2202      | 1/8" | Brass/Steel                      |
|             |                      | BL2202    |      | Ball Lock                        |
|             |                      | 2202S/S   |      | Brass                            |
|             |                      | BL2202S/S |      | Ball Lock, 303 Stainless         |
|             |                      | 2202H     | 1/4" | For Heat, Viton Seal             |
|             |                      | 2202S     |      | For Steam, Brass/SS, EPDM Seal   |
|             |                      | 2202W     |      | For Water, Brass/SS, Buna-N Seal |
|             |                      | 2402      | 1/4" | Brass/Steel                      |
|             |                      | BL2402    |      | Ball Lock                        |
| 2402H       | For Heat, Viton Seal |           |      |                                  |

Non-Standard Product Standard Product

| FEMALE THREAD |                                    | PART NO.  | FPT  | DESCRIPTION                        |
|---------------|------------------------------------|-----------|------|------------------------------------|
|               |                                    | 2302      | 1/8" | Brass/Steel                        |
|               |                                    | BL2302    |      | Ball Lock                          |
|               |                                    | 2302H     |      | Brass/Steel For Heat, Viton Seal   |
|               |                                    | 2302HW    |      | Brass/SS For Hot Water, Viton Seal |
|               |                                    | 2302S/S   | 1/4" | 303 Stainless                      |
|               |                                    | BL2302S/S |      | Ball Lock, 303 Stainless           |
|               |                                    | 2302S/SH  |      | 303 Stainless For Heat, Viton Seal |
|               |                                    | 2302W     | 1/4" | Brass/SS For Water, Buna-N Seal    |
|               |                                    | 2702      |      | Brass/Steel                        |
| BL2702        | Ball Lock                          |           |      |                                    |
| 2702H         | Brass/Steel For Heat, Viton Seal   |           |      |                                    |
| 2702HW        | Brass/SS For Hot Water, Viton Seal |           |      |                                    |

| HOSE STEM |                                     | PART NO. | I.D.  | DESCRIPTION                         |
|-----------|-------------------------------------|----------|-------|-------------------------------------|
|           |                                     | 2022     | 1/8"  | Brass/Steel                         |
|           |                                     | BL2022   |       | Ball Lock                           |
|           |                                     | 2022W    |       | For Water, Brass/SS, Buna-N Seal    |
|           |                                     | 2032     | 3/16" | Brass/Steel                         |
|           |                                     | BL2032   |       | Ball Lock                           |
|           |                                     | 2032HW   |       | For Hot Water, Brass/SS, Viton Seal |
|           |                                     | 2032S    | 1/4"  | For Steam, Brass/SS, EPDM Seal      |
|           |                                     | 2042     |       | Brass/Steel                         |
|           |                                     | BL2042   |       | Ball Lock                           |
| 2042HW    | For Hot Water, Brass/SS, Viton Seal |          |       |                                     |

Requires Hose Clamp

# ONE-WAY SHUT-OFF 2 SERIES

## 2 SERIES 1/8" PLUGS

| REUSABLE |  | PART NO. | I.D. X O.D.  | DESCRIPTION |
|----------|--|----------|--------------|-------------|
|          |  | PB3-2    | 1/4" x 1/2"  | Steel       |
|          |  | PB5-2    | 1/4" x 9/16" |             |
|          |  | PB7-2    | 1/4" x 5/8"  |             |

| FEMALE THREAD |  | PART NO. | FPT  | DESCRIPTION |
|---------------|--|----------|------|-------------|
|               |  | 23-2     | 1/8" | Steel       |
|               |  | 27-2     | 1/4" |             |

| MALE THREAD |      | PART NO. | MPT  | DESCRIPTION   |
|-------------|------|----------|------|---------------|
|             |      | 22-2     | 1/8" | Steel         |
|             |      | 22-2B    | 1/8" | Brass         |
|             |      | 22-2S/S  | 1/8" | 303 Stainless |
| 24-2        | 1/4" | Steel    |      |               |


| HOSE STEM |  | PART NO. | I.D.  | DESCRIPTION               |
|-----------|--|----------|-------|---------------------------|
|           |  | 02-2     | 1/8"  | Steel Requires Hose Clamp |
|           |  | 03-2     | 3/16" |                           |
|           |  | 04-2     | 1/4"  |                           |


| REUSABLE |  | PART NO. | I.D. X O.D.  | DESCRIPTION |
|----------|--|----------|--------------|-------------|
|          |  | PB3-2    | 1/4" x 1/2"  | Steel       |
|          |  | PB5-2    | 1/4" x 9/16" |             |
|          |  | PB7-2    | 1/4" x 5/8"  |             |

Non-Standard Product Standard Product





## 3 SERIES 1/4" PLUGS

| FEMALE THREAD |  | PART NO. | FPT  | DESCRIPTION   |
|---------------|---|----------|------|---------------|
|               |   | 13-3     | 1/8" | Steel         |
|               |   | 13-3B    |      | Brass         |
|               |   | 13-3S/S  |      | 303 Stainless |
|               |   | 11-3     | 1/4" | Steel         |
|               |   | 11-3B    |      | Brass         |
|               |   | 11-3S/S  |      | 303 Stainless |
|               |   | 15-3     | 3/8" | Steel         |

| HOSE STEM |  | PART NO. | I.D.  | DESCRIPTION |
|-----------|---|----------|-------|-------------|
|           |   | 16-3     | 1/4"  | Steel       |
|           |   | 16-3B    |       | Brass       |
|           |   | 165-3    | 5/16" | Steel       |
|           |   | 17-3     | 3/8"  | Steel       |
| 17-3B     | Brass   |          |       |             |

Requires Hose Clamp

| MALE THREAD |  | PART NO. | MPT               | DESCRIPTION  |
|-------------|--|----------|-------------------|--|
|             |  | 12-3     | 1/8"              | Steel  |
|             |  | 12-3B    |                   | Brass  |
|             |  | 12-3S/S  |                   | 303 Stainless  |
|             |  | 12S-3    | 1/4"              | Free Swivel Under Pressure Steel                                   |
|             |  | 10-3     |                   | Steel  |
|             |  | 10-3B    | 1/4"              | Brass  |
|             |  | 10-3S/S  |                   | 303 Stainless  |
|             |  | 10-3D    |                   | w/Dill Valve Steel   |
|             |  | 10-3G    |                   | Ball Check, Steel  |
|             |  | 10-3GB   |                   | Ball Check, Brass  |
|             |  | 10-3GS   |                   | Ball Check, Spring Loaded, For Steam, Brass/SS Material, EPDM Seal |
|             |  | 10-3GS/S |                   | Ball Check, 303 Stainless  |
|             |  | 10S-3    |                   | Free Swivel Under Pressure   |
|             |  | 10-3DB   |                   | Brass, Valve Core Plug   |
|             |  | 14-3     |                   | 3/8"   |
|             |  | 14-3B    | Brass             |  |
|             |  | 14-3GB   | Ball Check, Brass |  |
| 14S-3       | Free Swivel Under Pressure   |          |                   |  |

| PUSH-ON HOSE STEM |  | PART NO. | I.D. | DESCRIPTION |
|-------------------|---|----------|------|-------------|
|                   |   | 51-3     | 1/4" | Steel       |
| 71-3              | 3/8"  | Steel    |      |             |


Hose clamps not required when used with "Push On" hose.

| REUSABLE HOSE CLAMP |  | PART NO. | I.D. X O.D.   | DESCRIPTION   |
|---------------------|--|----------|---------------|---------------|
|                     |  | PB3-3    | 1/4" x 1/2"   | Steel         |
|                     |  | PB3-3B   | 1/4" x 1/2"   | Brass         |
|                     |  | PB3-3S/S | 1/4" x 1/2"   | 303 Stainless |
|                     |  | PB5-3    | 1/4" x 9/16"  | Steel         |
|                     |  | PB5-3B   | 1/4" x 9/16"  | Brass         |
|                     |  | PB7-3    | 1/4" x 5/8"   | Steel         |
|                     |  | PB7-3B   | 1/4" x 5/8"   | Brass         |
|                     |  | PB7-3S/S | 1/4" x 5/8"   | 303 Stainless |
|                     |  | PC5-3    | 5/16" x 9/16" | Steel         |
|                     |  | PC7-3    | 5/16" x 5/8"  | Steel         |
|                     |  | PD7-3    | 3/8" x 5/8"   | Steel         |
|                     |  | PD9-3    | 3/8" x 11/16" | Steel         |
|                     |  | PD11-3   | 3/8" x 3/4"   | Steel         |
|                     |  | PD13-3   | 3/8" x 13/16" | Steel         |

[1] Ball check plug eliminates hose whip at disconnect by checking the rapid flow of downstream exhaust air.  
 [2] Swivel Plug – Eliminates hose twist on end-drop applications such as blow guns, air tools, etc.


Non-Standard Product     Standard Product

## DUST CAPS


| DUST CAP |  | PART NO. | SIZE | DESCRIPTION |
|----------|---|----------|------|-------------|
|          |   | 3PDC     | 1/4" | Plastic     |


| DUST CAP |  | PART NO. | I.D. X O.D. | DESCRIPTION          |
|----------|---|----------|-------------|----------------------|
|          |   | 3SDC     | 1/4"        | For Manual 1/4" only |

## 3 SERIES 1/4" ONE-WAY MANUAL SLEEVE-GUARD SOCKETS

| FEMALE THREAD |  | PART NO. | FPT  | DESCRIPTION       |
|---------------|---|----------|------|-------------------|
|               |   | SG2803   | 1/8" | Brass             |
|               |   | SG3003   | 1/4" |                   |
|               |   | SG3003LV | 1/4" | Brass, less Valve |
| SG3203        | 3/8"  | Brass    |      |                   |

| HOSE STEM |  | PART NO. | I.D. | DESCRIPTION |
|-----------|---|----------|------|-------------|
|           |   | SG3603   | 1/4" | Brass       |
| SG3703    | 3/8"  |          |      |             |


| MALE THREAD |  | PART NO. | MPT  | DESCRIPTION        |
|-------------|---|----------|------|--------------------|
|             |   | SG2903   | 1/8" | Brass              |
|             |   | SG3103   | 1/4" |                    |
|             |   | SG3103D  | 1/4" | Brass w/Dill Valve |
| SG3303      | 3/8"  | Brass    |      |                    |

| PUSH-ON HOSE STEM |  | PART NO. | I.D. | DESCRIPTION |
|-------------------|---|----------|------|-------------|
|                   |   | SG1513   | 1/4" | Brass       |
| SG1713            | 3/8"  |          |      |             |

Hose clamps not required when used with "Push-On" hose.

[1] Sockets with modified valves are recommended for use with valve core plugs. Suffix-D to socket Cat. No.

## 3 SERIES 1/4" ONE-WAY AUTOMATIC SOCKETS

| REUSABLE HOSE CLAMP |  | PART NO. | I.D. X O.D.   | DESCRIPTION |
|---------------------|---|----------|---------------|-------------|
|                     |   | FMSB3-3  | 1/4" x 1/2"   | Brass       |
|                     |   | FMSB5-3  | 1/4" x 9/16"  |             |
|                     |   | FMSB7-3  | 1/4" x 5/8"   |             |
|                     |   | FMSC5-3  | 5/16" x 9/16" |             |
|                     |   | FMSC7-3  | 5/16" x 5/8"  |             |
|                     |   | FMSD7-3  | 3/8" x 5/8"   |             |
|                     |   | FMSD9-3  | 3/8" x 11/16" |             |
|                     |   | FMSD11-3 | 3/8" x 3/4"   |             |
|                     |   | FMSD13-3 | 3/8" x 13/16" |             |


| REUSABLE HOSE CLAMP WITH SLEEVE LOCK |  | PART NO. | I.D. X O.D.   | DESCRIPTION                                   |
|--------------------------------------|---|----------|---------------|---|
|                                      |   | SLSB3-3  | 1/4" x 1/2"   | Sleeve Lock, Brass                            |
|                                      |   | SLSB5-3  | 1/4" x 9/16"  |   |
|                                      |   | SLSB7-3  | 1/4" x 5/8"   |   |
|                                      |   | SLSB7-3W |               | Sleeve Lock, For Water, Brass/SS, Buna-N Seal |
|                                      |   | SLSC5-3  | 5/16" x 9/16" | Sleeve Lock, Brass                            |
|                                      |   | SLSC7-3  | 5/16" x 5/8"  |   |
|                                      |   | SLSD7-3  | 3/8" x 5/8"   |   |
|                                      |   | SLSD9-3  | 3/8" x 11/16" |   |
|                                      |   | SLSD11-3 | 3/8" x 3/4"   |   |
| SLSD13-3                             | 3/8" x 13/16"   |          |               |   |


Non-Standard Product     Standard Product







## 3 SERIES 1/4" ONE-WAY AUTOMATIC SOCKETS (CONTINUED)

| FEMALE THREAD |  | PART NO.                         | FPT  | DESCRIPTION                         |
|---------------|---|----------------------------------|------|-------------------------------------|
|               |   | FM2803                           | 1/8" | Brass                               |
|               |   | FM2803S                          |      | For Steam, Brass/SS, EPDM Seal      |
|               |   | SL2803                           |      | Sleeve Lock                         |
|               |   | FM2803W                          |      | For Water, Brass/SS, Buna-N Seal    |
|               |   | FM3003                           | 1/4" | Brass                               |
|               |   | SL3003                           |      | Sleeve Lock                         |
|               |   | FM3003HW                         |      | For Hot Water, Brass/SS, Viton Seal |
|               |   | FM3003S                          |      | For Steam, Brass/SS, EPDM Seal      |
|               |   | FM3003W                          | 1/4" | For Water, Brass/SS, Buna-N Seal    |
| SL3003W       | Sleeve Lock, For Water, Brass/SS, Buna-N Seal                                     |                                  |      |                                     |
| FM3203        | 3/8"  | Brass                            |      |                                     |
| SL3203        |   | Sleeve Lock                      |      |                                     |
| FM3203H       |   | For Heat, Viton Seal             |      |                                     |
| FM3203W       |   | For Water, Brass/SS, Buna-N Seal |      |                                     |

| HOSE STEM |  | PART NO. | I.D.  | DESCRIPTION                    |
|-----------|---|----------|-------|--------------------------------|
|           |   | FM3603   | 1/4"  | Brass                          |
|           |   | SL3603   | 1/4"  | Sleeve Lock, Brass             |
|           |   | FM3603S  | 1/4"  | For Steam, Brass/SS, EPDM Seal |
|           |   | FM3653   | 5/16" | Brass                          |
|           |   | SL3653   | 5/16" | Sleeve Lock, Brass             |
|           |   | FM3703   | 3/8"  | Brass                          |
|           |   | SL3703   | 3/8"  | Sleeve Lock, Brass             |
|           |   | FM3703S  | 3/8"  | For Steam, Brass/SS, EPDM Seal |

Requires Hose Clamps

| MALE THREAD |  | PART NO.                                      | MPT  | DESCRIPTION                                      |
|-------------|---|---|------|--|
|             |   | FM2903  | 1/8" | Brass  |
|             |   | SL2903  |      | Sleeve Lock, Brass                               |
|             |   | FM3103  | 1/4" | Brass  |
|             |   | SL3103  |      | Sleeve Lock, Brass                               |
|             |   | FM3103D                                       |      | w/Dill Valve                                     |
|             |   | SL3103D                                       |      | Sleeve Lock, w/Dill Valve, Brass                 |
|             |   | FM3103H                                       | 1/4" | For Heat, Viton Seal                             |
|             |   | FM3103HW                                      |      | For Hot Water, Brass/SS, Viton Seal              |
|             |   | SL3103HW                                      | 1/4" | Sleeve Lock, For Hot Water, Brass/SS, Viton Seal |
| FM3103S     | For Steam, Brass/SS, EPDM Seal  |   |      |  |
| FM3103W     | 1/4"  | For Water, Brass/SS, Buna-N Seal              |      |  |
| SL3103W     |   | Sleeve Lock, For Water, Brass/SS, Buna-N Seal |      |  |
| FM3303      | 3/8"  | Brass   |      |  |
| SL3303      |   | Sleeve Lock, Brass                            |      |  |
| FM3303W     |   | For Water, Brass/SS, Buna-N Seal              |      |  |


| PUSH-ON HOSE STEM |  | PART NO. | I.D. | DESCRIPTION                      |
|-------------------|---|----------|------|----------------------------------|
|                   |   | FM1513   | 1/4" | Brass                            |
|                   |   | SL1513   | 1/4" | Sleeve Lock, Brass               |
|                   |   | FM1713   | 3/8" | Brass                            |
|                   |   | SL1713   | 3/8" | Sleeve Lock, Brass               |
|                   |   | FM1713W  | 3/8" | For Water, Brass/SS, Buna-N Seal |

Hose clamps not required when used with "Push-On" hose.

Non-Standard Product     Standard Product

## 3 SERIES 1/4" ONE-WAY MANUAL SOCKETS

| FEMALE THREAD |  | PART NO.                                    | FPT  | DESCRIPTION                      |
|---------------|---|---|------|----------------------------------|
|               |   | 2803  | 1/8" | Brass/Steel                      |
|               |   | BL2803                                      |      | Ball Lock                        |
|               |   | 2803GB                                      |      | Brass                            |
|               |   | 2803GS                                      |      | Steel                            |
|               |   | 2803H                                       |      | Steel, For Heat, Viton Seal      |
|               |   | 2803S                                       |      | Brass/SS, For Steam, EPDM Seal   |
|               |   | 2803S/S                                     |      | 303 Stainless                    |
|               |   | BL2803S/S                                   |      | Ball Lock, 303 Stainless         |
|               |   | 2803W                                       |      | Brass/SS, For Water, Buna-N Seal |
| 3003          | 1/4"  | Brass/Steel                                 |      |                                  |
| BL3003        |   | Ball Lock                                   |      |                                  |
| 3003D         |   | w/Dill Valve                                |      |                                  |
| 3003GB        |   | Brass                                       |      |                                  |
| 3003GS        |   | Steel                                       |      |                                  |
| 3003H         |   | Steel, For Heat, Viton Seal                 |      |                                  |
| 3003HW        |   | Brass/SS, For Hot Water, Viton Seal         |      |                                  |
| 3003LV        |   | Steel, Less Valve                           |      |                                  |
| 3003S         |   | Brass/SS, For Steam, EPDM Seal              |      |                                  |
| 3003S/S       |   | 303 Stainless                               |      |                                  |
| BL3003S/S     | Ball Lock, 303 Stainless  |   |      |                                  |
| 3003S/SH      | 3/8"  | 303 Stainless, For Heat, Viton Seal         |      |                                  |
| 3003W         |   | Brass/SS, For Water, Buna-N Seal            |      |                                  |
| BL3003W       | 3/8"  | Brass/SS, Ball Lock, For Water, Buna-N Seal |      |                                  |
| 3203          |   | Brass/Steel                                 |      |                                  |
| BL3203        |   | Ball Lock                                   |      |                                  |
| 3203GB        |   | Brass                                       |      |                                  |
| 3203GS        |   | Steel                                       |      |                                  |
| 3203H         |   | Steel, For Heat, Viton Seal                 |      |                                  |
| 3203LV        |   | Steel, Less Valve                           |      |                                  |
| 3203S/S       |   | 303 Stainless                               |      |                                  |
| BL3203S/S     |   | Ball Lock, 303 Stainless                    |      |                                  |
| 3203S/SLV     |   | Less Valve, 303 Stainless                   |      |                                  |
| 3203W         | Brass/SS, For Water, Buna-N Seal  |   |      |                                  |

| MALE THREAD   |  | PART NO.                                    | MPT  | DESCRIPTION                    |
|---------------|---|---|------|--------------------------------|
|               |   | 2903  | 1/8" | Brass/Steel                    |
|               |   | BL2903                                      |      | Ball Lock                      |
|               |   | 2903GB                                      |      | Brass                          |
|               |   | 2903GS                                      |      | Steel                          |
|               |   | 2903H                                       |      | Steel, For Heat, Viton Seal    |
|               |   | 2903S                                       |      | Brass/SS, For Steam, EPDM Seal |
|               |   | 2903S/S                                     |      | 303 Stainless                  |
|               |   | BL2903S/S                                   |      | Ball Lock, 303 Stainless       |
|               |   | 3103  |      | 1/4"                           |
| BL3103        | Brass/Steel, Ball Lock  |   |      |                                |
| 3103D         | Brass/Steel, w/Dill Valve   |   |      |                                |
| 3103GB        | Brass   |   |      |                                |
| 3103GS        | Steel   |   |      |                                |
| 3103H         | Brass/Steel, For Heat, Viton Seal   |   |      |                                |
| 3103LV        | Brass/Steel, Less Valve   |   |      |                                |
| 3103S         | Brass/SS, For Steam, EPDM Seal  |   |      |                                |
| 3103S/S       | 303 Stainless   |   |      |                                |
| BL3103S/S     | Ball Lock, 303 Stainless  |   |      |                                |
| BL3103S/S-104 | Ball Lock, 303 Stainless, w/Silicone Seal   |   |      |                                |
| 3103S/SH      | 3/8"  | 303 Stainless, For Heat, Viton Seal         |      |                                |
| 3103S/SLV     |   | 303 Stainless, Less Valve                   |      |                                |
| 3103W         | 3/8"  | Brass/SS, For Water, Buna-N Seal            |      |                                |
| BL3103W       |   | Ball Lock, For Water, Brass/SS, Buna-N Seal |      |                                |
| 3303          |   | Brass/Steel                                 |      |                                |
| BL3303        |   | Ball Lock                                   |      |                                |
| 3303GB        |   | Brass                                       |      |                                |
| 3303GS        |   | Steel                                       |      |                                |
| 3303H         |   | Steel, For Heat, Viton Seal                 |      |                                |
| 3303S/S       |   | 303 Stainless                               |      |                                |
| BL3303S/S     |   | Ball Lock, 303 Stainless                    |      |                                |
| 3303W         |   | Brass/SS, For Water, Buna-N Seal            |      |                                |

Non-Standard Product     Standard Product



## 3 SERIES 1/4" ONE-WAY MANUAL SOCKETS (CONTINUED)

| HOSE STEM | PART NO.                         | I.D.                             | DESCRIPTION |
|-----------|----------------------------------|----------------------------------|-------------|
|           | 3603                             | 1/4"                             | Brass/Steel |
| BL3603    | Ball Lock                        |                                  |             |
| 3603GB    | Brass                            |                                  |             |
| 3603GS    | Steel                            |                                  |             |
| 3603S     | Brass/SS, For Steam, EPDM Seal   |                                  |             |
| 3603S/S   | 303 Stainless                    |                                  |             |
| BL3603S/S | Ball Lock, 303 Stainless         |                                  |             |
| 3603W     | Brass/SS, For Water, Buna-N Seal |                                  |             |
| 3653      | 5/16"                            |                                  | Brass/Steel |
| BL3653    |                                  |                                  | Ball Lock   |
| 3653GB    |                                  | Brass                            |             |
| 3653GS    |                                  | Steel                            |             |
| 3703      |                                  | Brass/Steel                      |             |
| BL3703    | 3/8"                             | Ball Lock                        |             |
| 3703GB    |                                  | Brass                            |             |
| 3703GS    |                                  | Steel                            |             |
| 3703S     |                                  | Brass/SS, For Steam, EPDM Seal   |             |
| 3703S/S   |                                  | 303 Stainless                    |             |
| BL3703S/S |                                  | Ball Lock, 303 Stainless         |             |
| 3703W     |                                  | Brass/SS, For Water, Buna-N Seal |             |

Requires Hose Clamp

| PUSH-ON HOSE STEM | PART NO.  | I.D.                             | DESCRIPTION |
|-------------------|-----------|----------------------------------|-------------|
|                   | 1513      | 1/4"                             | Brass/Steel |
| BL1513            | Ball Lock |                                  |             |
| 1513GB            | Brass     |                                  |             |
| 1513W             | 3/8"      | For Water, Brass/SS, Buna-N Seal |             |
| 1713              |           | Brass/Steel                      |             |
| BL1713            |           | Ball Lock                        |             |
| 1713GB            | 3/8"      | Brass                            |             |
| 1713W             |           | For Water, Brass/SS, Buna-N Seal |             |

Hose clamps not required when used with "Push-On" hose.

Non-Standard Product     Standard Product

| REUSABLE HOSE CLAMP | PART NO.                                    | I.D. X O.D.                                 | DESCRIPTION |
|---------------------|---|---|-------------|
|                     | SB3-3                                       | 1/4" x 1/2"                                 | Brass/Steel |
| BLSB3-3W            | Ball Lock, For Water, Brass/SS, Buna-N Seal |   |             |
| SB3-3GB             | Brass                                       |   |             |
| SB3-3GS             | Steel                                       |   |             |
| SB3-3S/S            | 303 Stainless                               |   |             |
| SB3-3W              | For Water, Brass/SS, Buna-N Seal            |   |             |
| SB5-3               | 1/4" x 9/16"                                |   | Brass/Steel |
| BLSB5-3             |   |   | Ball Lock   |
| SB5-3GB             |   |   | Brass       |
| SB5-3GS             |   |   | Steel       |
| BLSB5-3W            |   | Ball Lock, For Water, Brass/SS, Buna-N Seal |             |
| SB7-3               | 1/4" x 5/8"                                 | Brass/Steel                                 |             |
| BLSB7-3             |   | Ball Lock                                   |             |
| SB7-3GB             |   | Brass                                       |             |
| SB7-3GS             |   | Steel                                       |             |
| SB7-3S/S            |   | 303 Stainless                               |             |
| BLSB7-3S/S          |   | Ball Lock, 303 Stainless                    |             |
| SB7-3W              |   | For Water, Brass/SS, Buna-N Seal            |             |
| BLSB7-3W            |   | Ball Lock, For Water, Brass/SS, Buna-N Seal |             |
| SC5-3               |   | 5/16" x 9/16"                               | Brass/Steel |
| BLSC5-3             |   |   | Ball Lock   |
| SC7-3               | 5/16" x 5/8"                                | Brass/Steel                                 |             |
| BLSC7-3             |   | Ball Lock                                   |             |
| SD7-3               | 3/8" x 5/8"                                 | Brass/Steel                                 |             |
| BLSD7-3             |   | Ball Lock                                   |             |
| SD7-3GB             |   | Brass                                       |             |
| SD7-3GS             |   | Steel                                       |             |
| SD9-3               |   | 3/8" x 1 1/16"                              | Brass/Steel |
| BLSD9-3             | Ball Lock                                   |   |             |
| SD11-3              | 3/8" x 3/4"                                 | Brass/Steel                                 |             |
| BLSD11-3            |   | Ball Lock                                   |             |
| SD11-3GB            |   | Brass                                       |             |
| SD11-3GS            | 3/8" x 1 3/16"                              | Steel                                       |             |
| SD13-3              |   | Brass/Steel                                 |             |
| BLSD13-3            | Ball Lock                                   |   |             |

[1] Sockets with modified valves (Dill Valve) are recommended for use with valve core plugs.

## 4 SERIES 3/8" PLUGS

| HOSE STEM | PART NO. | I.D.  | DESCRIPTION |
|-----------|----------|-------|-------------|
|           | 46-4     | 1/4"  | Steel       |
| 47-4      | 5/16"    |       |             |
| 48-4      | 3/8"     | Brass |             |
| 48-4B     |          |       |             |
| 49-4      | 1/2"     | Steel |             |

Requires Hose Clamps

| FEMALE THREAD | PART NO. | FPT           | DESCRIPTION |
|---------------|----------|---------------|-------------|
|               | 41-4     | 1/4"          | Steel       |
| 43-4          | 3/8"     |               |             |
| 43-4S/S       |          | 303 Stainless |             |
| 45-4          | 1/2"     | Steel         |             |

| MALE THREAD | PART NO. | MPT           | DESCRIPTION |
|-------------|----------|---------------|-------------|
|             | 38-4     | 1/8"          | Steel       |
| 40-4        | 1/4"     |               |             |
| 40-4B       |          | Brass         |             |
| 40-4S/S     |          | 303 Stainless |             |
| 42-4        | 3/8"     | Steel         |             |
| 42-4B       |          | Brass         |             |
| 42-4S/S     |          | 303 Stainless |             |
| 44-4        | 1/2"     | Steel         |             |

| MALE THREAD - FREE SWIVEL - UNDER PRESSURE | PART NO. | MPT  | DESCRIPTION |
|--|----------|------|-------------|
|  | 40S-4    | 1/4" | Steel       |
| 42S-4                                      | 3/8"     |      |             |

| PUSH-ON HOSE STEM | PART NO. | I.D.  | DESCRIPTION |
|-------------------|----------|-------|-------------|
|                   | 51-4     | 1/4"  | Steel       |
| 71-4              | 3/8"     |       |             |
| 71-4B             |          | Brass |             |
| 81-4              | 1/2"     | Steel |             |

Hose clamps not required when used with "Push On" hose.

| REUSABLE | PART NO.       | I.D. X O.D. | DESCRIPTION |
|----------|----------------|-------------|-------------|
|          | PB3-4          | 1/4" x 1/2" | Steel       |
| PB5-4    | 1/4" x 9/16"   | Steel       |             |
| PB7-4    | 1/4" x 5/8"    | Steel       |             |
| PD7-4    | 3/8" x 5/8"    | Steel       |             |
| PD9-4    | 3/8" x 1 1/16" | Steel       |             |
| PD11-4   | 3/8" x 3/4"    | Steel       |             |
| PD13-4   | 3/8" x 1 3/16" | Steel       |             |

## 4 SERIES 3/8" ONE-WAY MANUAL SOCKETS

| FEMALE THREAD | PART NO.               | FPT                               | DESCRIPTION            |
|---------------|------------------------|-----------------------------------|------------------------|
|               | 4004                   | 1/4"                              | Brass/Steel            |
| BL4004        | Ball Lock, Brass/Steel |                                   |                        |
| 4204          | 3/8"                   | Brass/Steel                       |                        |
| BL4204        |                        | Ball Lock, Brass/Steel            |                        |
| 4204H         |                        | For Heat, Viton Seal, Brass/Steel |                        |
| 4204S         |                        | For Steam, Brass/SS, EPDM Seal    |                        |
| 4204S/S       |                        | 303 Stainless                     |                        |
| BL4204S/S     |                        | Ball Lock, 303 Stainless          |                        |
| 4204W         |                        | For Water, Brass/SS, Buna-N Seal  |                        |
| 4404          |                        | 1/2"                              | Brass/Steel            |
| BL4404        |                        |                                   | Ball Lock, Brass/Steel |

Non-Standard Product     Standard Product

| HOSE STEM | PART NO.                         | I.D.                             | DESCRIPTION |
|-----------|----------------------------------|----------------------------------|-------------|
|           | 4604                             | 1/4"                             | Brass/Steel |
| BL4604    | Ball Lock, Brass/Steel           |                                  |             |
| 4604W     | For Water, Brass/SS, Buna-N Seal |                                  |             |
| 4704      | 5/16"                            | Brass/Steel                      |             |
| BL4704    |                                  | Ball Lock, Brass/Steel           |             |
| 4804      | 3/8"                             | Brass/Steel                      |             |
| BL4804    |                                  | Ball Lock, Brass/Steel           |             |
| 4804S     |                                  | For Steam, Brass/SS, EPDM Seal   |             |
| 4804W     |                                  | For Water, Brass/SS, Buna-N Seal |             |
| 4904      | 1/2"                             | Brass/Steel                      |             |
| BL4904    |                                  | Ball Lock, Brass/Steel           |             |
| 4904S     |                                  | For Steam, Brass/SS, EPDM Seal   |             |

Requires Hose Clamp



## 4 SERIES 3/8" ONE-WAY MANUAL SOCKETS

| MALE THREAD | PART NO.                         | MPT                               | DESCRIPTION                       |
|-------------|----------------------------------|-----------------------------------|-----------------------------------|
|             | 4104                             | 1/4"                              | Brass/Steel                       |
|             | BL4104                           |                                   | Ball Lock, Brass/Steel            |
|             | 4104H                            |                                   | For Heat, Viton Seal, Brass/Steel |
|             | 4104S                            |                                   | For Steam, Brass/SS, EPDM Seal    |
|             | 4104W                            |                                   | For Water, Brass/SS, Buna-N Seal  |
|             | 4304                             | 3/8"                              | Brass/Steel                       |
|             | BL4304                           |                                   | Ball Lock, Brass/Stel             |
|             | 4304S                            |                                   | For Steam, Brass/SS, EPDM Seal    |
|             | 4304S/S                          |                                   | 303 Stainless                     |
| BL4304S/S   | Ball Lock, 303 Stainless         |                                   |                                   |
| 4304W       | For Water, Brass/SS, Buna-N Seal |                                   |                                   |
| 4504        | 1/2"                             | Brass/Steel                       |                                   |
| BL4504      |                                  | Ball Lock, Brass/Steel            |                                   |
| 4504H       |                                  | For Heat, Viton Seal, Brass/Steel |                                   |
| 4504S       |                                  | For Steam, Brass/SS, EPDM Seal    |                                   |
| 4504W       |                                  | For Water, Brass/SS, Buna-N Seal  |                                   |

| PUSH-ON HOSE STEM | PART NO.                         | I.D. | DESCRIPTION                      |
|-------------------|----------------------------------|------|----------------------------------|
|                   | 1714                             | 3/8" | Brass/Steel                      |
|                   | BL1714                           |      | Ball Lock                        |
|                   | 1714W                            |      | For Water, Brass/SS, Buna-N Seal |
|                   | 1814                             | 1/2" | Brass/Steel                      |
|                   | BL1814                           |      | Ball Lock                        |
| 1814W             | For Water, Brass/SS, Buna-N Seal |      |                                  |

Hose clamps not required when used with "Push-On" hose.

| REUSABLE HOSE CLAMP | PART NO.  | I.D. X O.D.   | DESCRIPTION            |
|---------------------|-----------|---------------|------------------------|
|                     | SB3-4     | 1/4" x 1/2"   | Brass/Steel            |
|                     | BLSB3-4   |               | Ball Lock, Brass/Steel |
|                     | SB5-4     | 1/4" x 9/16"  | Brass/Steel            |
|                     | BLSB5-4   |               | Ball Lock, Brass/Steel |
|                     | SB7-4     | 1/4" x 5/8"   | Brass/Steel            |
|                     | BLSB7-4   |               | Ball Lock, Brass/Steel |
|                     | SD7-4     | 3/8" x 5/8"   | Brass/Steel            |
|                     | B LSD7-4  |               | Ball Lock, Brass/Steel |
|                     | SD9-4     | 3/8" x 11/16" | Brass/Steel            |
|                     | B LSD9-4  |               | Ball Lock, Brass/Steel |
|                     | SD11-4    | 3/8" x 3/4"   | Brass/Steel            |
|                     | B LSD11-4 |               | Ball Lock, Brass/Steel |
|                     | SD13-4    | 3/8" x 13/16" | Brass/Steel            |
|                     | B LSD13-4 |               | Ball Lock, Brass/Steel |

[1] Ball check plugs eliminate hose whip at disconnect by checking the rapid flow of downstream exhaust air.

[2] Swivel Plug – Eliminates hose twist on end-drop applications such as blow guns, air tools, etc.

Non-Standard Product     Standard Product

## 4 SERIES 3/8" ONE-WAY AUTOMATIC SOCKETS

| FEMALE THREAD | PART NO.                         | FPT  | DESCRIPTION                      |
|---------------|----------------------------------|------|----------------------------------|
|               | FM4004                           | 1/4" | Brass                            |
|               | SL4004                           |      | Sleeve Lock Brass                |
|               | FM4204                           | 3/8" | Brass                            |
|               | SL4204                           |      | Sleeve Lock, Brass               |
|               | FM4204H                          |      | For Heat, Viton Seal             |
|               | FM4204W                          | 3/8" | For Water, Brass/SS, Buna-N Seal |
|               | FM4404                           |      | Brass                            |
|               | SL4404                           | 1/2" | Sleeve Lock, Brass               |
|               | FM4404S                          |      | For Steam, Brass/SS, EPDM Seal   |
| FM4404W       | For Water, Brass/SS, Buna-N Seal |      |                                  |

| REUSABLE HOSE CLAMP | PART NO.  | I.D. X O.D.   | DESCRIPTION        |
|---------------------|-----------|---------------|--------------------|
|                     | FMSB3-4   | 1/4" x 1/2"   | Brass              |
|                     | SLSB3-4   |               | Sleeve Lock, Brass |
|                     | FMSB5-4   | 1/4" x 9/16"  | Brass              |
|                     | SLSB5-4   |               | Sleeve Lock, Brass |
|                     | FMSB7-4   | 1/4" x 5/8"   | Brass              |
|                     | SLSB7-4   |               | Sleeve Lock, Brass |
|                     | FMSD7-4   | 3/8" x 5/8"   | Brass              |
|                     | S LSD7-4  |               | Sleeve Lock, Brass |
|                     | FMSD9-4   | 3/8" x 11/16" | Brass              |
|                     | S LSD9-4  |               | Sleeve Lock, Brass |
|                     | FMSD11-4  | 3/8" x 3/4"   | Brass              |
|                     | S LSD11-4 |               | Sleeve Lock, Brass |
|                     | FMSD13-4  | 3/8" x 13/16" | Brass              |
|                     | S LSD13-4 |               | Sleeve Lock, Brass |

[1] Swivel Plug – Eliminates hose twist on end-drop applications such as blow guns, air tools, etc.

[2] Ball Lock (BL) – Locks manual socket against accidental disconnect.

[3] Sleeve Lock (SL) – Locks automatic socket against accidental disconnect.

Non-Standard Product     Standard Product

| HOSE STEM | PART NO. | I.D.                             | DESCRIPTION                      |
|-----------|----------|----------------------------------|----------------------------------|
|           | FM4604   | 1/4"                             | Brass                            |
|           | SL4604   |                                  | Sleeve Lock, Brass               |
|           | FM4704   | 5/16"                            | Brass                            |
|           | SL4704   |                                  | Sleeve Lock, Brass               |
|           | FM4804   | 3/8"                             | Brass                            |
|           | SL4804   |                                  | Sleeve Lock, Brass               |
|           | FM4804H  |                                  | For Heat, Viton Seal             |
|           | FM4804W  | 3/8"                             | For Water, Brass/SS, Buna-N Seal |
|           | FM4904   |                                  | Brass                            |
| SL4904    | 1/2"     | Sleeve Lock, Brass               |                                  |
| FM4904W   |          | For Water, Brass/SS, Buna-N Seal |                                  |


| PUSH-ON HOSE STEM | PART NO.                         | I.D. | DESCRIPTION                      |
|-------------------|----------------------------------|------|----------------------------------|
|                   | FM1714                           | 3/8" | Brass                            |
|                   | SL1714                           |      | Sleeve Lock, Brass               |
|                   | FM1814                           | 1/2" | Brass                            |
|                   | SL1814                           |      | Sleeve Lock, Brass               |
|                   | FM1814W                          |      | For Water, Brass/SS, Buna-N Seal |
| FM1814W           | For Water, Brass/SS, Buna-N Seal |      |                                  |


Hose clamps not required when used with "Push-On" hose.

| MALE THREAD | PART NO.                       | MPT                              | DESCRIPTION                      |
|-------------|--------------------------------|----------------------------------|----------------------------------|
|             | FM4104                         | 1/4"                             | Brass                            |
|             | SL4104                         |                                  | Sleeve Lock, Brass               |
|             | FM4104S                        |                                  | For Steam, Brass/SS, EPDM Seal   |
|             | FM4104W                        | 1/4"                             | For Water, Brass/SS, Buna-N Seal |
|             | FM4304                         |                                  | Brass                            |
|             | SL4304                         | 3/8"                             | Sleeve Lock, Brass               |
|             | FM4304S                        |                                  | For Steam, Brass/SS, EPDM Seal   |
|             | FM4304W                        |                                  | For Water, Brass/SS, Buna-N Seal |
|             | FM4504                         | 1/2"                             | Brass                            |
| SL4504      | Sleeve Lock, Brass             |                                  |                                  |
| FM4504S     | For Steam, Brass/SS, EPDM Seal |                                  |                                  |
| FM4504W     | 1/2"                           | For Water, Brass/SS, Buna-N Seal |                                  |




## 5 SERIES 1/2" PLUG

| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION   |
|---|----------|------|---------------|
|  | 53-5     | 3/8" | Steel         |
|   | 55-5     | 1/2" | Steel         |
|   | 55-5S/S  |      | 303 Stainless |
|   | 57-5     | 3/4" | Steel         |

| HOSE STEM   | PART NO. | I.D. | DESCRIPTION       |
|---|----------|------|-------------------|
|  | 59-5     | 3/8" | Steel             |
|   | 59-5B    | 3/8" | Brass             |
|   | 60-5     | 1/2" | Steel             |
|   | 60-5G    | 1/2" | Ball Check, Steel |
|   | 60-5B    | 1/2" | Brass             |
|   | 61-5     | 3/4" | Steel             |
|   | 61-5B    | 3/4" | Brass             |


Requires Hose Clamps

| REUSABLE HOSE CLAMP  | PART NO. | I.D. X O.D.   | DESCRIPTION |
|--|----------|---------------|-------------|
|  | PB3-5    | 1/4" x 1/2"   | Steel       |
|  | PB5-5    | 1/4" x 9/16"  |             |
|  | PB7-5    | 1/4" x 5/8"   |             |
|  | PD7-5    | 3/8" x 5/8"   |             |
|  | PD9-5    | 3/8" x 11/16" |             |
|  | PD11-5   | 3/8" x 3/4"   |             |
|  | PD13-5   | 3/8" x 13/16" |             |
|  | PP13-5   | 1/2" x 13/16" |             |
|  | PP15-5   | 1/2" x 7/8"   |             |
|  | PP17-5   | 1/2" x 15/16" |             |
|  | PP19-5   | 1/2" x 1"     |             |


## COAXIAL PLUG/COUPLER

| MALE THREAD PLUG  | PART NO. | I.D. | DESCRIPTION |
|---|----------|------|-------------|
|  | 54-5CA   | 1/2" | Steel       |


| MALE THREAD COUPLER   | PART NO. | I.D. | DESCRIPTION           |
|---|----------|------|-----------------------|
|  | SV5305CA | 1/2" | Steel, Safety Coupler |
|   | SV5505CA | 3/4" |                       |


| PUSH-ON HOSE STEM   | PART NO. | I.D. | DESCRIPTION |
|---|----------|------|-------------|
|  | 71-5     | 3/8" | Steel       |
|   | 81-5     | 1/2" |             |
|   | 81-5B    | 1/2" |             |

Hose clamps not required when used with "Push On" hose.


| MALE THREAD   | PART NO. | MPT           | DESCRIPTION       |
|---|----------|---------------|-------------------|
|  | 50-5     | 1/4"          | Steel             |
|   | 52-5     | 3/8"          | Steel             |
|   | 52-5B    |               | Brass             |
|   | 54-5GB   | 1/2"          | Ball Check, Brass |
|   | 54-5     |               | Steel             |
|   | 54-5G    |               | Ball Check, Steel |
|   | 54-5B    | Brass         |                   |
|   | 54-5S/S  | 303 Stainless |                   |
|   | 56-5     | 3/4"          | Steel             |
|   | 56-5S/S  |               | 303 Stainless     |


| MALE THREAD SWIVEL UNDER PRESSURE  | PART NO. | MPT  | DESCRIPTION                       |
|--|----------|------|-----------------------------------|
|  | 54S-5    | 1/2" | Free Swivel Under Pressure, Steel |

 Non-Standard Product

 Standard Product

## 5 SERIES 1/2" 1-WAY SHUT-OFF SOCKETS


| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION                      |
|---|----------|------|----------------------------------|
|  | 4015     | 1/4" | Brass/Steel                      |
|   | BL4015   |      | Ball Lock, Brass/Steel           |
|   | 5005     | 3/8" | Brass/Steel                      |
|   | BL5005   |      | Ball Lock, Brass/Steel           |
|   | 5005H    |      | For Heat, Viton Seal             |
|   | 5005W    |      | For Water, Brass/SS, Buna-N Seal |
|   | 5205     | 1/2" | Brass/Steel                      |
|   | BL5205   |      | Ball Lock, Brass/Steel           |
|   | 5205H    |      | For Heat, Viton Seal             |
|   | 5205LV   |      | Less Valve                       |
|   | 5205S/S  |      | 303 Stainless                    |
|   | 5205W    |      | For Water, Brass/SS, Buna-N Seal |
|   | 5405     | 3/4" | Brass/Steel                      |
|   | BL5405   |      | Ball Lock, Brass/Steel           |
|   | 5405W    |      | For Water, Brass/SS, Buna-N Seal |


| HOSE STEM   | PART NO. | I.D.                             | DESCRIPTION                         |
|---|----------|----------------------------------|-------------------------------------|
|  | 5605     | 1/4"                             | Brass/Steel                         |
|   | BL5605   |                                  | Ball Lock, Brass/Steel              |
|   | 5705     | 3/8"                             | Brass/Steel                         |
|   | BL5705   |                                  | Ball Lock, Brass/Steel              |
|   | 5705H    |                                  | For Heat, Viton Seal                |
|   | 5805     | 1/2"                             | Brass/Steel                         |
|   | BL5805   |                                  | Ball Lock, Brass/Steel              |
|   | 5805H    |                                  | For Heat, Viton Seal                |
|   | 5805HW   |                                  | For Hot Water, Brass/SS, Viton Seal |
|   | 5805W    |                                  | For Water, Brass/SS, Buna-N Seal    |
|   | 5905     |                                  | 3/4"                                |
|   | BL5905   | Ball Lock, Brass/Steel           |                                     |
|   | 5905W    | For Water, Brass/SS, Buna-N Seal |                                     |


Requires Hose Clamps


| PUSH-ON   | PART NO. | I.D. | DESCRIPTION                      |
|---|----------|------|----------------------------------|
|  | 1815     | 1/2" | Brass/Steel                      |
|   | 1815W    | 1/2" | For Water, Brass/SS, Buna-N Seal |
|   | BL1815   | 1/2" | Ball Lock, Brass/Steel           |

Hose clamps not required when used with "Push On" hose.

| MALE THREAD   | PART NO. | MPT                              | DESCRIPTION            |
|---|----------|----------------------------------|------------------------|
|  | 4905     | 1/4"                             | Brass/Steel            |
|   | BL4905   |                                  | Ball Lock, Brass/Steel |
|   | 5105     | 3/8"                             | Brass/Steel            |
|   | BL5105   |                                  | Ball Lock, Brass/Steel |
|   | 5305     |                                  | Brass/Steel            |
|   | BL5305   | Ball Lock, Brass/Steel           |                        |
|   | 5305H    | 1/2"                             | For Heat, Viton Seal   |
|   | 5305S/S  |                                  | 303 Stainless          |
|   | 5305W    | For Water, Brass/SS, Buna-N Seal |                        |
|   | 5505     | 3/4"                             | Brass/Steel            |
|   | BL5505   |                                  | Ball Lock, Brass/Steel |


| REUSABLE HOSE CLAMP   | PART NO. | I.D. X O.D.   | DESCRIPTION                      |
|---|----------|---------------|----------------------------------|
|  | SD7-5    | 3/8" x 5/8"   | Brass/Steel                      |
|   | BLSD7-5  |               | Ball Lock, Brass/Steel           |
|   | SD7-5W   |               | For Water, Brass/SS, Buna-N Seal |
|   | SD9-5    | 3/8" x 11/16" | Brass/Steel                      |
|   | BLSD9-5  |               | Ball Lock, Brass/Steel           |
|   | SD9-5W   |               | For Water, Brass/SS, Buna-N Seal |
|   | SD11-5   | 3/8" x 3/4"   | Brass/Steel                      |
|   | BLSD11-5 |               | Ball Lock, Brass/Steel           |
|   | SD13-5   | 3/8" x 13/16" | Brass/Steel                      |
|   | BLSD13-5 |               | Ball Lock, Brass/Steel           |
|   | SP13-5   | 1/2" x 13/16" | Brass/Steel                      |
|   | BLSP13-5 |               | Ball Lock, Brass/Steel           |
|   | SP13-5W  |               | For Water, Brass/SS, Buna-N Seal |
|   | SP15-5   | 1/2" x 7/8"   | Brass/Steel                      |
|   | BLSP15-5 |               | Ball Lock, Brass/Steel           |
|   | SP17-5   | 1/2" x 15/16" | Brass/Steel                      |
|   | BLSP17-5 |               | Ball Lock, Brass/Steel           |
|   | SP19-5   | 1/2" x 1"     | Brass/Steel                      |
|   | BLSP19-5 |               | Ball Lock, Brass/Steel           |


 Non-Standard Product

 Standard Product




## 5 SERIES 1/2" ONE-WAY AUTOMATIC SOCKETS

| FEMALE THREAD |  | PART NO. | FPT                              | DESCRIPTION                      |
|---------------|---|----------|----------------------------------|----------------------------------|
|               |   | FM4015   | 1/4"                             | Brass                            |
|               |   | SL4015   |                                  | Sleeve Lock, Brass               |
|               |   | FM5005   | 3/8"                             | Brass                            |
|               |   | SL5005   |                                  | Sleeve Lock, Brass               |
|               |   | FM5005H  |                                  | For Heat, Viton Seal, Brass      |
|               |   | FM5005S  |                                  | For Steam, Brass/SS, EPDM Seal   |
|               |   | FM5005W  |                                  | For Water, Brass/SS, Buna-N Seal |
|               |   | FM5205   | 1/2"                             | Brass                            |
|               |   | SL5205   |                                  | Sleeve Lock, Brass               |
|               |   | FM5205H  |                                  | For Heat, Viton Seal, Brass      |
|               |   | FM5205LV |                                  | Less Valve, Brass                |
|               |   | FM5205S  |                                  | For Steam, Brass/SS, EPDM Seal   |
|               |   | FM5205W  | For Water, Brass/SS, Buna-N Seal |                                  |
|               |   | FM5405   | 3/4"                             | Brass                            |
|               |   | SL5405   |                                  | Sleeve Lock, Brass               |
|               |   | FM5405W  |                                  | For Water, Brass/SS, Buna-N Seal |


| HOSE STEM |  | PART NO. | I.D. | DESCRIPTION                       |
|-----------|---|----------|------|-----------------------------------|
|           |   | FM5605   | 1/4" | Brass                             |
|           |   | SL5605   |      | Sleeve Lock, Brass                |
|           |   | FM5705   | 3/8" | Brass                             |
|           |   | SL5705   |      | Sleeve Lock, Brass                |
|           |   | FM5705H  |      | For Heat, Viton Seal, Brass       |
|           |   | FM5805   | 1/2" | Brass                             |
|           |   | SL5805   |      | Sleeve Lock, Brass                |
|           |   | FM5805H  |      | For Heat, Viton Seal, Brass       |
|           |   | SL5805H  |      | For Heat, Sleeve Lock, Viton Seal |
|           |   | FM5805W  |      | For Water, Brass/SS, Buna-N Seal  |
|           |   | FM5905   | 3/4" | Brass                             |
| SL5905    | Sleeve Lock, Brass  |          |      |                                   |


Requires Hose Clamp

| REUSABLE HOSE CLAMP |  | PART NO. | I.D. X O.D.   | DESCRIPTION                 |
|---------------------|--|----------|---------------|-----------------------------|
|                     |  | FMSD7-5  | 3/8" x 5/8"   | Brass                       |
|                     |  | SLS7-5   |               | Sleeve Lock, Brass          |
|                     |  | FMSD7-5H | 3/8" x 11/16" | For Heat, Viton Seal, Brass |
|                     |  | SLS7-5H  |               | Sleeve Lock, Brass          |
|                     |  | FMSD9-5  | 3/8" x 13/16" | Brass                       |
|                     |  | SLS9-5   |               | Sleeve Lock, Brass          |
|                     |  | FMSD11-5 | 3/8" x 3/4"   | Brass                       |
|                     |  | SLS11-5  |               | Sleeve Lock, Brass          |
|                     |  | FMSD13-5 | 3/8" x 13/16" | Brass                       |
|                     |  | SLS13-5  |               | Sleeve Lock, Brass          |
|                     |  | FMSD15-5 | 1/2" x 13/16" | Brass                       |
|                     |  | SLS15-5  |               | Sleeve Lock, Brass          |
|                     |  | FMSD17-5 | 1/2" x 15/16" | Brass                       |
|                     |  | SLS17-5  |               | Sleeve Lock, Brass          |
|                     |  | FMSD19-5 | 1/2" x 1"     | Brass                       |
|                     |  | SLS19-5  |               | Sleeve Lock, Brass          |

- [1] Swivel Plug – Eliminates hose twist for applications such as blow guns, air tools, etc.
- [2] Ball check plugs eliminate hose whip at disconnect by checking the rapid flow of downstream exhaust air.
- [3] Ball Lock (BL) – Locks manual socket against accidental disconnect.
- [4] Sleeve Lock (SL) – Locks automatic socket against accidental disconnect.

Non-Standard Product     Standard Product

| MALE THREAD |  | PART NO. | MPT  | DESCRIPTION                      |
|-------------|---|----------|------|----------------------------------|
|             |   | FM4905   | 1/4" | Brass                            |
|             |   | SL4905   |      | Sleeve Lock, Brass               |
|             |   | FM5105   | 3/8" | Brass                            |
|             |   | SL5105   |      | Sleeve Lock, Brass               |
|             |   | FM5305   |      | Brass                            |
|             |   | SL5305   | 1/2" | Sleeve Lock, Brass               |
|             |   | FM5305S  |      | For Steam, Brass/SS, EPDM Seal   |
|             |   | FM5305W  |      | For Water, Brass/SS, Buna-N Seal |
|             |   | FM5505   | 3/4" | Brass                            |
| SL5505      | Sleeve Lock, Brass  |          |      |                                  |
| FM5505S     | For Steam, Brass/SS, EPDM Seal  |          |      |                                  |


| PUSH-ON HOSE STEM |  | PART NO. | I.D. | DESCRIPTION |
|-------------------|---|----------|------|-------------|
|                   |   | FM1815   | 1/2" | Brass       |


Hose clamps not required when used with "Push-On" hose.

## 6 SERIES 3/4" PLUGS

| FEMALE THREAD |  | PART NO. | FPT  | DESCRIPTION |
|---------------|---|----------|------|-------------|
|               |   | 65-6     | 1/2" | Steel       |
|               |   | 67-6     | 3/4" |             |
| 69-6          | 1"  |          |      |             |

| MALE THREAD |  | PART NO. | MPT  | DESCRIPTION |
|-------------|---|----------|------|-------------|
|             |   | 64-6     | 1/2" | Steel       |
|             |   | 66-6     | 3/4" |             |
|             |   | 68-6     | 1"   |             |

| HOSE STEM |  | PART NO. | I.D. | DESCRIPTION                |
|-----------|---|----------|------|----------------------------|
|           |   | 70-6     | 1/2" | Steel Requires Hose Clamps |
|           |   | 71-6     | 3/4" |                            |
|           |   | 72-6     | 1"   |                            |

## 6 SERIES 3/4" ONE-WAY AUTOMATIC SOCKETS


| FEMALE THREAD |  | PART NO. | FPT                              | DESCRIPTION                              |
|---------------|--|----------|----------------------------------|--|
|               |  | FM6206   | 1/2"                             | Brass                                    |
|               |  | SL6206   |                                  | Sleeve Lock, Brass                       |
|               |  | FM6206W  |                                  | For Water, Brass/SS, Buna-N Seal         |
|               |  | FM6406   | 3/4"                             | Brass                                    |
|               |  | SL6406   |                                  | Sleeve Lock, Brass                       |
|               |  | FM6406H  |                                  | For Heat, Viton Seal                     |
|               |  | SL6406H  |                                  | For Heat, Sleeve Lock, Viton Seal, Brass |
|               |  | FM6406S  |                                  | For Steam, Brass/SS, EPDM Seal           |
|               |  | FM6406W  |                                  | For Water, Brass/SS, Buna-N Seal         |
|               |  | FM6606   | 1"                               | Brass                                    |
|               |  | SL6606   |                                  | Sleeve Lock, Brass                       |
|               |  | FM6606W  | For Water, Brass/SS, Buna-N Seal |  |

| MALE THREAD |  | PART NO.           | MPT                              | DESCRIPTION                    |
|-------------|---|--------------------|----------------------------------|--------------------------------|
|             |   | FM6306             | 1/2"                             | Brass                          |
|             |   | SL6306             |                                  | Sleeve Lock, Brass             |
|             |   | FM6306S            |                                  | For Steam, Brass/SS, EPDM Seal |
|             |   | FM6306W            | For Water, Brass/SS, Buna-N Seal |                                |
|             |   | FM6506             | 3/4"                             | Brass                          |
|             |   | SL6506             |                                  | Sleeve Lock, Brass             |
|             |   | FM6506S            |                                  | For Steam, Brass/SS, EPDM Seal |
| FM6506W     | For Water, Brass/SS, Buna-N Seal  |                    |                                  |                                |
| FM6706      | 1"  | Brass              |                                  |                                |
| SL6706      |   | Sleeve Lock, Brass |                                  |                                |

| HOSE STEM |  | PART NO. | MPT                              | DESCRIPTION                      |
|-----------|---|----------|----------------------------------|----------------------------------|
|           |   | FM6806   | 1/2"                             | Brass                            |
|           |   | SL6806   |                                  | Sleeve Lock, Brass               |
|           |   | FM6806W  | For Water, Brass/SS, Buna-N Seal |                                  |
|           |   | FM6906   | 3/4"                             | Brass                            |
|           |   | SL6906   |                                  | Sleeve Lock, Brass               |
|           |   | FM6906W  |                                  | For Water, Brass/SS, Buna-N Seal |
|           |   | FM7006   | 1"                               | Brass                            |
| SL7006    | Sleeve Lock, Brass  |          |                                  |                                  |

[1] Sleeve Lock (SL) – Locks automatic socket against accidental disconnect.

## 6 SERIES COAXIAL PLUG/COUPLER

| MALE THREAD PLUG |  | PART NO. | I.D. | DESCRIPTION |
|------------------|---|----------|------|-------------|
|                  |   | 64-6CA   | 1/2" | Steel       |
|                  |   | 66-6CA   | 3/4" |             |

| FEMALE THREAD COUPLER |  | PART NO. | I.D. | DESCRIPTION           |
|-----------------------|---|----------|------|-----------------------|
|                       |   | SV6406CA | 3/4" | Steel, Safety Coupler |

Non-Standard Product     Standard Product

| MALE THREAD COUPLER |  | PART NO. | I.D. | DESCRIPTION           |
|---------------------|---|----------|------|-----------------------|
|                     |   | SV6506CA | 3/4" | Steel, Safety Coupler |

\* RAGCO supports the autonomy of its locations to select the best products to service their markets. Subtle variations of these specifications may exist. Contact your RAGCO affiliate for confirmation.

QUICK DETACHABLE COUPLERS



QUICK DETACHABLE COUPLERS

\* RAGCO supports the autonomy of its locations to select the best products to service their markets. Subtle variations of these specifications may exist. Contact your RAGCO affiliate for confirmation.



# LN SERIES

## FEATURES:

Ragco LN Series couplings are interchangeable with Lincoln's "Long Nose" series couplings and offer quick coupling of all air-operated equipment. They are only available in 1/4" body size, air-operated equipment. They are only available in 1/4" body size, brass and steel construction.

- Locking mechanism prevents accidental coupler detachment.
- Increased air flow due to a larger air passage.
- Automatic air-check valve shuts off air instantly when uncoupled, providing leak-proof seal.
- Corrosion-resistant steel for long service life.
- Free swivel helps prevent kinking or curling of air hoses.

## OPERATION:

**Manual:** socket sleeve must be retracted to connect and disconnect

**Automatic:** Push-To connect

## SPECIFICATIONS:

**Type:** One-Way Shut-Off

**Rated Pressure:** 300 PSIG

**Temperature Range (std seals):** -40° to +250°F.


## PLUGS - 1/4"

| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | LN13     | 1/8" | Steel       |
|   | LN11     | 1/4" |             |


| MALE THREAD   | PART NO. | MPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | LN12     | 1/8" | Steel       |
|   | LN10     | 1/4" |             |


## AUTOMATIC - 1/4" SOCKETS


| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | LN2803   | 1/8" | Brass/Steel |
|   | LN3003   | 1/4" |             |
|   | LN3203   | 3/8" |             |



| PUSH-ON HOSE STEM   | PART NO. | SIZE I.D. | DESCRIPTION |
|---|----------|-----------|-------------|
|  | LN1513   | 1/4"      | Brass/Steel |
|   | LN1713   | 3/8"      |             |

Hose clamps not required when used with "Push On" hose. See page 63.

| MALE THREAD   | PART NO. | MPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | LN2903   | 1/8" | Brass/Steel |
|   | LN3103   | 1/4" |             |
|   | LN3303   | 3/8" |             |

| REUSABLE HOSE CLAMP   | PART NO.      | SIZE (I.D. X O.D.) | DESCRIPTION |
|---|---------------|--------------------|-------------|
|  | LNSB3         | 1/4" x 1/2"        | Brass/Steel |
|   | LNSB5         | 1/4" x 9/16"       |             |
|   | LNSB7         | 1/4" x 5/8"        |             |
|   | LNSC5         | 15/16" x 3/16"     |             |
|   | LNSC7         | 15/16" x 5/8"      |             |
|   | LNSD11        | 3/8" x 5/8"        |             |
|   | LNSD13        | 3/8" x 11/16"      |             |
|   | LNSD7         | 3/8" x 3/4"        |             |
| LNSD9   | 3/8" x 13/16" |                    |             |

| HOSE STEM   | PART NO. | I.D.  | DESCRIPTION                        |
|---|----------|-------|------------------------------------|
|  | LN3603   | 1/4"  | Brass/Steel<br>Requires Hose Clamp |
|   | LN3653   | 5/16" |                                    |
|   | LN3703   | 3/8"  |                                    |


 Non-Standard Product  Standard Product

# LN SERIES CONTINUED

## MANUAL - 1/4" SOCKETS

| MALE THREAD   | PART NO. | MPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | LN2903M  | 1/8" | Brass/Steel |
|   | LN3103M  | 1/4" |             |
|   | LN3303M  | 3/8" |             |

| HOSE STEM   | PART NO. | I.D. | DESCRIPTION                        |
|---|----------|------|------------------------------------|
|  | LN3603M  | 1/4" | Brass/Steel<br>Requires Hose Clamp |
|   | LN3703M  | 3/8" |                                    |

| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | LN2803M  | 1/8" | Brass/Steel |
|   | LN3003M  | 1/4" |             |
|   | LN3203M  | 3/8" |             |

# SHD SERIES

## FEATURES:

- Engineered for speedy coupling and uncoupling. To lock - push in; To unlock - rotate sleeve 1/8 turn.
- Designed to protect against accidental uncoupling. A variety of types and sizes are available to meet specific needs.
- Standard Twist-Lock couplings are ideal for low-to-medium air flows, such as air tools.

**OPERATION:** Automatic Push-To connect; Twist-to-release

## SPECIFICATIONS:

**Temperature Range (Nitrile seal):** -10° to +165°F

**Locking Device:** Twist-Lock


**Vacuum Service:** 27 HG


**Type:** One-Way Shut-Off


**Rated Pressure:** 300 PSIG



**Materials:** Aluminum bodies and zinc-plated steel sleeves. Buna-N seals. Brass adapters.

## SHD3 SERIES - 1/2" PLUGS

| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | SHD53    | 3/8" | Steel       |

| HOSE STEM   | PART NO. | I.D. | DESCRIPTION                  |
|---|----------|------|------------------------------|
|  | SHD59    | 3/8" | Steel<br>Requires Hose Clamp |
|   | SHD60    | 1/2" |                              |

| MALE THREAD   | PART NO. | MPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | SHD50    | 1/4" | Steel       |
|   | SHD52    | 3/8" |             |
|   | SHD54    | 1/2" |             |


 Non-Standard Product  Standard Product







# SHD SERIES

## SHD3 SERIES - 1/4" PLUGS

| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION   |
|---|----------|------|---------------|
|  | SHD13    | 1/8" | Steel         |
|   | SHD11    | 1/4" | Steel         |
|   | SHD11S/S | 1/4" | 303 Stainless |


| HOSE STEM   | PART NO. | I.D. | DESCRIPTION                  |
|---|----------|------|------------------------------|
|  | SHD16    | 1/4" | Steel<br>Requires Hose Clamp |
|   | SHD17    | 3/8" |                              |


| MALE THREAD   | PART NO. | MPT  | DESCRIPTION   |
|---|----------|------|---------------|
|  | SHD12    | 1/8" | Steel         |
|   | SHD10    | 1/4" | Steel         |
|   | SHD10S/S | 1/4" | 303 Stainless |


| PUSH-ON HOSE STEM   | PART NO. | I.D. | DESCRIPTION |
|---|----------|------|-------------|
|  | SHD51    | 1/4" | Steel       |


Hose clamps not required when used with "Push On" hose.

## SHD5 SERIES - 1/2" AUTOMATIC SOCKETS


| FEMALE THREAD  | PART NO. | FPT  | DESCRIPTION              |
|--|----------|------|--------------------------|
|  | SHD4015  | 1/4" | Aluminum/Steel/<br>Brass |
|  | SHD5005  | 3/8" |                          |
|  | SHD5205  | 1/2" |                          |
|  | SHD5405  | 3/4" |                          |

| MALE THREAD   | PART NO. | MPT  | DESCRIPTION              |
|---|----------|------|--------------------------|
|  | SHD4905  | 1/4" | Aluminum/Steel/<br>Brass |
|   | SHD5105  | 3/8" |                          |
|   | SHD5305  | 1/2" |                          |
|   | SHD5505  | 3/4" |                          |

| HOSE STEM   | PART NO. | I.D. | DESCRIPTION                                     |
|---|----------|------|---|
|  | SHD5605  | 1/4" | Aluminum/Steel/<br>Brass<br>Requires Hose Clamp |
|   | SHD5705  | 3/8" |   |
|   | SHD5805  | 1/2" |   |
|   | SHD5905  | 3/4" |   |

| PUSH-ON HOSE STEM  | PART NO. | I.D. | DESCRIPTION          |
|--|----------|------|----------------------|
|  | SHD1815  | 1/2" | Aluminum/Steel/Brass |

Hose clamps not required when used with "Push On" hose.

| RELIABLE HOSE CLAMP   | PART NO. | I.D. X O.D.   | DESCRIPTION              |
|---|----------|---------------|--------------------------|
|  | SHDSD75  | 3/8" x 5/8"   | Aluminum/Steel/<br>Brass |
|   | SHDSD95  | 3/8" x 11/16" |                          |
|   | SHDSD115 | 3/8" x 3/4"   |                          |
|   | SHDSD135 | 3/8" x 13/16" |                          |
|   | SHDSP135 | 1/2" x 13/16" |                          |
|   | SHDSP155 | 1/2" x 1/8"   |                          |
|   | SHDSP175 | 1/2" x 15/16" |                          |
|   | SHDSP195 | 1/2" x 1"     |                          |


| DUST PLUG   | PART NO. | SIZE | DESCRIPTION        |
|---|----------|------|--------------------|
|  | SHD-DP   | 1/4" | Aluminum w/Lanyard |

Non-Standard Product  Standard Product


## SHD5 SERIES - 1/4" AUTOMATIC SOCKETS

| FEMALE THREAD   | PART NO.    | FPT  | DESCRIPTION                              |
|---|-------------|------|--|
|  | SHD2803     | 1/8" | Aluminum/Steel/<br>Brass                 |
|   | SHD2803S/S  |      | 303 Stainless                            |
|   | SHD3003     | 1/4" | Aluminum/Steel/<br>Brass                 |
|   | SHD3003-104 |      | Aluminum/Steel/<br>Brass w/Silicone Seal |
|   | SHD3003LV   |      | Aluminum/Steel/<br>Brass Less Valve      |
|   | SHD3003S/S  |      | 303 Stainless                            |
|   | SHD3203     | 3/8" | Aluminum/Steel/<br>Brass                 |
|   | SHD3203S/S  |      | 303 Stainless                            |

| MALE THREAD  | PART NO.    | MPT  | DESCRIPTION                              |
|--|-------------|------|--|
|  | SHD2903     | 1/8" | Aluminum/Steel/<br>Brass                 |
|  | SHD2903S/S  |      | 303 Stainless                            |
|  | SHD3103     | 1/4" | Aluminum/Steel/<br>Brass                 |
|  | SHD3103-104 |      | Aluminum/Steel/<br>Brass w/Silicone Seal |
|  | SHD3103S/S  |      | 303 Stainless                            |
|  | SHD3303     | 3/8" | Aluminum/Steel/<br>Brass                 |
|  | SHD3303S/S  |      | 303 Stainless                            |

| HOSE STEM   | PART NO.   | I.D.  | DESCRIPTION              |
|---|------------|-------|--------------------------|
|  | SHD3603    | 1/4"  | Aluminum/Steel/<br>Brass |
|   | SHD3603S/S |       | 303 Stainless            |
|   | SHD3653    | 5/16" | Aluminum/Steel/<br>Brass |
|   | SHD3703    | 3/8"  | Aluminum/Steel/<br>Brass |
|   | SHD3703S/S |       | 303 Stainless            |

Requires Hose Clamp

| RELIABLE HOSE CLAMP   | PART NO.   | I.D. X O.D.   | DESCRIPTION              |
|---|------------|---------------|--------------------------|
|  | SHDSB33    | 1/4" x 1/2"   | Aluminum/Steel/<br>Brass |
|   | SHDSB33S/S |               | 303 Stainless            |
|   | SHDSB53    | 1/4" x 9/16"  | Aluminum/Steel/<br>Brass |
|   | SHDSB73    | 1/4" x 5/8"   | Aluminum/Steel/<br>Brass |
|   | SHDSB73S/S |               | 303 Stainless            |
|   | SHDSC53    | 5/16" x 9/16" | Aluminum/Steel/<br>Brass |
|   | SHDSC73    | 5/16" x 5/8"  | Aluminum/Steel/<br>Brass |
|   | SHDSD73    | 3/8" x 5/8"   | Aluminum/Steel/<br>Brass |
|   | SHDSD93    | 3/8" x 11/16" | Aluminum/Steel/<br>Brass |
|   | SHDSD113   | 3/8" x 3/4"   | Aluminum/Steel/<br>Brass |
|   | SHDSD133   | 3/8" x 13/16" | Aluminum/Steel/<br>Brass |

| PUSH-ON HOSE STEM   | PART NO. | I.D. | DESCRIPTION              |
|---|----------|------|--------------------------|
|  | SHD1513  | 1/4" | Aluminum/Steel/<br>Brass |
|   | SHD1713  | 3/8" |                          |

Hose clamps not required when used with "Push On" hose.

Non-Standard Product  Standard Product





# FRL SERIES

**TYPE:** One-Way Shut-Off

**OPERATION:** Automatic Push-To connect; Twist-to-release

**FEATURES:**

- High flow capacity
  - 2RL flow equals that of most 3/8" couplings
  - 3RL flow equals that of most 1/2" couplings
- Ring lock
- Push-To connect
- Will not disconnect when hose is dragged on the ground
- Rotate locking sleeve approximately 20° to disconnect
- Optional seal materials available


**RATED PRESSURE:** 300 PSIG


**STANDARD MATERIALS:**


- Socket
  - Zinc-Plated Steel Body
  - Brass Socket End
  - Nickel-Plated Steel Sleeve
  - Zinc-Plated Steel Valve
  - Buna-N (Nitrile) Seal
  - Stainless Steel Spring
  - Zinc-Plated Steel Locking Ring
- Plug
  - Zinc-Plated Case-Hardened Steel

**ACCESSORIES:** Dust caps and dust plugs

## 2FRL SERIES 3/8" PLUGS


| FEMALE THREAD  | PART NO. | FPT  | DESCRIPTION |
|--|----------|------|-------------|
|  | 2L41     | 1/4" | Steel       |
|  | 2L43     | 3/8" |             |
|  | 2L45     | 1/2" |             |


| HOSE STEM   | PART NO. | I.D. | DESCRIPTION                  |
|---|----------|------|------------------------------|
|  | 2L46     | 1/4" | Steel<br>Requires Hose Clamp |
|   | 2L48     | 3/8" |                              |
|   | 2L49     | 1/2" |                              |
|   |          |      |                              |


| MALE THREAD  | PART NO. | MPT  | DESCRIPTION |
|--|----------|------|-------------|
|  | 2L38     | 1/8" | Steel       |
|  | 2L40     | 1/4" |             |
|  | 2L42     | 3/8" |             |
|  | 2L44     | 1/2" |             |



| REUSABLE HOSE CLAMP   | PART NO. | I.D. X O.D.   | DESCRIPTION |
|---|----------|---------------|-------------|
|  | 2LPD7    | 3/8" x 5/8"   | Steel       |
|   | 2LPD9    | 3/8" x 11/16" |             |
|   | 2LPD11   | 3/8" x 3/4"   |             |
|   | 2LPD13   | 3/8" x 13/16" |             |
|   | 2LPP13   | 1/2" x 13/16" |             |
|   | 2LPP15   | 1/2" x 7/8"   |             |
|   | 2LPP17   | 1/2" x 15/16" |             |
|   | 2LPP19   | 1/2" x 1"     |             |
|   |          |               |             |

## 3FRL SERIES 1/2" PLUGS

| HOSE STEM (3FRL SERIES 1/2")  | PART NO. | I.D. | DESCRIPTION       |
|---|----------|------|-------------------|
|  | 3L58     | 1/4" | Steel             |
|   | 3L59     | 3/8" |                   |
|   | 3L60     | 1/2" |                   |
|   | 3L60G    | 1/2" | Steel, Ball Check |
|   | 3L61     | 3/4" | Steel             |
|   | 3L61G    | 3/4" | Steel, Ball Check |
| Requires Hose Clamp   |          |      |                   |


| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | 3L51     | 1/4" | Steel       |
|   | 3L55     | 1/2" |             |
|   | 3L57     | 3/4" |             |


| MALE THREAD   | PART NO. | MPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | 3L50     | 1/4" | Steel       |
|   | 3L52     | 3/8" |             |
|   | 3L54     | 1/2" |             |
|   | 3L56     | 3/4" |             |


 Non-Standard Product  Standard Product


## 2FRL SERIES 3/8" AUTOMATIC SOCKETS

| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | 2R4004   | 1/4" | Brass/Steel |
|   | 2R4204   | 3/8" |             |
|   | 2R4404   | 1/2" |             |


| MALE THREAD   | PART NO. | MPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | 2R4104   | 1/4" | Brass/Steel |
|   | 2R4304   | 3/8" |             |
|   | 2R4504   | 1/2" |             |


| HOSE STEM   | PART NO. | I.D.  | DESCRIPTION                        |
|---|----------|-------|------------------------------------|
|  | 2R4604   | 1/4"  | Brass/Steel<br>Requires Hose Clamp |
|   | 2R4704   | 5/16" |                                    |
|   | 2R4804   | 3/8"  |                                    |
|   | 2R4904   | 1/2"  |                                    |


| PUSH-ON HOSE STEM   | PART NO. | I.D. | DESCRIPTION |
|---|----------|------|-------------|
|  | 2R1714   | 3/8" | Brass/Steel |
|   | 2R1814   | 1/2" |             |
| Hose clamps not required when used with "Push On" hose. See page 63.                |          |      |             |


| REUSABLE HOSE CLAMP   | PART NO. | I.D. X O.D.   | DESCRIPTION |
|---|----------|---------------|-------------|
|  | 2RSD7    | 3/8" x 5/8"   | Brass/Steel |
|   | 2RSD9    | 3/8" x 11/16" |             |
|   | 2RSD11   | 3/8" x 3/4"   |             |
|   | 2RSD13   | 3/8" x 13/16" |             |


## 3FRL SERIES 1/2" AUTOMATIC SOCKETS



| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | 3R4015   | 1/4" | Brass/Steel |
|   | 3R5005   | 3/8" |             |
|   | 3R5205   | 1/2" |             |
|   | 3R5405   | 3/4" |             |

| MALE THREAD   | PART NO. | MPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | 3R4905   | 1/4" | Brass/Steel |
|   | 3R5105   | 3/8" |             |
|   | 3R5305   | 1/2" |             |
|   | 3R5505   | 3/4" |             |

| PUSH-ON HOSE STEM   | PART NO. | I.D. | DESCRIPTION |
|---|----------|------|-------------|
|  | 3R1815   | 1/2" | Brass/Steel |
|   |          |      |             |
| Hose clamps not required when used with "Push-On" hose. See page 63.                  |          |      |             |

| HOSE STEM   | PART NO. | I.D. | DESCRIPTION                        |
|---|----------|------|------------------------------------|
|  | 3R5605   | 1/4" | Brass/Steel<br>Requires Hose Clamp |
|   | 3R5705   | 3/8" |                                    |
|   | 3R5805   | 1/2" |                                    |
|   | 3R5905   | 3/4" |                                    |


| REUSABLE HOSE CLAMP   | PART NO. | I.D. X O.D.   | DESCRIPTION |
|---|----------|---------------|-------------|
|  | 3RSD7    | 3/8" x 5/8"   | Brass/Steel |
|   | 3RSD9    | 3/8" x 11/16" |             |
|   | 3RSD11   | 3/8" x 3/4"   |             |
|   | 3RSD13   | 3/8" x 13/16" |             |
|   | 3RSP13   | 1/2" x 13/16" |             |
|   | 3RSP15   | 1/2" x 7/8"   |             |
|   | 3RSP17   | 1/2" x 15/16" |             |
|   | 3RSP19   | 1/2" x 1"     |             |
|   |          |               |             |


 Non-Standard Product  Standard Product





# 210 SERIES

## SERIES 210 1/4" SAFETY VENT SOCKETS

| FEMALE THREAD   | PART NO.   | FPT  | DESCRIPTION           |
|---|------------|------|-----------------------|
|  | SV210-3003 | 1/4" | Steel, Safety Coupler |
|   | SV210-3203 | 3/8" |                       |


| MALE THREAD   | PART NO.   | MPT  | DESCRIPTION           |
|---|------------|------|-----------------------|
|  | SV210-3103 | 1/4" | Steel, Safety Coupler |
|   | SV210-3303 | 3/8" |                       |


| HOSE STEM   | PART NO.   | I.D. | DESCRIPTION                                  |
|---|------------|------|--|
|  | SV210-3603 | 1/4" | Steel, Safety Coupler<br>Requires Hose Clamp |
|   | SV210-3703 | 3/8" |  |


| PUSH-ON HOSE STEM   | PART NO.   | I.D. | DESCRIPTION           |
|---|------------|------|-----------------------|
|  | SV210-1513 | 1/4" | Steel, Safety Coupler |
|   | SV210-1713 | 3/8" |                       |

Hose clamps not required when used with "Push On" hose.


## SERIES 210 1/4" AUTOMATIC SOCKETS

| FEMALE THREAD  | PART NO.    | FPT  | DESCRIPTION   |
|--|-------------|------|---------------|
|  | 210-2803    | 1/8" | Brass/Steel   |
|  | 210-2803S/S | 1/8" | 303 Stainless |
|  | 210-3003    | 1/4" | Brass/Steel   |
|  | 210-3003S/S | 1/4" | 303 Stainless |
|  | 210-3203    | 3/8" | Brass/Steel   |
|  | 210-3203S/S | 3/8" | 303 Stainless |


| MALE THREAD   | PART NO.    | MPT  | DESCRIPTION   |
|---|-------------|------|---------------|
|  | 210-2903    | 1/8" | Brass/Steel   |
|   | 210-2903S/S | 1/8" | 303 Stainless |
|   | 210-3103    | 1/4" | Brass/Steel   |
|   | 210-3103S/S | 1/4" | 303 Stainless |
|   | 210-3303    | 3/8" | Brass/Steel   |
|   | 210-3303S/S | 3/8" | 303 Stainless |



| HOSE STEM   | PART NO.    | I.D.  | DESCRIPTION   |
|---|-------------|-------|---------------|
|  | 210-3603    | 1/4"  | Brass/Steel   |
|   | 210-3603S/S | 1/4"  | 303 Stainless |
|   | 210-3653    | 5/16" | Brass/Steel   |
|   | 210-3703    | 3/8"  | Brass/Steel   |
|   | 210-3703S/S | 3/8"  | 303 Stainless |

Requires Hose Clamp.

| PUSH-ON HOSE STEM  | PART NO. | I.D. | DESCRIPTION |
|--|----------|------|-------------|
|  | 210-1513 | 1/4" | Brass/Steel |
|  | 210-1713 | 3/8" |             |

Hose clamps not required when used with "Push On" hose. See page 63.

| REUSABLE HOSE CLAMP   | PART NO.      | I.D. X O.D.   | DESCRIPTION   |
|---|---------------|---------------|---------------|
|  | 210-SB3       | 1/4" x 1/2"   | Brass/Steel   |
|   | 210-SB3S/S    | 1/4" x 1/2"   | 303 Stainless |
|   | 210-SB5       | 1/4" x 9/16"  | Brass/Steel   |
|   | 210-SB7       | 1/4" x 5/8"   | Brass/Steel   |
|   | 210-SB7S/S    | 1/4" x 5/8"   | 303 Stainless |
|   | 210-SC5       | 5/16" x 9/16" | Brass/Steel   |
|   | 210-SC7       | 5/16" x 5/8"  |               |
|   | 210-SD7       | 3/8" x 5/8"   |               |
|   | 210-SD9       | 3/8" x 11/16" |               |
|   | 210-SD11      | 3/8" x 3/4"   |               |
| 210-SD13  | 3/8" x 13/16" |               |               |

 Non-Standard Product  Standard Product

# 310 SERIES

TYPE: One-Way Shut-Off


RATED PRESSURE: 300 PSIG


OPERATION:


**Manual** - Retract socket sleeve to connect and disconnect

**Automatic** - Push-To connect


## 310 SERIES 3/8" PLUGS


| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | 310-43   | 3/8" | Steel       |


| MALE THREAD   | PART NO. | MPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | 310-42   | 3/8" | Steel       |


| HOSE STEM   | PART NO. | I.D. | DESCRIPTION                  |
|---|----------|------|------------------------------|
|  | 310-48   | 3/8" | Steel<br>Requires Hose Clamp |
|   | 310-49   | 1/2" |                              |

## 310 SERIES 3/8" AUTOMATIC SOCKETS


| FEMALE THREAD   | PART NO. | FPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | 310-4004 | 1/4" | Brass/Steel |
|   | 310-4204 | 3/8" | Brass/Steel |
|   | 310-4404 | 1/2" | Brass/Steel |



| MALE THREAD   | PART NO. | MPT  | DESCRIPTION |
|---|----------|------|-------------|
|  | 310-4104 | 1/4" | Brass/Steel |
|   | 310-4304 | 3/8" | Brass/Steel |
|   | 310-4504 | 1/2" | Brass/Steel |

| HOSE STEM   | PART NO. | I.D.  | DESCRIPTION                        |
|---|----------|-------|------------------------------------|
|  | 310-4604 | 1/4"  | Brass/Steel<br>Requires Hose Clamp |
|   | 310-4704 | 5/16" |                                    |
|   | 310-4804 | 3/8"  |                                    |
|   | 310-4904 | 1/2"  |                                    |

| PUSH-ON HOSE STEM   | PART NO. | I.D. | DESCRIPTION |
|---|----------|------|-------------|
|  | 310-1714 | 3/8" | Brass/Steel |
|   | 310-1814 | 1/2" |             |

Hose clamps not required when used with "Push-On" hose.

| REUSABLE HOSE CLAMP   | PART NO. | I.D. X O.D.   | DESCRIPTION |
|---|----------|---------------|-------------|
|  | 310-SB3  | 1/4" x 1/2"   | Brass/Steel |
|   | 310-SB5  | 1/4" x 9/16"  |             |
|   | 310-SB7  | 1/4" x 5/8"   |             |
|   | 310-SD7  | 3/8" x 5/8"   |             |
|   | 310-SD9  | 3/8" x 11/16" |             |
|   | 310-SD11 | 3/8" x 3/4"   |             |
|   | 310-SD13 | 3/8" x 13/16" |             |

 Non-Standard Product  Standard Product




310 SERIES 3/8" MANUAL SOCKETS

| FEMALE THREAD |  | PART NO.    | FPT  | DESCRIPTION                      |
|---------------|---|-------------|------|----------------------------------|
|               |   | 310M-4004   | 1/4" | Brass/Steel                      |
|               |   | 310M-4204   | 3/8" |                                  |
|               |   | 310M-4204NP | 3/8" | Brass/Steel Nickel Plated sleeve |
|               |   | 310M-4404   | 1/2" | Brass/Steel                      |

| MALE THREAD |  | PART NO.    | MPT  | DESCRIPTION                      |
|-------------|---|-------------|------|----------------------------------|
|             |   | 310M-4104   | 1/4" | Brass/Steel                      |
|             |   | 310M-4304NP | 1/4" | Brass/Steel Nickel Plated sleeve |
|             |   | 310M-4303   | 3/8" | Brass/Steel                      |
|             |   | 310M-4504   | 1/2" | Brass/Steel                      |


| HOSE STEM |  | PART NO.    | I.D.  | DESCRIPTION                      |
|-----------|---|-------------|-------|----------------------------------|
|           |   | 310M-4604   | 1/4"  | Brass/Steel                      |
|           |   | 310M-4704   | 5/16" |                                  |
|           |   | 310M-4804   | 3/8"  |                                  |
|           |   | 310M-4804NP | 3/8"  | Brass/Steel Nickel Plated sleeve |
|           |   | 310M-4904   | 1/2"  | Brass/Steel                      |

Requires Hose Clamp.

Non-Standard Product     Standard Product

FST SERIES PLUGS, STRAIGHT THRU

| FEMALE THREAD |  | PART NO. | FPT           | DESCRIPTION   |
|---------------|---|----------|---------------|---------------|
|               |   | 12FPB    | 1/8"          | Brass         |
|               |   | 12FPS    |               | 303 Stainless |
|               |   | 25FP     | 1/4"          | Steel         |
|               |   | 25FPB    |               | Brass         |
|               |   | 25FPS    |               | 303 Stainless |
|               |   | 38FP     | 3/8"          | Steel         |
|               |   | 38FPB    |               | Brass         |
|               |   | 38FPS    | 3/8"          | 303 Stainless |
|               |   | 50FP     |               | 1/2"          |
|               |   | 50FPB    | Brass         |               |
|               |   | 50FPS    | 1/2"          | 303 Stainless |
|               |   | 75FP     |               | 3/4"          |
|               |   | 75FPB    | Brass         |               |
|               |   | 75FPS    | 303 Stainless |               |
|               |   | 100FP    | 1"            | Steel         |
|               |   | 100FPB   |               | Brass         |
|               |   | 100FPS   |               | 303 Stainless |
|               |   | 125FP    | 1-1/4"        | Steel         |
|               |   | 125FPB   |               | Brass         |
| 150FP         | 1-1/2"  | Steel    |               |               |
| 150FPB        |   | Brass    |               |               |

| MALE THREAD |  | PART NO. | MPT           | DESCRIPTION   |
|-------------|---|----------|---------------|---------------|
|             |   | 12MP     | 1/8"          | Steel         |
|             |   | 12MPB    |               | Brass         |
|             |   | 12MPS    |               | 303 Stainless |
|             |   | 25MP     | 1/4"          | Steel         |
|             |   | 25MPB    |               | Brass         |
|             |   | 25MPS    |               | 303 Stainless |
|             |   | 38MP     | 3/8"          | Steel         |
|             |   | 38MPB    |               | Brass         |
|             |   | 38MPS    | 3/8"          | 303 Stainless |
|             |   | 50MP     |               | 1/2"          |
|             |   | 50MPB    | Brass         |               |
|             |   | 50MPS    | 1/2"          | 303 Stainless |
|             |   | 75MP     |               | 3/4"          |
|             |   | 75MPB    | Brass         |               |
|             |   | 75MPS    | 303 Stainless |               |
|             |   | 100MP    | 1"            | Steel         |
|             |   | 100MPB   |               | Brass         |
|             |   | 100MPS   |               | 303 Stainless |
|             |   | 125MP    | 1-1/4"        | Steel         |
| 125MPB      | Brass   |          |               |               |
| 150MP       | 1-1/2"  | Steel    |               |               |
| 150MPB      |   | Brass    |               |               |

Non-Standard Product     Standard Product

FST SERIES

**TYPE:** FST Straight-Thru, no valve in either socket or plug.

**INTERCHANGEABILITY:** Standard industrial interchange design, most widely used in industry. Within each series, only sockets and plugs of the same size will couple together.

**OPERATION:** Manual – Socket sleeve must be manually retracted to connect and disconnect.

**OPTIONS:** Ball Lock (BL) – Locks socket against accidental disconnect. To connect, align ball with slot. After connection, rotate sleeve to lock. To disconnect, realign ball with slot and retract sleeve.

**SEAL COMPOUND:** Standard seals are Buna-N

**PERFORMANCE DATA FLOW:** Couplers have same inside diameter as nominal pipe.

**RATED PRESSURE:** Rated pressures as defined by ANSI/B93.2-1986, based on 4:1 Safety Factor and non-shock service.


**VACUUM SERVICE:** 27" Hg maximum


| BODY SIZE | BRASS SOCKET W/ BRASS PLUG | BRASS SOCKET W/ STEEL PLUG | S/S SOCKET W/ S/S PLUG |
|-----------|----------------------------|----------------------------|------------------------|
|           | PSIG                       | PSIG                       | PSIG                   |
| 1/8"      | 2500                       | 2600                       | 4200                   |
| 1/4"      | 5200                       | 5500                       | 6700                   |
| 3/8"      | 2700                       | 3500                       | 5500                   |
| 1/2"      | 2200                       | 2700                       | 3000                   |
| 3/4"      | 1700                       | 2700                       | 3000                   |
| 1"        | 1700                       | 2000                       | 1700                   |
| 1 1/4"    | 1700                       | 2700                       | -                      |
| 1 1/2"    | 1400                       | 2200                       | -                      |

| HOSE STEM |  | PART NO. | I.D. | DESCRIPTION |
|-----------|---|----------|------|-------------|
|           |   | 25HP     | 1/4" | Steel       |
|           |   | 38HPB    | 3/8" | Brass       |
| 75HPB     | 3/4"  |          |      |             |




## FST SERIES SOCKETS, STRAIGHT THRU

| MALE THREAD |  | PART NO. | MPT  | DESCRIPTION         |
|-------------|---|----------|------|---------------------|
|             |   | 12MS     | 1/8" | Brass               |
|             |   | BL12MS   |      | Ball Lock, Brass    |
|             |   | 25MS     |      | Brass               |
|             |   | BL25MS   | 1/4" | Ball Lock, Brass    |
|             |   | 25MS-101 |      | Brass, w/Viton Seal |
|             |   | 38MS     | 3/8" | Brass               |
|             |   | 38MS-101 |      | Brass, w/Viton Seal |
|             |   | BL38MS   |      | Ball Lock, Brass    |
|             |   | 50MS     | 1/2" | Brass               |
|             |   | 50MS-101 |      | Brass, w/Viton Seal |
|             |   | BL50MS   |      | Ball Lock, Brass    |
|             |   | 75MS     | 3/4" | Brass               |
|             |   | BL75MS   |      | Ball Lock, Brass    |
|             |   | 100MS    | 1"   | Brass               |
| BL100MS     | Ball Lock, Brass  |          |      |                     |




| HOSE STEM |  | PART NO. | I.D. | DESCRIPTION      |
|-----------|--|----------|------|------------------|
|           |  | 38HS     | 3/8" | Brass            |
|           |  | BL38HS   | 3/8" | Ball Lock, Brass |
|           |  | 50HS     | 1/2" | Brass            |
|           |  | BL50HS   | 1/2" | Ball Lock, Brass |

Requires Hose Clamp

Non-Standard Product  Standard Product

| FEMALE THREAD |  | PART NO.  | FPT    | DESCRIPTION                    |
|---------------|--|-----------|--------|--------------------------------|
|               |  | 12FS      | 1/8"   | Brass                          |
|               |  | 12FS-101  |        | Brass, w/Viton Seal            |
|               |  | BL12FS    |        | Ball Lock, Brass               |
|               |  | 12FSS     | 1/8"   | 303 Stainless                  |
|               |  | 12FSS-101 |        | 303 Stainless, w/Viton Seal    |
|               |  | 12FSS-103 |        | 303 Stainless, w/EPDM Seal     |
|               |  | BL12FSS   | 1/4"   | Ball Lock, 303 Stainless Steel |
|               |  | 25FS      |        | Brass                          |
|               |  | 25FS-101  |        | Brass, w/Viton Seal            |
|               |  | BL25FS    | 1/4"   | Ball Lock, Brass               |
|               |  | 25FS-SWVL |        | Power Washer Swivel Tip, Brass |
|               |  | 25FSS     |        | 303 Stainless                  |
|               |  | 25FSS-101 | 1/4"   | 303 Stainless, w/Viton Seal    |
|               |  | 25FSS-103 |        | 303 Stainless, w/EPDM Seal     |
|               |  | BL25FSS   |        | Ball Lock, 303 Stainless Steel |
|               |  | 38FS      | 3/8"   | Brass                          |
|               |  | 38FS-101  |        | Brass, w/Viton Seal            |
|               |  | 38FS-103  |        | Brass, w/EPDM Seal             |
|               |  | BL38FS    | 3/8"   | Ball Lock, Brass               |
|               |  | 38FSS     |        | 303 Stainless                  |
|               |  | 38FSS-101 |        | 303 Stainless, w/Viton Seal    |
|               |  | 38FSS-103 | 3/8"   | 303 Stainless, w/EPDM Seal     |
|               |  | BL38FSS   |        | Ball Lock, 303 Stainless Steel |
|               |  | 50FS      |        | Brass                          |
|               |  | 50FS-101  | 1/2"   | Brass, w/Viton Seal            |
|               |  | 50FS-103  |        | Brass, w/EPDM Seal             |
|               |  | BL50FS    |        | Ball Lock, Brass               |
|               |  | 50FSS     | 1/2"   | 303 Stainless                  |
|               |  | 50FSS-101 |        | 303 Stainless, w/Viton Seal    |
|               |  | 50FSS-103 |        | 303 Stainless, w/EPDM Seal     |
|               |  | BL50FSS   | 3/4"   | Ball Lock, 303 Stainless Steel |
|               |  | 75FS      |        | Brass                          |
|               |  | BL75FS    |        | Ball Lock, Brass               |
|               |  | 75FS-101  | 3/4"   | Brass, w/Viton Seal            |
|               |  | 75FS-103  |        | Brass, w/EPDM Seal             |
|               |  | 75FS-104  |        | Brass, w/Silicone Seal         |
|               |  | 75FSS     | 3/4"   | 303 Stainless                  |
|               |  | 75FSS-101 |        | 303 Stainless, w/Viton Seal    |
|               |  | 75FSS-103 |        | 303 Stainless, w/EPDM Seal     |
|               |  | BL75FSS   | 3/4"   | Ball Lock, 303 Stainless Steel |
|               |  | 100FS     |        | Brass                          |
|               |  | 100FS-101 |        | Brass, w/Viton Seal            |
|               |  | BL100FS   | 1"     | Ball Lock, Brass               |
|               |  | 100FSS    |        | 303 Stainless                  |
|               |  | BL100FSS  |        | Ball Lock, 303 Stainless Steel |
|               |  | 125FS     | 1-1/4" | Brass                          |
|               |  | BL125FS   |        | Ball Lock, Brass               |
|               |  | 125FS-103 |        | Brass, w/EPDM Seal             |
|               |  | 150FS     | 1-1/2" | Brass                          |
| BL150FS       | Ball Lock, Brass   |           |        |                                |

## HANDY-AIR® BLOW GUNS AND ACCESSORIES

| LEVER OPERATED |  | PART NO.        | DESCRIPTION   |           |                         |
|----------------|---|-----------------|---|-----------|-------------------------|
|                |   | BG2L-30P        | Pressed – Standard Tip  |           |                         |
|                |   | BG2L-30STP      | Pressed – Safety Tip  |           |                         |
|                |   | BG2L-30STT      | Threaded – Safety Tip   |           |                         |
|                |   | BG2L-30T        | Threaded – Standard Tip   |           |                         |
|                |   | BUTTON OPERATED |  | BG2-30P   | Pressed – Standard Tip  |
|                |   |                 |   | BG2-30STP | Pressed – Safety Tip    |
|                |   |                 |   | BG2-30STT | Threaded – Safety Tip   |
|                |   | PISTOL GRIP     |  | BG2-30T   | Threaded – Standard Tip |
| PG2P           | Pressed – Safety Tip  |                 |   |           |                         |
|                |   | PG2T            | Threaded – Safety Tip   |           |                         |

| BLOW GUN ACCESSORIES  |  | PART NO.                |                                    |
|-----------------------|---|-------------------------|------------------------------------|
|                       |   | Extension (10")         | EX10DH                             |
|                       |   | Extension (12")         | EX12                               |
|                       |   | High Flow Safety Nozzle | EX2                                |
|                       |   | Rubber Tip              | EX2RT<br>EX2RT-104 w/Silicone Seal |
| Safety Air Screen Tip | EX2ST   |                         |                                    |

Non-Standard Product  Standard Product

## BLOW GUN KITS



**BG-KIT-F1** – The versatile Ragco blow gun kit BG-KIT-F1 contains three of the most popular nozzles for industrial and automotive uses as well as a 1/4" standard plug for easy air-hose connection. This kit includes a high quality, lever-operated heavy-duty blow gun featuring a quick-disconnect coupler that allows users to switch nozzles quickly and easily. Also included are a high-flow safety nozzle, six-inch extension safety nozzle, rubber-tip nozzle and quick-connector plug for connecting the blow gun to shop air supply. The kit comes ready for hanging display in a clear clamshell package.

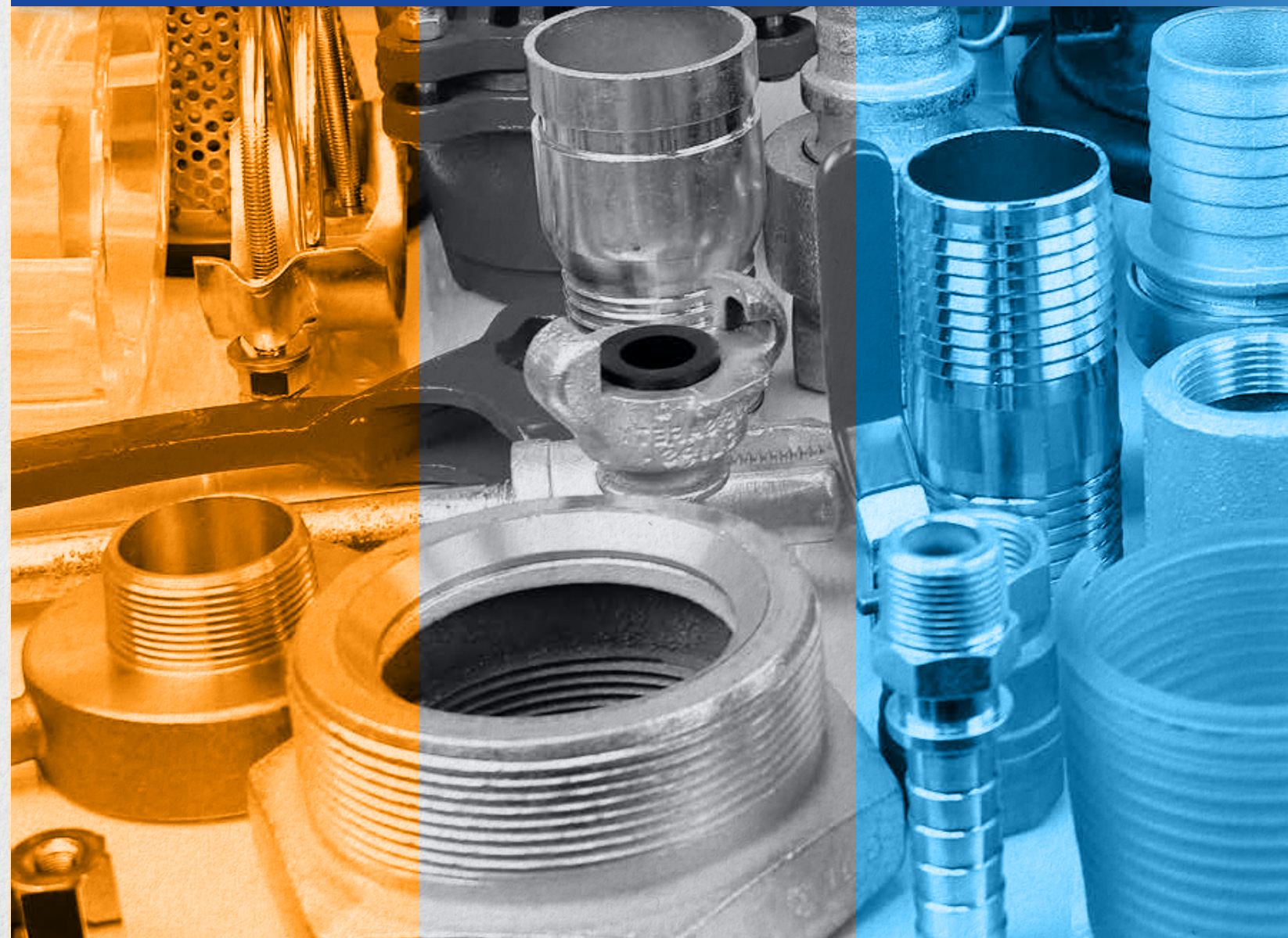


**BG-KIT-F2** – The Ragco BG-KIT-F2 contains five of the most popular nozzles for industrial and automotive uses. This kit includes a high quality, lever-operated heavy-duty blow gun featuring a quick disconnect coupler which allows users to switch nozzles quickly and easily. This multi-use kit also contains a high flow safety nozzle, six-inch extension safety nozzle, rubber-tip nozzle, needle-tip nozzle, and air-screen safety nozzle. For handy storage, a clear vinyl compartmented snap pouch is included.





# HOSE ACCESSORIES





# SUCTION HOSE STRAINERS

Used on the submersed end of suction hose to prevent debris from entering the pump during operation. All threads are NPS. "Trash strainers" are square hole. For the best strainer for your application, call your local RAGCO location.

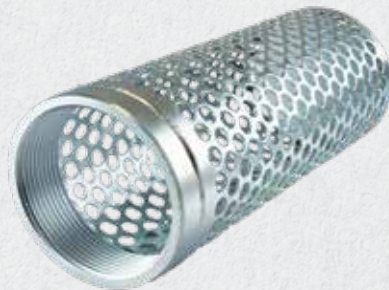
## STRAINERS

| SIZE   | ROUND HOLE PART # | TUBE PART # | SQUARE HOLE PART # | TOP HOLE PART # | BOTTOM HOLE PART # |
|--------|-------------------|-------------|--------------------|-----------------|--------------------|
| 1 1/2" | RHS150            | TRHS150     | SHS150             | THS150          | BHS150             |
| 2"     | RHS200            | TRHS200     | SHS200             | THS200          | BHS200             |
| 2 1/2" | RHS250            | CALL        | CALL               | CALL            | CALL               |
| 3"     | RHS300            | TRHS300     | SHS300             | THS300          | BHS300             |
| 4"     | RHS400            | CALL        | SHS400             | CALL            | CALL               |
| 6"     | RHS600            | CALL        | SHS600             | CALL            | CALL               |
| 8"     | RHS800            | CALL        | CALL               | CALL            | CALL               |

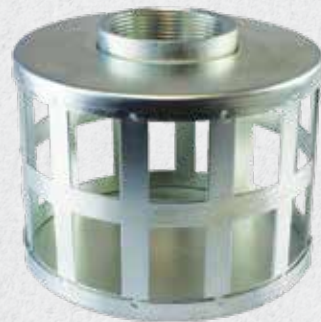
ROUND HOLE PART



TUBE PART



SQUARE HOLE PART



TOP HOLE PART



BOTTOM HOLE PART



# FOOT VALVES

Foot valves are used on the submersed end of the water suction hose to prevent the pump from losing its prime when it's shut down. The foot valve stops the water from draining by a closing leather-flapper gate. Each valve has a built-in strainer that prevents debris from entering during operation. All sizes have NPS threads and complete valves are painted red.

| SIZE   | PART # |
|--------|--------|
| 1 1/2" | FV150  |
| 2"     | FV200  |
| 2 1/2" | FV250  |
| 3"     | FV300  |
| 4"     | FV400  |
| 6"     | FV600  |
| 8"     | FV800  |

FOOT VALVE



# BRASS BALL VALVES

Standard full-port, quarter-turn, brass ball valves rated for 600psi WOG (up to 2") and 400psi WOG (2 1/2" thru 4"). Female NPT thread each side. Chromium-plated brass ball and Teflon® ball seat. Available with locking handles and in stainless steel.

| SIZE   | PART #  |
|--------|---------|
| 1/4"   | BV025BF |
| 3/8"   | BV038BF |
| 1/2"   | BV050BF |
| 3/4"   | BV075BF |
| 1"     | BV100BF |
| 1 1/4" | BV125BF |
| 1 1/2" | BV150BF |
| 2"     | BV200BF |
| 2 1/2" | BV250BF |
| 3"     | BV300BF |
| 4"     | BV400BF |

| COMPONENT          | MATERIAL            |
|--------------------|---------------------|
| Valve Body         | Brass               |
| Valve Cap          | Brass               |
| O-Ring             | PTFE                |
| Ball               | Chrome Plated Brass |
| Stem Spacer/Gasket | PTFE                |
| O-Ring             | PTFE                |
| Stem Spacer/Gasket | Brass               |
| Nut                | Brass               |
| Cap                | Brass               |
| Handle             | Carbon Steel        |

BRASS BALL VALVE





# THREADED FLANGES

Forged carbon steel, raised-face, threaded 150# ANSI flanges. Female threaded for easy installation on hose, pipe, or equipment with male threads. Available in blank, slip-on, and weldable version. Also available in stainless steel.

| PART #   | NOMINAL SIZE | OUTER DIAMETER | BOLT CIRCLE | HOLES | BOLT HOLE DIAMETER | THICKNESS |
|----------|--------------|----------------|-------------|-------|--------------------|-----------|
| CSF-050  | 1/2"         | 3 1/2"         | 2 3/8"      | 4     | 5/8"               | 5/8"      |
| CSF-075  | 3/4"         | 3 7/8"         | 2 3/4"      | 4     | 5/8"               | 5/8"      |
| CSF-100  | 1"           | 4 1/4"         | 3 1/8"      | 4     | 5/8"               | 3/4"      |
| CSF-125  | 1 1/4"       | 4 5/8"         | 3 1/2"      | 4     | 5/8"               | 7/8"      |
| CSF-150  | 1 1/2"       | 5"             | 3 7/8"      | 4     | 5/8"               | 7/8"      |
| CSF-200  | 2"           | 6"             | 4 3/4"      | 4     | 3/4"               | 1"        |
| CSF-250  | 2 1/2"       | 7"             | 5 1/2"      | 4     | 3/4"               | 1 1/8"    |
| CSF-300  | 3"           | 7 1/2"         | 6"          | 4     | 3/4"               | 1 1/4"    |
| CSF-400  | 4"           | 9"             | 7 1/2"      | 8     | 3/4"               | 1 3/8"    |
| CSF-500  | 5"           | 10"            | 8 1/2"      | 8     | 7/8"               | 1 3/8"    |
| CSF-600  | 6"           | 11"            | 9 1/2"      | 8     | 7/8"               | 1 1/2"    |
| CSF-800  | 8"           | 13 1/2"        | 11 3/4"     | 8     | 7/8"               | 1 3/4"    |
| CSF-1000 | 10"          | 16"            | 14 1/4"     | 12    | 1"                 | 2"        |
| CSF-1200 | 12"          | 19"            | 17"         | 12    | 1"                 | 2 1/8"    |

THREADED FLANGE

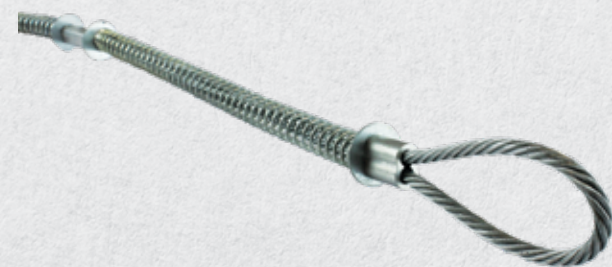


# WHIP CHECKS

Whip Checks are attachable safety cables for the prevention of hose whip in case of the accidental separation of a coupling or clamp device.

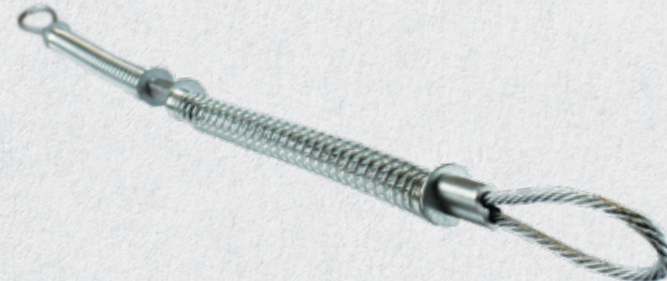
HOSE-TO-TOOL

| CABLE DIMENSIONS | HOSE I.D.     | PART # |
|------------------|---------------|--------|
| 1/8" X 20"       | 1/2" - 1 1/4" | HTWS1  |
| 1/4" X 38"       | 1 1/2" - 3"   | HTWS2  |



HOSE-TO-HOSE

| CABLE DIMENSIONS | HOSE I.D.     | PART # |
|------------------|---------------|--------|
| 1/8" X 20"       | 1/2" - 1 1/4" | HHWC1  |
| 1/4" X 38"       | 1 1/2" - 3"   | HHWC2  |



# WRENCHES

## HYDRANT WRENCHES

Part # HYD-1 is a standard and complete tool for fire hydrant operation. The pentagonal nut head is adjustable to fit hydrant valves to 1-3/4" for on/off operation. The head also operates pin-lug or rocker-lug connections from 1-1/2" to 6"

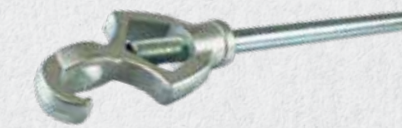
Part # HYD-3 is lighter in weight than the HYD-1 with the same adjustable features. Fits 1-3/4" pentagonal nuts. The head will operate hydrant cap and adapter-pin or rocker lugs. Handle is plated.

| HYDRANT WRENCH TYPE | PART # |
|---------------------|--------|
| Standard            | HYD-1  |
| Lightweight         | HYD-3  |

STANDARD HYDRANT



LIGHTWEIGHT HYDRANT



## SPANNER WRENCHES

Made from ductile iron with easy-grip handle, contour head to fit the coupling curve and a special round hole to engage the pin-lug. Dual diameter available for 2" x 2 1/2" size. Universal spanner wrench is painted red complete with pry bar end and gas cock shut off/on feature. Other end used as pin-lug or rocker-lug wrenching.

STANDARD SPANNER



DUAL DIAMETER SPANNER



UNIVERSAL SPANNER



| SPANNER WRENCH SIZE | PART # |
|---------------------|--------|
| 1 1/2"              | SW150  |
| 2"                  | SW200  |
| 2" X 2 1/2" *       | SW2025 |
| 2 1/2"              | SW250  |
| 3"                  | SW300  |
| 4"                  | SW400  |
| Universal           | US-1   |



# NOZZLES

## FOG NOZZLES

Plastic nozzles are made of high-impact bright red plastic with corrosion-resistant metal parts. Brass nozzles are high-quality heavy brass. These nozzles allow for straight stream or fog spray pattern in industrial, utility or commercial use. All sizes, for use at 100 PSI, water only at 70°F.

### BRASS FOG NOZZLE



### PLASTIC FOG NOZZLE



### BRASS FOG NOZZLE

| THREAD SIZE | THREAD TYPE | PART #    |
|-------------|-------------|-----------|
| 1 1/2"      | NPS         | FN150B    |
| 1 1/2"      | NST         | FN150BNST |
| 2"          | NPS         | FN200B    |
| 2 1/2"      | NPS         | FN250BNST |
| 2 1/2"      | NST         | FN250BNST |

### PLASTIC FOG NOZZLE

| THREAD SIZE | THREAD TYPE | PART #   |
|-------------|-------------|----------|
| 1 1/2"      | NPS         | FN150    |
| 1 1/2"      | NST         | FN150NST |

## TWIST GARDEN-HOSE NOZZLE

Features all-brass valve stem, four nozzle openings for full flow, and replaceable front and rear O-ring seals for leakproof shut-off. Precise tip angle eliminates side spray. Adjustable from fine spray to needle stream to heavy rinse. Heavy-duty, solid brass construction. Roughly 4" length.

| THREAD SIZE | THREAD TYPE | PART # |
|-------------|-------------|--------|
| 3/4"        | GHT         | TGHN   |



## INSULATED PISTOL-GRIP GARDEN-HOSE NOZZLE

Insulated for use with hot or cold water. Inlet is female garden-hose thread. Tip is male garden-hose thread as an easy combination with other attachments.

| THREAD SIZE | THREAD TYPE | PART # |
|-------------|-------------|--------|
| 3/4"        | GHT         | IPGN   |



# NOZZLES CONTINUED

## TAPERED (SUICIDE) NOZZLES

Made from cast brass with satin finish. Orifice tip sizes are standard. All sizes, for use at 100 psi, water only at 70°F.

### TAPERED NOZZLE



| THREAD SIZE | THREAD TYPE | NOZZLE LENGTH | PART #   |
|-------------|-------------|---------------|----------|
| 3/4"        | GHT         | 6"            | BN075GHT |
| 3/4"        | NPSH        | 6"            | BN075    |
| 1"          | NPSH        | 8"            | BN100    |
| 1 1/4"      | NPSH        | 9"            | BN125    |
| 1 1/2"      | NPSH        | 10"           | BN150    |
| 1 1/2"      | NST         | 10"           | BN150NST |
| 2"          | NPSH        | 12"           | BN200    |
| 2 1/2"      | NPSH        | CALL          | BN250    |
| 2 1/2"      | NST         | CALL          | BN250NST |

# BRASS PIN-LUG HYDRANT ADAPTERS

For industrial utility and fire department applications, these adapters allow easy connections from hydrant to smaller size hose. Made of heavy-duty cast brass with satin finish. Pin-lug style. All threads are V cut. Replacement gasket part # HAG250. Hex adapters and other configurations not shown are available. Please call for more information.

### HYDRANT ADAPTER



| FEMALE SIDE | MALE SIDE   | PART #    |
|-------------|-------------|-----------|
| 1 1/2" NPT  | 1 1/2" NST  | HAB1516   |
| 1 1/2" NST  | 1 1/2" NPT  | HAB1615   |
| 2" NPT      | 1 1/2" NST  | HAB2016   |
| 2 1/2" NST  | 3/4" GHT    | HAB075    |
| 2 1/2" NST  | 3/4" NPSM   | HAB076    |
| 2 1/2" NST  | 1" NPSM     | HAB100    |
| 2 1/2" NST  | 1 1/2" NPSM | HAB150    |
| 2 1/2" NST  | 1 1/2" NPT  | HAB150NPT |
| 2 1/2" NST  | 1 1/2" NST  | HAB150NST |
| 2 1/2" NST  | 2" NPSM     | HAB200    |
| 2 1/2" NST  | 2" NPT      | HAB200NPT |
| 2 1/2" NST  | 2 1/2" NPT  | HAB250NPT |



# HOSE CLAMPS

## WORM-GEAR CLAMPS

Engineered with efficient three-piece construction for tough installation. No spot welds to corrode material, and edges are rounded to protect the hose. Easily installed with a screwdriver, nut driver, or socket wrench. Available in partial- or all-stainless construction or in "quick release" style.

| CLAMP NUMBER | BAND WIDTH | DIAMETER MIN | DIAMETER MAX |
|--------------|------------|--------------|--------------|
| #6           | 1/2"       | 3/8"         | 7/8"         |
| #8           | 1/2"       | 7/16"        | 1"           |
| #10          | 1/2"       | 9/16"        | 1-1/16"      |
| #12          | 1/2"       | 9/16"        | 1-1/4"       |
| #16          | 1/2"       | 11/16"       | 1-1/2"       |
| #20          | 1/2"       | 3/4"         | 1-3/4"       |
| #24          | 1/2"       | 1-1/16"      | 2"           |
| #28          | 1/2"       | 1-5/16"      | 2-1/4"       |
| #32          | 1/2"       | 1-9/16"      | 2-1/2"       |
| #36          | 1/2"       | 1-13/16"     | 2-3/4"       |
| #40          | 1/2"       | 2-1/16"      | 3"           |
| #44          | 1/2"       | 2-5/16"      | 3-1/4"       |
| #48          | 1/2"       | 2-9/16"      | 3-1/2"       |
| #52          | 1/2"       | 2-13/16"     | 3-3/4"       |
| #56          | 1/2"       | 3-1/16"      | 4"           |
| #60          | 1/2"       | 3-5/16"      | 4-1/4"       |
| #64          | 1/2"       | 3-9/16"      | 4-1/2"       |
| #72          | 1/2"       | 4-1/16"      | 5"           |
| #80          | 1/2"       | 4-5/8"       | 5-1/2"       |
| #88          | 1/2"       | 4-3/32"      | 6"           |
| #96          | 1/2"       | 4-1/2"       | 6-1/2"       |
| #104         | 1/2"       | 5"           | 7"           |
| #116         | 1/2"       | 5-3/4"       | 7-1/2"       |



## LARGE DIAMETER WORM-GEAR CLAMPS

Similar design to worm-gear clamps for larger diameter applications. Usually open-ended for easy installation.

| CLAMP NUMBER | BAND WIDTH | DIAMETER MIN | DIAMETER MAX |
|--------------|------------|--------------|--------------|
| #128         | 1/2"       | 1-3/4"       | 8-9/16"      |
| #152         | 1/2"       | 2"           | 10"          |
| #188         | 1/2"       | 2-1/16"      | 12-5/16"     |
| #216         | 1/2"       | 10-3/16"     | 14"          |
| #248         | 1/2"       | 1-3/4"       | 16"          |
| #312         | 1/2"       | 1-7/8"       | 20"          |



# HOSE CLAMPS CONTINUED

## T-BOLT CLAMPS

T-Bolt clamps are a step up from basic worm-gear clamps. The principle is the same with a 3/4" band providing 360 degrees of sealing surface, and they are particularly useful in high-torque applications. Note: The T-Bolt clamp's design allows a smaller size range than other styles of field clamp. Please choose size carefully.

| CLAMP NUMBER | SIZE RANGE (INCHES) | CLAMP NUMBER | SIZE RANGE (INCHES) | CLAMP NUMBER | SIZE RANGE (INCHES) |
|--------------|---------------------|--------------|---------------------|--------------|---------------------|
| TBCS-21      | 1.31 X 1.56         | TBCS-53      | 3.31 X 3.62         | TBCS-93      | 5.81 X 6.12         |
| TBCS-25      | 1.56 X 1.81         | TBCS-57      | 3.56 X 3.87         | TBCS-97      | 6.06 X 6.37         |
| TBCS-27      | 1.69 X 1.94         | TBCS-58      | 3.63 X 3.94         | TBCS-101     | 6.31 X 6.62         |
| TBCS-29      | 1.81 X 2.06         | TBCS-61      | 3.81 X 4.12         | TBCS-105     | 6.56 X 6.87         |
| TBCS-33      | 2.06 X 2.31         | TBCS-65      | 4.06 X 4.37         | TBCS-109     | 6.81 X 7.12         |
| TBCS-35      | 2.19 X 2.50         | TBCS-69      | 4.31 X 4.62         | TBCS-113     | 7.06 X 7.37         |
| TBCS-37      | 2.31 X 2.62         | TBCS-73      | 4.56 X 4.87         | TBCS-117     | 7.31 X 7.62         |
| TBCS-38      | 2.38 X 2.69         | TBCS-77      | 4.81 X 5.12         | TBCS-121     | 7.56 X 7.87         |
| TBCS-39      | 2.44 X 2.75         | TBCS-81      | 5.06 X 5.37         | TBCS-125     | 7.81 X 8.12         |
| TBCS-41      | 2.56 X 2.87         | TBCS-85      | 5.31 X 5.62         | TBCS-129     | 8.06 X 8.37         |
| TBCS-43      | 2.69 X 3.00         | TBCS-89      | 5.56 X 5.87         | TBCS-139     | 8.69 X 9.19         |
| TBCS-45      | 2.81 X 3.12         | TBCS-93      | 5.81 X 6.12         | TBCS-170     | 10.63 X 11.13       |
| TBCS-47      | 2.94 X 3.25         | TBCS-97      | 6.06 X 6.37         | TBCS-202     | 12.63 X 13.13       |
| TBCS-49      | 3.06 X 3.37         |              |                     |              |                     |



## PUNCH-LOK CLAMPS

Preformed and ready for application to be installed with a center-punch tool. Diameter displayed is the actual diameter of the clamp. Choose the correct clamp for your application by selecting the next diameter over the outside diameter of your hose.

| CLAMP NUMBER SS | CLAMP NUMBER GALV. | BAND WIDTH | DIAMETER |
|-----------------|--------------------|------------|----------|
| P-311S          | P-311              | 3/8"       | 1-3/8"   |
| P-3S            | P-3                | 5/8"       | 13/16"   |
| P-5S            | P-5                | 5/8"       | 1-1/4"   |
| P-6S            | P-6                | 5/8"       | 1-1/2"   |
| P-7S            | P-7                | 5/8"       | 1-3/4"   |
| P-8S            | P-8                | 5/8"       | 2"       |
| P-10S           | P-10               | 5/8"       | 2-1/2"   |
| P-12S           | P-12               | 5/8"       | 3"       |
| P-16S           | P-16               | 5/8"       | 4"       |
| P-20S           | P-20               | 5/8"       | 5"       |
| P-24S           | P-24               | 5/8"       | 6"       |
| P-28S           | P-28               | 5/8"       | 7"       |
| P-32S           | P-32               | 5/8"       | 8"       |

## PUNCH-LOK CLAMP



## OPEN-ENDED PUNCH-LOK CLAMP





## J-LOK CLAMPS

For use with special air-actuated and mechanical machines. Not for use with center-punch tools.

| CLAMP NUMBER | DIAMETER |
|--------------|----------|
| PJ-201       | 13/16"   |
| PJ-202       | 1-3/8"   |
| PJ-206       | 1-3/4"   |
| PJ-207       | 2"       |
| PJ-208       | 2-1/4"   |
| PJ-209       | 2-1/2"   |
| PJ-210       | 2-3/4"   |
| PJ-211       | 3"       |

| CLAMP NUMBER | DIAMETER |
|--------------|----------|
| PJ-212       | 3-1/2"   |
| PJ-213       | 4"       |
| PJ-214       | 4-1/2"   |
| PJ-215       | 5"       |
| PJ-216       | 6"       |
| PJ-218       | 7"       |
| PJ-219       | 8"       |



## HEAVY DUTY DOUBLE-BOLT CLAMPS

Heavy duty clamps with two bolts 180° and saddles for demanding applications.

| CLAMP NUMBER | DIAMETER MIN | DIAMETER MAX |
|--------------|--------------|--------------|
| 400          | 3-7/16"      | 3-13/16"     |
| 463          | 4"           | 4-3/8"       |
| 525          | 4-1/2"       | 5-1/8"       |
| 550          | 4-11/16"     | 5-15/16"     |
| 600          | 5-1/2"       | 5-15/16"     |
| 675          | 6-1/8"       | 6-7/8"       |
| 769          | 6-7/8"       | 7-3/8"       |
| 818          | 7-3/8"       | 8"           |
| 875          | 8-1/4"       | 8-7/8"       |
| 988          | 8-15/16"     | 9-3/4"       |
| 1125         | 9-5/16"      | 11-3/8"      |
| 1275         | 11-3/16"     | 13"          |



## DOUBLE-BOLT CORRUGATED HOSE CLAMPS

Clamps (for corrugated hose) manufactured in either clockwise (right hand) or counter clockwise (left hand) design, the spiral double-bolt clamp fits between the convolutions on a corrugated hose. When fully tightened, the wire secures the full circumference of the outside hose wall—not the convolutions—for a safe, economical and efficient securing method. Consult hose manufacturer for correct convolution direction. Direction of clamp spiral and hose convolutions are the same. \*Specify clockwise (CW) or counterclockwise (CCW).

| CLAMP NUMBER | HOSE SIZE |
|--------------|-----------|
| SDB150       | 1 1/2"    |
| SDB200       | 2"        |
| SDB250       | 2 1/2"    |
| SDB300       | 3"        |
| SDB400       | 4"        |
| SDB500       | 5"        |
| SDB600       | 6"        |
| SDB800       | 8"        |
| SDB1000      | 10"       |
| SDB1200      | 12"       |





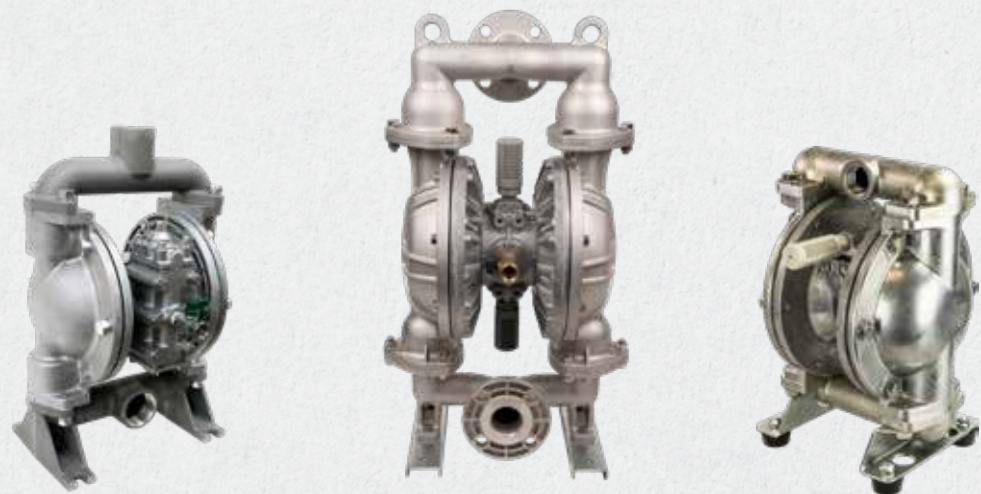


# PUMPS





## ADVANTAGES AND CHARACTERISTICS



- 1. Handle a wide variety of fluids with high solids content:** No close-fitting or rotating parts so liquid with high solids content and/or size can be easily pumped.
- 2. Self Priming:** The RAGCO pump design (incorporating internal check valves) provides high suction lift even at dry start-up and with heavier fluids.
- 3. Ability to Run Dry:** No close-fitting or sliding parts are at risk—the pump can run dry without damage.
- 4. Variable Flow Rate and Discharge Pressure:** RAGCO pumps will run at any setting within their operating range simply by adjusting the air inlet pressure and system conditions. One pump can fit a broad spectrum of applications.
- 5. Portable/Simple Installation:** RAGCO pumps transport easily to the application site. Simply connect an air supply, attach fluid connections, and the pump is ready to perform. There are no complex controls to install or operate.
- 6. Dead Head:** Because the discharge pressure can never exceed air inlet pressure, the discharge line can be closed with no damage or wear. The pump will simply slow down and stop.
- 7. Shear Sensitive:** The gentle nature and minimal parts contact with the liquid make RAGCO pumps an excellent choice for shear-sensitive fluids.
- 8. Safe Operation:** Powered by compressed air, RAGCO pumps are intrinsically safe.
- 9. Submersible:** If external components are compatible, RAGCO pumps can be submerged in liquids by simply running the exhaust line above the liquid level.
- 10. Pumping Efficiency Remains Constant:** There are no rotors, gears, or pistons, which wear over time and lead to the gradual decline in performance/ flow rate.

## 1/2" RG-15 METAL PUMP

The RG-15 Series Metal Pump is designed to provide maximum performance, while maintaining the reliability that you've grown accustomed to from RAGCO. These 1/2" pumps are perfect for spraying and dispensing applications, particularly when on-and-off cycling reliability is critical. Constructed of aluminum, it is available with Buna N, TPO, and PTFE elastomers.

With our new Step Spool (S-Spool), RG-15 uses up to 30% less air than the competition. Maintenance is also simplified with fewer wearing parts.

Suitable for lubricants, diesel, dispensing, spraying, automotive fluid transfer, waste oil, and evacuation.



| SPECIFICATIONS               |                          |
|------------------------------|--------------------------|
| <b>Maximum Flow Rate:</b>    | 15 GPM                   |
| <b>Port Size:</b>            | 1/2" Female              |
| <b>Air Supply Pressure:</b>  | 30-100 PSI               |
| <b>Liquid Temperature:</b>   | 32-212°F                 |
| <b>Max. Air Consumption:</b> | 18 SCFM                  |
| <b>Air Inlet:</b>            | 3/8" Female NPT          |
| <b>Dry Suction Lift:</b>     | 15'                      |
| <b>NPT Dimensions:</b>       | 7.32"L x 7.64"W x 10.4"H |
| <b>Body Material:</b>        | Aluminum (ADC 12)        |
| <b>Weight:</b>               | 11.9 lbs.                |
| <b>Diaphragm Materials:</b>  | Buna N/TPO/PTFE          |

### FEATURES:

- No Lubrication Required
- Stall-Free / S-Spool Design
- Fewer Wearing Parts
- Ease of Repair—Quick Teardown / Rebuild
- 30% Less Air Consumption Over Competitors' Pumps
- Perfect for Dispensing and Spraying Applications
- Critical On/Off Cycling
- Optional Drum Pump Conversion Kits Available!

### ACCESSORIES:

- RG-1A Filter Regulator
- Air Motor and Liquid Kits



## 1/2" RG-15 METAL DRUM PUMP

Everything that the RG-15 Metal Pump has to offer, but available as a drum pump! RAGCO Air-Powered Double Diaphragm Pumps have distinct design advantages that make them very versatile and cost-effective drum pumps.

It's suitable for lubricants, diesel, dispensing, spraying, automotive fluid transfer, waste oil, and evacuation.



| SPECIFICATIONS               |                          |
|------------------------------|--------------------------|
| <b>Maximum Flow Rate:</b>    | 15 GPM                   |
| <b>Port Size:</b>            | 1/2" Female              |
| <b>Air Supply Pressure:</b>  | 30-100 PSI               |
| <b>Liquid Temperature:</b>   | 32-212°F                 |
| <b>Max. Air Consumption:</b> | 18 SCFM                  |
| <b>Air Inlet:</b>            | 3/8" Female NPT          |
| <b>Dry Suction Lift:</b>     | 15'                      |
| <b>NPT Dimensions:</b>       | 7.32"L x 7.64"W x 10.4"H |
| <b>Body Material:</b>        | Aluminum (ADC 12)        |
| <b>Weight:</b>               | 11.9 lbs.                |
| <b>Diaphragm Materials:</b>  | Buna N/TPO/PTFE          |

### FEATURES:

- No Lubrication Required
- Stall-Free / S-Spool Design
- Fewer Wearing Parts
- Ease of Repair—Quick Teardown / Rebuild
- 30% Less Air Consumption Over Competitors' Pumps
- Perfect for Dispensing and Spraying Applications
- Critical On/Off Cycling

### ACCESSORIES:

- RG-1A Filter Regulator
- Air Motor and Liquid Kits

## 1/2" RG-15 PLASTIC PUMP

The RG-15 Series Plastic Pumps are designed to provide maximum performance, while maintaining the reliability that you've grown accustomed to from RAGCO. These 1/2" pumps are perfect for spraying and dispensing applications, particularly when on-and-off cycling reliability is critical. Constructed in Polypropylene, this pump is available with Buna N, TPO, and PTFE elastomers.

Suitable for lubricants, diesel, dispensing, spraying, automotive fluid transfer, waste oil, and evacuation.



| SPECIFICATIONS               |                   |
|------------------------------|-------------------|
| <b>Maximum Flow Rate:</b>    | 15 GPM            |
| <b>Port Size:</b>            | 1/2" Female       |
| <b>Air Supply Pressure:</b>  | 20-100 PSI        |
| <b>Liquid Temperature:</b>   | 32-212°F          |
| <b>Max. Air Consumption:</b> | 9 SCFM            |
| <b>Air Inlet:</b>            | 1/4" Female NPT   |
| <b>Dry Suction Lift:</b>     | 10'               |
| <b>NPT Dimensions:</b>       | 9.68"W x 11.69" H |
| <b>Body Material:</b>        | Polypropylene     |
| <b>Weight:</b>               | 9 lbs.            |
| <b>Diaphragm Materials:</b>  | Buna N/TPO/PTFE   |

### FEATURES:

- Stall Free
- Fewer Wearing Parts
- Ease of Repair—Quick Teardown / Rebuild
- Perfect for Dispensing and Spraying Applications
- Critical On/Off Cycling

### ACCESSORIES:

- RG-1A Filter Regulator
- Air Motor and Liquid Kits



## 1" RG-25 METAL PUMP

The new RG-25 Metal Pump has been specifically engineered with reduced parts, while ensuring maximum performance and unmatched reliability in a variety of applications.

The RG-25 is truly a non-lubricated, air distribution system with no messy grease to pre-pack. The main air valve is comprised of a patented, carbon-filled Ekonol® seal ring system that is designed to be non-stalling for reliability, while our staged exhaust design allows for an ice-free operation. All of these advanced features enable the RG-25 to use 20% less air than other brands, providing superior efficiency and exceptional durability.

Ideal for waste oil, slurries, solvents, automotive fluids, inks, paints, and more!



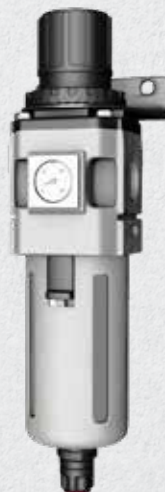
| SPECIFICATIONS               |                         |
|------------------------------|-------------------------|
| <b>Maximum Flow Rate:</b>    | 37 GPM                  |
| <b>Port Size:</b>            | 1" Female               |
| <b>Air Supply Pressure:</b>  | 30-100 PSI              |
| <b>Liquid Temperature:</b>   | 32-180°F                |
| <b>Max. Air Consumption:</b> | 30 SCFM                 |
| <b>Max. Size Solid:</b>      | 1/8"                    |
| <b>Air Inlet:</b>            | 3/8" Female NPT         |
| <b>NPT Dimensions:</b>       | 8.25"L x 8.5"W x 12.4"H |
| <b>Body Material:</b>        | Aluminum (ADC 12)       |
| <b>Weight:</b>               | 17.4 lbs.               |
| <b>Diaphragm Materials:</b>  | Buna N/Hytrel®/TPO/PTFE |

### FEATURES:

- No Lubrication Required
- Maintenance-Free Air Distribution System
- Stall-Free / Ice-Free Operation
- Fewer Wearing Parts
- Ease of Repair—Quick Teardown / Rebuild
- 20% Less Air Consumption
- Drop-in Replacement for Other Brands
- Graphite Filled Ekonol Seal Rings (Lube Free)
- Independent, Non-Lubricated Piloting System

### ACCESSORIES:

- RG-3A Filter Regulator
- Air Motor and Liquid Kits
- Base Cushion Kit
- Pulsation Dampener



## 1-1/2" RG-32 METAL PUMP

The RG-32 makes converting to a RAGCO pump easy! The 1-1/2" inlet and 1-1/4" outlet matches up dimensionally with old competing brands' designs. The re-piping issue has been solved!

Suitable for lubricants, diesel, dispensing, spraying, automotive fluid transfer, waste oil, and evacuation.



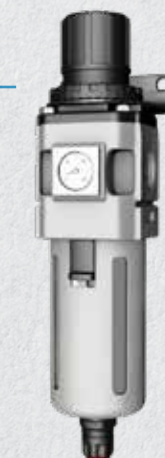
| SPECIFICATIONS              |                                  |
|-----------------------------|----------------------------------|
| <b>Maximum Flow Rate:</b>   | 50.2 GPM                         |
| <b>Port Size:</b>           | 1-1/2" Intake / 1-1/4" Discharge |
| <b>Air Supply Pressure:</b> | 30-100 PSI                       |
| <b>Liquid Temperature:</b>  | 180-248°F                        |
| <b>Max. Size Solid:</b>     | 1/8" (3 mm)                      |
| <b>Air Inlet:</b>           | 3/8" Female NPT                  |
| <b>NPT Dimensions:</b>      | 11.18"W x 16.87"H                |
| <b>Body Material:</b>       | Aluminum (ADC 12)                |
| <b>Weight:</b>              | 16.5 lbs.                        |
| <b>Diaphragm Materials:</b> | Buna N/Hytrel®/TPO/PTFE          |
| <b>Diaphragm Materials:</b> | Buna N/TPO/PTFE                  |

### FEATURES:

- No Lubrication Required
- Maintenance-Free Air Distribution System
- Stall-Free / Ice-Free Operation
- Ease of Repair—Quick Teardown / Rebuild
- Drop-in Replacement for Other Brands

### ACCESSORIES:

- RG-3A Filter Regulator
- Air Motor and Liquid Kits
- Pulsation Dampener





## 2" RG-50 METAL PUMP

The RG-50 is designed for use in process-type applications including filter press, high pressure, extended deadheading, long runs of discharge pipe, and where air consumption is critical. Air power is conserved by actuating the air valve using a mechanical linkage instead of relying on air pressure. Air power is reduced versus a standard air-actuated valve, providing higher pump efficiency.

Suitable for lubricants, diesel, dispensing, spraying, automotive fluid transfer, waste oil, and evacuation.



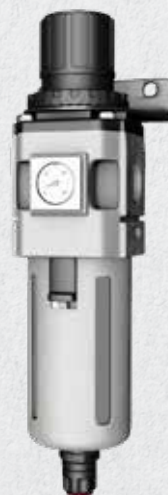
| SPECIFICATIONS               |  |
|------------------------------|--|
| <b>Maximum Flow Rate:</b>    | 164 GPM  |
| <b>Port Size:</b>            | 2" ANSI  |
| <b>Air Supply Pressure:</b>  | 20-100 PSI                                     |
| <b>Liquid Temperature:</b>   | 180-248°F                                      |
| <b>Max. Air Consumption:</b> | 105 SCFM                                       |
| <b>Max. Size Solid:</b>      | 5/16" (8 mm)                                   |
| <b>Air Inlet:</b>            | 3/4" Female NPT                                |
| <b>NPT Dimensions:</b>       | 18.63"W x 32.32"H                              |
| <b>Body Material:</b>        | Aluminum (ADC 12)                              |
| <b>Weight:</b>               | 92 lbs.  |
| <b>Diaphragm Materials:</b>  | Neoprene/Buna-N/EPDM/ Hytrel®/ TPO/Viton®/PTFE |

### FEATURES:

- Maintenance-Free Air Distribution System
- Stall-Free / Ice-Free Operation
- Ease of Repair—Quick Teardown / Rebuild
- Lower Air Consumption
- Graphite-Filled Seal Rings—Longer Life, Better Wear
- Mechanically-Actuated Air Motor

### ACCESSORIES:

- RG-3A Filter Regulator
- Air Motor and Liquid Kits
- Pulsation Dampener



### AIR MOTOR AND LIQUID KITS

RAGCO Liquid and Air Motor kits are conveniently packaged and available for easy maintenance on your pump.



### FILTER REGULATOR

Protecting your valuable investment at the end of your air lines has never been so easy. RAGCO filter/regulators provide precise air inlet pressure control and prevent air-line contaminants from reaching your pump.



### PULSATION DAMPENER

RAGCO Pulsation Dampeners greatly reduce pressure fluctuations in fluid flow when mounted close to the pump.



### DRUM PUMP KIT

Have a RAGCO RG-15 pump, but need it to be a drum pump? Not a problem. RAGCO offers drum pump kits for easy conversions.

Drum Pump Kit includes the following:

- Bung Adapter
- Coupling
- Nipple
- 3/4" Pipe
- Thumb Screw





# RESOURCES





**Abrasion:** external damage to a hose assembly caused by its being rubbed by a foreign object; a wearing away by friction.

**Abrasion tester:** a machine for determining the quantity of material worn away by friction under specified conditions.

**Absorption:** regarding hose, the process of taking in fluid. Hose materials are often compared with regard to relative rates and total amounts of absorption as they pertain to specific fluids.

**Accelerated life test:** a method designed to approximate in a short time the deteriorating effects obtained under normal service conditions.

**Acid resistant:** having the ability to withstand the action of identified acids within specified limits of concentration and temperature.

**Adapter, Adaptor:** 1) fittings of various sizes and materials used to change an end fitting from one type to another type or one size to another. (i.e., a male JIC to male pipe adapter is often attached to a female JIC to create a male end union fitting); 2) the grooved portion of a cam & groove coupling.

**Adhesion:** the strength of bond between cured rubber surfaces or between a cured rubber surface and a non-rubber surface.

**Adhesion failure:** (1) the separation of two bonded surfaces at an interface by a force less than specified in a test method; (2) the separation of two adjoining surfaces due to service conditions.

**Adhesive:** a material which, when applied, will cause two surfaces to adhere.

**Aerostatic testing:** see Pneumatic testing.

**Afterglow:** in fire resistance testing, the red glow persisting after extinction of the flame.

**Algaflon®:** a registered trademark of Ausimont USA. See PTFE.

**Air oven aging:** a means of accelerating a change in the physical properties of rubber compounds by exposing them to the action of air at an elevated temperature at atmospheric pressure.

**Air under water testing:** see Pneumatic testing.

**Ambient temperature:** the temperature of the atmosphere or medium surrounding an object under consideration.

**Ambient/atmospheric conditions:** the surrounding conditions, such as temperature, pressure, and corrosion, to which a hose assembly is exposed.

**Amplitude of vibrations and/or lateral movement:** the distance a hose assembly deflects laterally to one side from its normal position, when this deflection occurs on both sides of the normal hose centerline.

**Anchor:** a restraint applied to eliminate motion and restrain forces.

**Angular displacement:** displacement of two parts defined by an angle.

**Annular:** refers to the convolutions on a hose that are a series of complete circles or rings located at right angles to the longitudinal axis of the hose (sometimes referred to as "bellows").

**ANSI:** American National Standards Institute.

**Antistatic:** see Static conductive.

**Application working pressure:** unique to customer's application. See pressure, working.

**Application:** the service conditions that determine how a hose assembly will be used.

**Armor:** a protective cover slid over and affixed to a hose assembly; used to prevent over bending or for the purpose of protecting hose from severe external environmental conditions such as hot materials, abrasion or traffic.

**Assembly:** a general term referring to any hose coupled with end fittings of any style attached to one or both ends.

**ASTM:** American Society for Testing and Materials.

**Attachment:** the method of securing an end fitting to a hose (e.g., banding, crimping, swaging, or screw-together-2 piece or 3 piece-style-reusable fittings).

**Autoclave:** an apparatus using superheated high pressure steam for sterilization, vulcanization and other processes.

**Axial movement:** compression or elongation along the longitudinal axis.

**Backing:** a soft rubber layer between a hose tube and/or cover and carcass to provide adhesion.

**Band:** (1) a metal ring that is welded, shrunk, or cast on the outer surface of a hose nipple or fitting; (2) a thin strip of metal used as a non-bolted. See Hose clamp.

**Barb:** the portion of a fitting (coupling) that is inserted into the hose, usually comprised of two or more radial serrations or ridges designed to form a redundant seal between the hose and fitting.

**Barbed and ferrule fitting:** a two-piece hose fitting comprised of a barbed insert (nipple), normally with peripheral ridges or backward-slanted barbs, for inserting into a hose and a ferrule, usually crimped or swaged.

**Basket weave:** a braid pattern in which the plaits of wire alternately cross over and under two strands (two over-two under).

**Bench marks:** marks of known separation applied to a specimen used to measure strain (elongation of specimen).

**Bench test:** a modified service test in which the service conditions are approximated in the laboratory.

**Bend radius:** the radius of a bent section of hose measured to the innermost surface of the curved portion.

**Bend radius, minimum:** the smallest radius at which a hose can be used. For Metal Hose: -the radius of a bend measured to the hose centerline, as recommended by the manufacturer.

**Bend radius, dynamic:** the radius at which constant or continuous flexing occurs.

**Bending force:** an amount of stress required to induce bending around a specified radius and hence, a

measure of stiffness. Bend radius, static: the smallest fixed radius at which a hose can be subjected.

**Bevel seat fitting:** see Fitting, Bevel Seat.

**Beverly shear:** hand or pneumatically operated, table mounted, metal cutting shear used to cut medium pressure hose of PTFE.

**Billet:** (1) a compressed cylinder of PTFE resin, from which raw tubing is extruded. Also called a preform. (2) a solid piece of material from which a fitting is manufactured.

**Bleeding:** surface exudation. See Bloom.

**Blister:** a raised area on the surface or a separation between layers usually creating a void or air-filled space in a vulcanized article.

**Bloom:** a discoloration or change in appearance of the surface of a rubber product caused by the migration of a liquid or solid to the surface, (e.g. sulfur bloom, wax bloom). Not to be confused with dust on the surface from external sources.

**Blow out force:** the force generated from the internal pressure attempting to push the fitting from the hose.

**Body wire:** normally a round or flat wire helix embedded in the hose wall to increase strength or to resist collapse.

**Bolt hole circle:** a circle on the flange face around which the center of the bolt holes are distributed.

**Bore:** (1) an internal cylindrical passageway, as of a tube, hose or pipe; (2) the internal diameter of a tube, hose, or pipe.

**Bowl:** (1) the exterior shell of an expansion ring type coupling; (2) the larger internal diameter of the internal portion of a ferrule.

**Braid:** the woven portion of a hose used as reinforcement to increase pressure rating and add hoop strength. Various materials such as polyester, cotton or metal wire are used. A hose may have one or more braids, outside or between layers of hose material.

**Braid angle:** the angle developed at the intersection of a braid strand and a line parallel to the axis of a hose.

**Braid coverage:** the relative amount of braid material covering a hose expressed as a percent.

**Braid make up:** description of braid (i.e., 32-12-.015, T321 55), where: 32 is the number of carriers; 12 is the number of wires on each carrier; .015 is the wire diameter in inches; and T321 55 is the material, (Type 321 stainless steel).

**Braid sleeve/ring/ferrule:** a ring made from tube or metal strip placed over the ends of a braided hose to contain the braid wires for attachment of fitting and ferrule, and to immobilize heat affected corrugations.

**Braid wear:** motion between the braid and corrugated hose, which normally causes wear on the outside diameter of the corrugation and the inside diameter of the braid.

**Braided braid:** a braid where the strands of wire on each carrier of the braiding machine are braided together, and then braided in normal fashion.

**Braided ply:** a layer of braided reinforcement.

**Braid-over-braid:** multiple plies of braid having no separating layers.

**Brand:** a mark or symbol identifying or describing a product and/or manufacturer, that is embossed, inlaid or printed.

**Brass:** a family of copper/zinc alloys.

**Brazing:** a process of joining metals using a nonferrous filler metal having a melting point that is lower than the "parent metals" to be joined, typically over +800°F.

**Bronze:** an alloy of copper, tin and zinc.

**Buffing (sizing):** grinding a surface to obtain dimensional conformance or surface uniformity.

**Bumped convoluted:** a type of hose (typically fluoroplastic) made by re-forming a smooth bore tube to create annular or helical ridges or convolutions, and allow the cuffed ends to extend through the end fittings, and be flared over the fitting face, providing a seamless assembly with no metal contact. Typically used in high corrosion and sanitary applications.

**Bunch braid:** braid applied to hose in bundles rather than flat strands (plaits), usually done to achieve high pressure versus hose weight.

**Butt weld:** process in which the edges or ends of metal sections are butted together and joined by welding.

**C of C Certificate of conformance or certificate of compliance:** a document, usually signed and dated pertaining to a particular lot or purchase ( ) of item(s), which describes any standards, specifications, tests, materials and/or performance attributes to which the referenced item(s) have met or will meet.

**Cam & groove:** see Fitting/coupling -Cam & Groove.

**Capped end:** a hose end covered to protect its internal elements.

**Carcass:** the fabric, cord and/or metal reinforcing section of a hose as distinguished from the hose tube or cover.

**Casing:** see Armor.

**Cement:** unvulcanized raw or compounded rubber in a suitable solvent used as an adhesive or sealant.

**Cemented end:** a hose end sealed with the application of a liquid coating.

**Chafe sleeve:** an outer sleeve providing resistance to chafing and external resistance to damage to braided hoses, available in wide variety of materials to meet the application requirements (e.g., chafe sleeves include slip-on, heat shrinkable, integrally extruded).

**Chalking:** the formation of a powdery surface condition due to disintegration of surface binder or elastomer by weathering or other destructive environments.

**Checking:** the short, shallow cracks on the surface of a rubber product resulting from damaging action of environmental conditions.

**Chemical compatibility:** the relative degree to which a material may contact another without corrosion, degradation or adverse change of properties.



**Chemical resistance:** the ability of a particular polymer, rubber compound, or metal to exhibit minimal physical and/or chemical property changes when in contact with one or more chemicals for a specified length of time, at specified concentrations, pressure, and temperature.

**Clamp:** see Hose clamp.

**Cloth impression:** see Fabric impression.

**Coefficient of friction:** a relative measure of the surface lubricity.

**Cold flex:** see Low temperature flexibility.

**Cold flexibility:** relative ease of bending while being exposed to specified low temperature.

**Cold flow:** continued deformation under stress. See Creep.

**Collar:** 1) the portion of a fitting that is compressed by swaging or crimping to seal the hose onto the fitting barbs and create a permanent attachment; also called a ferrule. (With reusable fittings, the lock and seal are accomplished mechanically by the collar without swaging or crimping); 2) a raised portion on the hose shank which functions as a connection for a ferrule or other locking device or functions as a hose stop.

**Combustible liquid:** a combustible liquid is one having a flash point at or above +100°F (37.8°C).

**Composite hose:** non-vulcanized hose that consists of the following: An internal wire helix; A multi-ply wall of thermoplastic films and reinforcing fabrics in proportions that give the required physical properties and provide a complete seal. (Note: The film content may be built of tubular films.) A cover consisting of fabric with an abrasion resistant polymeric coating; An external helix wire.

**Compound:** the mixture of rubber or plastic and other materials, which are combined to give the desired properties when. Used in the manufacture of a product.

**Compression fitting:** see Fitting/coupling -Compression

**Compression set:** the deformation which remains in rubber after it has been subjected to and released from a specific compressive stress for a definite period of time at a prescribed temperature. (Compression set measurements are for evaluating creep and stress relaxation properties of rubber.)

**Concentricity:** the uniformity of hose wall thickness as measured in a plane normal to the axis of the hose.

**Conditioning:** the exposure of a specimen under specified conditions, e.g., temperature, humidity, for a specified period of time before testing.

**Conductive:** the ability to transfer electrical potential.

**Configuration:** the combination of fittings on a particular assembly.

**Control:** a product of known characteristics, which is included in a series of tests to provide a basis for evaluation of other products.

**Controlled flexing:** occurs when the hose is being flexed regularly, as in the case of connections to moving components (e.g., platen presses, thermal growth in pipe work).

**Convolute:** description of hose or inner core having annular or helical ridges formed to enhance flexibility.

**Convolution/corrugation:** the annular or helical flexing member in corrugated or strip wound hose/corrugation.

**Convolution count:** the number of ridges or corrugations per inch of a hose.

**Copolymer:** a blend of two polymers.

**Core:** the inner portion of a hose, usually referring to the material in contact with the medium.

**Corrosion:** the process of material degradation by chemical or electrochemical means.

**Corrosion resistance:** ability of metal components to resist oxidation.

**Corrugated cover:** a ribbed or grooved exterior.

**Corrugated hose:** hose with a carcass fluted, radially or helically, to enhance flexibility or reduce its weight.

**Coupler:** the female portion of the cam & groove connection with the cam arms.

**Coupling:** a frequently used alternative term for fitting.

**Cover wear:** the loss of material during use due to abrasion, cutting or gouging.

**Cover:** the outer component usually intended to protect the carcass of a product.

**CPE:** chlorinated polyethylene; a rubber elastomer.

**Cracking:** a sharp break or fissure in the surface, generally caused by strain and environmental conditions.

**Creep:** the deformation, in material under stress, which occurs with lapse of time after the immediate deformation.

**Crimp diameter:** the distance across opposite flats after crimping.

**Crimp/crimping:** a fitting attachment method utilizing a number of fingers or dies mounted in a radial configuration. The dies close perpendicular to the hose and fitting axis, compressing the collar, ferrule, or sleeve around the hose.

**CSM:** chlorosulfonated polyethylene.

**Cure:** the act of vulcanization. See Vulcanization.

**Cut off factor:** the hose length to be subtracted from the overall assembly length that allows for the hose coupling end connection extension beyond the end of the hose.

**Cut resistant:** having that characteristic of withstanding the cutting action of sharp object.

**Cycle-motion:** movement from normal to extreme position and return.

**Date Code:** any combination of numbers, letters, symbols or other methods used by a manufacturer to identify the time of manufacture of a product.

**Deburr:** to remove ragged edges from the inside diameter of a hose end; an important fabrication step for assembling hose of PTFE in order to insure a good seal.

**Deduct length:** the amount of fitting length deducted from a hose to result in the desired finished assembly length.

**Design factor:** a ratio used to establish the working pressure of the hose, based on the burst strength of the hose.

**Design pressure:** see Application working pressure and Pressure, working.

**Developed length:** see Overall length.

**Diamond weave:** braid pattern in which the strands alternately cross over one and under one of the strands (one over-one under); also known as "plain weave."

**Die:** a tool used to swage or crimp a fitting onto a hose. Swage dies usually consist of two halves machined to a predetermined diameter, designed for a specific hose type and size. A crimp die set is typically six to eight "fingers" designed for infinite diameter settings within a range or preset to a diameter for a given hose type and size.

**Dielectric strength:** the relative measure of a material's ability to resist conducting an electrical charge.

**Displacement:** the amount of motion applied to a hose defined as inches for parallel offset and degrees for angular misalignment.

**Dog-leg assembly:** two hose assemblies joined by a common elbow.

**DOT:** Department of Transportation.

**Duplex assembly:** an assembly consisting of two hose assemblies-one inside the other, and connected at the ends; also known as "jacketed assemblies."

**Durometer:** an instrument for measuring the hardness of rubber and plastic compounds.

**Durometer hardness:** a numerical value, which indicates the resistance to indentation of the blunt indenter of the durometer.

**Dye penetrant inspection/test:** nondestructive inspection method for detecting surface defects.

**Dynamic bend radius:** see bend radius, dynamic.

**Eccentric wall:** a wall of varying thickness.

**Eccentricity:** the condition resulting from the inside and outside diameters not having a common center. See eccentric wall.

**ECTFE:** ethylene-chlorotrifluoroethylene.

**Effective thrust area-hose:** cross-sectional area described by the mean diameter of the hose.

**Effusion:** the escape, usually of gases, through a material. See Permeation.

**Elastic limit:** the limiting extent to which a body may be deformed and yet return to its original shape after removal of the deforming force.

**Elastic/intermittent flexure:** The smallest radius that a given hose can be bent to without permanent deformation to the metal in its flexing members (convolutions or corrugations).

**Elastomer:** anyone of a group of polymeric materials, usually designated thermoset, such as natural rubber, or thermoplastic, which will soften with application of heat.

**Electrostatic discharge:** the sudden discharge of static electricity from an area of buildup to a grounding point.

**Elongation:** the increase in length expressed numerically as a percentage of the initial length.

**Encapsulated fitting:** see Fitting/coupling-Encapsulated fittings.

**Endurance test:** a service or laboratory test, conducted to product failure, usually under normal use conditions.

**Enlarged end:** an end having a bore diameter greater than that of the main body of the hose, in order to accommodate a larger fitting.

**EPDM:** Ethylene Propylene Diene Monomer; an elastomer.

**Exothermic:** releasing heat.

**Extrude/extruded/extrusion:** forced through the shaping die of an extruder; extrusion may have a solid or hollow cross section.

**Fabric impression:** impression formed on the rubber surface during vulcanization by contact with fabric jacket or wrapper.

**Fabricator:** the producer of hose assemblies.

**Fatigue:** the weakening or deterioration of a material occurring when a repetitious or continuous application of stress causes strain, which could lead to failure.

**FDA:** United States Food and Drug Administration.

**FEP:** fluorinated ethylene propylene.

**Ferrule:** a metal cylinder placed over a hose end to affix the fitting to the hose. See braid sleeve, interlocking ferrule, and sleeve.

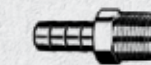


brass ferrule

**Fire sleeve:** slip-on or integrally extruded sleeve used to retard the effects of fire in certain applications; most often made with silicone and/or ceramic fiber.

**Fitting/coupling:** a device attached to the end of the hose to facilitate connection. The following is only a partial list of types of fittings available-

**Banjo Fitting** - a through bolted designed featuring a hollow circle or "donut" attached to one end of the fitting barb so that the inner diameter is along the hose axis.



barbed inserts

**Barbed inserts** - for low or medium pressure air, water and fluids. Machined brass with serrated shank; NPT or NPTF male and solid female, and



NPSM swivel female; thread seal to NPT or NPTF female, and ball end or washer seal to NPSM female. Attached with bands or clamps.

**Butt Weld Fittings** - a hose fitting designed to be permanently welded to a connecting member such as another pipe or a butt weld flange.



**Cam & Groove Fittings** - a type of fitting that allows connection and disconnection by means of arm(s) or cam(s) on the female fitting. The seal is accomplished by means of a gasket, available in various materials. These fittings are frequently used on product transfer hose assemblies.

**Compression Fitting** - a fitting style that seals on a mating tube by compressing an internal ferrule against the tube O.D..

**Encapsulated Fittings** - a metal fitting of various styles usually encased in a thermoplastic or fluoroplastic material by means of molding or coating. Most often done for sanitary purposes or to eliminate corrosion.

**Field Attachable Fitting** - a fitting designed to be attached to hose without crimping or swaging. This fitting is not always a Reusable type fitting.

**Flange Retainer Fittings** - a hose fitting flared to a 90° surface, designed to hold a circular rotating flange, such as a slip-on or lap joint style flange.

**Flange Style Fittings** - pipe flanges and flanged fitting standards are listed under ANSI 816.5. Flanges are rated for pressure and listed as «American Class 150, 300, 400, 600, 900, 1,500 or 2,500». Pressure- Temperature ratings can be obtained by consulting the ANSI specification or ASME 816.5 (American Society of Mechanical Engineers). Designs vary by neck and face style, or other dimensional changes based on use. Various finishes or grooves may be applied to the face for sealing on a gasket or O-ring. Bolt holes and other dimensions are per the ANSI standard.

**Slip-on Flange** - a flange designed to slip over a flange retainer and float freely in place for bolt alignment. Similar to a lap joint flange except with a very small radius on the face side of the inside diameter to mate with a machined flange retainer. May have a flat or raised face.

**Lap Joint Flange** - a flange designed to float freely on the flange retainer for bolt alignment. Made with a flat face and having a large radius on the I.D. to mate with a flared pipe style flange retainer.

**Threaded Flange** - a flange, the inside diameter of which is threaded to attach to a male pipe fitting. A leak proof seal, made with thread sealant, usually does not allow for bolt hole alignment.



**Interlocking** - for high pressure air and water service, steam, high pressure spray, and LPG service. Plated malleable iron; insert and spud may be either steel or malleable iron; NPT male and female with ground joint or washer seal. Attached with four bolts or two interlocking clamps.

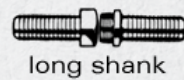


**Interlocking Clamp** - Heavy duty high pressure applications such as air, steam, water, spray. Malleable iron, plated. Clamps are bolted into position.

**Inverted Flare Fitting** - a fitting consisting of a male or female nut, trapped on a tube by flaring the end of the tube material to either 37° or 45°.

**JIC Fittings** - joint Industrial Council (no longer in existence). An engineering group that established an industry standard fitting design incorporating a 37° mating surface, male and female styles. These standards now governed by SAE.

**Lined Fitting** - any fitting of which the wetted surface or entire fitting is covered with a protective material. The covering process may be by spray coating, molding or by inserting hose liner through the I.D. of fitting and anchoring.



**Long Shank** - designed for medium pressure air, water, sanitary and liquids in suction or discharge service. Machined brass with serrated shank; NPT or NPTF male and solid female, and NPSM swivel female; thread seal to NPT or NPTF female, and ball end washer seal to NPSM female. Attached with clamps or bands.

**Pipe Thread Fittings** -

- NPT- National Pipe Taper. Pipe thread per ANSI B1.20.1
- NPTF- National Pipe Tapered for Fuels. Same as above except dry-seal per ANSI B1.20.3
- NPSH- National Pipe Straight Hose per ANSI B1.20.7
- NPSM- National Pipe Straight Mechanical. Straight thread per ANSI B1.20.1
- NPSL- National Pipe Straight Loosefit per ANSI B1.20.1
- BSPP, BSPT- British Standard Pipe Parallel, British Standard Pipe Taper. BS21.



**Quick Acting** - for low to medium pressure; air, water or oil service where frequent and fast connections must be made. Malleable iron plated, stainless steel or bronze. Attached with interlocking clamps or bands.

**Quick Connect Fitting** - a fitting designed to quickly connect and disconnect. These fittings come in many styles and types.

**Reusable Fitting** - a fitting designed to be attached and unattached to a hose, allowing all or most of the fitting to be reused.

**Sanitary Fittings** - a fitting whose seal is accomplished by means of a round gasket in a groove on the face of the fitting. The design eliminates the need for a male and female, since the fitting mates to itself. A re-attachable clamp is also used for coupling.

**Bevel Seat** - a type of sanitary fitting incorporating a 45° beveled sealing surface. Used in the food and pharmaceutical industries.

**Combination Nipple** - for low or medium pressure suction and discharge of water, fluids, and material handling. Tubular steel, stainless, malleable



combination nipple

iron, aluminum or brass with serrated shank; NPT male threads, grooved, or beveled for welding. Attached with clamps or bands.



serrated nipple

**Serrated Nipple** - for medium to high pressure air, water, and liquid service. Machined steel and plated; NPT male threads; thread or washer seal. Attached with clamps or bands

**Steel Nipple** - for medium to high pressure; wide variety of applications. Machined from cold drawn bar steel, heat treated for toughness. Attached with interlocking clamps.



steel nipple



short shank

**Short Shank** - designed for low pressure water and air service. Cast brass with serrated shank; GHT, NPSM or NPT male and HPSH female; washer seal. Attached with clamps or bands.

**Split Flange Fitting** - a fitting consisting of a flange retainer and a flange of two halves. This design allows the flanges to be installed after the retainer has been attached to the hose, making the flange reusable. SAE Code 61 and 62.



swaged or crimped

**Swaged or crimped** - for use on all types of hose where high pressures are used. Couplings consist of swaged fitting shaving serrated steel shanks with ferrules of plated steel. Attached with swaging or crimping equipment.

**Tube Fitting** - a hose fitting of which the mating end conforms to a tube diameter. The mate or male end of a compression fitting.

**2-Bolt Flange Fitting** - an elliptical flange with two bolt holes. Typically used in steam applications such as laundry and tire presses.



water suction

**Water Suction** - Heavy duty water discharge and suction service. Malleable iron and/or brass. Attached with clamps or bands.

**Flammable gases/liquid/media:** a flammable gas, including liquefied gas, is one having a closed cup flash point below +100°F (+37.8°C) and a vapor pressure greater than 25 psi. (174.2 KPa).

**Flat spots:** flat areas on the surface of cured hose caused by deformation during vulcanization.

**Flex cracking:** a surface cracking induced by repeated bending and straightening.

**Flex life:** the relative ability of an article to withstand bending stresses.

**Flex life test:** a laboratory method used to determine the life of a rubber product when subjected to dynamic bending stresses.

**Flow rate:** a volume of media being conveyed in a given time period.

**Fluid:** a gas or liquid medium.

**Fluid velocity:** the speed of fluid through a cross section expressed in length divided by time.

**Fluorocarbon:** an organic compound containing fluorine directly bonded to carbon. The ability of the carbon atom to form a large variety of structural chains gives rise to many fluorocarbons and fluorocarbon derivatives.

**Fluron®:** a registered trademark of ICI. A term descriptive of the family of fluorocarbons and fluorocarbon derivatives in general commercial use. See PTFE.

**Fluoropolymer:** a high molecular weight (long chain) chemical containing fluorine as a major element.

**Free length:** the lineal measurement of hose between fittings or couplings.

**Frequency:** the rate of vibration or flexure in a given time period.

**Galvanic corrosion:** corrosion that occurs on the less noble of two dissimilar metals in direct contact with each other in an electrolyte, such as water, sodium chloride in solution, sulfuric acid, etc.

**GMAW:** Gas Metal Arc Weld.

**GPM:** Gallons per minute.

**GTAW:** see Tig Weld/GTAW.

**Guide (for piping):** a device that supports a pipe radially in all directions, but directs movement.

**Halar®:** Ausimont USA registered trademark. See ECTFE.

**Hand built hose:** a hose made by hand on a mandrel, reinforced by textile or wire or combination of both.

**Hardness:** resistance to indentation. See Durometer hardness.

**Heat resistance:** the property or ability to resist the deteriorating effects of elevated temperatures.

**Heat-shrink sleeving:** tubular thermoplastic sleeve used for chafe protection or identification. The sleeve is slipped over the hose and shrunk down by the application of heat to fit tightly on the hose.

**Helical wire armor/spring guard:** an abrasion resistance device.

**Helical:** used to describe a type of corrugated hose having one continuous convolution resembling a screw thread.

**Helix:** a shape formed by spiraling a wire or other reinforcement around the cylindrical body of a hose; typically used in suction hose.

**Higbee:** the thread of a hose coupling, the outermost convolution of which has been removed to such an extent that a full cross section of the thread is exposed, this exposed end being beveled.

**Hoop strength:** the relative measure of a hose's resistance to collapse of the diameter perpendicular to the hose axis.

**Hose:** a flexible conduit consisting of a tube, reinforcement, and usually an outer cover.

**Hose assembly:** see Assembly.



band clamp

device used to hold a hose onto a fitting.



**Band Clamp** - use with low or medium pressure and suction service. Pre-formed flat stainless steel, high carbon steel. Attached with special locking band tool.

**Double Bolt Clamp** - use with low or medium pressure and suction service with large sizes of combination nipples or couplings. Cast malleable iron, plated, and brass. Applied over hose and bolted into position.



double bolt clamp



single bolt clamp

**Single Bolt Clamp** - use with low pressure and suction service on shank couplings, combination nipples, and pipe nipples. Cast malleable iron, plated. Attached by bolting tightly on hose.

**Wire Hose Clamp** - suitable for medium pressure air, water or general purpose hose; good for hose with helical wire or corrugations; available in larger sizes for pin lug, serrated pipe nipple or combination. Pre-formed round wire made of stainless steel, galvanized steel, copper, bronze or aluminum. Wire ends pulled and crimped with special tool or machine.



wire hose clamp

**Hostaflo®**: a registered trademark of Dyneon. See PFA.

**Hydrostatic testing**: the use of liquid pressure to test a hose or hose assembly for leakage, twisting, and/or hose change-in-length.

**Hypalon®**: a DuPont registered trademark. See CSM.

**Hytrel®**: a DuPont registered trademark.

**I.D.:** the abbreviation for inside diameter.

**Identification yarn**: a yarn of single or multiple colors, usually embedded in the hose wall, used to identify the manufacturer.

**Impression**: a design formed during vulcanization in the surface of a hose by a method of transfer, such as fabric impression or molded impression.

**Impulse service**: an application parameter characterized by continuous cyclical pressure changes from low to high.

**Impulse**: an application of force in a manner to produce sudden strain or motion, such as hydraulic pressure applied in a hose.

**Indentation**: 1) the extent of deformation by the indenter point of any one of a number of standard hardness testing instruments; 2) a recess in the surface of a hose.

**Innercore**: the innermost layer of a hose; the hose material in contact with the medium.

**Insert**: optional term for nipple. See Nipple.

**Interlocked hose**: formed from profiled strip and wound into flexible metal tubing with no subsequent welding, brazing, or soldering; may be made pressure-tight by winding in strands of packing.

**Interlocking clamp**: a clamp which engages the fitting in a manner which prevents the clamp from sliding off the fitting, typically a bolt or U-bolt style with interlocking fingers which engage an interlock ring on the fitting.

**Interlocking ferrule**: a ferrule, which physically attaches to the fitting preventing the ferrule from sliding off the fitting.

**Interstice**: a small opening, such as between fibers in a cord or threads in a woven or braided fabric.

**IPT**: iron pipe threads; a reference to NPT or NPTF.

**ISO**: International Organization for Standardization.

**Jacket**: seamless tubular braided or woven ply generally on the outside of hose.

**JIC**: see Fitting/coupling-JIC.

**Kinking**: temporary or permanent distortion of the hose induced by bending beyond the minimum bend radius.

**Kynar®**: ELF Atochem registered trademark. See PVDF.

**Lap seam**: seam made by placing the edge of one piece of material extended flat over the edge of the second piece of material.

**Lap weld (LW)**: type of weld in which the ends or edges of the metal overlap each other.

**Lay**: 1) the direction of advance of any point in a strand for one complete turn; (2) the amount of advance of any point in a strand for one complete turn. See Pitch.

**Layer**: a single thickness of rubber or fabric between adjacent parts.

**Leaker**: 1) a crack or hole in the tube which allows fluids to escape; 2) a hose assembly which allows fluids to escape at the fittings or couplings.

**Life test**: a laboratory procedure used to determine the resistance of a hose to a specific set of destructive forces or conditions. See Accelerated life test.

**Light resistance**: the ability to retard the deleterious action of light.

**Lined bolt holes**: the bolt holes, which have been given a protective coating to cover the internal structure.

**Liner**: flexible sleeve used to line the inside diameter of hose when conveying a high velocity media, also prevents erosion.

**Live length**: see Free length.

**LJF (lap joint flange)**: see Fitting/coupling -Lap Joint Flange.

**Long shank**: a shank length greater than the nominal diameter, typically two diameters in length, which allows more than a single clamp.

**Loop installation**: the assembly is installed in a loop or "U" shape, and is most often used when frequent and/or large amounts of motion are involved.

**Low temperature flexibility**: the ability of a hose to be flexed, bent or bowed at low temperatures without loss of serviceability.

**LPG, LP Gas**: the abbreviation for liquefied petroleum gas.

**MAWP**: see pressure, maximum allowable working.

**Mandrel**: 1) a form, generally of elongated round section used for size and to support hose during fabrications and/

or vulcanization. It may be rigid or flexible; 2) a tapered expanding device, fixed in diameter, which is pulled through a shank of a fitting thus expanding the diameter to exert force on the hose between the shank and ferrule.

**Mandrel built**: a hose fabricated and/or vulcanized on a mandrel.

**Mandrel, flexible**: a long, round, smooth rod capable of being coiled in a small diameter. It is used for support during the manufacture of certain types of hose. (The mandrel is made of rubber or plastic material and may have a core of flexible wire to prevent stretching.)

**Mandrel, rigid**: a non-flexible cylindrical form on which a hose may be manufactured.

**Manufacturer's identification**: a code symbol used on or in some hose to indicate the manufacturer.

**Mass flow rate**: the mass of fluid per unit of time passing through a given cross-section of a flow passage in a given direction.

**Mean diameter**: the midpoint between the inside diameter and the outside diameter of a corrugated/convoluted hose.

**Mechanical fitting/reusable fitting**: a fitting attached to a hose, which can be disassembled and used again.

**Media, medium**: the substance(s) being conveyed through a system.

**Mender**: a fitting or device used to join two sections of hose.

**Metal hose**: thin wall metal tubing formed into flexible hose with helical or annular ridges and grooves, often braided with stainless steel to increase the operating pressure capability. With fittings welded on, assemblies are used in applications outside temperature range of rubber, thermoplastic and fluoroplastic.

**Misalignment**: a condition where two parts do not meet true.

**NAHAD**: the abbreviation for the National Association of Hose & Accessories Distributors.

**Necking down**: a localized decrease in the cross-sectional area of a hose resulting from tension.

**Neoflon®**: a registered trademark of Daikin USA.

**Neoprene®**: a registered trademark of DuPont.

**Nipple**: the internal member or portion of a hose fitting.

**Nitrile rubber (NB/Buna-N)**: a family of acrylonitrile elastomers used extensively for industrial hose.

**Nominal**: a size indicator for reference only.

**Nomograph**: a chart used to compare hose size to flow rate to recommended velocity.

**Non-conductive**: the inability to transfer an electrical charge.

**Non-interlocking ferrule**: see Sleeve.

**Nozzle end**: an end of hose in which both the inside and outside diameters are reduced.

**NPT/NPTF**: abbreviation for national pipe threads. See fitting/coupling -Pipe Thread Fittings.

**Nylon**: a family of polyamide materials.

**OAL**: overall length

**O.D.:** the abbreviation for outside diameter.

**OE/OEM**: original equipment manufacturer.

**Off-center**: see Eccentricity.

**Offset-lateral, parallel**: the distance that the ends of a hose assembly are displaced in relation to each other as the result of connecting two misaligned terminations in a system, or intermittent flexure required in a hose application.

**Oil resistance**: the ability of the materials to withstand exposure to oil.

**Oil swell**: the change in volume of a rubber article resulting from contact with oil.

**Open steam cure**: a method of vulcanizing in which steam comes in direct contact with the product being cured.

**Operating conditions**: the pressure, temperature, motion, and environment to which a hose assembly is subjected.

**O-ring fitting**: a fitting that seals by means of an elastomeric ring of a specified material.

**OS&D hose**: the abbreviation for oil suction and discharge hose.

**Overall length (OAL)**: the total length of a hose assembly, which consists of the free hose length plus the length of the coupling(s).

**Oxidation**: the reaction of oxygen on a material, usually evidenced by a change in the appearance or feel of the surface or by a change in physical properties.

**Ozone cracking**: the surface cracks, checks or crazing caused by exposure to an atmosphere containing ozone.

**Ozone resistance**: the ability to withstand the deteriorating effects of ozone (generally cracking).

**PFA**: perfluoralkoxy

**Penetration (weld)**: the percentage of wall thickness of the two parts to be joined that is fused into the weld pool in making a joint.

**Performance test (service test)**: a test in which the product is used under actual service conditions.

**Permanent fitting**: the type of fitting which, once installed, may not be removed for reuse.

**Permeation**: the process of migration of a substance into and through another, usually the movement of a gas into and through a hose material; the rate of permeation is specific to the substance, temperature, pressure and the material being permeated.

**Pharmacopoeia Class VI**: a standard for sanitary fittings, designating the form, fit, function and finish.

**Pick**: the distance across a group of braid wires from a single carrier, measured along the axis of the hose.

**Pig**: a mechanical projectile used for cleaning hose.

**Pin pricked**: perforations through the cover of a hose to vent permeating gases.



**Pitch:** 1) the distance from one point on a helix to the corresponding point on the next turn of the helix, measured parallel to the axis; 2) the distance between the two peaks of adjacent corrugation or convolution.

**Pitted tube:** surface depressions on the inner tube of a hose.

**Plain ends:** fitting ends without threads, groove, or a bevel typically used for welding, as in a flange.

**Plaits:** an individual group of reinforcing braid wires/strands.

**Plating:** a material, usually metal, applied to another metal by electroplating, for the purpose of reducing corrosion; typically a more noble metal such as zinc is applied to steel.

**Ply:** an individual layer in hose construction.

**Pneumatic testing:** the use of compressed air to test a hose or hose assembly for leakage, twisting, and/or hose change-in-length. NOTE: Use of high pressure air is extremely hazardous.

**Polyflon®:** a registered trademark of Daikin USA. See PTFE.

**Polymer:** a macromolecular material formed by the chemical combination of monomers, having either the same or different chemical compositions.

**Post-sinter:** the technique of re-heating PTFE inner core to process temperature in order to reduce permeability.

**Preform:** the compressed cylinder of PTFE resin that is used to extrude into raw tubing. Also called a billet.

**Pre-production inspection or test:** the examination of samples from a trial run of hose to determine adherence to a given specification, for approval to production.

**Preset:** the process of pressurizing a hose to set the braid and minimize length change in final product.

**Pressure:** force + unit area. For purposes of this document, refers to PSIG (pounds per square inch gauge).

**Pressure drop:** the measure of pressure reduction or loss over a specific length of hose.

**Pressure, burst:** the pressure at which rupture occurs.

**Pressure, deformation:** the pressure at which the convolutions of a metal hose become permanently deformed.

**Pressure, gauge:** relative pressure between inside and outside of an assembly.

**Pressure, maximum allowable working:** the maximum pressure at which a hose or hose assembly is designed to be used.

**Pressure, operating:** see Pressure, working.

**Pressure, proof test:** a nondestructive pressure test applied to hose assemblies.

**Pressure, pulsating:** a rapid change in pressure above and below the normal base pressure, usually associated with reciprocating type pumps.

**Pressure, rated working:** see Pressure, maximum allowable working.

**Pressure, service:** see Working pressure.

**Pressure, shock/spike:** the peak value of a sudden increase of pressure in a hydraulic or pneumatic system producing a shock wave.

**Pressure, working:** the maximum pressure to which a hose will be subjected, including the momentary surges in pressure, which can occur during service. Abbreviated as WP.

**Printed brand:** see Brand.

**Profile:** used in reference to the contour rolled into strip during the process of manufacturing strip wound hose, or the finished shape of a corrugation on/convolution.

**Propane:** see LPG, LP Gas.

**PSI:** pounds per square inch.

**PTFE:** polytetrafluoroethylene, a high molecular weight fluoroplastic polymer with carbon atoms shielded by fluorine atoms having very strong inter atomic bonds, giving it chemical inertness.

**Pull off force:** the force required to pull the hose from its attachment not generated by the internal pressure.

**PVC:** polyvinyl chloride. A low cost thermoplastic material typically used in the manufacture of industrial hoses. The operating temperature range is -500°F to +1750°F (-295.5°C to +954.4°C)

**PVDF:** polyvinylidene fluoride.

**Quality conformance inspection or test:** the examination of samples from a production run of hose to determine adherence to given specifications, for acceptance of that production.

**RAC:** Rubber Association of Canada.

**Random motion:** the uncontrolled motion of a metal hose, such as occurs in manual handling.

**Reinforcement:** the strengthening members, consisting of either fabric, cord, and/or metal, of a hose. See Ply.

**Reusable fitting/coupling:** see Fitting/coupling, reusable.

**RMA:** The Rubber Manufacturers Association, Inc.

**SAE:** Society of Automotive Engineers.

**Safety factor:** see Design factor.

**Sampling:** a process of selecting a portion of a quantity for testing or inspection, selected without regard to quality.

**Santoprene®:** a registered trademark of Monsanto.

**Scale:** the oxide in a hose assembly brought about by surface conditions or welding.

**Serrations:** bumps, barbs, corrugations, or other features that increase the holding power of the device.

**Service temperature:** see Working temperature

**Shank:** that portion of a fitting, which is inserted into the bore of a hose.

**Shelf/storage life:** the period of time prior to use during which a product retains its intended performance capability

**Shell:** see Ferrule.

**Shock load:** a stress created by a sudden force.

**Short shank:** shank length, approximately equal to the nominal diameter, but long enough to allow a single clamp at minimum.

**Simulated service test:** see Bench test.

**Skive:** the removal of a short length of cover and/or tube to permit the attachment of a fitting directly over the hose reinforcement.

**Sleeve:** a metal cylinder, which is not physically attached to the fitting, for the purpose of forcing the hose into the serrations of the fitting.

**Smooth bore:** a term used to describe the type of inner core in a hose.

**Socket:** the external member or portion of a hose fitting commonly used in describing screw-together reusable fittings.

**Soft end:** a hose end in which the rigid reinforcement of the body, usually wire, is omitted.

**Specification:** a document setting forth pertinent details of a product.

**Spiral:** a method of applying reinforcement in which there is not interlacing between individual strands of the reinforcement.

**Spiral angle:** the angle developed by the intersection of the helical strand and a line parallel to the axis of a hose. See braid angle.

**Splice:** a fitting or device used to join two sections of hose.

**Spring guard:** a helically wound component applied internally or externally to a hose assembly, used for strain relief, abrasion resistance, collapse resistance.

**Squirm:** a form of failure where the hose is deformed into an "S" or "U" bend, as the result of excessive internal pressure being applied to unbraided corrugated hose while its ends are restrained or in a braided corrugated hose which has been axially compressed.

**Standard:** a document, or an object for physical comparison, for defining product characteristics, products, or processes, prepared by a consensus of a properly constituted group of those substantially affected and having the qualifications to prepare the standard for use.

**Static bonding:** use of a grounded conductive material between fittings to eliminate static electrical charges.

**Static conductive:** having the capability of furnishing a path for a flow of static electricity.

**Static discharge:** see Electrostatic discharge.

**Static wire:** wire incorporated in a hose to conduct static electricity.

**Stem:** see Nipple.

**Stress corrosion:** a form of corrosion in metal.

**Strip wound:** see Interlocked hose.

**Surge (spike):** a rapid and transient rise in pressure.

**Swage:** the method of fitting attachment that incorporates a set of die halves designed to progressively reduce the collar or ferrule diameter to the required finish dimension by mechanically forcing the fitting into the mating die.

**Swelling:** an increase in volume or linear dimension of a specimen immersed in liquid or exposed to a vapor.

**Tape wrapped convoluted:** a type of flexible hose incorporating layers of tape to form helical ridges and grooves.

**Tear resistance:** the property of a rubber tube or cover of a hose to resist tearing forces.

**Teflon®:** a registered trademark of E.I. DuPont. See PTFE, FEP and PFA.

**TFE:** Polytetrafluoroethylene. See PTFE.

**Tig weld/GTAW:** the gas tungsten arc welding process sometimes referred to a "shielded arc" or "heliarc."

**Traveling loop, Class A Loop:** an application wherein the radius remains constant and one end of the hose moves parallel to the other end.

**Traveling loop, Class B Loop:** a condition wherein a hose is installed in a U-shaped configuration and the ends move perpendicular to each other so as to enlarge or decrease the width of the loop.

**Tube:** the innermost continuous all-rubber or plastic element of a hose

**Tube fitting:** see Fitting/coupling- Tube.

**Tubing:** a non-reinforced, homogeneous conduit, generally of circular cross-section.

**Twist:** (1) the turns about the axis, per unit of length, of a fiber, roving yarn, cord, etc. Twist is usually expressed as turns per inch; (2) the turn about the axis of a hose subjected to internal pressure.

**Unsintered:** material that has not undergone primary heat processing.

**Vacuum formed convoluted:** smooth bore hose that is made flexible by the formation of ridges and grooves during a process that utilizes heat and vacuum to mechanically form convolutions.

**Vacuum resistance:** the measure of a hoses ability to resist negative gauge pressure.

**Velocity resonance:** vibration due to the buffeting of a high velocity gas or liquid flow.

**Vibration:** amplitude motion occurring at a given frequency

**Viscosity:** the resistance of a material to flow.

**Volume change:** a change in dimensions of a specimen due to exposure to a liquid or vapor.

**Volume swell:** see Swelling.



**Volumetric expansion:** the volume increase of hose when subjected to internal pressure.

**Vulcanization:** a process during which a rubber compound, through a change in its chemical structure, improves or extends elastic properties over a greater range of temperature.

**Weathering:** the surface deterioration of a hose cover during outdoor exposure as shown by checking, cracking, crazing and chalking

**Wire reinforced:** a hose containing wires to give added strength, increased dimensional stability; crush resistance. See Reinforcement.

**Working temperature:** the temperature range of the application, may include the temperature of the fluid conveyed or the environmental conditions the assembly is exposed to in use.

**WP:** the abbreviation for working pressure.

**Wrapped cure:** a vulcanizing process using a tensioned wrapper (usually of fabric) to apply external pressure

The preceding Glossary of Terms, as utilized in the hose industry, includes some definitions from The Hose Handbook, published by the Rubber Manufacturers Association.

**verall length (OAL):** the total length of a hose assembly, which consists of the free hose length plus the length of the coupling(s).



## COVER

The cover is the outermost or visible area of the hose. It is designed to be a protective covering against wear, abrasion, cuts, weather, and the general destructive action encountered in normal service.

## BODY OR CARCASS

The body reinforcement is the supporting structure of the hose. It can range from simple to complex combinations and consists of cord, yarn, fabric, wire, or any combination of these.

## TUBE OR LINING

The tube is the innermost element of a hose and is compounded to provide resistance to the material being carried. With the wide range of rubber compounds available, a hose can be built to withstand abrasive materials, chemicals, oil and a wide variety of other materials.

## THE FOUR BASIC METHODS OF HOSE CONSTRUCTION

Keep in mind that a reference to any one of these types of construction will imply all the characteristics and benefits outlined here plus specific features attained through the proper compounding of rubber, choice materials, and variation in plies and thickness to ensure that each hose is exactly right for the job for which it is designed.

### TYPE 1: VERTICAL BRAIDED HOSE

Entire hose length cured in one operation.

- A. Extruded seamless tube
- B. Seamless reinforcing braids of synthetic textile wire—or other material—applied by high-speed vertical or horizontal braiders
- C. Rubber layers between braids establish positive bond between braids when vulcanized
- D. Extruded, seamless cover

**Advantages:** Flexible. High resistance to kinking. Cover either smooth or wrapped. Available in long, continuous lengths. Excellent tensile strength.

### TYPE 2: SPIRAL HOSE

Built by machine with either textile or wire cord reinforcement applied so that each ply is laid at a given angle for maximum dimensional stability.

- A. Extruded or calendared tube
- B. Reinforcement of synthetic textile wire or other material
- C. Rubber layers between reinforcement plies to establish positive bond
- D. Cover

**Advantages:** Extremely flexible. Smooth bore, uniform tube. High strength with long-length capability.

### TYPE 3: HAND-BUILT SPIRALED PLY HOSE

Built by hand on a mandrel. Cured under pressure applied from outside by cloth wraps and steam.

- A. Calendared, or "built-up" tube to fit service
- B. Tailor-made spiral wrapped fabric
- C. Wire reinforcement where needed
- D. Cover stock of selected gauge and compound; wrap cured

**Advantages:** Craftsman-built to special requirements. Wide variation in sizes, constructions, and materials. Built-in strength to fit most rugged job requirements. Couplings, fittings, nipples, flanges and beaded ends can be built in. Available in lengths up to 50 feet, in sizes up to 18 inches. On larger diameters, consult your Ragco location.

### TYPE 4: KNITTED HOSE

- A. Extruded seamless tube
- B. Seamless woven textile jacket
- C. Interwoven wire helix reinforcement where needed
- D. Extruded seamless cover



# CARE, MAINTENANCE, AND STORAGE

A hose has a limited life and the user must be alert to signs of impending failure, particularly when the conditions of service include high working pressures and/or the conveyance or containment of hazardous materials. The periodic inspection and testing procedures described here provide a schedule of specific measures, which constitute a minimum level of user action to detect signs indicating hose deterioration or loss of performance before conditions leading to malfunction or failure are reached.

**WARNING:** Failure to properly follow the manufacturer's recommended procedures for the care, maintenance and storage of a particular hose might result in its failure to perform in the manner intended and might result in possible damage to property and serious bodily injury.

General instructions are also described for the proper storage of a hose to minimize deterioration from exposure to elements or environments that are known to be deleterious to rubber products. Proper storage conditions can enhance and extend substantially the ultimate life of hose products.

## GENERAL CARE AND MAINTENANCE OF YOUR HOSE

A hose should not be subjected to any form of abuse in service. It should be handled with reasonable care. Hose should not be dragged over sharp or abrasive surfaces unless specifically designed for such service.

Care should be taken to protect the hose from severe end loads for which the hose or hose assembly were not designed. The hose should be used at or below its rated working pressure; any changes in pressure should be made gradually so as to not subject the hose to excessive surge pressures.

A hose should not be kinked or be run over by equipment. In handling large-size hose, dollies should be used whenever possible; slings or handling rigs, properly placed, should be used to support heavy hoses used in oil suction and discharge service.

## GENERAL TEST AND INSPECTION PROCEDURES FOR YOUR HOSE

An inspection and hydrostatic test should be made at periodic intervals to determine if a hose is suitable for continued service. A visual inspection of the hose should be made for loose covers, kinks, soft spots that might indicate broken or displaced reinforcement.

The couplings or fittings should be closely examined and, if there is any sign of movement of the hose from the couplings, the hose should be removed from service. The periodic inspection should include a hydrostatic test for one minute at 150% of the recommended working pressure of the hose. An exception to this would be the woven-jacketed fire hose.\*

During the hydrostatic test, the hose should be straight, not coiled or in a kinked position. Water is the usual test medium and, following the test, the hose may be flushed with alcohol to remove traces of moisture. A regular schedule for testing should be followed and inspection records maintained.

\* A woven-jacket fire hose should be tested in accordance with the service test provisions contained in the current edition of National Fire Protection Association Bulletin No. 1962 - Standard for the Care, Use and Service Testing of Fire Hose.

# CARE, MAINTENANCE, AND STORAGE

## STORAGE

Rubber hose products in storage can be affected adversely by temperature, humidity, ozone, sunlight, oils, solvents, corrosive liquids and fumes, insects, rodents and radioactive materials.

The appropriate method for storing a hose depends to a great extent on its size (diameter and length), the quantity to be stored, and the way in which it is packaged. A hose should not be piled or stacked to such an extent that the weight of the stack creates distortions on the lengths stored at the bottom.

Since hose products vary considerably in size, weight, and length, it is not practical to establish definite recommendations on this point. A hose having a very light wall will not support as much load as a hose having a heavier wall or a hose having a wire reinforcement. A hose that is shipped in coils or bales should be stored so that the coils are in a horizontal plane.

Whenever feasible, rubber hose products should be stored in their original shipping containers, especially when such containers are wooden crates or cardboard cartons that provide some protection against the deteriorating effects of oils, solvents, and corrosive liquids; shipping containers also afford some protection against ozone and sunlight.

Certain rodents and insects will damage rubber hose products, and adequate protection from them should be provided.

A cotton-jacketed hose should be protected against fungal growths if the hose is to be stored for prolonged periods in humidity conditions in excess of 70%.

The ideal temperature for the storage of rubber products ranges from 50°To 70° F (10°C to 21°C) with a maximum limit of 100°F (38°C). If stored below 32°F (0°C), some rubber products become stiff and would require warming before being placed in service. Rubber products should not be stored near sources of heat, such as radiators, base heaters, etc.

To avoid the adverse effects of high-ozone concentration, rubber hose products should not be stored near electrical equipment that may generate ozone or be stored for any lengthy period in geographical areas of known high-ozone concentration. Exposure to direct or reflected sunlight, even through windows, should also be avoided. An uncovered hose should not be stored under fluorescent or mercury lamps that generate light waves harmful to rubber.

Storage areas should be relatively cool and dark, and free of dampness and mildew. Items should be stored on a first-in, first-out basis, since even under the best of conditions, an unusually long shelf life could deteriorate certain rubber products.

(From RMA Hose Handbook IP-2 Sixth Edition 1996)



## SAFETY WARNING

Before conducting any pressure tests on a hose, provisions must be made to ensure the safety of the personnel performing the tests and to prevent any possible damage to property. Only trained personnel using proper tools and procedures should conduct any pressure tests.

1. Air or any other compressible gas must never be used as the test media because of the explosive action of the hose should a failure occur. Such a failure might result in possible damage to property and serious bodily injury.
2. Air should be removed from the hose by bleeding it through an outlet valve while the hose is being filled with the test medium.
3. The hose to be pressure tested must be restrained by placing steel rods or straps close to each end and at approximate 10 foot (3m) intervals along its length to keep the hose from "whipping" if failure occurs; the steel rods or straps are to be anchored firmly to the test structure, but in such a manner that they do not contact the hose which must be free to move.
4. The outlet end of hose is to be bulwarked so that a blown-out fitting will be stopped.
5. Provisions must be made to protect testing personnel from the forces of the pressure media if a failure occurs.
6. Testing personnel must never stand in front of or in back of the ends of a hose being pressure tested.
7. When liquids such as gasoline, oil, solvent, or other hazardous fluids are used as the test fluid, precautions must be taken to protect against fire or other damage should a hose fail and the test liquid be sprayed over the surrounding area. A hose has a limited life and the user must be alert to signs of impending failure, particularly when the conditions of service include high working pressures and/or the conveyance or containment of hazardous materials. The periodic inspection and testing procedures described here provide a schedule of specific measures that constitute a minimum level of user action to detect signs indicating hose deterioration or loss of performance before conditions leading to malfunction or failure are reached.

**WARNING:** Failure to properly follow the manufacturer's recommended procedures for the care, maintenance and storage of a particular hose might result in its failure to perform in the manner intended, and might result in possible damage to property and serious bodily injury.

Use this simple acronym to determine the right product for you. Knowledge of your required parameters will help to endure proper function while a hose is in service.

|                    |   |
|--------------------|---|
| <b>SIZE</b>        | Refers to the overall dimensions of the hose required for your particular needs. You'll need to know the hose ID, OD and length. If the assembled length is critical to the hose's application, you may need to determine overall assembled lengths (length including fittings).  |
| <b>TEMPERATURE</b> | Refers to the temperature of the application, which is an important factor, particularly how hot it is. Consider both internal (media and friction) and external (ozone and sunlight) temperatures. Most rubber compounds will naturally begin to break down as it approaches 200° Fahrenheit. There are specially-blended rubber compounds that are made to withstand higher temperatures, such as EPDM and Viton. |
| <b>APPLICATION</b> | Refers to the environment in which the hose is being used. Is there a direct exposure to sunlight? If so, your customer will need a hose that is made from a compound that has ozone resistance, such as EPDM. Is there direct exposure to oil or petroleum products? If so, your customer will need a hose that is made from a compound that has oil or aromatic resistance, such as NITRILE.                      |
| <b>MEDIA</b>       | Refers to what product is running through the system. This parameter is important because the media will come in contact with the ID of the hose. Certain rubber compounds are made to withstand particular media. For example, NITRILE is good for oil/petroleum-based products, and GUM is good for abrasives.  |
| <b>PRESSURE</b>    | Refers to how much pressure is going through the system. Be aware of any spikes in pressure and allow for these drastic changes in the design and selection of your hose. It is equally important to be aware of the correlation between temperature and pressure. A hose cannot be used at its maximum-rated working pressure and maximum-rated temperature at the same time.                                      |
| <b>ENDS</b>        | Refers to which fittings are needed and how they are to be attached to the hose. A hose assembly is rated for the lesser of the working pressure of the hose and the fittings. So, a 4-inch 200 psi hose with aluminum cam-and-groove fittings double banded on will only be rated for 100 psi.   |
| <b>DELIVERY</b>    | Refers to when the assembly is expected on a job.   |



# BEND RADIUS

**Bend Radius:** The minimum bend radius of a hose is an important factor in hose selection if it will be subject to sharp curvatures in normal use. The bend radius (calculated in a lab environment; applications may vary) is measured as the distance to the inside edge of the hose (not the center line) when making a 90° bend. When bent at too sharp an angle, the reinforcement may be unduly stressed or distorted, thereby shortening the hose life. Textile-reinforced hoses have a tendency to kink as the bend radius is reduced. Generally, a “helix” is used when a hose must withstand severe bends without flattening or kinking.

**SPECIAL NOTE:** Perhaps more important in determining flexibility in an application, the “force-to-bend” is defined as the amount of stress required to induce bending around a specified bend radius. Some hoses with thick walls, large bores, short lengths, or heavy-duty construction will NOT bend easily without significant physical exertion.

**GENERAL FORMULA TO DETERMINE BEND LENGTH**

$$\frac{\text{Angle of Bend}}{360^\circ} \times 2\pi r = \text{minimum length of hose to make bend}$$

$r = \text{given bend radius of hose}$

Example: To make a 90° bend with a hose with a 2" I.D. Given  $r = 4.5$  inches

$$\frac{90^\circ}{360^\circ} [2 \times 3.14 \times 4.5] = .25 \times 2 \times 3.14 \times 4.5 = 7"$$

# TEMPERATURE DE-RATING CHART

The effect of elevated temperature on any hose system is significant and often overlooked. Since the lay line of most hoses indicates the maximum WP and the maximum temperature, it can be assumed the hose assembly will achieve both at the same time. Hot hoses get soft and are more pliable, hampering the ability of the attachment to hold the couplings securely on the hose. Since Campbell's pressure ratings are established by testing at 70°F, we established a separate pressure de-rating chart for elevated temperatures.

| ELEVATED TEMPERATURE DE-RATING CHART – DE-RATING FACTOR APPLIES TO HOSE SYSTEM PRESSURE RATINGS |      |      |      |      |      |      |      |      |      |      |
|---|------|------|------|------|------|------|------|------|------|------|
| HOSE TYPE   | 70°  | 90°  | 150° | 200° | 250° | 300° | 350° | 400° | 450° | 500° |
| STEAM   | 1.00 | 0.95 | 0.81 | 0.68 | 0.56 | 0.44 | 0.32 | 0.20 | 0.08 | N/R  |
| HOT TAR & ASPHALT   | 1.00 | 0.95 | 0.81 | 0.68 | 0.56 | 0.44 | 0.32 | 0.20 | 0.08 | N/R  |
| PVC   | 1.00 | 0.82 | 0.30 | N/R  | N/R  | N/R  | N/R  | N/R  | N/R  | N/R  |
| RUBBER  | 1.00 | 0.91 | 0.64 | 0.42 | 0.20 | N/R  | N/R  | N/R  | N/R  | N/R  |
| CHEMICAL  | 1.00 | 0.91 | 0.64 | 0.42 | 0.20 | N/R  | N/R  | N/R  | N/R  | N/R  |
| AIR   | 1.00 | 0.91 | 0.64 | 0.42 | 0.20 | N/R  | N/R  | N/R  | N/R  | N/R  |
| SOFT  | 1.00 | 0.91 | 0.64 | 0.42 | 0.20 | N/R  | N/R  | N/R  | N/R  | N/R  |

## HOW THE DE-RATING CHART WORKS:

The chart lists temperatures across the top and hose type down the left column. Based on your hose system application, locate the appropriate de-rating factor and multiply it by the hose system pressure rating in the pressure chart above.

### STEAM HOSE EXAMPLE:

- Hose – ¾" steam hose, rated to 250 psi at 406°F
- Coupling/Attachment – Campbell Viton Seal Ground Joint Couplings with crimp ferule are rated to 1250 psi at 70°F
- Operating temperature – 406°F
- De-rating factor at 406° – .20
- Hose System de-rating – 1250 x .20 = 250 psi \*

### RUBBER HOSE EXAMPLE:

- Hose – 3" air hose rated to 500 psi
- Coupling/Attachment – Long Shank Crimpology Nipple with Long Ferrule rated to 600 psi
- Operating Temperature – 150°F
- De-rating factor – .64
- Hose System de-rating – 600 psi x .64 = 384 psi\*

\* After the de-rating is calculated for the fitting and attachment, check maximum working pressure of the hose.

The hose system should never operate at a higher pressure than the lowest-rated component. (Example: 150 psi-rated hose with 500 psi-rated coupling and attachment at 90°F. The de-rating factor is .90. So, the newly calculated pressure rating is 500 x .90 = 450 psi. Since the hose is rated to 150 psi, then the maximum working pressure of the system is still 150 psi.

On a typical summer day at any construction site, compressors crank out high-pressure air to operate tools and equipment. Between the weather and the compressor motors, the compressed air gets dangerously hot. So hot, that those hoses can no longer safely operate at the intended pressure rating. Our de-rating chart shows that at 150°F, the hose system should operate at 64% of the pressure rating given for 70°F. That's when 500 psi should be 320 psi. Know the safety limits of hoses.







# CHEMICAL COMPATIBILITY RUBBER

|  | S | N | I | C | P | L | U |   |   |
|--|---|---|---|---|---|---|---|---|---|
|  | B | B | B | B | B | B | H |   |   |
|  | R | R | R | R | R | R | M |   |   |
|  | R | R | R | R | R | R | W |   |   |
|  | R | R | R | R | R | R | P |   |   |
| Argon                                  | X | X | X | C | G | X | E | N | E |
| Arguad                                 | E | E | E | E | E | E | E | E | E |
| Aromatic Hydrocarbons                  | X | X | X | C | X | X | X | E | E |
| Aromatic Tar                           | X | N | N | X | X | X | X | E | E |
| Arsenic Acid                           | E | E | E | E | E | E | E | E | E |
| Arsenic Chloride                       | X | X | E | C | X | X | G | X | X |
| Arsenic Trichloride                    | X | X | E | C | X | X | G | X | X |
| Asphalt                                | X | X | G | E | X | X | G | G | G |
| ASTM Fuel A                            | X | X | E | E | X | G | X | N | N |
| ASTM Fuel B                            | X | X | X | E | X | X | X | N | N |
| ASTM Fuel C                            | X | X | X | E | X | X | X | N | N |
| ASTM Oil No. 1                         | X | X | E | E | X | G | X | E | E |
| ASTM Oil No. 2                         | X | X | G | E | X | F | X | E | E |
| ASTM Oil No. 3                         | X | X | G | E | X | F | X | E | E |
| ASTM Oil No. 4                         | X | X | X | G | X | X | X | N | N |
| Automatic Trans. Fluid                 | X | X | G | E | X | C | X | N | N |
| Aviation Gasoline                      | X | X | C | E | X | X | X | E | E |
| Baltic Types 100, 150, 200, 300, 500   | N | N | N | E | X | N | X | E | N |
| Bardol B                               | X | X | X | X | X | X | X | E | N |
| Barium Carbonate                       | E | E | E | E | E | E | E | E | E |
| Barium Chloride                        | E | E | E | E | E | E | E | E | E |
| Barium Hydroxide                       | E | E | E | E | E | E | E | E | E |
| Barium Sulfate                         | E | E | E | E | E | E | E | E | E |
| Barium Sulfide                         | E | E | E | E | E | E | E | E | E |
| BBP (Butyl Benzyl Phthalate)           | X | N | N | X | E | X | N | N | N |
| Beer                                   | E | E | G | C | E | E | G | N | N |
| Beet Sugar Liquors                     | E | E | E | E | E | E | E | E | E |
| Bellows 80-20 Hydraulic Oil            | N | N | N | E | X | N | X | E | N |
| Benzaldehyde                           | X | N | N | X | G | X | G | E | E |
| Benzal Chloride                        | N | N | N | X | G | N | N | E | E |
| Benzene (Benzol)                       | X | X | X | X | X | X | X | E | G |
| Benzene Sulfonic Acid                  | X | X | X | N | G | G | N | E | E |
| Benzidine                              | E | X | X | G | X | N | X | G | N |
| Benzine                                | X | X | G | E | X | X | X | E | E |
| Benzene Solvent (Ligroin)              | X | N | N | E | X | X | X | E | E |
| Benzoic Acid                           | G | X | E | X | E | G | G | E | E |
| Benzoic Aldehyde                       | X | X | X | X | X | X | X | E | E |
| Benzophenone                           | E | N | N | N | N | N | N | E | N |
| Benzotrithloride                       | X | X | X | X | X | X | X | G | G |
| Benzoyl Chloride                       | X | X | X | X | X | X | X | G | G |
| Benzyl Acetate                         | X | X | X | X | G | G | G | E | E |
| Benzyl Alcohol                         | G | G | C | X | G | F | G | E | E |
| Benzyl Benzoate                        | N | N | N | N | G | N | G | E | N |
| Benzyl Chloride                        | X | X | X | X | C | X | X | E | E |
| Bichromate of Soda (Sodium Dichromate) | X | X | G | X | E | G | C | E | E |
| Bismuth Carbonate                      | E | N | X | N | N | N | N | N | N |
| Bisphenol A                            | E | N | N | N | N | N | N | N | N |
| Bitumastic                             | X | X | G | G | X | X | X | N | X |
| Black Sulfate Liquor                   | G | G | E | G | E | G | E | E | E |
| Blast Furnace Gas                      | X | X | G | C | C | G | C | E | E |
| Bleach                                 | X | X | C | X | X | F | G | E | E |
| Borax Solution                         | G | G | E | C | E | E | E | E | E |
| Bordeaux Mixture                       | G | G | E | E | E | E | E | E | E |
| Boric Acid                             | E | E | E | E | E | E | E | E | E |
| Brake Fluid (HD-557)                   | N | E | E | G | C | G | G | E | N |
| Brine                                  | E | E | E | E | E | E | E | E | E |

|  | S | N | I | C | P | L | U |   |   |
|--|---|---|---|---|---|---|---|---|---|
|  | B | B | B | B | B | B | H |   |   |
|  | R | R | R | R | R | R | M |   |   |
|  | R | R | R | R | R | R | W |   |   |
|  | R | R | R | R | R | R | P |   |   |
| Bromine                                    | X | X | X | X | X | X | X | X | X |
| Bromine Water                              | X | X | G | C | C | E | C | E | E |
| Bromobenzene                               | X | X | X | X | X | X | X | C | C |
| Bromochloroethane                          | X | X | N | N | X | X | X | X | X |
| Bromochloromethane                         | X | X | X | X | X | X | X | X | X |
| Bromotoluene                               | X | X | N | N | X | N | X | N | N |
| Bubble Bath Compounds                      | N | N | N | N | N | N | N | N | E |
| Bunker Oil                                 | X | X | G | E | X | X | X | E | E |
| Butadiene                                  | X | X | F | X | X | C | X | F | F |
| Butandiol (Butylene Glycol)                | N | N | N | N | N | N | N | E | G |
| Butane                                     | X | X | E | E | E | G | X | E | N |
| Butanoic Acid                              | N | N | N | N | N | N | N | N | N |
| Butanol                                    | E | E | E | E | E | E | E | E | E |
| Butraldehyde (Butanal)                     | X | X | X | X | X | X | X | G | N |
| Butter (Non FDA)                           | C | C | G | E | E | E | G | E | E |
| Butyl Acetate                              | X | X | X | X | G | X | C | G | G |
| Butyl Acetoacetate                         | X | N | N | X | X | X | N | E | E |
| Butyl Acrylate                             | X | X | X | X | X | X | X | G | G |
| Butyl Alcohol                              | E | E | E | E | E | E | E | E | E |
| Butyl Aldehyde                             | X | N | N | X | X | X | X | E | E |
| Butylamine                                 | G | C | X | C | C | C | C | E | E |
| Butyl Benzene                              | X | X | X | X | X | X | X | E | E |
| Butyl Benzyl Phthalate (BBP)               | X | N | N | X | E | X | N | N | N |
| Butyl Bromide                              | X | X | X | X | X | X | X | G | G |
| Butyl Butyrate                             | X | X | X | X | C | X | G | G | G |
| Butyl Carbitol                             | X | X | G | G | E | E | E | E | E |
| Butyl Cellosolve                           | X | X | G | G | E | G | E | E | E |
| Butyl Chloride                             | X | X | X | X | C | X | C | G | G |
| Butylate                                   | N | N | N | N | N | N | E | N | E |
| Butylene                                   | X | X | G | G | C | G | C | E | E |
| Butyl Ether                                | X | X | G | G | C | G | C | E | E |
| Butyl Ethyl Acetaldehyde                   | X | X | X | X | C | X | X | E | E |
| Butyl Ethyl Ether                          | X | X | X | X | C | G | C | E | E |
| Butyl Formate                              | X | N | X | X | N | N | N | N | N |
| Butyl Mercaptan (2-Methyl - 2-Butanathiol) | X | X | N | X | X | N | X | E | N |
| Butyl Oleate                               | X | X | X | X | G | X | G | E | E |
| Butyl "Oxiol" tm for EG Monobutyl Ether    | N | N | N | N | N | N | E | E | N |
| Butyl Phthalate                            | X | X | X | X | C | X | C | E | E |
| Butyl Stearate                             | X | X | X | G | C | X | C | E | E |
| Butylene Glycol                            | N | N | N | N | N | N | N | E | G |
| Butyraldehyde                              | X | N | N | X | G | X | X | E | E |
| Butyric Acid                               | G | G | X | N | G | X | G | E | E |
| Butyric Anhydride                          | C | X | X | C | C | G | C | E | E |
| Cadmium Acetate                            | X | N | N | X | G | N | N | N | N |
| Calcine Liquor (Radioactive Waste)         | N | N | N | E | E | N | E | E | N |
| Calcium Acetate                            | C | X | X | X | E | X | E | E | E |
| Calcium Aluminate                          | E | N | E | E | E | E | N | N | N |
| Calcium Aresenate                          | N | N | N | N | N | N | N | E | N |
| Calcium Bisulfate                          | E | E | E | E | E | E | E | E | E |
| Calcium Bisulfide                          | G | G | E | E | E | E | N | E | N |
| Calcium Bisulfite                          | C | E | E | E | G | E | C | E | E |
| Calcium Bromide Solution                   | N | N | N | N | N | N | N | E | E |
| Calcium Bichromate                         | N | N | N | N | E | F | N | G | F |
| Calcium Carbonate                          | E | E | E | E | E | E | E | E | E |
| Calcium Chlorate                           | G | G | E | E | G | E | G | E | N |
| Calcium Chloride                           | E | E | E | E | E | E | E | E | E |
| Calcium Hydroxide                          | E | G | E | E | E | G | E | E | E |

# CHEMICAL COMPATIBILITY RUBBER

|   | S | N | I | C | P | L | U |   |   |
|---|---|---|---|---|---|---|---|---|---|
|   | B | B | B | B | B | B | H |   |   |
|   | R | R | R | R | R | R | M |   |   |
|   | R | R | R | R | R | R | W |   |   |
|   | R | R | R | R | R | R | P |   |   |
| Calcium Hydrosulfide                    | G | G | E | E | E | E | N | E | N |
| Calcium Hypochlorite                    | X | X | X | X | G | F | G | G | G |
| Calcium Metasilicate                    | E | G | N | G | G | G | N | N | N |
| Calcium Nitrate                         | E | E | E | E | E | E | E | E | E |
| Calcium Silicate                        | E | G | N | G | G | G | N | N | N |
| Calcium Stearate                        | E | N | N | N | N | N | N | N | N |
| Calcium Sulfate                         | E | E | E | E | E | E | E | E | E |
| Calcium Sulfhydrate                     | E | E | E | E | E | E | E | E | E |
| Calcium Sulfide                         | E | E | E | E | E | E | E | E | E |
| Calcium Sulfite                         | E | E | E | E | E | E | E | E | E |
| Caliche Liquor (Crude Sodium Nitrate)   | E | E | G | C | E | E | E | E | E |
| Camphene (Liquid above 115° F)          | N | N | N | N | N | X | X | N | N |
| Cane Sugar Liquors (Non F.D.A.)         | E | E | E | E | E | E | E | E | E |
| Caproic Acid                            | N | N | N | N | N | N | G | E | E |
| Caprolactam                             | E | N | N | N | N | N | N | N | N |
| Caprylic Acid                           | X | N | N | X | G | G | N | E | E |
| Carbamates                              | X | X | X | X | X | X | X | E | N |
| Carbitol                                | X | X | G | G | E | G | G | E | E |
| Carbitol Acetate                        | X | X | X | X | G | X | G | E | E |
| Carbolic Acid (Phenol)                  | X | X | C | X | G | C | C | E | E |
| Carbon Bisulfide (See Carbon Disulfide) | N | N | N | N | N | N | N | N | N |
| Carbon Dioxide                          | E | E | E | E | E | E | E | E | E |
| Carbon Disulfide                        | X | X | X | X | X | X | X | E | C |
| Carbonic Acid                           | E | E | E | E | E | E | E | E | E |
| Carbon Monoxide                         | E | E | E | E | E | E | E | E | E |
| Carbon Tetrachloride                    | X | X | X | C | G | X | G | C | C |
| Carbon Tetrafluoride                    | X | X | X | C | X | X | X | C | C |
| Carbonyl Chloride                       | X | X | X | X | E | X | X | X | X |
| Casein                                  | N | N | N | N | E | N | N | N | N |
| Castor Oil                              | C | X | G | E | G | C | G | E | E |
| Caustic Potash (Potassium Hydroxide)    | E | G | G | E | E | E | E | E | E |
| Caustic Soda (Sodium Hydroxide)         | E | G | G | G | E | G | E | E | E |
| Cellosolve                              | X | X | E | G | G | G | G | E | E |
| Cellulose Acetate                       | C | X | C | X | G | C | G | G | G |
| Cellulube                               | C | X | X | X | G | X | E | E | E |
| Cement, Portland                        | N | N | N | N | E | N | N | N | E |
| China Wood Oil (Tung Oil)               | X | X | G | E | G | G | G | E | E |
| Chlordane                               | N | N | X | X | N | X | X | E | N |
| Chlorinated Napthalene                  | X | X | X | X | X | X | N | N | N |
| Chlorinated Solvents                    | X | X | N | N | X | X | X | X | X |
| Chlorine Dioxide                        | X | X | X | X | X | C | X | G | G |
| Chlorine Gas (Dry)                      | C | C | X | C | C | G | C | G | G |
| Chlorine Trifluoride                    | N | N | N | N | N | N | X | N | N |
| Chlorine, Water Solutions (2%)          | C | X | X | X | C | G | C | E | E |
| Chloroacetic Acid                       | G | X | X | X | C | X | C | E | E |
| Chloroacetone                           | X | X | X | X | G | G | X | E | E |
| Chlorobenzene                           | X | X | X | X | X | X | X | G | G |
| Chlorobenzol                            | X | N | N | X | X | X | X | E | E |
| Chlorobromomethane                      | X | X | X | X | X | X | X | G | X |
| Chlorobutane                            | X | X | X | X | X | X | X | G | G |
| Chlorobutadiene                         | X | X | X | X | X | X | X | G | G |
| Chloroethylbenzene                      | X | X | X | X | X | X | X | E | E |

|                               | S | N | I | C | P | L | U |   |   |
|-------------------------------|---|---|---|---|---|---|---|---|---|
|                               | B | B | B | B | B | B | H |   |   |
|                               | R | R | R | R | R | R | M |   |   |
|                               | R | R | R | R | R | R | W |   |   |
|                               | R | R | R | R | R | R | P |   |   |
| Chloroform                    | X | X | X | X | X | X | X | G | G |
| Chloronapthalene              | X | X | X | X | X | X | X | N | N |
| Chloronated Hydrocarbons      | X | X | X | X | X | X | X | G | G |
| Chloropentane                 | X | X | C | X | X | X | X | E | E |
| Chlorophenol                  | X | X | X | X | X | X | X | G | G |
| Chloropropanone               | X | X | X | X | C | X | C | G | G |
| Chlorosulfonic Acid           | X | X | X | X | X | C | X | G | G |
| Chlorothene (Trichloroethane) | X | X | X | X | X | X | X | G | G |
| Chlorotoluene                 | X | X | X | X | X | X | X | G | G |
| Chlorox                       | G | G | G | N | G | G | N | G | E |
| Chlorpyrifos                  | N | N | N | N | N | N | X | N | N |
| Chrome Alum                   | E | E | E | E | E | E | E | N | N |
| Chrome Plating Solutions      | X | X | X | X | X | X | G | N | N |
| Chromic Acid                  | X | X | X | X | X | E | C | E | E |
| Citgo FR Fuels                | N | N | X | E | E | N | N | E | N |
| Citric Acid                   | E | E | G | G | E | E | E | E | E |
| Coal Oil                      | X | X | G | E | X | X | X | E | E |
| Coal Tar                      | X | X | G | E | X | G | G | E | E |



# CHEMICAL COMPATIBILITY RUBBER

|                               | S | N | I | C | P | L | W | U |   |
|-------------------------------|---|---|---|---|---|---|---|---|---|
|                               | N | B | C | B | I | S | D | P |   |
|                               | R | R | R | R | R | M | M | E |   |
| Cutting Oil                   | X | X | G | E | X | X | X | G | N |
| Cutting Oil (Sulfur Base)     | N | N | X | E | N | N | N | N | N |
| Cutting Oil (Water Solutions) | N | N | X | E | N | N | N | N | N |
| Cyanide, Copper               | G | G | G | G | G | G | G | E | N |
| Cyanide Mercuric              | G | G | E | G | G | E | G | E | N |
| Cyanide, Silver               | N | N | E | N | N | N | N | E | N |
| Cyanide, Sodium               | E | E | E | E | E | E | E | E | N |
| Cyclohexane                   | X | X | X | G | X | X | X | E | E |
| Cyclohexanol                  | X | X | G | C | X | X | X | E | E |
| Cyclohexanone                 | X | X | X | X | X | X | X | E | E |
| Cyclohexylamine               | N | X | N | N | E | N | E | N | N |
| Cyclopentane                  | X | X | G | G | X | X | X | E | E |
| Cyclopentanol                 | X | X | N | N | X | X | N | E | E |
| Cyclopentanone                | X | N | N | X | X | X | N | N | N |
| P-Cymene                      | X | X | X | C | X | X | X | E | E |
| DDT in Kerosene               | X | X | G | E | F | X | X | E | E |
| Decaline                      | X | X | X | X | X | X | X | E | E |
| Decanal                       | X | N | N | X | X | X | N | N | N |
| Decanol                       | X | N | X | E | X | G | N | N | N |
| Decane                        | X | X | X | G | X | X | X | E | E |
| Decyl Alcohol                 | X | N | N | E | E | E | E | E | E |
| Decyl Aldehyde                | X | N | N | X | X | X | N | N | N |
| Decyl Butyl Phthalate         | X | N | N | X | E | X | N | E | E |
| Deicing Fluid                 | N | N | E | E | E | G | E | E | E |
| Denatured Alcohol             | E | E | E | E | E | E | E | E | E |
| Detergent, Water Solutions    | G | G | G | E | G | G | E | E | E |
| Developing Fluid (plctures)   | E | G | E | E | E | E | G | N | N |
| Dextrin                       | N | N | E | E | X | N | X | X | N |
| Dextron                       | N | N | N | E | X | N | X | X | N |
| DHSO Butylene                 | X | X | X | G | X | X | X | E | N |
| Diacetone Alcohol             | X | X | G | X | E | G | G | E | E |
| Diammonium Phosphate          | N | N | N | N | N | N | N | N | N |
| Diamylamine                   | G | C | E | G | E | C | C | E | E |
| Diamyl Naphthalene            | X | X | N | N | X | X | N | E | N |
| Diamyl Phenol                 | X | N | N | X | X | X | X | E | E |
| Diamylene                     | X | N | N | X | X | X | N | E | E |
| Diazonin                      | E | E | N | N | N | N | E | N | N |
| Dibenzyl Ether                | X | X | X | X | G | X | X | E | E |
| Dibenzyl Sebacate             | C | X | X | X | G | X | G | E | E |
| Dibromobenzene                | X | X | X | X | X | X | X | G | G |
| Dibromomethane                | X | X | X | X | X | X | X | G | G |
| Dibutyl Ether                 | X | X | X | X | X | X | C | E | E |
| Dibutylamine                  | G | F | G | E | F | F | G | E | E |
| Dybutylphthalate              | X | X | X | X | G | X | E | E | E |
| Dibutyl Sebacate              | X | X | X | X | G | X | G | G | G |
| Dicalcium Phosphate           | E | E | E | E | E | E | E | E | E |
| Dicamba                       | N | N | N | N | N | N | E | E | E |
| Dichloroacetic Acid           | X | N | N | X | X | X | X | E | E |
| Dichloroaniline               | N | X | X | X | X | N | X | N | N |
| Dichlorobenzene               | X | X | X | X | X | X | X | G | G |
| Dichlorobenzyl                | X | X | X | X | X | X | X | G | N |
| Dichlorobutane                | X | X | X | X | X | X | X | E | E |
| Dichlorodifluorometh          | X | X | E | G | X | X | X | E | E |
| Dichloroethane                | X | X | X | X | C | X | X | E | C |
| Dichloroethyl Ether           | X | X | X | X | X | X | X | E | E |
| Dichloroethylene              | X | X | X | X | C | X | X | E | X |
| Dichlorohexane                | X | X | X | X | X | X | X | E | E |

|   | S | N | I | C | P | L | W | U |   |
|---|---|---|---|---|---|---|---|---|---|
|   | N | B | C | B | I | S | D | P |   |
|   | R | R | R | R | R | M | M | E |   |
| Dichloroisopropyl Ether                   | X | X | X | X | X | X | X | E | E |
| Dichloromethane                           | X | X | X | X | X | X | X | E | E |
| Dichloropentane                           | X | X | X | X | X | X | X | E | E |
| Dichloropropane                           | X | X | N | N | X | X | N | E | E |
| Dichlorotoluene                           | N | N | N | N | N | N | N | N | N |
| Dicyclohexylamine                         | N | N | N | N | N | N | N | N | N |
| DIDA (Diisodecyl Adipate)                 | X | N | N | X | E | X | N | N | N |
| Diethrin Xylene                           | X | X | X | X | X | X | X | E | E |
| Diethrin in Xylene (And Water Spray)      | X | X | G | G | X | X | X | E | E |
| Diesel Fuel                               | X | X | G | E | X | X | X | E | E |
| Diesel Oil                                | X | X | G | E | X | C | X | E | E |
| Diethanol Amine                           | G | G | G | G | E | F | F | E | E |
| Diethyl Benzene                           | X | X | X | X | X | X | X | E | E |
| Diethyl Carbonal                          | E | N | N | E | E | E | N | E | E |
| Diethyl Ether                             | X | X | C | G | X | X | X | E | E |
| Diethyl Ketone                            | F | X | N | N | G | X | N | E | E |
| Diethylphthalate                          | X | X | X | X | E | X | G | E | E |
| Diethyl Oxalate                           | C | X | X | X | C | X | E | E | E |
| Diethyl Sebacate                          | X | X | X | X | E | X | C | E | E |
| Diethyl Sulfate                           | X | X | X | X | G | X | G | E | E |
| Diethyl Sulfide                           | N | N | N | N | N | N | N | E | N |
| Diethyl Triamine                          | G | C | G | G | E | C | G | E | E |
| Diethylacetaldehyde                       | N | N | N | N | N | N | N | E | N |
| Diethylamine                              | N | N | N | N | N | N | N | G | N |
| Diethylene Dioxide                        | X | X | X | X | G | X | G | E | N |
| Diethylene Glycol                         | E | E | E | E | E | E | E | E | E |
| Diethylene Glycol Methyl Ether            | N | N | N | N | N | N | E | E | N |
| Diethylene Glycol Monobutyl Ether         | N | N | N | N | N | N | E | E | N |
| Diethylene Glycol Monobutyl Ether Acetate | N | N | N | N | N | N | E | E | N |
| Diethylenetriamine                        | G | G | C | G | E | C | E | E | E |
| Dihydroxyacetone                          | N | N | N | N | N | N | E | E | N |
| Dihydroxydiethyl Ether                    | E | E | E | E | E | N | E | E | E |
| Dihydroxyethyl Amine                      | G | C | G | G | E | C | G | E | E |
| Dihydroxyethyl Ether                      | E | E | G | E | E | E | G | E | E |
| Diisobutylene                             | X | X | G | E | X | X | X | E | E |
| Diisobutyl Ketone                         | X | X | X | X | G | X | G | E | E |
| Diisobutyl Phenol                         | E | N | N | N | N | N | N | N | N |
| Diisocyanate                              | X | X | X | X | X | X | X | X | X |
| Diisooctyl Phthalate                      | X | N | N | X | E | X | E | N | N |
| Diisooctyl Adipate                        | X | N | N | X | E | X | N | E | E |
| Diisodecyl Adipate                        | X | X | E | X | X | C | E | E | E |
| Diisodecyl Phthalate                      | X | X | X | X | E | C | E | E | E |
| Diisooctyl Adipate                        | X | X | X | X | E | X | E | E | E |
| Diisooctyl Phthalate                      | X | X | X | X | E | C | E | E | E |
| Diisopropanolamine                        | G | N | N | G | E | N | N | N | N |
| Diisopropyl Benzene                       | X | X | X | C | X | X | X | E | E |
| Diisopropyl Ether                         | X | X | X | G | X | X | X | E | E |
| Diisopropyl Ketone                        | X | X | X | X | E | X | E | E | E |
| Diisopropylidene Acetone                  | X | X | X | X | G | X | G | E | N |
| Dilauryl Ether                            | X | X | X | C | X | C | X | E | E |
| Dimethyl Aniline                          | X | X | X | X | G | X | X | E | N |
| Dimethyl Benzene                          | X | N | N | X | X | X | X | E | E |
| Dimethyl Carbonal                         | E | N | N | E | E | E | E | E | E |
| Dimethyl Ether                            | X | X | X | X | G | X | E | E | E |
| Dimethyl Formamide                        | N | N | N | N | N | N | G | E | N |
| Dimethyl Ketone                           | G | F | F | X | E | F | E | E | E |

# CHEMICAL COMPATIBILITY RUBBER

|  | S | N | I | C | P | L | W | U |   |
|--|---|---|---|---|---|---|---|---|---|
|  | N | B | C | B | I | S | D | P |   |
|  | R | R | R | R | R | M | M | E |   |
| Dimethyl Phenol                        | X | N | N | X | X | X | X | E | E |
| Dimethyl Phthalate                     | X | X | X | X | E | X | G | E | E |
| Dimethyl Sulfate                       | X | X | X | X | G | X | X | E | E |
| Dimethyl Sulfide                       | X | X | X | X | C | X | X | G | G |
| Dimethyl Terephthalate                 | N | X | X | X | X | N | N | N | N |
| Dimethylamine                          | G | F | G | G | E | F | E | E | E |
| Dimethylaminoethanol                   | N | N | N | N | N | N | G | E | N |
| Dimethylaniline                        | X | X | X | X | X | X | C | G | G |
| Dimethylbenzene                        | X | X | X | X | X | X | X | E | E |
| Dimethylcarbinol                       | G | G | G | E | E | G | E | E | E |
| Dimethylformamide (DMF)                | C | C | C | X | C | C | C | E | E |
| DMP (Dimethylaminoethyl Phenol)        | N | N | N | N | N | N | N | E | N |
| Dinitrobenzene                         | X | X | C | X | C | X | C | E | E |
| Dinitrotoluene                         | X | X | X | X | X | X | X | E | E |
| Diocetyl Adipate (DOA)                 | X | X | X | X | E | X | G | E | E |
| Diocetylamine                          | G | G | X | G | E | C | G | E | E |
| Diocetyl Phosphite                     | N | N | N | N | N | N | X | E | N |
| Diocetyl Phthalate (DOP)               | X | X | X | X | G | X | G | E | E |
| Diocetyl Sebacate (DOS)                | X | X | X | X | G | X | G | E | E |
| Dioxane                                | X | X | X | X | G | X | G | E | E |
| Dioxolane                              | X | X | X | X | C | X | G | E | E |
| Dipentene                              | X | X | N | X | N | N | X | G | N |
| Dipentene (Limonene)                   | X | X | X | X | C | X | X | E | E |
| Diphenyl (Biphenyl)                    | X | X | X | X | X | X | X | E | E |
| Diphenyl Oxide (Phenyl Ether)          | X | X | X | X | X | C | X | E | E |
| Diphenyl Phthalate                     | X | N | N | X | E | X | N | E | E |
| Dipropylene Glycol                     | E | N | N | E | E | N | N | E | E |
| Dipropyl Ketone                        | X | X | X | X | G | X | G | E | E |
| Dipropylamine                          | G | G | G | G | E | C | E | E | E |
| Dirco Oils                             | N | N | N | E | X | N | X | E | N |
| Disodium Phosphate                     | E | E | E | E | E | E | E | E | E |
| Distillate Fuel Oil                    | N | N | N | N | N | N | X | G | N |
| Divinyl Benzene                        | X | X | X | X | X | X | X | E | E |
| Dodecyl Benzene                        | X | X | X | X | X | X | X | E | E |
| Dodecylphenol                          | N | N | N | N | N | N | E | E | N |
| Dodecyl Toluene                        | X | X | X | X | X | X | X | E | E |
| Dolomite                               | N | N | E | N | N | E | G | N | N |
| Dowfume W 40, 100%                     | X | X | C | X | X | C | C | G | G |
| Dow-Per (perchloroethylene)            | X | X | X | C | X | X | X | E | E |
| Dowtherm Oil, A and E                  | X | X | X | X | X | C | X | E | E |
| Dowtherm S. R. I.                      | E | E | E | E | E | E | E | E | E |
| Dry Cleaning Fluids                    | X | X | X | C | X | X | X | E | G |
| Duro Oils                              | N | N | N | E | X | N | X | E | N |
| EDTA (Ethylenediaminetetraacetic Acid) | N | N | N | N | N | N | E | E | N |
| Emulsion (Oil in Water)                | N | N | N | N | N | N | E | E | E |
| Enamels                                | N | N | N | N | N | N | X | E | N |
| Epichlorohydrin                        | X | X | X | X | C | C | G | G | G |
| Epoxy Resin                            | N | N | E | N | G | N | E | N | N |
| Essential Oils                         | X | X | G | E | N | N | X | G | N |
| Ethanoic Acid                          | N | N | N | N | N | N | N | N | N |
| Ethanol (Grain Alcohol)                | X | X | X | X | X | X | X | N | G |
| Ethanolamine                           | G | G | G | G | E | C | E | C | E |
| Ethers                                 | X | X | X | X | F | F | C | E | E |
| Ethyl Acetate                          | X | X | X | X | G | X | C | E | E |
| Ethyl Acetoacetate                     | X | X | X | X | G | X | G | E | E |
| Ethyl Acrylate                         | X | X | X | X | C | X | X | G | G |
| Ethyl Alcohol                          | X | X | X | X | X | X | X | N | G |

|                                | S | N | I | C | P | L | W | U |   |
|--------------------------------|---|---|---|---|---|---|---|---|---|
|                                | N | B | C | B | I | S | D | P |   |
|                                | R | R | R | R | R | M | M | E |   |
| Ethyl Aldehyde                 | F | N | N | N | E | E | N | E | E |
| Ethyl Aluminum Dichloride 90°F | X | N | N | X | X | X | N | N | N |
| Ethyl Benzene                  | X | X | X | F | X | X | X | G | G |
| Ethyl Benzoate                 | X | X | C | G | G | C | G | E | E |
| Ethyl Bromide                  | X | X | X | X | X | X | X | G | N |
| Ethyl Butanol                  | E | E | E | E | E | E | E | E | E |
| Ethyl Butyrate                 | X | X | X | X | G | N | N | E | N |
| Ethyl Butyl Acetate            | X | N | N | X | E | G | N | E | E |
| Ethyl Butyl Alcohol            | E | E | E | E | E | E | E | E | E |
| Ethyl Butyl Amine              | G | C | G | G | E | C | G | E | E |
| Ethyl Butyl Ketone             | X | X | X | X | G | X | G | E | E |
| Ethyl Butylaldehyde            | X | N | N | X | G | X | N | E | E |
| Ethyl Cellulose                | G | G | G | G | G | G | G | E | E |
| Ethyl Chloride                 | F | F | F | F | X | X | X | E | G |
| Ethyl Chloroformate            | N | N | N | X | N | N | X | G | G |
| Ethyl Dichloride               | X | X | X | X | X | X | X | G | G |
| Ethylene                       | X | X | G | E | X | C | X | E | E |
| Ethyl Ether                    | X | X | X | C | C | X | X | E | E |
| Ethyl Ether Acetate            | N | N | N | X | N | N | G | E |   |



# CHEMICAL COMPATIBILITY RUBBER

|                                     | S N I C P L W |   |   |   |   |   |   |   | U H M |   |   |   |
|-------------------------------------|---------------|---|---|---|---|---|---|---|-------|---|---|---|
|                                     | N             | B | C | B | I | S | D | P | P     | E | X | M |
|                                     | R             | R | R | R | R | R | R | R | R     | M | M | E |
| Ethylhexyl Alcohol                  | E             | E | E | N | E | N | E | E | E     | E | E | E |
| Ethylhexyl Phosphodieth             | X             | N | N | E | X | X | X | X | N     |   |   |   |
| EX TRI (Trichloroethylene)          | X             | X | X | C | X | X | X | G | G     |   |   |   |
| Fatty Acids                         | X             | X | C | C | X | X | X | E | E     |   |   |   |
| Fatty Alcohol, Blend                | E             | E | E | E | E | N | E | E | E     |   |   |   |
| Fatty Petroleum Alcohol             | N             | N | N | E | E | N | E | E | E     |   |   |   |
| Ferric Bromide                      | E             | N | N | N | N | N | N | N | N     |   |   |   |
| Ferric Chloride                     | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Ferric Nitrate                      | N             | N | G | G | G | G | G | E | N     |   |   |   |
| Ferric Sulfate                      | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Ferrous Acetate                     | X             | X | X | X | E | X | G | E | E     |   |   |   |
| Ferrous Ammonium Sulfate            | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Ferrous Chloride                    | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Ferrous Hydroxide                   | G             | C | E | G | E | G | E | E | E     |   |   |   |
| Ferrous Nitrate                     | N             | N | G | G | G | G | G | E | N     |   |   |   |
| Ferrous Sulfate                     | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Fertilizer (Liquid Manure)          | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Fire-Resistant Hydra-Fluid (Texaco) | N             | N | N | E | X | N | X | E | N     |   |   |   |
| Fish Oil                            | X             | X | E | E | E | E | E | E | E     |   |   |   |
| Fluoroboric Acid                    | E             | C | G | E | E | E | E | E | E     |   |   |   |
| Fluorine                            | X             | X | X | X | X | X | X | X | X     |   |   |   |
| Fluosilicic Acid                    | E             | C | G | E | E | E | E | E | E     |   |   |   |
| Formaldehyde                        | C             | C | G | G | E | C | G | E | E     |   |   |   |
| Formalin (37-50% HCHO w/15% MeOH)   | X             | X | G | G | G | G | E | E | N     |   |   |   |
| Formamide                           | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Formic Acid                         | G             | G | C | X | E | F | E | C | E     |   |   |   |
| FR Fluid D                          | N             | N | N | E | X | N | X | E | N     |   |   |   |
| Freon So 2                          | N             | N | E | N | N | N | E | N | N     |   |   |   |
| Freon 11                            | X             | X | G | E | X | E | X | E | E     |   |   |   |
| Freon 12                            | X             | X | G | G | X | X | X | G | G     |   |   |   |
| Freon13                             | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Freon 21                            | X             | X | G | X | X | X | X | E | E     |   |   |   |
| Freon 22                            | X             | X | X | E | E | X | E | E | E     |   |   |   |
| Freon 31                            | G             | G | E | X | E | G | E | E | E     |   |   |   |
| Freon 32                            | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Freon 112                           | X             | X | G | G | X | G | X | E | E     |   |   |   |
| Freon 113                           | C             | G | E | E | X | E | X | E | E     |   |   |   |
| Freon 114                           | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Freon 115                           | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Freon 142b                          | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Freon 152b                          | E             | E | E | E | E | C | E | E | E     |   |   |   |
| Freon 218                           | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Freon C316                          | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Freon C318                          | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Freon 1381                          | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Freon 114B2                         | X             | C | E | G | X | E | X | E | E     |   |   |   |
| Freon 502                           | E             | E | E | G | E | E | E | E | E     |   |   |   |
| Freon TF                            | C             | G | E | E | E | E | E | E | E     |   |   |   |
| Freon T-WD602                       | C             | G | G | E | E | G | G | E | E     |   |   |   |
| Freon TMC                           | G             | C | G | G | G | G | G | E | E     |   |   |   |
| Freon T-P35                         | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Freon TA                            | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Freon TC                            | X             | G | E | E | E | E | G | E | E     |   |   |   |
| Freon BF                            | X             | X | G | G | X | G | X | E | E     |   |   |   |
| Freon MF                            | X             | G | C | E | X | G | X | E | E     |   |   |   |
| Fuel A (ASTM)                       | X             | X | G | E | X | F | X | E | E     |   |   |   |
| Fuel B (ASTM)                       | X             | X | F | E | X | X | X | G | G     |   |   |   |

|  | S N I C P L W |   |   |   |   |   |   |   | U H M |   |   |   |
|--|---------------|---|---|---|---|---|---|---|-------|---|---|---|
|  | N             | B | C | B | I | S | D | P | P     | E | X | M |
|  | R             | R | R | R | R | R | R | R | R     | M | M | E |
| Fuel C (ASTM)                                  | X             | X | C | G | X | X | X | G | G     |   |   |   |
| Fuel Oil                                       | X             | X | G | E | X | E | X | E | E     |   |   |   |
| Fumaric Acid                                   | E             | E | G | E | X | G | X | E | E     |   |   |   |
| Furan  | X             | X | X | X | C | X | C | E | E     |   |   |   |
| Furfural                                       | X             | X | C | X | G | G | G | E | E     |   |   |   |
| Furfuryl Alcohol                               | X             | X | C | X | C | C | C | E | E     |   |   |   |
| Fyrguard 150, 200                              | N             | N | N | E | E | N | E | E | N     |   |   |   |
| Fyrquel 15R & O, 220 R&O, 550R&O               | N             | N | N | E | E | N | E | E | N     |   |   |   |
| Fyrquel 90, 150, 220, 550, 1000                | N             | N | N | E | E | N | E | E | N     |   |   |   |
| Gallic Acid                                    | E             | E | G | G | G | G | G | E | E     |   |   |   |
| Gasohol  | X             | X | G | G | X | X | X | G | E     |   |   |   |
| Gasoline (oxgenated-blended with MTBE)         | X             | X | G | G | X | X | X | G | E     |   |   |   |
| Gasoline - Regular                             | X             | X | E | E | X | C | X | E | E     |   |   |   |
| Gasoline - Hi-Test                             | X             | X | G | E | X | X | X | E | E     |   |   |   |
| Gasoline - Lead Free                           | X             | X | G | G | X | X | X | E | E     |   |   |   |
| Gasoline (White)                               | X             | X | G | G | X | X | X | G | N     |   |   |   |
| Gas, Coal                                      | N             | N | N | N | N | N | N | N | N     |   |   |   |
| Gas, High Octane                               | X             | X | G | E | X | X | X | E | E     |   |   |   |
| Gelatin  | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Glacial Acetic Acid                            | N             | N | X | N | X | N | G | E | E     |   |   |   |
| Glauber's salt                                 | E             | E | N | N | N | N | E | N | N     |   |   |   |
| Gluconic Acid                                  | X             | X | C | C | C | G | C | E | E     |   |   |   |
| Glucose  | E             | E | G | G | E | E | G | E | G     |   |   |   |
| Glue   | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Glycerine (Glycerol)                           | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Glycerol Monolaurate                           | N             | N | N | N | E | N | E | E | E     |   |   |   |
| Glycol FR Fluids                               | N             | N | N | E | E | N | E | N | N     |   |   |   |
| Glycols  | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Glyphosate                                     | N             | N | N | N | N | N | E | N | E     |   |   |   |
| Graffinite                                     | X             | N | N | E | X | X | X | X | N     |   |   |   |
| Graphite                                       | E             | N | N | N | N | N | N | N | E     |   |   |   |
| Grease   | X             | X | X | X | F | X | E | G | E     |   |   |   |
| Green Sulfate Liquor                           | E             | E | G | E | E | E | E | E | E     |   |   |   |
| Halium   | E             | E | E | E | E | E | E | N | N     |   |   |   |
| Halowax Oil                                    | X             | X | X | X | X | X | X | E | E     |   |   |   |
| Heptachlor in Petroleum Solvents               | X             | X | G | G | X | X | X | E | E     |   |   |   |
| Heptachlor in Petroleum Solvents (Water Spray) | X             | X | G | G | X | X | X | E | E     |   |   |   |
| Heptanal (Heptaldehyde)                        | X             | X | X | X | X | X | G | E | E     |   |   |   |
| Heptane  | X             | X | E | E | X | G | X | E | E     |   |   |   |
| Heptane Carboxylic Acid                        | X             | N | N | X | X | G | N | E | E     |   |   |   |
| Heptanol                                       | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Hexaldehyde                                    | N             | N | N | N | N | N | E | E | E     |   |   |   |
| Hexane   | X             | X | E | E | X | F | X | E | E     |   |   |   |
| Hexanol  | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Hexene   | X             | X | G | G | X | G | X | E | E     |   |   |   |
| Hexylamine                                     | G             | C | G | G | G | C | G | E | E     |   |   |   |
| Hexylene                                       | X             | X | G | E | X | X | C | G | G     |   |   |   |
| Hexylene Glycol                                | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Hexyl Methyl Ketone                            | X             | X | X | X | G | X | G | E | E     |   |   |   |
| Hi-Tri (Trichloroethylene)                     | X             | X | X | C | X | X | X | G | G     |   |   |   |
| Honey  | E             | N | E | E | N | N | E | N | N     |   |   |   |
| Houghto-Safe 1055, 1110, 1115, 1120, 1130      | N             | N | N | X | E | N | E | E | N     |   |   |   |
| Houghto-Safe 271, 416, 520, 616 & 620          | N             | N | N | E | E | N | E | E | N     |   |   |   |
| Houghto-Safe 5046                              | N             | N | N | E | E | N | X | E | N     |   |   |   |
| Houghto-Safe 625, 640, & 525 under 100°F       | N             | N | N | E | E | N | E | E | N     |   |   |   |
| Hy-Chock Oil                                   | N             | N | N | E | N | N | N | E | N     |   |   |   |

# CHEMICAL COMPATIBILITY RUBBER

|   | S N I C P L W |   |   |   |   |   |   |   | U H M |   |   |   |
|---|---------------|---|---|---|---|---|---|---|-------|---|---|---|
|   | N             | B | C | B | I | S | D | P | P     | E | X | M |
|   | R             | R | R | R | R | R | R | R | R     | M | M | E |
| Hydrafluid 760 (Texaco & Houghton)          | N             | N | N | E | X | N | X | E | N     |   |   |   |
| Hydrafluid AZR&O, A, B, AA, C               | N             | N | N | E | X | N | X | E | N     |   |   |   |
| Hydrasol A (Textile Drying)                 | N             | N | N | E | X | N | X | E | N     |   |   |   |
| Hydraulic Fluid (Petroleum)                 | X             | X | G | E | X | G | X | E | E     |   |   |   |
| Hydraulic Fluid (Phosphate Ester Based)     | X             | X | X | X | E | X | E | E | E     |   |   |   |
| Hydraulic Fluid (Poly Alkylene Glycol Base) | G             | G | E | E | E | E | E | E | E     |   |   |   |
| Hydraulic & Motor Oil                       | X             | X | C | E | X | G | X | E | E     |   |   |   |
| Hydrazine                                   | X             | X | X | X | G | X | G | E | N     |   |   |   |
| Hydrazine Hydrate                           | X             | X | X | X | G | X | G | E | N     |   |   |   |
| Hydrazine Solution                          | X             | X | X | X | G | X | G | E | N     |   |   |   |
| Hydrobromic Acid                            | E             | X | X | F | E | E | G | E | E     |   |   |   |
| Hydrochloric Acid 37%                       | E             | X | X | X | F | X | X | E | E     |   |   |   |
| Hydrochloric Acid 50%                       | E             | C | X | X | G | E | C | E | E     |   |   |   |
| Hydrochloric Acid 100%                      | G             | C | X | X | C | G | C | E | E     |   |   |   |
| Hydrocyanic Acid                            | G             | F | E | F | E | E | C | E | E     |   |   |   |
| Hydro-Drive Oil (Houghton)                  | N             | N | N | E | X | N | X | N | N     |   |   |   |
| Hydrofluoric Acid                           | X             | X | X | X | E | E | X | C | E     |   |   |   |
| Hydrogen Chloride Anhydrous                 | N             | N | N | N | N | N | N | N | N     |   |   |   |
| Hydrogen Bromide Liquid                     | X             | X | N | X | X | N | E | N | N     |   |   |   |
| Hydrogen Dioxide 10%                        | X             | X | N | N | F | N | N | N | G     |   |   |   |
| Hydrogen Fluoride                           | X             | X | N | X | G | N | E | N | N     |   |   |   |
| Hydrogen Gas                                | X             | X | N | X | G | N | E | N | N     |   |   |   |
| Hydrogen peroxide 3%                        | E             | C | G | G | E | E | G | E | E     |   |   |   |
| Hydrogen Peroxide 10%                       | X             | X | C | X | C | C | C | E | E     |   |   |   |
| Hydrogen Peroxide 30%                       | X             | X | X | X | X | X | C | E | E     |   |   |   |
| Hydrogen Peroxide 90%                       | X             | X | X | X | X | X | C | G | G     |   |   |   |
| Hydrogen Sulfide                            | X             | X | E | X | E | G | E | E | E     |   |   |   |
| Hydrolube                                   | N             | N | G | E | G | N | E | N | E     |   |   |   |
| Hydroquinine                                | G             | G | X | X | G | C | G | E | E     |   |   |   |
| Hydroxyacetic Acid Solution                 | N             | N | N | N | N | N | G | E | E     |   |   |   |
| Hydroxyethyl Acrylate (HEA)                 | N             | N | N | N | N | N | X | E | E     |   |   |   |
| Hydroxyethyl Acrylate Acid (HEA Acid)       | N             | N | N | N | N | N | X | E | E     |   |   |   |
| Hydroxypropyl Acrylate Acid                 | N             | N | N | N | N | N | X | E | E     |   |   |   |
| Hylene                                      | X             | X | X | X | G | X | G | N | N     |   |   |   |
| Hypochlorous Acid                           | G             | G | G | X | G | E | G | E | E     |   |   |   |
| Ink Oil (Linseed Oil Base)                  | X             | X | G | G | G | G | G | E | E     |   |   |   |
| Insulating Oil                              | X             | X | G | E | X | X | X | E | E     |   |   |   |
| Iodine                                      | X             | X | X | X | X | F | X | E | E     |   |   |   |
| Iron Acetate                                | X             | X | X | X | E | X | G | E | E     |   |   |   |
| Iron Hydroxide                              | C             | C | E | G | E | G | G | E | E     |   |   |   |
| Iron Salts                                  | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Iron Sulfate                                | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Iron Sulfide                                | E             | E | E | E | E | E | E | E | E     |   |   |   |
| Isoamyl Acetate                             | X             | X | X | X | E | X | G | E | E     |   |   |   |
| Isoamyl Chloride                            | X             | X | X | X | C |   |   |   |       |   |   |   |



# CHEMICAL COMPATIBILITY RUBBER

|  | S | N | I | C | P | L | W | U |
|--|---|---|---|---|---|---|---|---|
|  | N | B | C | B | I | S | D | P |
|  | R | R | R | R | R | M | M | E |
| Magnesium Hydrate                                | E | G | E | G | E | G | E | E |
| Magnesium Hydroxide                              | E | E | E | E | E | E | G | E |
| Magnesium Nitrate                                | E | E | E | E | E | E | E | E |
| Magnesium Oxide, Slurry                          | G | N | E | G | N | N | E | N |
| Magnesium Sulfate                                | E | E | E | E | E | E | E | E |
| Malathion 50 in Aromatic Solvents                | X | X | C | C | X | X | X | E |
| Malathion 50 in Aromatic Solvents, (Water Spray) | X | X | E | E | X | X | X | E |
| Maleic Acid                                      | X | X | X | F | X | F | F | G |
| Maleic Anhydride                                 | X | X | C | X | C | X | C | E |
| Malic Acid                                       | E | G | C | G | X | G | X | E |
| Malt Extract (Maltine)                           | N | N | N | N | N | N | E | E |
| Maganese Sulfate                                 | E | E | E | E | E | E | E | E |
| Maganese Sulfide                                 | C | E | G | E | E | E | G | E |
| Manganese Sulfite                                | C | E | G | E | E | E | G | E |
| Maxmul (Penzoil Hydraulic Fluid)                 | N | N | G | E | N | N | N | N |
| Mek  | G | X | X | X | G | X | G | E |
| Mercuric Chloride                                | G | G | C | C | G | G | C | E |
| Mercuric Cyanide Solutions                       | G | G | E | G | G | E | G | N |
| Mercurous Nitrate Solutions                      | N | N | N | N | N | N | G | E |
| Mercury  | E | E | E | E | E | E | E | E |
| Mercury Vapors                                   | E | E | E | E | E | E | E | E |
| Mesityl Oxide (Methyl Isobutanyl Ketone)         | X | X | X | X | G | X | G | E |
| Mesitylene                                       | X | X | X | X | N | X | N | N |
| Metallic Soaps                                   | X | X | N | E | X | G | X | E |
| Methacrylic Acid                                 | X | X | G | X | G | C | G | E |
| Methallyl Alcohol                                | G | N | N | E | G | G | N | N |
| Methane  | X | X | G | E | X | G | X | E |
| Methanoic Acid                                   | N | N | N | N | N | E | N | N |
| Methanol (Methyl Alcohol)                        | X | X | X | X | X | X | G | G |
| Methyl Acetate                                   | F | X | X | X | G | X | G | E |
| Methyl Acetoacetate                              | X | N | X | X | G | X | G | N |
| Methyl Acetone                                   | X | N | N | X | G | X | E | N |
| Methyl Acrylate                                  | C | X | C | X | G | X | G | E |
| Methacrylic Acid                                 | X | X | N | G | E | N | G | E |
| Methylaniline                                    | N | N | X | X | N | G | G | E |
| Methyl Alcohol (Methanol)                        | X | X | X | X | X | X | G | G |
| Methylallyl Alcohol                              | G | N | N | E | G | G | N | N |
| Methylamine (30-40% in water)                    | N | N | N | X | N | N | G | E |
| Methyl Benzene (Toluene)                         | X | X | X | X | X | X | E | N |
| Methyl Bromide                                   | X | X | X | G | G | X | G | E |
| Methyl Butanethiol                               | X | X | N | N | X | N | X | E |
| Methyl Butanol                                   | N | N | N | E | E | N | E | E |
| Methyl Butyl Ketone                              | X | X | X | X | G | X | G | E |
| Methyl Carbitol                                  | X | X | N | X | X | E | E | N |
| Methyl Cellosolve                                | X | X | G | C | G | C | G | E |
| Methyl Chloride                                  | X | X | X | F | X | X | E | G |
| Methyl Chloroform                                | X | X | X | X | X | X | G | N |
| Methyl Chloroformate                             | X | X | X | X | X | X | N | N |
| Methyl Cyclohexane                               | X | X | X | X | X | X | G | N |
| Methyl Ethyl Acetate                             | X | N | N | X | E | G | X | E |
| Methyl Ethyl Alcohol                             | E | N | N | E | E | E | E | E |
| Methyl Ethyl Carbinol                            | E | N | N | E | E | E | E | E |
| Methyl Ethyl Ketone                              | X | N | N | X | G | X | N | N |
| Methyl Hexanone                                  | X | N | N | X | G | X | N | N |
| Methylcyanide                                    | N | N | N | N | N | N | X | N |
| Methylene Bromide                                | X | X | X | X | X | X | G | C |

|  | S | N | I | C | P | L | W | U |
|--|---|---|---|---|---|---|---|---|
|  | N | B | C | B | I | S | D | P |
|  | R | R | R | R | R | M | M | E |
| Methylene Chloride                     | X | X | X | X | X | X | X | E |
| Methylene Dichloride                   | X | X | X | X | X | X | X | E |
| Methyl Ethyl Ketone (MEK)              | G | X | X | X | G | X | G | E |
| Methyl Formate                         | C | C | G | X | G | C | G | G |
| Methyl Hexanol                         | E | E | E | E | E | E | E | E |
| Methyl Hexyl Ketone                    | X | X | X | X | G | X | G | E |
| Methyl Isoamyl Ketone                  | X | N | N | X | G | X | N | N |
| Methyl Isobutenyl Ketone               | X | X | X | X | G | X | G | E |
| Methyl Isobutyl Carbinol               | G | C | G | G | E | G | E | E |
| Methyl Isobutyl Ketone (MIBK)          | G | X | X | X | G | X | G | E |
| Methyl Isopropyl Ketone                | X | X | X | X | G | X | G | E |
| Methyl Methacrylate                    | X | X | X | X | X | G | G | N |
| Methyl Methacrylate Monomer, Inhibited | X | X | X | X | X | X | N | N |
| Methyl Normal Amyl Ketone              | X | N | N | X | G | X | G | E |
| Methyl Phenol                          | X | X | X | X | G | X | N | N |
| Methyl Propyl Carbinol                 | E | E | E | E | E | E | E | E |
| Methyl Propyl Ether                    | X | X | X | X | X | X | X | E |
| Methyl Propyl Ketone                   | X | X | X | X | G | X | G | E |
| Methyl Salicylate                      | X | X | X | X | G | X | X | E |
| Methyl Sulfate                         | X | X | X | X | G | X | X | E |
| Methyl Tertiary Butyl Ether (MTBE)     | X | X | X | X | X | X | X | E |
| Methylallyl Acetate                    | X | N | N | X | E | G | E | E |
| Methylallyl Chloride                   | X | N | N | X | X | X | N | G |
| Methyldiethanolamine                   | X | N | N | E | X | X | X | E |
| Metribuzin                             | N | N | N | N | N | N | E | N |
| Mineral Oil                            | X | X | C | E | X | G | X | E |
| Mineral Spirits                        | X | X | G | E | X | X | X | E |
| Molasses                               | G | G | G | G | E | E | E | N |
| Molten Sulfur                          | X | X | N | N | G | F | X | X |
| Monochlorobenzene                      | X | X | X | X | X | X | G | G |
| Monochlorodifluoromethane (Freon 22)   | X | X | E | X | E | X | E | E |
| Monoethanolamine                       | G | C | G | C | G | G | G | E |
| Monochloroacetic Acid                  | G | N | N | X | X | X | X | E |
| Monoethylamine                         | X | X | X | X | G | X | E | G |
| Monoisopropanol Amine                  | G | N | N | G | E | X | N | E |
| Monomethylether                        | G | G | E | E | E | C | C | E |
| Monopentaerythritol Solution           | N | N | N | N | N | N | E | E |
| Monosodium Phosphate                   | G | G | X | N | G | N | G | E |
| Monovinyl Acetate                      | X | X | X | X | G | C | C | E |
| Morpholine                             | N | N | N | X | N | N | X | N |
| Motor Oil - 40W                        | X | X | E | E | X | X | X | E |
| Muriatic Acid                          | E | X | X | X | F | X | F | E |
| Mustard                                | E | E | E | N | E | E | N | N |
| N-Octane                               | X | X | G | G | X | X | X | G |
| Naphta                                 | X | X | G | E | X | X | X | E |
| Naphthalene                            | X | X | X | X | X | X | X | E |
| Naphthenic Acids                       | X | X | X | G | X | X | X | E |
| Natural Gas                            | X | X | F | F | X | F | X | C |
| Neatsfoot Oil                          | X | X | G | E | G | G | G | E |
| Neohexane                              | N | N | G | E | N | N | X | N |
| Neon Gas                               | E | E | E | E | E | E | X | N |
| Neu-Tri (Trichloroethylene)            | X | X | X | C | X | X | X | G |
| Neutral Oil                            | X | X | G | G | X | N | X | E |
| Nickel Acetate                         | X | X | X | X | E | X | G | E |
| Nickel Chloride                        | E | E | E | E | E | E | E | E |
| Nickel Nitrate                         | E | E | E | E | E | E | E | E |
| Nickel Plating Solution                | E | X | C | G | G | G | G | E |

# CHEMICAL COMPATIBILITY RUBBER

|   | S | N | I | C | P | L | W | U |
|---|---|---|---|---|---|---|---|---|
|   | N | B | C | B | I | S | D | P |
|   | R | R | R | R | R | M | M | E |
| Nickel Salts                                | E | E | E | E | E | E | E | N |
| Nickel Sulfate                              | E | E | E | E | E | E | E | E |
| Niter Cake                                  | E | E | E | E | E | E | E | E |
| Nitric Acid, Conc (16N)                     | X | X | X | X | G | G | E | N |
| Nitric Acid, Red Fuming                     | X | X | X | X | X | X | X | X |
| Nitric Acid - 10%                           | X | X | X | X | G | G | G | E |
| Nitric Acid - 13N                           | N | N | N | N | N | N | C | N |
| Nitric Acid - 13N + 5%                      | N | N | N | N | N | N | N | N |
| Nitric Acid - 20%                           | X | X | X | X | G | G | F | E |
| Nitric Acid - 30%                           | X | X | X | X | F | F | F | G |
| Nitric Acid - 30% to 70%                    | X | X | X | X | F | F | C | F |
| Nitrobenzene                                | X | X | X | X | X | X | E | E |
| Nitroethane                                 | G | G | C | X | G | G | X | E |
| Nitrogen Gas                                | E | E | E | E | E | E | E | N |
| Nitrogen Oxide                              | X | X | X | X | E | E | G | E |
| Nitrogen Tetraoxide                         | X | X | X | X | X | X | X | X |
| Nitromethane                                | G | G | C | X | G | C | G | E |
| Nitropropane                                | C | C | C | X | E | C | G | E |
| Nitrous Oxide Gas                           | E | E | E | E | E | E | E | E |
| Nonenes                                     | X | N | N | E | X | X | X | E |
| Octadecanoic Acid                           | X | X | G | E | G | X | C | E |
| Octane                                      | X | X | G | E | X | X | X | G |
| Octanol (Octyl Alcohol)                     | G | G | E | G | G | G | G | E |
| Octyl Acetate                               | X | X | X | X | E | X | G | E |
| Octyl Aldehyde                              | X | N | N | X | X | X | N | N |
| Octyl Amine                                 | C | C | G | C | G | C | G | E |
| Octyl Carbinol                              | E | E | E | E | E | E | E | E |
| Octylene Glycol                             | E | E | E | E | E | E | E | E |
| Oil, ASTM #1                                | X | X | E | E | X | G | X | E |
| Oil, ASTM #2                                | X | X | E | E | X | C | X | E |
| Oil, ASTM #3                                | X | X | C | G | E | X | X | E |
| Oil - Petroleum                             | X | X | E | E | X | F | X | E |
| Oil of Turpentine                           | X | X | G | E | X | X | X | G |
| Oils, Animal (high fatty acid content)      | X | X | G | E | G | X | X | N |
| Oleic Acid                                  | X | X | F | C | G | X | G | E |
| Oleum (Fuming Sulf Acid)                    | X | X | X | X | X | X | X | X |
| Olive Oil                                   | X | X | G | E | E | G | G | E |
| Organic Fatty Acids                         | X | N | N | E | X | X | X | E |
| Ortho-Dichlorobenzene                       | X | X | X | X | X | X | X | E |
| Orthodichlorobenzol                         | X | N | N | X | X | X | X | E |
| Orthoxylene                                 | X | X | N | N | X | X | X | E |
| OS 45 Hydraulic Fluid (Silicate Ester Base) | X | X | E | G | X | G | X | N |
| Oxalic Acid                                 | F | F | G | F | E | G | E | E |
| Oxygen, Cold                                | G | G | G | G | E | G | G | E |
| Oxygen, Hot                                 | X | X | X | X | X | X | E | E |
| Ozone                                       | X | F | G | X | G | E | E | E |
| Paint Thinner                               | X | X | X | X | X | X | E | E |
| Paint (Emulsion or Latex)                   | N | N | N | G | N | N | G | E |
| Paint (Oil or Solvent Based)                | X | X | N | G | X | X | X | E |
| Palmitic Acid                               | X | X | C | E | E | C | C | G |
| Palm Oil                                    | X | X | G | E | E | G | G | E |
| Papermakers Alum                            | E | E | E | E | E | E | E | E |
| Para-Dichlorobenzene                        | X | X | X | X | X | X | G | G |
| Paraffin Wax                                | X | X | G | E | X | X | X | X |
| Paraformaldehyde                            | X | X | G | G | G | G | G | E |
| Paraldehyde                                 | X | N | N | X | G | X | G | E |
| Paraxylene                                  | X | N | N | N | X | X | N | E |

|                                  | S | N | I | C | P | L | W | U |
|----------------------------------|---|---|---|---|---|---|---|---|
|                                  | N | B | C | B | I | S | D | P |
|                                  | R | R | R | R | R | M | M | E |
| Peanut Oil                       | X | X | G | E | C | G | X | E |
| Pelargonic Acid                  | X | N | N | E | E | X | N | E |
| Pentachloroethane                | X | X | N | N | X | X | N | E |
| Pentachlorophenol in Oil         | X | X | X | X | E | N | X | E |
| Pentane                          | X | X | E | E | X | G | X | E |
| Pentanol                         | E | N | N | E | E | E | E | E |
| Pentatone                        | X | N | N | X | G | X | N | E |
| Perchloric Acid - 2N             | G | G | E | X | G | E | C | E |
| Perchloroethylene                | X | X | X | X | X | X | X | G |
| Petrolatum                       | X | X | E | E | X | C | X | E |
| Petroleum, Crude                 | X | X | G | E | X | X | X | E |
| Petroleum Ether (Naptha)         | X | X | E | E | X | X | X | E |
| Petroleum Naptha                 | X | X | X | X | X | X | X | X |
| Petroleum Oils                   | X | X | E | E | X | C | X | E |
| Petroleum Paraffin Wax           | N | N | N | N | N | N | X | G |
| Phenol                           | F | F | F | X | E | F | F | E |
| Phenol Acid                      | X | X | X | X | G | X | G | N |
| Phenolates                       | N | N | X | X | N | X | N | N |
| Phenolsulfonic Acid              | X | X | C | X | C | X | C | G |
| Phenyl Chloride                  | X | X | X | X | X | X | X | E |
| Phenylhydrazine                  | C | X | X | X | G | C | C | E |
| Phorone                          | X | X | X | X | E | X | G | E |
| Phosgene (Carbonyl Chloride)     | X | X | X | X | G | X | X | X |
| Phosphate Esters                 | X | X | X | X | E | X | E | E |
| Phosphoric Acid 10%              | E | E | E | E | E | E | E | E |
| Phosphoric Acid 10% - 85%        | F | F | G | F | E | E | E | E |
| Phosphorus Trichloride           | X | X | X | X | E | X | E | E |
| Pickling Solution                | C | C | C | C | C | C | C | E |
| Pitric Acid, Molten              | C | C | C | C | C | G | C | X |
| Pitric Acid, Water Solution      | E | C | G | G | E | E | G | E |
| Pinene                           | X | X | X | E | X | X | X | E |
| Pine Oil                         | X | X | X | F | F | X | X | E |
| Piperidine                       | X | X | X | X | X | X | X | G |
| Pitch                            | X | X | G | X | C | X | E | E |
| Plating Solutions, Chrome        | X | X | G | G | E | C | E | E |
| Plating Solutions, Other         | E | E | G | G | E | C | E | E |
| Polyvinyl Acetate Emulsion (PVA) | C | C |   |   |   |   |   |   |







**WARNING:** The following data has been compiled from generally available sources and should not be relied upon without consulting and following the hose manufacturer's specific chemical recommendations. Neglecting to do so might result in failure of the hose to fulfill its intended purpose. This may result in possible damage to property and serious bodily injury.

| MATERIAL CONVEYED            | HOSE CONSTRUCTION WITH TEMPERATURE |     |          |     |          |     |                   |     |
|------------------------------|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|                              | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|                              | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Acetaldehyde                 | 4                                  | 4   | 4        | 4   | 4        | 4   | 4                 | 4   |
| Acetaldehyde 40%             | 4                                  | 4   | 4        | 4   | 4        | 4   | 4                 | 4   |
| Acetate Solvents, crude      | 4                                  | 4   | 3        | 4   | 3        | 4   | 3                 | 4   |
| Acetate Solvents, pure       | 4                                  | 4   | 3        | 4   | 3        | 4   | 3                 | 4   |
| Acetic Acid 0-1%             | 1                                  | 2   | 1        | 2   | 3        | 4   | 4                 | 4   |
| Acetic Acid 20-30%           | 1                                  | 2   | 1        | 2   | 3        | 4   | 4                 | 4   |
| Acetic Acid 80%              | 2                                  | 2   | 1        | 2   | 4        | 4   | 4                 | 4   |
| Acetic Acid Vapors           | 1                                  | 2   | 1        | 2   | 3        | 3   | 4                 | 4   |
| Acetic Acid Glacial          | 2                                  | 3   | 2        | 3   | 4        | 4   | 4                 | 4   |
| Acetic Anhydride             | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Acetone                      | 2                                  | 3   | 1        | 1   | 3        | 4   | 3                 | 4   |
| Acetylene                    | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Acrylonitrile                | 1                                  | 2   |          |     |          |     |                   |     |
| Adipic Acid                  | 2                                  | 3   |          |     |          |     | 4                 | 4   |
| Allyl Alcohol 96%            | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Allyl Chloride               | 3                                  | 3   |          |     |          |     | 4                 | 4   |
| Alum                         | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Aluminum Acetate             | 2                                  | 3   |          |     |          |     |                   |     |
| Aluminum Alkyl               | 4                                  | 4   |          |     |          |     |                   |     |
| Aluminum Chloride            | 1                                  | 1   | 1        | 1   | 1        | 1   | 3                 | 3   |
| Aluminum Flouride            | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Aluminum Hydroxide           | 1                                  |     | 1        | 1   | 2        | 2   | 2                 | 3   |
| Aluminum Nitrate             | 1                                  | 2   |          |     |          |     | 1                 | 1   |
| Aluminum Oxochloride         | 1                                  | 1   |          |     |          |     |                   |     |
| Aluminum Phosphate Solution  | 4                                  | 4   |          |     |          |     |                   |     |
| Aluminum Salts               | 1                                  | 1   |          |     |          |     |                   |     |
| Aluminum Sulphate            | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Aminoethanol                 | 2                                  |     |          |     |          |     |                   |     |
| Ammonia - aqueous            | 1                                  |     | 1        |     | 3        |     | 3                 | 4   |
| Ammonia- dry gas             | 3                                  | 4   | 2        |     | 3        |     | 3                 | 4   |
| Ammonia- liquid              | 4                                  | 4   | 3        |     | 3        |     | 3                 | 4   |
| Ammoniated Latex             | 1                                  | 3   |          |     |          |     |                   |     |
| Ammonium Acetate             | 1                                  | 1   |          |     |          |     |                   |     |
| Ammonium Bicarbonate         | 1                                  | 1   |          |     |          |     |                   |     |
| Ammonium Carbonate           | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Ammonium Chloride Solution   | 1                                  | 1   |          |     |          |     | 2                 | 3   |
| Ammonium Flouride 25%        | 4                                  | 4   |          |     |          |     | 3                 | 4   |
| Ammonium Hydroxide (30% NH)  | 4                                  | 4   |          |     |          |     | 3                 | 4   |
| Ammonium Metaphosphate       | 1                                  | 1   |          |     |          |     | 2                 | 2   |
| Ammonium Persulfate          | 1                                  | 1   |          |     |          |     | 2                 | 2   |
| Ammonium Nitrate             | 1                                  | 1   |          |     |          |     | 2                 | 2   |
| Ammonium Phosphate Solutions | 1                                  | 1   |          |     |          |     |                   |     |
| Ammonium Sulfate             | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Ammonium Sulfide             | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Ammonium Thiocyanate         | 1                                  | 1   | 1        | 1   | 2        | 2   | 2                 | 2   |
| Amyl Acetate                 | 4                                  | 4   |          |     |          |     |                   |     |
| Amyl Alcohol                 | 1                                  | 2   | 1        | 2   | 4        | 4   | 4                 | 4   |
| Amyl Chloride                | 4                                  | 4   | 4        | 4   | 4        | 4   |                   |     |
| Aniline                      | 2                                  | 3   | 1        | 2   |          |     | 4                 | 4   |
| Aniline Chlorohydrate        | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Aniline Hydrochloride        | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Animal Gelatin               | 1                                  |     |          |     |          |     |                   |     |
| Animal Oils                  | 1                                  | 1   | 1        | 1   |          |     |                   |     |
| Ant Oil                      | 4                                  | 4   |          |     |          |     |                   |     |
| Antifreeze                   | 1                                  | 1   |          |     |          |     |                   |     |
| Antimony Chloride            | 1                                  |     |          |     |          |     |                   |     |
| Antimony Salts               | 1                                  |     |          |     |          |     |                   |     |

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| MATERIAL CONVEYED                    | HOSE CONSTRUCTION WITH TEMPERATURE |     |          |     |          |     |                   |     |
|--------------------------------------|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|                                      | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|                                      | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Antimony Trichloride                 | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Apple Sauce/Juice                    | 1                                  | 1   |          |     |          |     |                   |     |
| Aqua Ammonia                         | 4                                  | 4   |          |     |          |     |                   |     |
| Aqua Regia                           | 3                                  | 4   | 2        | 3   |          |     | 4                 | 4   |
| Argon, Compressed                    | 4                                  | 4   |          |     |          |     |                   |     |
| Aromatic Hydrocarbons                | 3                                  | 3   | 1        | 1   |          |     |                   |     |
| Arsenic Acid 80%                     | 1                                  | 2   | 1        | 1   | 4        | 4   | 4                 | 4   |
| Arsenic Trichloride                  | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Arsenic Trioxide                     | 1                                  |     |          |     |          |     |                   |     |
| Arylsulfonic Acid                    | 3                                  | 4   |          |     |          |     | 4                 | 4   |
| Askarel (Transformer Oil)            | 4                                  | 4   |          |     |          |     |                   |     |
| Asphalt                              | 4                                  | 4   |          |     |          |     |                   |     |
| ASTM Fuel Oil # 1                    | 1                                  | 1   | 1        | 1   | 2        | 2   | 1                 | 1   |
| ASTM Oil No. 2                       | 4                                  | 4   |          |     |          |     |                   |     |
| ASTM Fuel Oil # 3                    | 2                                  | 3   | 1        | 1   | 2        | 2   | 1                 | 1   |
| ASTM Fuel A                          | 2                                  | 2   | 1        | 1   | 2        | 2   | 1                 | 1   |
| ASTM Fuel B                          | 4                                  | 4   | 1        | 1   | 2        | 3   | 2                 | 3   |
| ASTM Fuel C                          | 4                                  | 4   |          |     |          |     | 2                 | 3   |
| Baby Food                            | 1                                  | 1   |          |     |          |     |                   |     |
| Baltic Types 100, 150, 200, 300, 500 | 2                                  |     |          |     |          |     |                   |     |
| Barium Carbonate                     | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Barium Chloride                      | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Barium Hydroxide                     | 1                                  | 1   |          |     |          |     | 2                 | 3   |
| Barium Sulfate                       | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Barium Sulfide                       | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Barley                               | 1                                  | 4   |          |     |          |     |                   |     |
| Basic Copper Arsenate                | 1                                  |     |          |     |          |     |                   |     |
| Beer                                 | 1                                  | 1   |          |     |          |     |                   |     |
| Beet Sugar - liquor                  | 1                                  | 1   |          |     |          |     |                   |     |
| Bellows 80-20 Hydraulic Oil          | 2                                  |     |          |     |          |     |                   |     |
| Benzaldehyde                         | 4                                  | 4   |          |     |          |     |                   |     |
| Benzene                              | 4                                  | 4   |          |     |          |     |                   |     |
| Benzidine                            | 4                                  | 4   |          |     |          |     |                   |     |
| Benzoic Acid                         | 2                                  | 3   | 1        | 2   | 4        | 4   | 4                 | 4   |
| Benzoic Aldehyde                     | 4                                  | 4   |          |     |          |     |                   |     |
| Benzol                               | 4                                  | 4   | 2        | 3   | 3        | 4   | 3                 | 4   |
| Benzotrchloride                      | 4                                  | 4   |          |     |          |     |                   |     |
| Benzyl Alcohol                       | 1                                  |     |          |     |          |     |                   |     |
| Benzyl Chloride                      | 4                                  | 4   |          |     |          |     |                   |     |
| Berries                              | 1                                  | 1   |          |     |          |     |                   |     |
| Bismuth Carbonate                    | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Black Liquor                         | 1                                  | 1   | 1        | 1   |          |     |                   |     |
| Blast Furnace Gas                    | 4                                  | 4   |          |     |          |     |                   |     |
| Bleach 12.5% Active CL               | 2                                  | 3   | 1        | 2   | 3        | 4   | 3                 | 4   |
| Borax                                | 1                                  | 2   | 1        | 1   |          |     | 1                 | 1   |
| Bordeaux Mixture                     | 1                                  | 1   | 1        | 1   |          |     |                   |     |
| Boric Acid                           | 1                                  | 1   | 1        | 1   |          |     | 4                 | 4   |
| Boric Oxide                          | 1                                  |     |          |     |          |     |                   |     |
| Boron Trifluoride                    | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Brake Fluid (Petroleum Base)         | 2                                  |     |          |     |          |     |                   |     |
| Brake Fluid (Synthetic Base)         | 2                                  |     |          |     |          |     |                   |     |
| Brine                                | 1                                  | 1   | 1        | 1   | 3        | 4   | 2                 | 3   |
| Bromic Acid                          | 1                                  | 2   | 1        | 2   | 3        | 4   | 4                 | 4   |
| Bromine - Liquid                     | 4                                  | 4   | 3        | 4   | 4        | 4   | 4                 | 4   |
| Bromine - Water                      | 4                                  | 4   | 3        | 4   | 4        | 4   | 4                 | 4   |
| Bromobenzene                         | 4                                  | 4   |          |     |          |     |                   |     |
| Bromochloromethane                   | 4                                  | 4   |          |     |          |     |                   |     |
| Bromotoluene                         | 4                                  | 4   |          |     |          |     |                   |     |
| Bunker Oil                           | 4                                  | 4   |          |     |          |     |                   |     |
| Butadiene                            | 3                                  | 4   |          |     |          |     |                   |     |
| Butane                               | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Butanol - Primary                    | 4                                  | 4   |          |     |          |     | 3                 | 4   |
| Butanol - Secondary                  | 4                                  | 4   |          |     |          |     | 3                 | 4   |
| Butter                               | 2                                  | 3   |          |     |          |     |                   |     |
| Butyl Acetate                        | 1                                  |     |          |     |          |     |                   |     |

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# CHEMICAL COMPATIBILITY PLASTIC

| MATERIAL CONVEYED        | HOSE CONSTRUCTION WITH TEMPERATURE |     |          |     |          |     |                   |     |
|--------------------------|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|                          | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|                          | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Butyl Alcohol            | 1                                  | 2   | 1        | 2   | 1        | 2   | 3                 | 4   |
| Butyl Cellosolve         | 4                                  | 4   | 3        | 4   |          |     |                   |     |
| Butyl Mercaptan          | 4                                  | 4   |          |     |          |     |                   |     |
| Butyl Phenol             | 3                                  | 4   | 2        | 3   |          |     |                   |     |
| Butyl Stearate           | 1                                  |     |          |     |          |     |                   |     |
| Butylene                 | 1                                  | 2   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Butyric Acid 20%         | 3                                  | 4   | 2        | 3   | 3        | 4   | 3                 | 4   |
| Butynedial               | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Cake Alum Solution       | 1                                  |     |          |     |          |     |                   |     |
| Calcium Arsenate         | 1                                  |     |          |     |          |     |                   |     |
| Calcium Bisulfate        | 1                                  | 1   | 1        | 1   | 1        | 1   |                   |     |
| Calcium Bisulfide        | 2                                  |     |          |     |          |     |                   |     |
| Calcium Bisulfite        | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Calcium Carbonate        | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Calcium Chlorate         | 1                                  | 1   | 1        | 1   | 2        | 3   | 2                 | 3   |
| Calcium Chloride         | 1                                  | 1   | 1        | 1   | 3        | 4   | 3                 | 4   |
| Calcium Hydrosulfide     | 2                                  |     |          |     |          |     |                   |     |
| Calcium Hydroxide        | 1                                  | 1   | 1        | 1   | 2        | 3   | 2                 | 3   |
| Calcium Hypochlorite     | 1                                  | 1   | 1        | 1   | 4        | 4   | 4                 | 4   |
| Calcium Metasilicate     | 1                                  |     |          |     |          |     |                   |     |
| Calcium Nitrate          | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Calcium Silicate         | 1                                  |     |          |     |          |     |                   |     |
| Calcium Sulfate          | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Calcium Sulfide          | 2                                  |     |          |     |          |     |                   |     |
| Cane Sugar Liquors       |                                    |     |          |     |          |     |                   |     |
| Carbolic Acid            | 4                                  | 4   |          |     |          |     |                   |     |
| Carbon Bisulfide         | 1                                  | 1   |          |     |          |     |                   |     |
| Carbon Dioxide           | 1                                  | 1   |          |     |          |     |                   |     |
| Carbon Disulfide         | 4                                  | 4   |          |     |          |     |                   |     |
| Carbon Monoxide          | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Carbon Tetrachloride     | 4                                  | 4   | 2        | 3   | 3        | 4   | 3                 | 4   |
| Carbolic Acid            | 4                                  | 4   |          |     |          |     |                   |     |
| Carbonic Acid            | 1                                  | 1   | 1        | 1   | 4        | 4   | 4                 | 4   |
| Carrots                  | 1                                  | 1   | 1        | 1   | 4        | 4   |                   |     |
| Casein                   | 1                                  | 2   |          |     |          |     | 1                 | 1   |
| Castor Oil               | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Catsup                   | 1                                  | 2   |          |     |          |     |                   |     |
| Caustic Potash           | 1                                  | 1   | 1        | 1   | 3        | 4   | 3                 | 4   |
| Caustic Soda             | 1                                  | 1   | 1        | 1   | 3        | 4   | 3                 | 4   |
| Cellosolve               | 3                                  | 4   | 2        | 3   | 2        | 3   | 2                 | 3   |
| Cellulose Acetate        | 1                                  |     |          |     |          |     |                   |     |
| Cellulose Butyl          | 1                                  |     |          |     |          |     |                   |     |
| Cheese                   | 1                                  | 2   |          |     |          |     |                   |     |
| Cherries                 | 1                                  | 1   |          |     |          |     |                   |     |
| China-Wood Oil           | 2                                  |     |          |     |          |     |                   |     |
| Chlordane                | 2                                  |     |          |     |          |     |                   |     |
| Chloracetic Acid         | 1                                  | 4   |          |     |          |     | 4                 | 4   |
| Chloral Hydrate          | 1                                  | 1   |          |     |          |     | 2                 | 3   |
| Chloric Acid 20%         | 1                                  | 1   |          |     |          |     | 4                 | 4   |
| Chlorinated Hydrocarbons | 1                                  | 1   |          |     |          |     | 4                 | 4   |
| Chlorinated Solvents     | 4                                  | 4   |          |     |          |     |                   |     |
| Chlorine Gas - dry       | 1                                  | 1   | 1        | 1   | 4        | 4   | 4                 | 4   |
| Chlorine Gas - moist     | 3                                  | 4   | 2        | 3   | 3        | 4   | 4                 | 4   |
| Chlorine Trifluoride     | 4                                  | 4   |          |     |          |     |                   |     |
| Chloroacetyl Chloride    | 1                                  |     |          |     |          |     |                   |     |
| Chlorobenzene            | 4                                  | 4   |          |     |          |     |                   |     |
| Chlorobromomethane       | 4                                  | 4   |          |     |          |     |                   |     |
| Chloroethane             | 4                                  | 4   |          |     |          |     |                   |     |
| Chloroform               | 4                                  | 4   |          |     |          |     |                   |     |
| Chloropentane            | 4                                  | 4   |          |     |          |     |                   |     |
| Chloropicrin Mixture     | 4                                  | 4   |          |     |          |     |                   |     |
| Chlorotoluene            | 4                                  | 4   |          |     |          |     |                   |     |
| Chlorox                  | 1                                  |     |          |     |          |     |                   |     |
| Chlorsulfonic Acid       | 3                                  | 4   |          |     |          |     | 4                 | 4   |

# CHEMICAL COMPATIBILITY PLASTIC

| MATERIAL CONVEYED        | HOSE CONSTRUCTION WITH TEMPERATURE |     |          |     |          |     |                   |     |
|--------------------------|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|                          | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|                          | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Chocolate                | 2                                  | 3   |          |     |          |     |                   |     |
| Chocolate Syrup          | 1                                  |     |          |     |          |     |                   |     |
| Chromic Chloride         | 1                                  |     |          |     |          |     |                   |     |
| Chrome Alum              | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Chromic Acid 25%         | 2                                  | 3   | 1        | 2   | 4        | 4   | 4                 | 4   |
| Chromic Acid 50%         | 2                                  | 3   | 1        | 2   | 4        | 4   | 4                 | 4   |
| Chromium Trioxide        | 4                                  | 4   |          |     |          |     |                   |     |
| Cider                    | 2                                  |     |          |     |          |     |                   |     |
| Citgo FR Fuels           | 2                                  |     |          |     |          |     |                   |     |
| Coal Gas                 | 1                                  |     |          |     |          |     |                   |     |
| Coal Tar                 | 4                                  | 4   | 3        | 3   |          |     | 4                 | 4   |
| Coconut Oil              | 3                                  | 4   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Cola Beverage            | 1                                  | 1   |          |     |          |     |                   |     |
| Copper Chloride          | 1                                  | 2   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Copper Cyanide           | 1                                  | 1   |          |     |          |     |                   |     |
| Copper Flouride 2%       | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Copper Nitrate           | 1                                  | 2   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Copper Sulphate          | 1                                  | 2   |          |     |          |     | 1                 | 1   |
| Core Oils                | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Corn Oils                | 1                                  | 2   |          |     |          |     |                   |     |
| Cottonseed Oil           | 2                                  | 3   |          |     |          |     | 1                 | 1   |
| Creosole                 | 4                                  | 4   | 3        | 4   | 3        | 4   |                   |     |
| Creosote                 | 4                                  | 4   | 3        | 4   |          |     |                   |     |
| Cresylic Acid 50%        | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Crude Oil Sour           | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Crude Oil Sweet          | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Crude Wax                | 1                                  |     |          |     |          |     |                   |     |
| Cupric Chloride          | 1                                  |     |          |     |          |     |                   |     |
| Cupric Cyanide           | 1                                  |     |          |     |          |     |                   |     |
| Cupric Nitrate           | 1                                  |     |          |     |          |     |                   |     |
| Cupric Sulfate           | 1                                  |     |          |     |          |     |                   |     |
| Cyanide, Copper          | 1                                  |     |          |     |          |     |                   |     |
| Cyanide, Silver          | 1                                  |     |          |     |          |     |                   |     |
| Cyanide Sodium           | 1                                  |     |          |     |          |     |                   |     |
| Cyclohexane              | 4                                  | 4   |          |     |          |     |                   |     |
| Cyclohexanol             | 4                                  | 4   |          |     |          |     | 3                 | 4   |
| Cyclohexanone            | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Cymene                   | 4                                  | 4   |          |     |          |     |                   |     |
| Decanol                  | 4                                  | 4   |          |     |          |     |                   |     |
| Deicing Fluid            | 1                                  | 1   |          |     |          |     |                   |     |
| Deminerlized Water       | 1                                  | 1   | 1        | 1   | 3        | 4   | 2                 | 4   |
| Denatured Alcohol        | 1                                  |     |          |     |          |     |                   |     |
| Detergents, synthetic    | 1                                  | 2   | 1        | 1   |          |     |                   |     |
| Developers, photographic | 1                                  | 1   | 1        | 1   |          |     |                   |     |
| Dextrin                  | 1                                  |     |          |     |          |     |                   |     |
| Dextron                  | 2                                  |     |          |     |          |     |                   |     |
| Dextrose                 | 1                                  | 2   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Diacetone                | 4                                  | 4   |          |     |          |     |                   |     |
| Diacetone Alcohol        | 4                                  | 4   |          |     |          |     |                   |     |
| Diammonium Phosphate     | 1                                  |     |          |     |          |     |                   |     |
| Diazinon                 | 2                                  |     |          |     |          |     |                   |     |
| Diazo Salts              | 1                                  | 1   |          |     |          |     |                   |     |
| Dibutyl Phthalate        | 1                                  |     |          |     |          |     |                   |     |
| Dibutylamine             | 4                                  | 4   |          |     |          |     |                   |     |
| Dichlorobenzene          | 4                                  | 4   |          |     |          |     |                   |     |
| Dichlorobenzyl Chloride  | 4                                  | 4   |          |     |          |     |                   |     |
| Dichloroethane           | 4                                  | 4   |          |     |          |     |                   |     |
| Dichloroethylene         | 4                                  | 4   |          |     |          |     |                   |     |
| Dichloromethane          | 4                                  | 4   |          |     |          |     |                   |     |
| Diesel Oils              | 3                                  | 4   | 1        | 2   |          |     |                   |     |
| Diethanolamine           | 2                                  |     |          |     |          |     |                   |     |
| Diethyl Ether            | 2                                  |     |          |     |          |     |                   |     |
| Diethyl Ketone           | 4                                  | 4   |          |     |          |     |                   |     |
| Diethyl Oxalate          | 4                                  | 4   |          |     |          |     |                   |     |





| MATERIAL CONVEYED              | HOSE CONSTRUCTION WITH TEMPERATURE |     |          |     |          |     |                   |     |
|--------------------------------|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|                                | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|                                | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Diethylene Dioxide             | 2                                  |     |          |     |          |     |                   |     |
| Diethylene Ether               | 4                                  | 4   |          |     |          |     |                   |     |
| Diethylene Glycol              | 1                                  |     |          |     |          |     |                   |     |
| Diglycolic Acid                | 1                                  | 2   |          |     |          |     |                   |     |
| Dihydroxyethyl Ether           | 1                                  |     |          |     |          |     |                   |     |
| Dimethylamine                  | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Dimethylbenzene                | 4                                  | 4   |          |     |          |     |                   |     |
| Dimethylcarbonal               | 2                                  |     |          |     |          |     |                   |     |
| Dimethylketone                 | 4                                  | 4   |          |     |          |     |                   |     |
| Dioctyl Phthalate              | 4                                  | 4   |          |     |          |     |                   |     |
| Dioctyl Phosphite              | 4                                  | 4   |          |     |          |     |                   |     |
| Dioxane                        | 4                                  | 4   |          |     |          |     |                   |     |
| Disodium Phosphate             | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Distilled Water                | 1                                  | 1   | 1        | 1   | 3        | 4   | 2                 | 4   |
| DMB ( Dimethylbenzene )        | 4                                  | 4   |          |     |          |     |                   |     |
| Duro Oils                      | 2                                  |     |          |     |          |     |                   |     |
| EDB (Ethylene Dibromide)       | 4                                  | 4   |          |     |          |     |                   |     |
| Eggs                           | 1                                  | 1   |          |     |          |     |                   |     |
| Emulsions, photographic        | 1                                  | 1   |          |     |          |     |                   |     |
| Enamels                        | 2                                  |     |          |     |          |     |                   |     |
| Essential Oils                 | 2                                  |     |          |     |          |     |                   |     |
| Ethanolamine                   | 2                                  |     |          |     |          |     |                   |     |
| Ethers                         | 4                                  | 4   |          |     |          |     | 2                 | 3   |
| Ethyl Acetate                  | 4                                  | 4   |          |     |          |     |                   |     |
| Ethyl Acrylate                 | 4                                  | 4   |          |     |          |     |                   |     |
| Ethyl Alcohol                  | 2                                  | 3   |          |     |          |     |                   |     |
| Ethyl Alcohol 50-98%           | 3                                  | 4   |          |     |          |     |                   |     |
| Ethyl Bromide                  | 4                                  | 4   |          |     |          |     |                   |     |
| Ethyl Chloride                 | 4                                  | 4   | 4        | 4   | 4        | 4   | 4                 | 4   |
| Ethyl Ether                    | 4                                  | 4   |          |     |          |     | 2                 | 3   |
| Ethyl Ether Acetate            | 1                                  |     |          |     |          |     |                   |     |
| Ethyl Mercaptan                | 4                                  | 4   |          |     |          |     |                   |     |
| Ethyl Methyl Ketone            | 4                                  | 4   |          |     |          |     |                   |     |
| Ethylbutanol                   | 1                                  |     |          |     |          |     |                   |     |
| Ethylbutyl Alcohol             | 1                                  |     |          |     |          |     |                   |     |
| Ethylene Bromide               | 1                                  | 4   | 1        | 3   | 4        | 4   | 4                 | 4   |
| Ethylene Chlorohydrin          | 4                                  | 4   |          |     |          |     |                   |     |
| Ethylene Dibromide             | 4                                  | 4   |          |     |          |     |                   |     |
| Ethylene Dichloride            | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Ethylene Glycol                | 1                                  | 1   | 1        | 1   | 2        | 3   | 2                 | 3   |
| Ethylene Oxide                 | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Ethylhexanol                   | 1                                  |     |          |     |          |     |                   |     |
| Ethylhexyl Acrylate            | 4                                  | 4   |          |     |          |     |                   |     |
| Ethylhexyl Alcohol             | 1                                  |     |          |     |          |     |                   |     |
| Fatty Acid                     | 2                                  |     |          |     |          |     |                   |     |
| Fatty Alcohol, Blend           | 1                                  |     |          |     |          |     |                   |     |
| Ferric Chloride                | 1                                  | 1   | 1        | 1   | 2        | 3   | 2                 | 3   |
| Ferric Nitrate                 | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Ferric Sulphate                | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Ferrous Chloride               | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Ferrous Nitrate                | 2                                  |     |          |     |          |     |                   |     |
| Ferrous Sulfate Solution       | 1                                  |     |          |     |          |     |                   |     |
| Fertilizer                     | 2                                  |     |          |     |          |     |                   |     |
| Figs                           | 1                                  | 1   |          |     |          |     |                   |     |
| Fish Solubles                  | 1                                  | 1   |          |     |          |     |                   |     |
| Fixing Solutions, photographic | 1                                  | 2   |          |     |          |     |                   |     |
| Flour                          | 1                                  | 4   |          |     |          |     |                   |     |
| Fluorobac Acid                 | 1                                  | 1   | 1        | 1   | 1        | 1   |                   |     |
| Fluorine                       | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Fluosilic Acid                 | 4                                  | 4   |          |     |          |     |                   |     |
| Formic Acid                    | 1                                  | 3   |          |     |          |     | 4                 | 4   |
| Formaldehyde Solution (to 50%) | 1                                  |     |          |     |          |     |                   |     |
| Formalin                       | 1                                  |     |          |     |          |     |                   |     |
| Formic Acid 3%                 | 1                                  | 2   |          |     |          |     |                   |     |
| Formic Acid 10%                | 1                                  | 2   |          |     |          |     | 4                 | 4   |

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| MATERIAL CONVEYED                   | HOSE CONSTRUCTION WITH TEMPERATURE |     |          |     |          |     |                   |     |
|-------------------------------------|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|                                     | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|                                     | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Formic Acid 25%                     | 1                                  | 2   |          |     |          |     | 4                 | 4   |
| Formic Acid 50%                     | 3                                  | 4   |          |     |          |     | 4                 | 4   |
| Freon-12                            | 1                                  | 2   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Fructose                            | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Fruit Pulps and Juices              | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Fuel Oil                            | 2                                  | 3   | 1        | 1   | 1        | 2   | 1                 | 1   |
| Fumaric Acid                        | 4                                  | 4   |          |     |          |     |                   |     |
| Furan                               | 4                                  | 4   |          |     |          |     |                   |     |
| Furfural                            | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Furfuryl Alcohol                    | 1                                  | 3   |          |     |          |     |                   |     |
| Fusel Oil                           | 1                                  |     |          |     |          |     |                   |     |
| Gallic Acid Solution                | 4                                  | 4   |          |     |          |     |                   |     |
| Gasohol                             | 4                                  | 4   |          |     |          |     |                   |     |
| Gas - cook oven                     | 2                                  | 2   | 1        | 2   | 2        | 2   | 2                 | 2   |
| Gas - natural (dry)                 | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Gas- natural (wet)                  | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Gasoline                            | 4                                  | 4   |          |     |          |     |                   |     |
| Gasoline - refined                  | 3                                  | 4   | 1        | 1   | 2        | 3   |                   |     |
| Gasoline, Unleaded                  | 4                                  | 4   |          |     |          |     |                   |     |
| Gasoline, White                     | 4                                  | 4   |          |     |          |     |                   |     |
| Gelatin                             | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Gin                                 | 1                                  | 2   |          |     |          |     |                   |     |
| Ginger Ale                          | 1                                  | 1   |          |     |          |     |                   |     |
| Glacial Acetic Acid                 | 4                                  | 4   |          |     |          |     |                   |     |
| Glucose                             | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Glue                                | 1                                  |     |          |     |          |     |                   |     |
| Glycerine                           | 1                                  | 1   | 1        | 1   | 1        | 1   |                   |     |
| Glycerol                            | 1                                  | 1   |          |     |          |     |                   |     |
| Glycol                              | 1                                  | 1   | 1        | 1   | 2        | 2   | 1                 | 1   |
| Glycolic Acid 30%                   | 1                                  | 1   |          |     |          |     | 4                 | 4   |
| Grape Juice                         | 1                                  | 1   |          |     |          |     |                   |     |
| Grapefruit Juice                    | 1                                  | 1   |          |     |          |     |                   |     |
| Grease                              | 1                                  |     |          |     |          |     |                   |     |
| Green Liquor (paper)                | 1                                  | 1   |          |     |          |     |                   |     |
| Heptachlor                          | 4                                  | 4   |          |     |          |     |                   |     |
| Heptane                             | 3                                  | 4   | 1        | 2   | 1        |     | 1                 |     |
| Heptanol                            | 1                                  |     |          |     |          |     |                   |     |
| Hexane                              | 3                                  | 4   |          |     |          |     |                   |     |
| Honey                               | 1                                  | 1   |          |     |          |     |                   |     |
| HPO (Sodium Thiosulfate)            | 1                                  |     |          |     |          |     |                   |     |
| Hydraulic Fluid                     | 1                                  |     |          |     |          |     |                   |     |
| Hydraulic Fluid HF-18, HF-20        | 2                                  |     |          |     |          |     |                   |     |
| Hydrazine                           | 4                                  | 4   |          |     |          |     |                   |     |
| Hydro-Drive Oil (houghton)          | 2                                  |     |          |     |          |     |                   |     |
| Hydrobromic Acid                    | 4                                  | 4   |          |     |          |     |                   |     |
| Hydrochloric Acid 10%               | 1                                  | 1   | 1        | 1   | 4        | 4   | 4                 | 4   |
| Hydrochloric Acid 48%               | 3                                  | 4   |          |     |          |     | 4                 | 4   |
| Hydrocyanic Acid                    | 4                                  | 4   |          |     |          |     |                   |     |
| Hydrofluoric Acid 4%                | 2                                  | 3   |          |     |          |     | 4                 | 4   |
| Hydrofluoric Acid 10%               | 3                                  | 3   |          |     |          |     | 4                 | 4   |
| Hydrofluoric Acid 48%               | 3                                  | 4   |          |     |          |     | 4                 | 4   |
| Hydrofluoric Acid 60%               | 3                                  | 4   |          |     |          |     | 4                 | 4   |
| Hydrofluosilicic Acid               | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Hydrogen                            | 1                                  | 2   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Hydrogen Bromide (Dry) (liquid)     |                                    |     |          |     |          |     | 1                 | 1   |
| Hydrogen Cyanide                    | 1                                  | 1   |          |     |          |     | 4                 | 4   |
| Hydrogen Peroxide                   | 4                                  | 4   |          |     |          |     |                   |     |
| Hydrogen Peroxide 12%               | 1                                  | 2   | 1        | 1   | 2        | 3   |                   |     |
| Hydrogen Peroxide 50%               | 1                                  | 3   | 1        | 2   | 3        | 4   | 2                 | 3   |
| Hydrogen Peroxide 90%               | 4                                  | 4   | 3        | 4   | 4        | 4   | 4                 | 4   |
| Hydrogen Phosphide                  | 1                                  | 3   |          |     |          |     |                   |     |
| Hydrogen Sulfide - Aqueous Solution | 1                                  | 1   |          |     |          |     |                   |     |
| Hydrogen Sulfide - Dry              | 1                                  | 1   |          |     |          |     |                   |     |
| Hydrolube (water glycol)            | 1                                  | 1   |          |     |          |     |                   |     |
| Hydrolubric Oil                     | 2                                  |     |          |     |          |     |                   |     |

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| MATERIAL CONVEYED          | HOSE CONSTRUCTION WITH TEMPERATURE |     |          |     |          |     |                   |     |
|----------------------------|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|                            | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|                            | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Hydroquinone Solution      | 2                                  |     |          |     |          |     |                   |     |
| Hydroxylamine Sulfate      | 1                                  | 1   |          |     |          |     |                   |     |
| Hypochlorous Acid          | 1                                  | 1   |          |     |          |     | 3                 | 4   |
| Iodine                     | 4                                  | 4   |          |     |          |     |                   |     |
| Iron Acetate Liquor        | 1                                  |     |          |     |          |     |                   |     |
| Iron Salts                 | 1                                  |     |          |     |          |     |                   |     |
| Iron Sulfate Solution      | 1                                  |     |          |     |          |     |                   |     |
| Isobutanol                 | 2                                  |     |          |     |          |     |                   |     |
| Isobutyl Alcohol           | 2                                  |     |          |     |          |     |                   |     |
| Isooctane                  | 4                                  | 4   |          |     |          |     |                   |     |
| Isopropanol                | 2                                  |     |          |     |          |     |                   |     |
| Isopropyl Acetate          | 4                                  | 4   |          |     |          |     |                   |     |
| Isopropyl Alcohol          | 1                                  | 2   | 1        | 1   | 3        | 4   |                   |     |
| Isopropyl Ether            | 4                                  | 4   |          |     |          |     |                   |     |
| JP 3, 4, 5                 | 4                                  | 4   | 2        | 3   | 3        | 3   | 2                 | 3   |
| Jelly                      | 1                                  | 1   |          |     |          |     |                   |     |
| Jet Fuel - All Types       | 4                                  | 4   |          |     |          |     |                   |     |
| Karo Syrup                 | 1                                  | 1   |          |     |          |     |                   |     |
| Kerosene                   | 4                                  | 4   | 1        | 1   | 1        | 1   | 1                 | 2   |
| Ketones                    | 4                                  | 4   |          |     |          |     |                   |     |
| Kraft Liquor (paper)       | 1                                  | 1   |          |     |          |     |                   |     |
| Lacquer Thinner            | 3                                  | 4   | 2        | 2   | 3        | 3   | 2                 |     |
| Lactic Acid 28%            | 1                                  | 1   |          |     |          |     | 4                 | 4   |
| Lard                       | 2                                  | 3   |          |     |          |     |                   |     |
| Lard Oil                   | 1                                  | 2   |          |     |          |     | 1                 | 2   |
| Latex Paint                | 1                                  |     |          |     |          |     |                   |     |
| Lauric Acid                | 1                                  | 1   | 1        | 1   | 3        | 4   | 3                 | 4   |
| Lauryl Chlorite            | 1                                  | 1   |          |     |          |     | 1                 | 2   |
| Lauryl Sulfate             | 1                                  | 1   |          |     |          |     |                   |     |
| Lead Acetate               | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Lead Nitrate Solution      | 1                                  |     |          |     |          |     |                   |     |
| Lead, Tetraethyl           | 1                                  |     |          |     |          |     |                   |     |
| Lemon Juice                | 1                                  | 2   |          |     |          |     |                   |     |
| Ligroin                    | 4                                  | 4   |          |     |          |     |                   |     |
| Lime Chlorinated           | 2                                  |     |          |     |          |     |                   |     |
| Lime, sulfur               | 1                                  | 1   |          |     |          |     |                   |     |
| Linoleic Acid              | 1                                  |     |          |     |          |     |                   |     |
| Linseed Oil                | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Liquid Soap                | 2                                  |     |          |     |          |     |                   |     |
| Liquors                    | 1                                  | 2   |          |     |          |     |                   |     |
| Lubricating Oils           | 4                                  | 4   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Machine Oil under 135°F    | 2                                  |     |          |     |          |     |                   |     |
| Magnesium Carbonate        | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Magnesium Hydroxide        | 1                                  | 1   | 1        | 1   | 3        | 4   | 2                 | 3   |
| Magnesium Nitrate          | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Magnesium Sulfate Solution | 1                                  |     |          |     |          |     |                   |     |
| Malathion                  | 1                                  |     |          |     |          |     |                   |     |
| Maleic Acid Solution       | 4                                  | 4   |          |     |          |     |                   |     |
| Manganese Salts            | 1                                  |     |          |     |          |     |                   |     |
| Manganese Sulfate Solution | 1                                  |     |          |     |          |     |                   |     |
| Mayonnaise                 | 1                                  | 1   |          |     |          |     |                   |     |
| MBK (Methyl Butyl Ketone)  | 4                                  | 4   |          |     |          |     |                   |     |
| MEA (Ethanolamine)         | 2                                  |     |          |     |          |     |                   |     |
| MEK (Ethyl Methyl Ketone)  | 4                                  | 4   |          |     |          |     |                   |     |
| Mercuric Chloride          | 2                                  | 2   | 1        | 1   | 2        | 3   | 2                 | 3   |
| Mercuric Chloride Solution | 2                                  |     |          |     |          |     |                   |     |
| Mercuric Cyanide           | 2                                  | 2   |          |     |          |     |                   |     |
| Mercuric Nitrate           | 2                                  | 2   |          |     |          |     | 2                 | 2   |
| Mercury                    | 2                                  | 2   |          |     |          |     |                   |     |
| Mesitylene                 | 4                                  | 4   |          |     |          |     |                   |     |
| Mesityl Oxide              | 4                                  | 4   |          |     |          |     |                   |     |
| Mesitylene                 | 4                                  | 4   |          |     |          |     |                   |     |
| Methanol                   | 4                                  | 4   | 4        | 4   | 4        | 4   | 4                 | 4   |
| Methyl Acetate             | 4                                  | 4   |          |     |          |     |                   |     |
| Methyl Acetone             | 1                                  |     |          |     |          |     |                   |     |

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| MATERIAL CONVEYED           | HOSE CONSTRUCTION WITH TEMPERATURE |     |          |     |          |     |                   |     |
|-----------------------------|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|                             | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|                             | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Methyl Alcohol              | 3                                  | 4   | 2        | 3   | 3        | 4   | 4                 | 4   |
| Methyl Bromide              | 4                                  | 4   |          |     |          |     |                   |     |
| Methyl Butanethiol          | 4                                  | 4   |          |     |          |     |                   |     |
| Methyl Butanol              | 1                                  |     |          |     |          |     |                   |     |
| Methyl Chloride             | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Methyl Chloroform           | 4                                  | 4   |          |     |          |     |                   |     |
| Methyl Cyanide              | 1                                  |     |          |     |          |     |                   |     |
| Methyl Ethyl Ketone         | 4                                  | 4   | 2        | 3   | 3        | 4   |                   |     |
| Methyl Isobutyl Ketone      | 4                                  | 4   |          |     |          |     |                   |     |
| Methyl Isobutyl Ketone      | 4                                  | 4   |          |     |          |     |                   |     |
| Methyl Isopropyl Ketone     | 4                                  | 4   |          |     |          |     |                   |     |
| Methyl Methacrylate         | 1                                  |     |          |     |          |     |                   |     |
| Methyl Methacrylate Monomer | 4                                  | 4   |          |     |          |     |                   |     |
| Methyl Propyl Ketone        | 4                                  | 4   |          |     |          |     |                   |     |
| Methyl Silacrylate          | 1                                  |     |          |     |          |     |                   |     |
| Methyl Sulfate              | 1                                  |     |          |     |          |     |                   |     |
| Methylamine                 | 4                                  | 4   |          |     |          |     |                   |     |
| Methylaniline               | 4                                  | 4   |          |     |          |     |                   |     |
| Methylene Bromide           | 4                                  | 4   |          |     |          |     |                   |     |
| Methylene Chloride          | 4                                  | 4   |          |     |          |     |                   |     |
| Methylene Dichloride        | 4                                  | 4   |          |     |          |     |                   |     |
| Milk                        | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Mineral Oils                | 1                                  | 2   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Molasses                    | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Monochlorobenzene           | 4                                  | 4   |          |     |          |     |                   |     |
| Monomethylamine             | 4                                  | 4   |          |     |          |     |                   |     |
| Monosodium Phosphate        | 1                                  |     |          |     |          |     |                   |     |
| Motor Oil                   | 3                                  |     |          |     |          |     |                   |     |
| Muriatic Acid               | 4                                  | 4   |          |     |          |     |                   |     |
| N-Octane                    | 4                                  | 4   |          |     |          |     |                   |     |
| Naphthenic Acid             | 1                                  |     |          |     |          |     |                   |     |
| Naptha                      | 4                                  | 4   | 1        | 1   |          |     |                   |     |
| Napthalene                  | 3                                  | 4   | 1        | 1   |          |     |                   |     |
| Nickel Chloride Solution    | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Nickel Nitrate Solution     | 2                                  |     |          |     |          |     | 1                 | 1   |
| Nickel Plating Solution     | 4                                  | 4   |          |     |          |     |                   |     |
| Nickel Salts                | 2                                  |     |          |     |          |     |                   |     |
| Nickel Sulfate Solution     | 1                                  |     |          |     |          |     |                   |     |
| Nicotine                    | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Nicotine Acids              | 1                                  | 2   | 1        | 1   | 3        | 4   | 3                 | 4   |
| Nicotine Salts              | 1                                  |     |          |     |          |     |                   |     |
| Niter Cake                  | 1                                  |     |          |     |          |     |                   |     |
| Nitric Acid 10%             | 1                                  | 2   |          | 1   | 4        | 4   | 4                 | 4   |
| Nitric Acid 40%             | 2                                  | 3   | 1        | 1   | 4        | 4   | 4                 | 4   |
| Nitric Acid 60%             | 3                                  | 4   | 2        | 3   | 4        | 4   | 4                 | 4   |
| Nitric Acid 68%             | 3                                  | 4   | 2        | 3   | 4        | 4   | 4                 | 4   |
| Nitric Acid 70%             | 4                                  | 4   | 3        | 3   | 4        | 4   | 4                 | 4   |
| Nitrobenzene                | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Nitrogen                    | 1                                  |     |          |     |          |     |                   |     |
| Nitrogen Oxide              | 4                                  | 4   |          |     |          |     |                   |     |
| Nitromethane                | 4                                  | 4   |          |     |          |     |                   |     |
| Nitrous Acid (up to 10%)    | 1                                  |     |          |     |          |     |                   |     |
| Nitrous Oxide               | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Oats                        | 1                                  | 4   |          |     |          |     |                   |     |
| Octadecanoic Acid           | 1                                  |     |          |     |          |     |                   |     |
| Octanol                     | 2                                  |     |          |     |          |     |                   |     |
| Octyl Alcohol               | 2                                  |     |          |     |          |     |                   |     |
| Oil of Turpentine           | 1                                  |     |          |     |          |     |                   |     |
| Oils, Animal                | 2                                  |     |          |     |          |     |                   |     |
| Oils, Mineral               | 4                                  | 4   |          |     |          |     |                   |     |
| Oils, Petroleum             | 1                                  | 2   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Oleic Acid                  | 2                                  | 3   | 1        | 1   | 4        | 4   | 4                 | 4   |
| Oleum                       | 4                                  | 4   | 4        | 4   | 4        | 4   | 4                 | 4   |
| Olive Oil                   | 2                                  | 2   |          |     |          |     |                   |     |
| Ortho-Dichlorobenzene       | 4                                  | 4   |          |     |          |     |                   |     |





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|-------------------------------|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|                               | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|                               | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Ortho-xylene                  | 4                                  | 4   |          |     |          |     |                   |     |
| Oxalic Acid                   | 4                                  | 4   |          |     |          |     |                   |     |
| Oxygen                        | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Ozone                         | 3                                  | 4   |          |     |          |     |                   |     |
| Paint                         | 1                                  |     |          |     |          |     |                   |     |
| Para formaldehyde             | 1                                  | 2   |          |     |          |     |                   |     |
| Paraffin                      | 1                                  | 2   |          |     |          |     |                   |     |
| Palmitic Acid 10%             | 1                                  | 2   |          |     |          |     | 4                 | 4   |
| Palmitic Acid 70%             | 3                                  | 4   |          |     |          |     | 4                 | 4   |
| Peaches                       | 1                                  | 1   |          |     |          |     |                   |     |
| Peanut Butter                 | 1                                  | 2   |          |     |          |     |                   |     |
| Peanut Oil                    | 2                                  |     |          |     |          |     |                   |     |
| Peas                          | 1                                  | 1   |          |     |          |     |                   |     |
| Pentachlorophenol in Oil      | 4                                  | 4   |          |     |          |     |                   |     |
| Pentane                       | 3                                  | 4   |          |     |          |     |                   |     |
| Pentanone                     | 4                                  | 4   |          |     |          |     |                   |     |
| Pentasol                      | 2                                  |     |          |     |          |     |                   |     |
| Perchloric acid               | 4                                  | 4   |          |     |          |     |                   |     |
| Perchloroethylene             | 4                                  | 4   |          |     |          |     |                   |     |
| Petrol                        | 4                                  | 4   |          |     |          |     |                   |     |
| Petroleum Ether               | 3                                  | 3   | 1        | 1   |          |     |                   |     |
| Petroleum Naptha              | 4                                  | 4   |          |     |          |     |                   |     |
| Petroleum Oils (Refined)      | 1                                  |     |          |     |          |     |                   |     |
| Petroleum Oils (Sour)         | 2                                  |     |          |     |          |     |                   |     |
| Phenol                        | 4                                  | 4   |          |     |          |     |                   |     |
| Phenol Acid                   | 4                                  | 4   |          |     |          |     |                   |     |
| Phenyl Chloride               | 4                                  | 4   |          |     |          |     |                   |     |
| Phenolhydrazine               | 4                                  | 4   |          |     |          |     |                   |     |
| Phenolhydrazine Hydrochloride | 3                                  | 4   |          |     |          |     |                   |     |
| Phosgene (gas)                | 1                                  | 2   |          |     |          |     |                   |     |
| Phosgene (liquid)             | 4                                  | 4   |          |     |          |     |                   |     |
| Phosphorous (yellow)          | 2                                  | 3   |          |     |          |     |                   |     |
| Phosphorous Pentoxide         | 4                                  | 4   |          |     |          |     |                   |     |
| Phosphorous Trichloride       | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Phosphorous Trichloride       | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Photographic Chemicals        | 1                                  | 1   |          |     |          |     | 1                 | 2   |
| Photographic Fixing Solutions | 1                                  |     |          |     |          |     |                   |     |
| Picric Acid                   | 4                                  | 4   | 4        | 4   | 4        | 4   | 4                 | 4   |
| Pinene                        | 4                                  | 4   |          |     |          |     |                   |     |
| Pitch                         | 2                                  | 3   | 1        | 1   |          |     |                   |     |
| Plating Solutions             | 1                                  | 2   |          |     |          |     | 1                 | 1   |
| Polyethylene Glycol           | 2                                  |     |          |     |          |     |                   |     |
| Potash                        | 1                                  |     |          |     |          |     |                   |     |
| Potassium Acetate             | 1                                  |     |          |     |          |     |                   |     |
| Potassium Acid Sulfate        | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Potassium Antimonate          | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Potassium Bicarbonate         | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Potassium Bichromate          | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Potassium Bisulfate           | 1                                  |     |          |     |          |     |                   |     |
| Potassium Bisulfite           | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Potassium Borate 1%           | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Potassium Bisulfate           | 1                                  |     |          |     |          |     |                   |     |
| Potassium Bromate 10%         | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Potassium Bromide             | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Potassium Carbonate           | 1                                  |     |          |     |          |     |                   |     |
| Potassium Chlorate            | 1                                  |     |          |     |          |     |                   |     |
| Potassium Chloride            | 1                                  | 1   | 1        | 1   | 1        | 2   | 1                 | 2   |
| Potassium Chromate            | 1                                  |     |          |     |          |     | 2                 | 2   |
| Potassium Cuprocyanide        | 1                                  |     |          |     |          |     |                   |     |
| Potassium Cyanide             | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Potassium Dichromate          | 1                                  | 1   |          |     |          |     | 2                 | 2   |
| Potassium Ferrocyanide        | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Potassium Fluoride            | 1                                  | 1   | 1        | 1   | 1        | 2   |                   |     |
| Potassium Hydrate             | 2                                  |     |          |     |          |     |                   |     |
| Potassium Hydroxide           | 1                                  | 1   |          |     |          |     |                   |     |

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# CHEMICAL COMPATIBILITY PLASTIC

| MATERIAL CONVEYED           | HOSE CONSTRUCTION WITH TEMPERATURE |     |          |     |          |     |                   |     |
|-----------------------------|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|                             | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|                             | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Potassium Hypochlorite      | 2                                  | 3   |          |     |          |     | 4                 | 4   |
| Potassium Iodide            | 1                                  |     |          |     |          |     |                   |     |
| Potassium Nitrate           | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Potassium Perborate         | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Potassium Perchlorate       | 1                                  | 1   |          |     |          |     | 2                 | 3   |
| Potassium Permanganate      | 4                                  | 4   |          |     |          |     |                   |     |
| Potassium Persulfate        | 1                                  |     |          |     |          |     |                   |     |
| Potassium Sulfate           | 1                                  |     |          |     |          |     |                   |     |
| Potassium Sulfide           | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Potassium Sulfite           | 2                                  |     |          |     |          |     |                   |     |
| Potassium Thiosulfate       | 1                                  |     |          |     |          |     |                   |     |
| Potatoes                    | 1                                  | 1   |          |     |          |     |                   |     |
| Propane                     | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Propargyl Alcohol           | 1                                  | 1   |          |     |          |     |                   |     |
| Propyl Alcohol              | 1                                  | 2   | 1        | 1   | 2        | 3   | 2                 | 3   |
| Propylene Dichloride        | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Propylene Glycol            | 1                                  |     |          |     |          |     | 4                 | 4   |
| Prune Juice                 | 1                                  | 1   |          |     |          |     |                   |     |
| Puropale RX Oils            | 2                                  |     |          |     |          |     |                   |     |
| Pyrene                      | 4                                  | 4   |          |     |          |     |                   |     |
| Pyrethrum                   | 2                                  |     |          |     |          |     |                   |     |
| Pyridine                    | 4                                  | 4   |          |     |          |     |                   |     |
| Pyrogard C, D               | 2                                  |     |          |     |          |     |                   |     |
| Red Oil                     | 2                                  |     |          |     |          |     |                   |     |
| Regal Oils R&O              | 2                                  |     |          |     |          |     |                   |     |
| Richfield A Weed Killer     | 1                                  | 2   |          |     |          |     |                   |     |
| Rubilene Oils               | 2                                  |     |          |     |          |     |                   |     |
| Salicylic Acid              | 1                                  |     |          |     |          |     |                   |     |
| Salt Water                  | 1                                  | 1   | 1        | 1   | 2        | 3   | 2                 | 4   |
| Sauerkraut                  | 2                                  |     |          |     |          |     |                   |     |
| Selenic Acid                | 1                                  | 2   |          |     |          |     | 4                 | 4   |
| Sewage                      | 2                                  |     |          |     |          |     |                   |     |
| Shortening                  | 2                                  | 3   |          |     |          |     |                   |     |
| Silicic Acid                | 1                                  | 1   |          |     |          |     | 4                 | 4   |
| Silicone Greases            | 2                                  |     |          |     |          |     |                   |     |
| Silicone Oils               | 2                                  |     |          |     |          |     |                   |     |
| Silver Cyanide              | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Silver Nitrate              | 1                                  | 1   | 1        | 1   | 1        | 1   |                   |     |
| Silver Plating Solution     | 1                                  | 2   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Skydrol 500A & 7000         | 4                                  | 4   |          |     |          |     |                   |     |
| Soap                        | 1                                  | 1   | 1        | 1   | 2        | 3   | 2                 | 4   |
| Soda Ash                    | 1                                  |     |          |     |          |     |                   |     |
| Soda Water                  | 1                                  | 1   |          |     |          |     |                   |     |
| Sodium Acetate              | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Sodium Alminate Solution    | 2                                  |     |          |     |          |     |                   |     |
| Sodium Arsenite             | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Sodium Benzoate             | 1                                  | 2   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Sodium Bicarbonate          | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Sodium Bichromate Solution  | 2                                  |     |          |     |          |     |                   |     |
| Sodium Bisulfite            | 1                                  |     |          |     |          |     |                   |     |
| Sodium Borate               | 1                                  |     |          |     |          |     |                   |     |
| Sodium Bromide              | 1                                  | 1   | 1        | 1   | 1        | 2   | 1                 | 2   |
| Sodium Carbonate (soda ash) | 1                                  | 1   | 1        | 1   | 1        | 2   | 1                 | 1   |
| Sodium Chlorate             | 2                                  | 3   | 1        | 2   | 3        | 3   | 2                 | 2   |
| Sodium Chloride             | 1                                  | 1   | 1        | 1   | 1        | 2   | 1                 | 2   |
| Sodium Chlorite Solution    | 2                                  |     |          |     |          |     |                   |     |
| Sodium Chromate             | 2                                  |     |          |     |          |     |                   |     |
| Sodium Cyanide              | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Sodium Dichromate           | 1                                  | 2   | 1        | 2   | 1        | 2   | 1                 | 2   |
| Sodium Ferricyanide         | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Sodium Ferrocyanide         | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Sodium Fluoride (70%)       | 1                                  | 1   |          |     |          |     | 1                 | 2   |
| Sodium Hydrate              | 2                                  |     |          |     |          |     |                   |     |
| Sodium Hydrochlorite        | 2                                  |     |          |     |          |     |                   |     |
| Sodium Hydrosulfide         | 1                                  |     |          |     |          |     |                   |     |

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# CHEMICAL COMPATIBILITY PLASTIC

| MATERIAL CONVEYED            | HOSE CONSTRUCTION WITH TEMPERATURE |     |          |     |          |     |                   |     |
|------------------------------|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|                              | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|                              | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Sodium Hydrosulfite          | 2                                  |     |          |     |          |     |                   |     |
| Sodium Hydroxide 10%         | 1                                  | 1   | 1        | 1   | 3        | 4   | 3                 | 4   |
| Sodium Hydroxide 35%         | 1                                  | 2   | 1        | 1   | 4        | 4   | 4                 | 4   |
| Sodium Hydroxide 50%         | 1                                  | 3   | 1        | 2   |          |     |                   |     |
| Sodium Hypochlorite (20%)    | 1                                  | 1   |          |     |          |     | 4                 | 4   |
| Sodium Hyposulfate           | 1                                  |     |          |     |          |     |                   |     |
| Sodium Metaphosphate         | 1                                  |     |          |     |          |     |                   |     |
| Sodium Nitrate               | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Sodium Nitrite               | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Sodium Peroxide              | 1                                  |     |          |     |          |     |                   |     |
| Sodium Phosphate             | 1                                  |     |          |     |          |     |                   |     |
| Sodium Phosphate Acid        | 2                                  | 2   | 1        | 2   | 4        | 4   |                   |     |
| Sodium Silicate              | 1                                  |     |          |     |          |     |                   |     |
| Sodium Sulfate               | 1                                  |     |          |     |          |     |                   |     |
| Sodium Sulfhydrate           | 2                                  |     |          |     |          |     |                   |     |
| Sodium Sulfide               | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Sodium Sulfite               | 1                                  | 1   |          |     |          |     | 1                 | 1   |
| Sodium Sulphrydate           | 2                                  |     |          |     |          |     |                   |     |
| Sodium Thiosulfat            | 1                                  | 1   |          |     |          |     | 1                 | 2   |
| Solnus Oils                  | 1                                  |     |          |     |          |     |                   |     |
| Sour Crude Oil               | 4                                  | 4   |          |     |          |     |                   |     |
| Soya Beans                   | 1                                  | 4   |          |     |          |     |                   |     |
| Soya Oil                     | 1                                  | 3   |          |     |          |     |                   |     |
| Soybean Oil                  | 1                                  | 1   |          |     |          |     |                   |     |
| Spent Acid                   | 4                                  | 4   |          |     |          |     |                   |     |
| Spinach                      | 1                                  | 1   |          |     |          |     |                   |     |
| Squash                       | 1                                  | 1   |          |     |          |     |                   |     |
| Stannic Chloride             | 2                                  |     |          |     |          |     |                   |     |
| Stannis Chloride             | 1                                  | 1   | 1        | 1   | 1        | 2   | 1                 | 2   |
| Starch                       | 1                                  |     |          |     |          |     |                   |     |
| Starch Gum                   | 1                                  |     |          |     |          |     |                   |     |
| Stearic Acid                 | 1                                  |     |          |     |          |     |                   |     |
| Stoddard Solvent             | 2                                  |     |          |     |          |     |                   |     |
| Straight Synthetic Oils      | 2                                  |     |          |     |          |     |                   |     |
| Styrene                      | 4                                  | 4   |          |     |          |     |                   |     |
| Sugar - all forms            | 1                                  | 1   |          |     |          |     |                   |     |
| Sulfamic Acid                | 4                                  | 4   |          |     |          |     |                   |     |
| Sulfate Liquors under 150° F | 1                                  |     |          |     |          |     |                   |     |
| Sulfur                       | 2                                  | 2   |          |     |          |     |                   |     |
| Sulfur Chloride              | 2                                  |     |          |     |          |     |                   |     |
| Sulfur Dioxide (dry)         | 1                                  |     |          |     |          |     |                   |     |
| Sulfur Dioxide (liquid)      | 4                                  | 4   |          |     |          |     |                   |     |
| Sulfur Hexafluoride (Gas)    | 2                                  |     |          |     |          |     |                   |     |
| Sulfur Trioxide              | 1                                  |     |          |     |          |     |                   |     |
| Sulfuric Acid 10%            | 1                                  | 2   | 1        | 1   | 3        | 4   | 3                 | 4   |
| Sulfuric Acid 70%            | 1                                  | 2   | 1        | 1   | 4        | 4   | 4                 | 4   |
| Sulfuric Acid 95%            | 3                                  | 3   | 1        | 2   | 4        | 4   | 4                 | 4   |
| Sulfurous Acid               | 2                                  | 3   | 1        | 2   | 4        | 4   | 4                 | 4   |
| Sulphur Dioxide Gas - dry    | 1                                  | 1   |          |     |          |     |                   |     |
| Sulfur Dioxide Gas - wet     | 4                                  | 4   |          |     |          |     |                   |     |
| Sulfur Dioxide - Liquid      | 3                                  | 4   |          |     |          |     |                   |     |
| Sun R&O Oils                 | 2                                  |     |          |     |          |     |                   |     |
| Suntac HP Oils               | 2                                  |     |          |     |          |     |                   |     |
| Suntac WR Oils               | 2                                  |     |          |     |          |     |                   |     |
| Sunvis Oils 700, 800, 900    | 2                                  |     |          |     |          |     |                   |     |
| Synthetic Oil (Citgo)        | 2                                  |     |          |     |          |     |                   |     |
| Tall Oil                     | 4                                  | 4   |          |     |          |     |                   |     |
| Tallow                       | 2                                  |     |          |     |          |     |                   |     |
| Tannic Acid                  | 1                                  | 1   | 1        | 1   | 3        | 4   | 3                 | 4   |
| Tanning Liquors              | 1                                  | 1   |          |     |          |     |                   |     |
| Tar Oil                      | 2                                  |     |          |     |          |     |                   |     |
| Tartaric Acid                | 1                                  | 2   | 1        | 1   | 2        | 3   | 3                 | 4   |
| TEA (Triethanolamine)        | 2                                  | 3   |          |     |          |     |                   |     |
| Tellus Oils                  | 2                                  |     |          |     |          |     |                   |     |

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# CHEMICAL COMPATIBILITY PLASTIC

| MATERIAL CONVEYED                       | HOSE CONSTRUCTION WITH TEMPERATURE |     |          |     |          |     |                   |     |
|---|------------------------------------|-----|----------|-----|----------|-----|-------------------|-----|
|   | PVC (F°)                           |     | TPR (F°) |     | TPE (F°) |     | POLYURETHANE (F°) |     |
|   | 68                                 | 104 | 68       | 104 | 68       | 104 | 68                | 104 |
| Tenol Oils                              | 2                                  |     |          |     |          |     |                   |     |
| Terpineol                               | 2                                  |     |          |     |          |     |                   |     |
| Tetrachloroethane                       | 4                                  | 4   |          |     |          |     |                   |     |
| Tetraethyl Lead                         | 2                                  | 3   |          |     |          |     |                   |     |
| Tetrahydrofuran                         | 4                                  | 4   |          |     |          |     |                   |     |
| Tetrahydrodicyclopentadiene             | 4                                  | 4   |          |     |          |     |                   |     |
| THF (Tetrahydrofuran)                   | 4                                  | 4   |          |     |          |     |                   |     |
| Thionyl Chloride                        | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Tin Chloride                            | 1                                  | 1   | 1        | 1   | 1        | 1   |                   |     |
| Titanium Tetrachloride                  | 1                                  | 4   |          |     |          |     | 3                 | 4   |
| Toluene                                 | 4                                  | 4   | 2        | 2   | 3        | 4   |                   |     |
| Toluol                                  | 4                                  | 4   |          |     |          |     |                   |     |
| Tomatoes                                | 1                                  | 1   |          |     |          |     |                   |     |
| Tributyl Phosphate                      | 4                                  | 4   |          |     |          |     |                   |     |
| Trichloroethylene                       | 4                                  | 4   |          |     |          |     | 3                 | 4   |
| Trichloroethane                         | 4                                  | 4   |          |     |          |     |                   |     |
| Tricresyl Phosphate                     | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Triethanolamine                         | 3                                  | 4   |          |     |          |     |                   |     |
| Triethylamine                           | 2                                  | 3   |          |     |          |     |                   |     |
| Trihydroxybenzoic Acid                  | 4                                  | 4   |          |     |          |     |                   |     |
| Trimethylbenzene                        | 4                                  | 4   |          |     |          |     |                   |     |
| Trimethyl Propane                       | 3                                  | 4   |          |     |          |     |                   |     |
| Trinitrophenol                          | 1                                  |     |          |     |          |     |                   |     |
| Trisodium Phosphate                     | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Tung Oil                                | 2                                  |     |          |     |          |     |                   |     |
| Turpentine                              | 3                                  | 4   | 1        | 1   | 2        | 3   | 1                 | 2   |
| Ucon Hydrolube Types 150CP, 200CP       | 2                                  |     |          |     |          |     |                   |     |
| Ucon Hydrolube Types 275CP,300CP, 550CP | 2                                  |     |          |     |          |     |                   |     |
| Ucon M1                                 | 2                                  |     |          |     |          |     |                   |     |
| Union Hydraulic Tractor Fluid           | 2                                  |     |          |     |          |     |                   |     |
| Urea                                    | 1                                  | 2   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Urine                                   | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Varnish                                 | 4                                  | 4   | 1        | 1   | 1        | 2   | 1                 | 2   |
| Vegetable Oils                          | 2                                  | 3   |          |     |          |     |                   |     |
| Versilube F-50, F-44                    | 2                                  |     |          |     |          |     |                   |     |
| Vinegar                                 | 1                                  | 2   |          |     |          |     | 2                 | 3   |
| Vinyl Acetate                           | 4                                  | 4   |          |     |          |     | 4                 | 4   |
| Vinyl Chloride                          | 4                                  | 4   |          |     |          |     |                   |     |
| Vinyl Trichloride                       | 4                                  | 4   |          |     |          |     |                   |     |
| Vitrea Oils                             | 2                                  |     |          |     |          |     |                   |     |
| Vodka                                   | 1                                  | 2   |          |     |          |     |                   |     |
| Water Acid - mine water                 | 1                                  | 1   | 1        | 1   | 3        | 4   | 2                 | 4   |
| Water in Oil Emulsions                  | 1                                  |     |          |     |          |     |                   |     |
| Water - distilled                       | 1                                  | 1   | 1        | 1   | 3        | 4   | 2                 | 4   |
| Water - fresh                           | 1                                  | 1   | 1        | 1   | 3        | 4   | 2                 | 4   |
| Water - salt                            | 1                                  | 1   | 1        | 1   | 3        | 4   | 2                 | 4   |
| Whiskey                                 | 1                                  | 2   |          |     |          |     |                   |     |
| White Gasoline                          | 1                                  | 1   | 1        | 1   | 1        | 2   | 1                 | 2   |
| White Liquor (paper)                    | 1                                  | 1   |          |     |          |     |                   |     |
| Wines                                   | 1                                  | 2   |          |     |          |     |                   |     |
| Wood Oil                                | 1                                  |     |          |     |          |     |                   |     |
| Xylene                                  | 4                                  | 4   | 1        | 1   | 2        | 3   | 2                 | 3   |
| Xylol                                   | 4                                  | 4   | 1        | 1   | 2        | 3   | 2                 | 3   |
| Yeast                                   | 1                                  | 2   |          |     |          |     |                   |     |
| Yogurt                                  | 1                                  | 2   |          |     |          |     |                   |     |
| Zeric                                   | 2                                  |     |          |     |          |     |                   |     |
| Zinc Acetate                            | 1                                  |     |          |     |          |     |                   |     |
| Zinc Chloride Solutions                 | 1                                  |     |          |     |          |     |                   |     |
| Zinc Chromate                           | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Zinc Cyanide                            | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |
| Zinc Hydrate                            | 1                                  |     |          |     |          |     |                   |     |
| Zinc Nitrate                            | 1                                  | 1   | 1        | 1   | 1        |     | 1                 | 1   |
| Zinc Sulfate                            | 1                                  | 1   | 1        | 1   | 1        | 1   | 1                 | 1   |

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# METRIC CONVERSIONS

| INCHES     |         | METRIC |
|------------|---------|--------|
| FRACTIONAL | DECIMAL | MM     |
|            | 0.0039  | 0.1    |
|            | 0.0079  | 0.2    |
|            | 0.0118  | 0.3    |
| 1/64       | 0.0156  | 0.3969 |
|            | 0.0157  | 0.4    |
|            | 0.0197  | 0.5    |
|            | 0.0236  | 0.6    |
|            | 0.0276  | 0.7    |
| 3/64       | 0.0313  | 0.7938 |
|            | 0.0315  | 0.8    |
|            | 0.0354  | 0.9    |
|            | 0.0394  | 1      |
|            | 0.0433  | 1.1    |
|            | 0.0469  | 1.1906 |
|            | 0.0472  | 1.2    |
|            | 0.0512  | 1.3    |
|            | 0.0551  | 1.4    |
|            | 0.0591  | 1.5    |
| 1/16       | 0.0625  | 1.5875 |
|            | 0.063   | 1.6    |
|            | 0.0669  | 1.7    |
|            | 0.0709  | 1.8    |
|            | 0.0748  | 1.9    |
| 5/64       | 0.0781  | 1.9844 |
|            | 0.0787  | 2      |
|            | 0.0827  | 2.1    |
|            | 0.0866  | 2.2    |
|            | 0.0906  | 2.3    |
| 3/32       | 0.0938  | 2.3813 |
|            | 0.0945  | 2.4    |
|            | 0.0984  | 2.5    |
| 7/64       | 0.1094  | 2.7781 |
|            | 0.1181  | 3      |
| 1/8        | 0.125   | 3.175  |
|            | 0.1378  | 3.5    |
| 9/64       | 0.1406  | 3.5719 |
| 5/32       | 0.1563  | 3.9688 |
|            | 0.1575  | 4      |
| 10/64      | 0.1719  | 4.3656 |
|            | 0.1772  | 4.5    |
| 3/16       | 0.1875  | 4.7625 |

| INCHES     |         | METRIC  |
|------------|---------|---------|
| FRACTIONAL | DECIMAL | MM      |
| .          | 0.1969  | 5       |
| 13/64      | 0.2031  | 5.1594  |
| .          | 0.2165  | 5.5     |
| 7/32       | 0.2188  | 5.5563  |
| 15/64      | 0.2344  | 5.9531  |
| .          | 0.2362  | 6       |
| 1/4        | 0.25    | 6.35    |
| .          | 0.2559  | 6.5     |
| 17/64      | 0.2656  | 6.7469  |
| .          | 0.2756  | 7       |
| 9/32       | 0.2813  | 7.1438  |
| .          | 0.2953  | 7.5     |
| 19/64      | 0.2969  | 7.5406  |
| 5/16       | 0.3125  | 7.9375  |
| .          | 0.315   | 8       |
| 21/64      | 0.3281  | 8.3344  |
| .          | 0.3346  | 8.5     |
| 9/32       | 0.3438  | 8.7313  |
| .          | 0.3543  | 9       |
| 23/64      | 0.3594  | 9.1281  |
| .          | 0.374   | 9.5     |
| 3/8        | 0.375   | 9.525   |
| 25/64      | 0.3906  | 9.9219  |
| .          | 0.3937  | 10      |
| 13/32      | 0.4063  | 10.3188 |
| .          | 0.4134  | 10.5    |
| 27/64      | 0.4219  | 10.7156 |
| .          | 0.4331  | 11      |
| 7/16       | 0.4375  | 11.1125 |
| .          | 0.4528  | 11.5    |
| 29/64      | 0.4531  | 11.5094 |
| 15/32      | 0.4688  | 11.9063 |
| .          | 0.4724  | 12      |
| 31/64      | 0.4844  | 12.3031 |
| .          | 0.4921  | 12.5    |
| 1/2        | 0.5     | 12.7    |
| .          | 0.5118  | 13      |
| 33/64      | 0.5156  | 13.0969 |
| 17/32      | 0.5313  | 13.4938 |
| .          | 0.5315  | 13.5    |
| 35/64      | 0.5469  | 13.8906 |

| INCHES     |         | METRIC  |
|------------|---------|---------|
| FRACTIONAL | DECIMAL | MM      |
| .          | 0.5512  | 14      |
| 9/16       | 0.5625  | 14.2875 |
| .          | 0.5709  | 14.5    |
| 37/64      | 0.5781  | 14.6844 |
| .          | 0.5906  | 15      |
| 19/32      | 0.5938  | 15.0813 |
| 39/64      | 0.6094  | 15.4781 |
| .          | 0.6102  | 15.5    |
| 5/8        | 0.625   | 15.875  |
| .          | 0.6299  | 16      |
| 41/64      | 0.6406  | 16.2719 |
| .          | 0.6496  | 16.5    |
| 21/32      | 0.6563  | 16.6688 |
| .          | 0.6693  | 17      |
| 43/64      | 0.6719  | 17.0656 |
| 11/16      | 0.6875  | 17.4625 |
| .          | 0.689   | 17.5    |
| 45/64      | 0.7031  | 17.8594 |
| .          | 0.7087  | 18      |
| 23/32      | 0.7188  | 18.2563 |
| .          | 0.7283  | 18.5    |
| 47/64      | 0.7344  | 18.6531 |
| .          | 0.748   | 19      |
| 3/4        | 0.75    | 19.05   |
| 49/64      | 0.7656  | 19.4469 |
| .          | 0.7677  | 19.5    |
| 25/32      | 0.7813  | 19.8438 |
| .          | 0.7874  | 20      |
| 51/64      | 0.7969  | 20.2406 |
| .          | 0.8071  | 20.5    |
| 13/16      | 0.8125  | 20.6375 |
| .          | 0.8268  | 21      |
| 53/64      | 0.8281  | 21.0344 |
| 27/32      | 0.8438  | 21.4313 |
| .          | 0.8465  | 21.5    |
| 55/64      | 0.8594  | 21.8281 |
| .          | 0.8661  | 22      |
| 7/8        | 0.875   | 22.225  |
| .          | 0.8858  | 22.5    |
| 57/64      | 0.8906  | 22.6219 |
| .          | 0.9055  | 23      |

# METRIC CONVERSIONS

| INCHES     |         | METRIC  |
|------------|---------|---------|
| FRACTIONAL | DECIMAL | MM      |
| 29/32      | 0.9063  | 23.0188 |
| 59/64      | 0.9219  | 23.4156 |
| .          | 0.9252  | 23.5    |
| 15/16      | 0.9375  | 23.8125 |
| .          | 0.9449  | 24      |
| 61/64      | 0.9531  | 24.2094 |
| .          | 0.9646  | 24.5    |
| 31/32      | 0.9688  | 24.6063 |
| .          | 0.9843  | 25      |
| 63/64      | 0.9844  | 25.0031 |
| 1          | 1       | 25.4    |
| .          | 1.0039  | 25.5    |
| .          | 1.0236  | 26      |
| .          | 1.0433  | 26.5    |
| .          | 1.063   | 27      |
| .          | 1.0827  | 27.5    |
| .          | 1.1024  | 28      |
| .          | 1.122   | 28.5    |
| .          | 1.1417  | 29      |
| .          | 1.1614  | 29.5    |
| .          | 1.1811  | 30      |
| .          | 1.2205  | 31      |
| 1 1/4      | 1.25    | 31.75   |
| .          | 1.2598  | 32      |
| .          | 1.2992  | 33      |
| .          | 1.3386  | 34      |
| .          | 1.378   | 35      |
| .          | 1.4173  | 36      |
| .          | 1.4567  | 37      |
| .          | 1.4961  | 38      |
| 1 1/2      | 1.5     | 38.1    |
| .          | 1.5354  | 39      |
| .          | 1.5748  | 40      |
| .          | 1.6142  | 41      |
| .          | 1.6535  | 42      |
| .          | 1.6929  | 43      |
| .          | 1.7323  | 44      |
| 1 3/4      | 1.75    | 44.45   |
| .          | 1.7717  | 45      |
| .          | 1.811   | 46      |
| .          | 1.8504  | 47      |

| INCHES     |         | METRIC |
|------------|---------|--------|
| FRACTIONAL | DECIMAL | MM     |
| .          | 1.8898  | 48     |
| .          | 1.9291  | 49     |
| .          | 1.9685  | 50     |
| 2          | 2       | 50.8   |
| .          | 2.0079  | 51     |
| .          | 2.0472  | 52     |
| .          | 2.0866  | 53     |
| .          | 2.126   | 54     |
| .          | 2.1654  | 55     |
| .          | 2.2047  | 56     |
| .          | 2.2441  | 57     |
| 2 1/4      | 2.25    | 57.15  |
| .          | 2.2835  | 58     |
| .          | 2.3228  | 59     |
| .          | 2.3622  | 60     |
| .          | 2.4016  | 61     |
| .          | 2.4409  | 62     |
| .          | 2.4803  | 63     |
| 2 1/2      | 2.5     | 63.5   |
| .          | 2.5197  | 64     |
| .          | 2.5591  | 65     |
| .          | 2.5984  | 66     |
| .          | 2.6378  | 67     |
| .          | 2.6772  | 68     |
| .          | 2.7165  | 69     |
| 2 3/4      | 2.75    | 69.85  |
| .          | 2.7559  | 70     |
| .          | 2.7953  | 71     |
| .          | 2.8346  | 72     |
| .          | 2.874   | 73     |
| .          | 2.9134  | 74     |
| .          | 2.9528  | 75     |
| .          | 2.9921  | 76     |
| 3          | 3       | 76.2   |
| .          | 3.0315  | 77     |
| .          | 3.0709  | 78     |
| .          | 3.1102  | 79     |
| .          | 3.1496  | 80     |
| .          | 3.189   | 81     |
| .          | 3.2283  | 82     |
| .          | 3.2677  | 83     |

| INCHES     |         | METRIC |
|------------|---------|--------|
| FRACTIONAL | DECIMAL | MM     |
| .          | 3.3071  | 84     |
| .          | 3.3465  | 85     |
| .          | 3.3858  | 86     |
| .          | 3.4252  | 87     |
| .          | 3.4646  | 88     |
| 3 1/2      | 3.5     | 88.9   |
| .          | 3.5039  | 89     |
| .          | 3.5433  | 90     |
| .          | 3.5827  | 91     |
| .          | 3.622   | 92     |
| .          | 3.6614  | 93     |
| .          | 3.7008  | 94     |
| .          | 3.7402  | 95     |
| .          | 3.7795  | 96     |
| .          | 3.8189  | 97     |
| .          | 3.8583  | 98     |
| .          | 3.8976  | 99     |
| .          | 3.937   | 100    |
| 4          | 4       | 101.6  |
| .          | 4.3307  | 110    |
| 4 1/2      | 4.5     | 114.3  |
| .          | 4.7244  | 120    |
| 5          | 5       | 127    |
| .          | 5.1181  | 130    |
| .          | 5.1118  | 140    |
| .          | 5.9055  | 150    |
| 6          | 6       | 152.4  |
| .          | 6.2992  | 160    |
| .          | 6.6929  | 170    |
| .          | 7.0866  | 180    |
| .          | 7.4803  | 190    |
| .          | 7.874   | 200    |
| 8          | 8       | 203.2  |
| .          | 9.8425  | 250    |
| 10         | 10      | 254    |
| 20         | 20      | 508    |
| 30         | 30      | 762    |
| 40         | 40      | 1016   |
| 60         | 60      | 1524   |
| 80         | 80      | 2032   |
| 100        | 100     | 2540   |

