



Do More.®



# CHAMPION FLAME SHIELD®

PHENOLIC CONDUIT

MADE IN  
THE U.S.A.

ISO 9001:2008 CERTIFIED

Champion Fiberglass, Inc. is the leading manufacturer of fiberglass conduit, Flame Shield and bridge hangers for electrical and mechanical markets.

Champion Fiberglass began production of epoxy fiberglass conduit and fittings in 1988. The company has the most advanced production facilities for manufacturing fiberglass conduit in North America. A well-trained and highly efficient work force utilizes proprietary high-speed winding equipment and high temperature curing ovens to ensure consistent production standards to produce the highest quality fiberglass conduit on the market.

In 1989, Champion Fiberglass developed the first conduit from epoxy resins that had flame resistance and low smoke characteristics, meeting the most stringent codes and specifications. Today this conduit system has been integrated into the **CHAMPION DUCT®** system and is **UL** and **CSA listed** for both below and above ground use.

Another milestone evolved in 2006 when Champion Fiberglass completed development of a Phenolic Conduit System, **FLAME SHIELD®**. It is now the number one choice conduit for subways, including tunnels and stations. **FLAME SHIELD** conforms to the **NFPA 130** requirements, including the 2010 edition.

In 2008, **CHAMPION FLAME SHIELD®** (XW Type fiberglass conduit) was allowed for use in **Class I Div 2** installations, per the **National Electrical Code (NEC)**. This was accomplished by Champion Fiberglass after having worked with UL and NEC on this issue for many years.

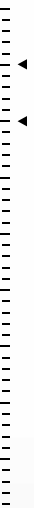
Champion Fiberglass is an **ISO 9001:2008 Certified Company**. We offer our customers innovative solutions with the highest quality products and customer service available in our industry. Our headquarters and manufacturing are located in Spring, Texas.



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Champion Fiberglass's comprehensive line of phenolic conduit, **FLAME SHIELD®** is the number one choice of surface mounted conduit for transit and passenger rail systems including subway tunnels and stations. **FLAME SHIELD** conforms to the latest **NFPA 130** requirements.

The **FLAME SHIELD** conduit system provides for improved system longevity and relief from stray eddy current issues common with some transit systems. It is a system that handles the damp, cold environments found in subterranean transit and rail systems while providing a low coefficient of thermal expansion. **FLAME SHIELD** is a non-metallic system tested and proven to handle the elevated conduit temperature requirements of **NFPA 130** and **NFPA 502**. It does this while maintaining low smoke density and without release of toxic gases.

**FLAME SHIELD** is manufactured without generating formaldehyde or residual corrosive by-products. In addition, this lightweight and cost effective system is easy on the maintenance crew.

**FLAME SHIELD** is an engineered product by the industry's foremost manufacturer of Reinforced Thermosetting Resin Conduit (RTRC), Champion Fiberglass, an **ISO 9001:2008 Certified Company**.

### ***Important differences between... CHAMPION DUCT® vs. FLAME SHIELD®***

A key difference between **CHAMPION DUCT** fiberglass conduit (RTRC) and **FLAME SHIELD** phenolic conduit is that phenolic conduit meets the elevated temperatures requirements of exposed conduits by **NFPA 130** and **ASTM E136**. This allows **FLAME SHIELD** to be in compliance when surface mounted. Fiberglass conduit (RTRC) is in compliance when encased in concrete. In addition, **FLAME SHIELD** has met the increased temperature and duration demands of **NFPA 502**.

To meet the requirements of **NFPA 130** and **502**, Champion has developed a phenolic conduit adhesive system that maintains the integrity of the conduit system. If those standards are not required, Champion's epoxy adhesive system is available.

Another important difference between fiberglass conduit (RTRC) and phenolic conduit is the low flame spread and low smoke characteristics of **FLAME SHIELD**. This allows **FLAME SHIELD** to be used in applications requiring these low numbers.

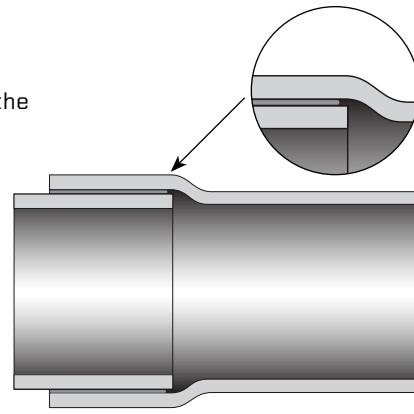
Due to the physical properties of phenolic conduit, **FLAME SHIELD** is not field bendable for elbows or offsets. Field bending is allowed for **CHAMPION DUCT** (RTRC) by **NFPA 70** (National Electric Code).

Phenolic **FLAME SHIELD** SW (Standard Wall) and MW (Medium Wall) conduits are not **UL** listed due to their physical properties. Phenolic **FLAME SHIELD** XW is **UL** listed and approved.



## ADHESIVE JOINT

The Adhesive Joint is the straight socket joint combined with the appropriate adhesive. The adhesive is applied to the spigot end of the conduit. Please select an adhesive from page 34.

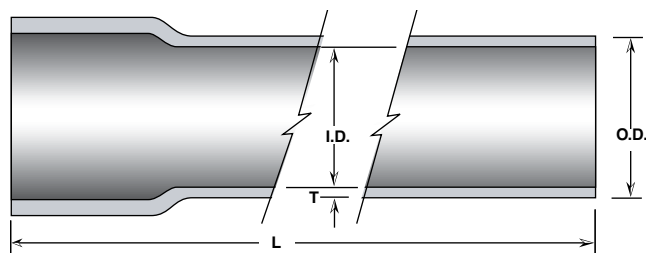


## EXPANSION JOINTS

We recommend that expansion fittings should be provided to compensate for thermal expansion and contraction where the length change is expected to be ¼ inch (**6 mm**) or greater in a straight run between securely mounted items such as boxes, cabinets, elbows, or other conduit terminations.

Expansion Characteristics of Flame Shield (Phenolic Conduit)  
Coefficient of Thermal Expansion =  $5.1 \times 10^{-6}$  in/in/°F ( $9.27 \times 10^{-6}$  mm/mm/°C)

| Temperature Change (°F) | Length Change (in/100 ft) | Temperature Change (°F) | Length Change (in/100 ft) | Temperature Change (°C) | Length Change (mm/m) |
|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|----------------------|
| 5                       | 0.03                      | 105                     | 0.64                      | 5                       | 0.05                 |
| 10                      | 0.06                      | 110                     | 0.67                      | 10                      | 0.09                 |
| 15                      | 0.09                      | 115                     | 0.70                      | 15                      | 0.14                 |
| 20                      | 0.12                      | 120                     | 0.73                      | 20                      | 0.19                 |
| 25                      | 0.15                      | 125                     | 0.77                      | 25                      | 0.23                 |
| 30                      | 0.18                      | 130                     | 0.80                      | 30                      | 0.28                 |
| 35                      | 0.21                      | 135                     | 0.83                      | 35                      | 0.32                 |
| 40                      | 0.24                      | 140                     | 0.86                      | 40                      | 0.37                 |
| 45                      | 0.28                      | 145                     | 0.89                      | 45                      | 0.42                 |
| 50                      | 0.31                      | 150                     | 0.92                      | 50                      | 0.46                 |
| 55                      | 0.34                      | 155                     | 0.95                      | 55                      | 0.51                 |
| 60                      | 0.37                      | 160                     | 0.98                      | 60                      | 0.56                 |
| 65                      | 0.40                      | 165                     | 1.01                      | 65                      | 0.60                 |
| 70                      | 0.43                      | 170                     | 1.04                      | 70                      | 0.65                 |
| 75                      | 0.46                      | 175                     | 1.07                      | 75                      | 0.70                 |
| 80                      | 0.49                      | 180                     | 1.10                      | 80                      | 0.74                 |
| 85                      | 0.52                      | 185                     | 1.13                      | 85                      | 0.79                 |
| 90                      | 0.55                      | 190                     | 1.16                      | 90                      | 0.83                 |
| 95                      | 0.58                      | 195                     | 1.19                      | 95                      | 0.88                 |
| 100                     | 0.61                      | 200                     | 1.22                      | 100                     | 0.93                 |



## STRAIGHT SOCKET JOINT (IPS)

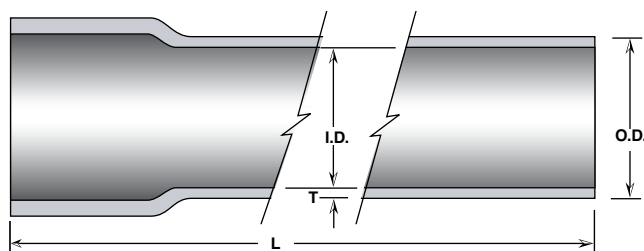
| Type SW (Standard Wall) Inches (Metric) |             |                  |                              |                      |                             |              |             |
|-----------------------------------------|-------------|------------------|------------------------------|----------------------|-----------------------------|--------------|-------------|
| Nominal. Size                           | Item No.    | Outside Diameter |                              | Min. Inside Diameter | Nominal Wall Thickness* (T) | Length* (L)  | Weight      |
|                                         |             | Average          | Tolerance                    |                      |                             |              | lbs/ft kg/m |
| ¾ (19)                                  | 07E-SW-10S  | 1.050 (27)       | +0.028 (0.7)<br>-0.018 (0.4) | 0.910 (23)           | .070 (2)                    | 10 ft (3m)   | .17 (0.25)  |
| 1 (25)                                  | 10E-SW-10S  | 1.315 (33)       | +0.028 (0.7)<br>-0.018 (0.4) | 1.175 (30)           | .070 (2)                    | 10 ft (3m)   | .19 (0.28)  |
| 1¼ (32)                                 | 12E-SW-20-S | 1.660 (42)       | +0.028 (0.7)<br>-0.018 (0.4) | 1.520 (39)           | .070 (2)                    | 20 ft (6.1m) | .23 (0.34)  |
| 1½ (38)                                 | 15E-SW-20-S | 1.900 (48)       | +0.028 (0.7)<br>-0.018 (0.4) | 1.760 (45)           | .070 (2)                    | 20 ft (6.1m) | .33 (0.49)  |
| 2 (51)                                  | 20E-SW-20-S | 2.375 (60)       | +0.028 (0.7)<br>-0.018 (0.4) | 2.235 (57)           | .070 (2)                    | 20 ft (6.1m) | .38 (0.57)  |
| 2½ (64)                                 | 25E-SW-20-S | 2.875 (73)       | +0.028 (0.7)<br>-0.018 (0.4) | 2.740 (69)           | .070 (2)                    | 20 ft (6.1m) | .46 (0.68)  |
| 3 (76)                                  | 30E-SW-20-S | 3.500 (89)       | +0.028 (0.7)<br>-0.018 (0.4) | 3.360 (85)           | .070 (2)                    | 20 ft (6.1m) | .60 (0.89)  |
| 4 (102)                                 | 40E-SW-20-S | 4.460 (113)      | +0.028 (0.7)<br>-0.018 (0.4) | 4.320 (110)          | .070 (2)                    | 20 ft (6.1m) | .72 (1.07)  |

| Type MW (Medium Wall) Inches (Metric) |             |             |                              |             |          |              |             |
|---------------------------------------|-------------|-------------|------------------------------|-------------|----------|--------------|-------------|
| 5 (127)                               | 50E-MW-20-S | 5.572 (142) | +0.034 (0.9)<br>-0.028 (0.7) | 5.380 (137) | .096 (2) | 20 ft (6.1m) | 1.20 (1.79) |
| 6 (152)                               | 60E-MW-20-S | 6.627 (168) | +0.034 (0.9)<br>-0.028 (0.7) | 6.435 (163) | .096 (2) | 20 ft (6.1m) | 1.42 (2.11) |
| 8 (203)                               | 80E-MW-20-S | 8.620 (219) | +0.034 (0.9)<br>-0.028 (0.7) | 8.400 (213) | .110 (3) | 20 ft (6.1m) | 2.14 (3.20) |

| Type HW (Heavy Wall) Inches (Metric) |             |             |                              |             |          |              |             |
|--------------------------------------|-------------|-------------|------------------------------|-------------|----------|--------------|-------------|
| 4 (102)                              | 40E-HW-20-S | 4.512 (115) | +0.028 (0.7)<br>-0.022 (0.6) | 4.320 (110) | .096 (2) | 20 ft (6.1m) | 0.97 (1.44) |
| 5 (127)                              | 50E-HW-20-S | 5.600 (142) | +0.034 (0.9)<br>-0.028 (0.7) | 5.380 (137) | .110 (3) | 20 ft (6.1m) | 1.32 (1.96) |
| 6 (152)                              | 60E-HW-20-S | 6.655 (169) | +0.034 (0.9)<br>-0.028 (0.7) | 6.435 (163) | .110 (3) | 20 ft (6.1m) | 1.63 (2.43) |
| 8 (203)                              | 80E-HW-20-S | 8.650 (220) | +0.034 (0.9)<br>-0.028 (0.7) | 8.400 (213) | .125 (3) | 20 ft (6.1m) | 2.43 (3.62) |

Note: 10 ft (3.05 m) lengths available.

\* Actual wall thickness is that required to meet the performance requirements for specifications. Other wall thicknesses are available by special request.



## STRAIGHT SOCKET JOINT (ID)

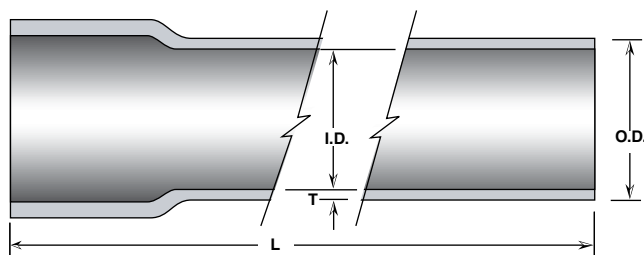
| Type SW (Standard Wall) Inches (Metric) |             |                  |                              |                      |                             |              |             |
|-----------------------------------------|-------------|------------------|------------------------------|----------------------|-----------------------------|--------------|-------------|
| Nominal Size                            | Item No.    | Outside Diameter |                              | Min. Inside Diameter | Nominal Wall Thickness* (T) | Length** (L) | Weight      |
| Average                                 |             | Tolerance        |                              |                      |                             |              | lbs/ft kg/m |
| 2 (51)                                  | 20F-SW-20-S | 2.140 (54)       | +0.028 (0.7)<br>-0.018 (0.4) | 2.000 (51)           | .070 (2)                    | 20 ft (6.1m) | 0.34 (0.51) |
| 2½ (64)                                 | 25F-SW-20-S | 2.640 (67)       | +0.028 (0.7)<br>-0.018 (0.4) | 2.500 (64)           | .070 (2)                    | 20 ft (6.1m) | 0.42 (0.63) |
| 3 (76)                                  | 30F-SW-20-S | 3.140 (80)       | +0.028 (0.7)<br>-0.018 (0.4) | 3.000 (76)           | .070 (2)                    | 20 ft (6.1m) | 0.48 (0.72) |
| 3½ (89)                                 | 35F-SW-20-S | 3.640 (92)       | +0.028 (0.7)<br>-0.018 (0.4) | 3.500 (89)           | .070 (2)                    | 20 ft (6.1m) | 0.60 (0.89) |
| 4 (102)                                 | 40F-SW-20-S | 4.140 (105)      | +0.028 (0.7)<br>-0.018 (0.4) | 4.000 (101)          | .070 (2)                    | 20 ft (6.1m) | 0.69 (1.03) |
| 4½ (114)                                | 45F-SW-20-S | 4.640 (118)      | +0.028 (0.7)<br>-0.018 (0.4) | 4.500 (114)          | .070 (2)                    | 20 ft (6.1m) | 0.75 (1.12) |

| Type MW (Medium Wall) Inches (Metric) |              |              |                              |                      |                             |              |             |
|---------------------------------------|--------------|--------------|------------------------------|----------------------|-----------------------------|--------------|-------------|
| Item No.                              | Item No.     | Average      | Tolerance                    | Min. Inside Diameter | Nominal Wall Thickness* (T) | Length** (L) | Weight      |
| 5 (127)                               | 50F-MW-20-S  | 5.192 (131)  | +0.034 (0.9)<br>-0.028 (0.7) | 5.000 (127)          | .096 (2)                    | 20 ft (6.1m) | 1.13 (1.68) |
| 6 (152)                               | 60F-MW-20-S  | 6.192 (157)  | +0.034 (0.9)<br>-0.028 (0.7) | 6.000 (152)          | .096 (2)                    | 20 ft (6.1m) | 1.35 (2.01) |
| 8 (203)                               | 80F-MW-20-S  | 8.220 (209)  | +0.028 (0.7)<br>-0.018 (0.4) | 8.000 (203)          | .110 (3)                    | 20 ft (6.1m) | 2.13 (3.17) |
| 10 (254)                              | 100F-MW-20-S | 10.312 (262) | +0.034 (0.9)<br>-0.028 (0.7) | 10.000 (254)         | .156 (4)                    | 20 ft (6.1m) | 3.65 (5.43) |
| 12 (305)                              | 120F-MW-20-S | 12.312 (313) | +0.034 (0.9)<br>-0.028 (0.7) | 12.000 (305)         | .156 (4)                    | 20 ft (6.1m) | 4.37 (6.50) |

| Type HW (Heavy Wall) Inches (Metric) |              |              |                              |                      |                             |              |             |
|--------------------------------------|--------------|--------------|------------------------------|----------------------|-----------------------------|--------------|-------------|
| Item No.                             | Item No.     | Average      | Tolerance                    | Min. Inside Diameter | Nominal Wall Thickness* (T) | Length** (L) | Weight      |
| 4 (102)                              | 40F-HW-20-S  | 4.192 (106)  | +0.028 (0.7)<br>-0.022 (0.6) | 4.000 (101)          | .096 (2)                    | 20 ft (6.1m) | 0.92 (1.37) |
| 4½ (114)                             | 45F-HW-20-S  | 4.692 (119)  | +0.028 (0.7)<br>-0.022 (0.6) | 4.500 (114)          | .096 (2)                    | 20 ft (6.1m) | 1.04 (1.55) |
| 5 (127)                              | 50F-HW-20-S  | 5.220 (132)  | +0.034 (0.9)<br>-0.028 (0.7) | 5.000 (127)          | .110 (3)                    | 20 ft (6.1m) | 1.30 (1.92) |
| 6 (152)                              | 60F-HW-20-S  | 6.220 (158)  | +0.034 (0.9)<br>-0.028 (0.7) | 6.000 (152)          | .110 (3)                    | 20 ft (6.1m) | 1.58 (2.35) |
| 8 (203)                              | 80F-HW-20-S  | 8.250 (210)  | +0.028 (0.7)<br>-0.018 (0.4) | 8.000 (203)          | .125 (3)                    | 20 ft (6.1m) | 2.42 (3.60) |
| 10 (254)                             | 100F-HW-20-S | 10.376 (264) | +0.034 (0.9)<br>-0.028 (0.7) | 10.000 (254)         | .188 (5)                    | 20 ft (6.1m) | 4.50 (6.70) |
| 12 (305)                             | 120F-HW-20-S | 12.376 (314) | +0.034 (0.9)<br>-0.028 (0.7) | 12.000 (305)         | .188 (5)                    | 20 ft (6.1m) | 5.38 (8.01) |

Note: 10 ft (3.05 m) lengths available.

\* Actual wall thickness is that required to meet the performance requirements for specifications. Other wall thicknesses are available by special request.



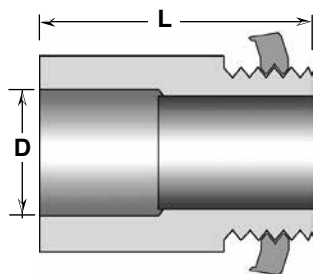
## STRAIGHT SOCKET JOINT (XW)

| Type XW (Xtra Wall) Inches (Metric) |              |                  |                              |                      |                             |              |              |
|-------------------------------------|--------------|------------------|------------------------------|----------------------|-----------------------------|--------------|--------------|
| Nominal Size                        | Item No.     | Outside Diameter |                              | Min. Inside Diameter | Nominal Wall Thickness* (T) | Length (L)   | Weight       |
|                                     |              | Average          | Tolerance                    |                      |                             |              | lbs/ft kg/m  |
| ¾ (19)                              | 07E-XW-10S   | 1.410 (36)       | +0.056 (1.4)<br>-0.036 (0.9) | 0.910 (23)           | .25 (6)                     | 10 ft (3m)   | .61 (.91)    |
| 1 (25)                              | 10E-XW-10S   | 1.675 (43)       | +0.056 (1.4)<br>-0.036 (0.9) | 1.175 (30)           | .25 (6)                     | 10 ft (3m)   | .68 (1.01)   |
| 1¼ (32)                             | 12E-XW-20-S  | 2.020 (51)       | +0.056 (1.4)<br>-0.036 (0.9) | 1.520 (39)           | .25 (6)                     | 20 ft (6.1m) | .82 (1.22)   |
| 1½ (38)                             | 15E-XW-20-S  | 2.260 (57)       | +0.056 (1.4)<br>-0.036 (0.9) | 1.760 (45)           | .25 (6)                     | 20 ft (6.1m) | 1.18 (1.76)  |
| 2 (51)                              | 20F-XW-20-S  | 2.500 (64)       | +0.056 (1.4)<br>-0.036 (0.9) | 2.000 (51)           | .25 (6)                     | 20 ft (6.1m) | 1.26 (1.88)  |
| 2½ (64)                             | 25F-XW-20-S  | 3.000 (76)       | +0.056 (1.4)<br>-0.036 (0.9) | 2.500 (64)           | .25 (6)                     | 20 ft (6.1m) | 1.54 (2.29)  |
| 3 (76)                              | 30F-XW-20-S  | 3.500 (89)       | +0.056 (1.4)<br>-0.036 (0.9) | 3.000 (76)           | .25 (6)                     | 20 ft (6.1m) | 1.82 (2.71)  |
| 3½ (89)                             | 35F-XW-20-S  | 4.000 (102)      | +0.056 (1.4)<br>-0.036 (0.9) | 3.500 (89)           | .25 (6)                     | 20 ft (6.1m) | 2.10 (3.13)  |
| 4 (102)                             | 40F-XW-20-S  | 4.500 (114)      | +0.056 (1.4)<br>-0.036 (0.9) | 4.000 (102)          | .25 (6)                     | 20 ft (6.1m) | 2.38 (3.54)  |
| 5 (127)                             | 50F-XW-20-S  | 5.500 (140)      | +0.056 (1.4)<br>-0.036 (0.9) | 5.000 (127)          | .25 (6)                     | 20 ft (6.1m) | 2.94 (4.38)  |
| 6 (152)                             | 60F-XW-20-S  | 6.500 (165)      | +0.056 (1.4)<br>-0.036 (0.9) | 6.000 (152)          | .25 (6)                     | 20 ft (6.1m) | 3.50 (5.21)  |
| 8** (203)                           | 80E-XW-20-S  | 8.900 (226)      | +0.056 (1.4)<br>-0.036 (0.9) | 8.400 (213)          | .25 (6)                     | 20 ft (6.1m) | 4.80 (7.14)  |
| 10 (254)                            | 100F-XW-20-S | 10.500 (267)     | +0.056 (1.4)<br>-0.036 (0.9) | 10.000 (254)         | .25 (6)                     | 20 ft (6.1m) | 5.74 (8.54)  |
| 12 (305)                            | 120F-XW-20-S | 12.500 (318)     | +0.056 (1.4)<br>-0.036 (0.9) | 12.000 (305)         | .25 (6)                     | 20 ft (6.1m) | 6.86 (10.21) |

Note: 10 ft. **(3.05 m)** lengths available for 1¼" nominal size and larger.

\* Actual wall thickness is that required to meet the performance requirements for specifications. Other wall thicknesses are available by special request.

\*\* XW type conduit is also available with an inside diameter of 8.000 (203). Please contact our factory for further information.



## BOX CONNECTOR

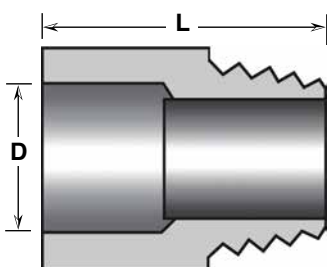
(Straight Threads)

A box connector creates a separable termination into a box. This connector has straight threads (NPS) and is supplied with a locknut. O-ring supplied upon request.

| Nominal Size | Type | IPS Item No. | D          | L       | Weight lbs | kg     |
|--------------|------|--------------|------------|---------|------------|--------|
| ¾            | SW   | 07E-SW-30    | 1.06 (27)  | 3 (76)  | 0.11       | (.05)  |
| 1            | SW   | 10E-SW-30    | 1.32 (34)  | 3 (76)  | 0.22       | (.10)  |
| 1¼           | SW   | 12E-SW-30    | 1.67 (42)  | 3 (76)  | 0.25       | (.12)  |
| 1½           | SW   | 15E-SW-30    | 1.91 (49)  | 3 (76)  | 0.29       | (.13)  |
| 2            | SW   | 20E-SW-30    | 2.40 (61)  | 5 (127) | 0.85       | (.39)  |
| 3            | SW   | 30E-SW-30    | 3.52 (89)  | 5 (127) | 1.28       | (.58)  |
| 4            | SW   | 40E-SW-30    | 4.47 (114) | 5 (127) | 2.09       | (.95)  |
| 4            | HW   | 40E-HW-30    | 4.52 (115) | 5 (127) | 2.09       | (.95)  |
| 5            | MW   | 50E-MW-30    | 5.59 (142) | 5 (127) | 2.75       | (1.25) |
| 5            | HW   | 50E-HW-30    | 5.63 (143) | 5 (127) | 2.75       | (1.25) |
| 6            | MW   | 60E-MW-30    | 6.66 (169) | 5 (127) | 2.97       | (1.35) |
| 6            | HW   | 60E-HW-30    | 6.69 (170) | 5 (127) | 2.97       | (1.35) |

| Nominal Size | Type | ID Item No. | D          | L       | Weight lbs | kg     |
|--------------|------|-------------|------------|---------|------------|--------|
| 2            | SW   | 20F-SW-30   | 2.16 (55)  | 5 (127) | 0.85       | (.39)  |
| 2½           | SW   | 25F-SW-30   | 2.66 (68)  | 5 (127) | 0.94       | (.43)  |
| 3            | SW   | 30F-SW-30   | 3.16 (80)  | 5 (127) | 1.28       | (.58)  |
| 3½           | SW   | 35F-SW-30   | 3.66 (93)  | 5 (127) | 1.77       | (.80)  |
| 4            | SW   | 40F-SW-30   | 4.16 (106) | 5 (127) | 2.09       | (.95)  |
| 4            | HW   | 40F-HW-30   | 4.20 (107) | 5 (127) | 2.09       | (.95)  |
| 4½           | SW   | 45F-SW-30   | 4.66 (118) | 5 (127) | 2.40       | (1.08) |
| 4½           | HW   | 45F-HW-30   | 4.70 (119) | 5 (127) | 2.40       | (1.08) |
| 5            | MW   | 50F-MW-30   | 5.20 (132) | 5 (127) | 2.75       | (1.25) |
| 5            | HW   | 50F-HW-30   | 5.24 (133) | 5 (127) | 2.75       | (1.25) |
| 6            | MW   | 60F-MW-30   | 6.20 (157) | 5 (127) | 2.97       | (1.35) |
| 6            | HW   | 60F-HW-30   | 6.24 (158) | 5 (127) | 2.97       | (1.35) |

| Nominal Size | Type | Item No.  | D          | L       | Weight lbs | kg     |
|--------------|------|-----------|------------|---------|------------|--------|
| ¾            | XW   | 07E-XW-30 | 1.44 (36)  | 3 (76)  | 0.11       | (0.05) |
| 1            | XW   | 10E-XW-30 | 1.70 (43)  | 3 (76)  | 0.22       | (0.10) |
| 1¼           | XW   | 12E-XW-30 | 2.05 (52)  | 3 (76)  | 0.35       | (0.16) |
| 1½           | XW   | 15E-XW-30 | 2.29 (58)  | 3 (76)  | 0.49       | (0.22) |
| 2            | XW   | 20F-XW-30 | 2.52 (64)  | 5 (127) | 0.85       | (0.39) |
| 3            | XW   | 30F-XW-30 | 3.52 (89)  | 5 (127) | 1.28       | (0.58) |
| 4            | XW   | 40F-XW-30 | 4.52 (115) | 7 (165) | 2.09       | (0.95) |
| 5            | XW   | 50F-XW-30 | 5.52 (140) | 7 (165) | 2.75       | (1.25) |
| 6            | XW   | 60F-XW-30 | 6.52 (166) | 7 (165) | 2.97       | (1.35) |



## MALE ADAPTER

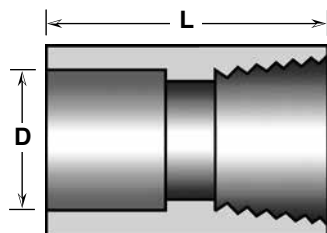
(Tapered Threads)

Male adapters with tapered threads (NPT) are generally used for joining to female threads of rigid steel, Myers type hubs or terminating into precast iron boxes with female thread entrances.

| Nominal Size | Type | IPS Item No. | D          | L       | Weight lbs | kg    |
|--------------|------|--------------|------------|---------|------------|-------|
| ¾            | SW   | 07E-SW-33    | 1.06 (27)  | 3 (76)  | 0.08       | (.04) |
| 1            | SW   | 10E-SW-33    | 1.32 (34)  | 3 (76)  | 0.08       | (.04) |
| 1¼           | SW   | 12E-SW-33    | 1.67 (42)  | 3 (76)  | 0.15       | (.07) |
| 1½           | SW   | 15E-SW-33    | 1.91 (49)  | 3 (76)  | 0.15       | (.07) |
| 2            | SW   | 20E-SW-33    | 2.40 (61)  | 5 (127) | 0.44       | (.20) |
| 3            | SW   | 30E-SW-33    | 3.52 (89)  | 5 (127) | 0.64       | (.29) |
| 4            | SW   | 40E-SW-33    | 4.47 (114) | 5 (127) | 0.93       | (.42) |
| 4            | HW   | 40E-HW-33    | 4.52 (115) | 5 (127) | 0.97       | (.44) |
| 5            | MW   | 50E-MW-33    | 5.59 (142) | 5 (127) | 1.30       | (.59) |
| 5            | HW   | 50E-HW-33    | 5.63 (143) | 5 (127) | 1.15       | (.52) |
| 6            | MW   | 60E-MW-33    | 6.66 (169) | 5 (127) | 1.70       | (.77) |
| 6            | HW   | 60E-HW-33    | 6.69 (170) | 5 (127) | 1.40       | (.64) |

| Nominal Size | Type | ID Item No. | D          | L       | Weight lbs | kg    |
|--------------|------|-------------|------------|---------|------------|-------|
| 2            | SW   | 20F-SW-33   | 2.16 (55)  | 5 (127) | 0.43       | (.20) |
| 2½           | SW   | 25F-SW-33   | 2.66 (68)  | 5 (127) | 0.62       | (.28) |
| 3            | SW   | 30F-SW-33   | 3.16 (80)  | 5 (127) | 0.76       | (.35) |
| 3½           | SW   | 35F-SW-33   | 3.66 (93)  | 5 (127) | 0.86       | (.39) |
| 4            | SW   | 40F-SW-33   | 4.16 (106) | 5 (127) | 1.02       | (.46) |
| 4            | HW   | 40F-HW-33   | 4.20 (107) | 5 (127) | 0.95       | (.43) |
| 4½           | SW   | 45F-SW-33   | 4.66 (118) | 5 (127) | 1.22       | (.55) |
| 4½           | HW   | 45F-HW-33   | 4.70 (119) | 5 (127) | 1.15       | (.52) |
| 5            | MW   | 50F-MW-33   | 5.20 (132) | 5 (127) | 1.30       | (.59) |
| 5            | HW   | 50F-HW-33   | 5.24 (133) | 5 (127) | 1.18       | (.54) |
| 6            | MW   | 60F-MW-33   | 6.20 (157) | 5 (127) | 1.40       | (.64) |
| 6            | HW   | 60F-HW-33   | 6.24 (158) | 5 (127) | 1.30       | (.59) |

| Nominal Size | Type | Item No.  | D          | L       | Weight lbs | kg     |
|--------------|------|-----------|------------|---------|------------|--------|
| ¾            | XW   | 07E-XW-33 | 1.44 (36)  | 3 (76)  | 0.09       | (0.04) |
| 1            | XW   | 10E-XW-33 | 1.70 (43)  | 3 (76)  | 0.19       | (0.09) |
| 1¼           | XW   | 12E-XW-33 | 2.05 (52)  | 3 (76)  | 0.24       | (0.11) |
| 1½           | XW   | 15E-XW-33 | 2.29 (58)  | 3 (76)  | 0.35       | (0.16) |
| 2            | XW   | 20F-XW-33 | 2.52 (64)  | 5 (127) | 0.69       | (0.31) |
| 2½           | XW   | 25F-XW-33 | 3.03 (77)  | 5 (127) | 0.85       | (0.38) |
| 3            | XW   | 30F-XW-33 | 3.52 (89)  | 5 (127) | 1.00       | (0.45) |
| 3½           | XW   | 35F-XW-33 | 4.03 (102) | 5 (127) | 1.28       | (0.58) |
| 4            | XW   | 40F-XW-33 | 4.52 (115) | 7 (178) | 1.56       | (0.71) |
| 5            | XW   | 50F-XW-33 | 5.52 (140) | 7 (178) | 2.08       | (0.94) |
| 6            | XW   | 60F-XW-33 | 6.52 (166) | 7 (178) | 2.47       | (1.12) |



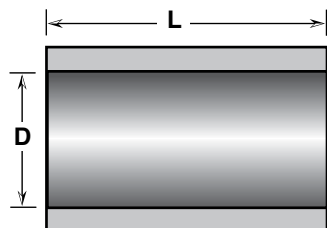
## FEMALE TERMINAL ADAPTER

This adapter is generally used for joining phenolic conduit with galvanized rigid steel (GRS) conduit. It has the same threads as GRS conduit and can easily be attached to GRS conduit.

| Nominal Size | Type | IPS Item No. | D          | L       | Weight lbs  | kg |
|--------------|------|--------------|------------|---------|-------------|----|
| ¾            | SW   | 07E-SW-32    | 1.06 (27)  | 3 (76)  | 0.07 (0.03) |    |
| 1            | SW   | 10E-SW-32    | 1.32 (34)  | 3 (76)  | 0.13 (0.06) |    |
| 1¼           | SW   | 12E-SW-32    | 1.67 (42)  | 3 (76)  | 0.18 (0.08) |    |
| 1½           | SW   | 15E-SW-32    | 1.91 (49)  | 3 (76)  | 0.21 (0.10) |    |
| 2            | SW   | 20E-SW-32    | 2.40 (61)  | 5 (127) | 0.47 (0.21) |    |
| 3            | SW   | 30E-SW-32    | 3.52 (89)  | 5 (127) | 0.80 (0.36) |    |
| 4            | SW   | 40E-SW-32    | 4.47 (114) | 5 (127) | 1.05 (0.48) |    |
| 4            | HW   | 40E-HW-32    | 4.52 (115) | 5 (127) | 1.00 (0.45) |    |
| 5            | MW   | 50E-MW-32    | 5.59 (142) | 5 (127) | 1.05 (0.48) |    |
| 5            | HW   | 50E-HW-32    | 5.63 (143) | 5 (127) | 1.00 (0.45) |    |
| 6            | MW   | 60E-MW-32    | 6.66 (169) | 5 (127) | 1.10 (0.50) |    |
| 6            | HW   | 60E-HW-32    | 6.69 (170) | 5 (127) | 1.05 (0.48) |    |

| Nominal Size | Type | ID Item No. | D          | L       | Weight lbs  | kg |
|--------------|------|-------------|------------|---------|-------------|----|
| 2            | SW   | 20F-SW-32   | 2.16 (55)  | 5 (127) | 0.75 (0.34) |    |
| 2½           | SW   | 25F-SW-32   | 2.66 (55)  | 5 (127) | 1.00 (0.45) |    |
| 3            | SW   | 30F-SW-32   | 3.16 (80)  | 5 (127) | 1.08 (0.49) |    |
| 3½           | SW   | 35F-SW-32   | 3.66 (93)  | 5 (127) | 1.18 (0.54) |    |
| 4            | SW   | 40F-SW-32   | 4.16 (106) | 5 (127) | 1.25 (0.57) |    |
| 4            | HW   | 40F-HW-32   | 4.20 (107) | 5 (127) | 1.08 (0.49) |    |
| 4½           | SW   | 45F-SW-32   | 4.66 (118) | 5 (127) | 1.50 (0.68) |    |
| 4½           | HW   | 45F-HW-32   | 4.70 (119) | 5 (127) | 1.40 (0.64) |    |
| 5            | MW   | 50F-MW-32   | 5.20 (132) | 5 (127) | 1.75 (0.80) |    |
| 5            | HW   | 50F-HW-32   | 5.24 (133) | 5 (127) | 1.65 (0.75) |    |
| 6            | MW   | 60F-MW-32   | 6.20 (157) | 5 (127) | 2.00 (0.91) |    |
| 6            | HW   | 60F-HW-32   | 6.24 (158) | 5 (127) | 1.83 (0.83) |    |

| Nominal Size | Type | Item No.  | D          | L       | Weight lbs  | kg |
|--------------|------|-----------|------------|---------|-------------|----|
| ¾            | XW   | 07E-XW-32 | 1.44 (36)  | 3 (76)  | 0.30 (0.14) |    |
| 1            | XW   | 10E-XW-32 | 1.70 (43)  | 3 (76)  | 0.38 (0.17) |    |
| 1¼           | XW   | 12E-XW-32 | 2.05 (52)  | 3 (76)  | 0.45 (0.20) |    |
| 1½           | XW   | 15E-XW-32 | 2.29 (58)  | 3 (76)  | 0.60 (0.27) |    |
| 2            | XW   | 20F-XW-32 | 2.52 (64)  | 5 (127) | 1.20 (0.55) |    |
| 2½           | XW   | 25F-XW-32 | 3.03 (77)  | 5 (127) | 0.85 (0.38) |    |
| 3            | XW   | 30F-XW-32 | 3.52 (89)  | 5 (127) | 1.40 (0.64) |    |
| 3½           | XW   | 35F-XW-32 | 4.03 (102) | 5 (127) | 1.28 (0.58) |    |
| 4            | XW   | 40F-XW-32 | 4.52 (115) | 7 (178) | 2.08 (0.94) |    |
| 5            | XW   | 50F-XW-32 | 5.52 (140) | 7 (178) | 2.60 (1.18) |    |
| 6            | XW   | 60F-XW-32 | 6.52 (166) | 7 (178) | 3.51 (1.59) |    |

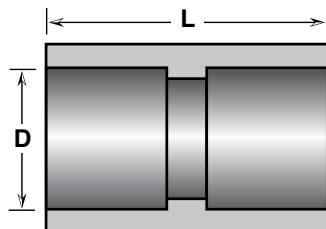


## SLEEVE COUPLING

| Nominal Size | Type | IPS Item No. | D          | L       | Weight lbs  | kg |
|--------------|------|--------------|------------|---------|-------------|----|
| ¾            | SW   | 07E-SW-42    | 1.06 (27)  | 6 (152) | 0.06 (0.03) |    |
| 1            | SW   | 10E-SW-42    | 1.32 (34)  | 6 (152) | 0.08 (0.04) |    |
| 1¼           | SW   | 12E-SW-42    | 1.67 (42)  | 6 (152) | 0.10 (0.05) |    |
| 1½           | SW   | 15E-SW-42    | 1.91 (49)  | 6 (152) | 0.11 (0.05) |    |
| 2            | SW   | 20E-SW-42    | 2.40 (61)  | 6 (152) | 0.20 (0.09) |    |
| 3            | SW   | 30E-SW-42    | 3.52 (89)  | 6 (152) | 0.30 (0.14) |    |
| 4            | SW   | 40E-SW-42    | 4.47 (114) | 6 (152) | 0.36 (0.16) |    |
| 4            | HW   | 40E-HW-42    | 4.52 (115) | 6 (152) | 0.50 (0.23) |    |
| 5            | MW   | 50E-MW-42    | 5.59 (142) | 6 (152) | 0.60 (0.27) |    |
| 5            | HW   | 50E-HW-42    | 5.63 (143) | 6 (152) | 0.70 (0.32) |    |
| 6            | MW   | 60E-MW-42    | 6.66 (169) | 6 (152) | 0.80 (0.36) |    |
| 6            | HW   | 60E-HW-42    | 6.69 (170) | 6 (152) | 0.90 (0.41) |    |

| Nominal Size | Type | ID Item No. | D          | L       | Weight lbs  | kg |
|--------------|------|-------------|------------|---------|-------------|----|
| 2            | SW   | 20F-SW-42   | 2.16 (55)  | 6 (152) | 0.17 (0.08) |    |
| 2½           | SW   | 25F-SW-42   | 2.66 (68)  | 6 (152) | 0.21 (0.10) |    |
| 3            | SW   | 30F-SW-42   | 3.16 (80)  | 6 (152) | 0.24 (0.11) |    |
| 3½           | SW   | 35F-SW-42   | 3.66 (93)  | 6 (152) | 0.32 (0.15) |    |
| 4            | SW   | 40F-SW-42   | 4.16 (106) | 6 (152) | 0.35 (0.16) |    |
| 4            | HW   | 40F-HW-42   | 4.20 (107) | 6 (152) | 0.46 (0.21) |    |
| 4½           | SW   | 45F-SW-42   | 4.66 (118) | 6 (152) | 0.38 (0.17) |    |
| 4½           | HW   | 45F-HW-42   | 4.70 (119) | 6 (152) | 0.54 (0.25) |    |
| 5            | MW   | 50F-MW-42   | 5.20 (132) | 6 (152) | 0.60 (0.27) |    |
| 5            | HW   | 50F-HW-42   | 5.24 (133) | 6 (152) | 0.70 (0.32) |    |
| 6            | MW   | 60F-MW-42   | 6.20 (157) | 6 (152) | 0.83 (0.38) |    |
| 6            | HW   | 60F-HW-42   | 6.24 (158) | 6 (152) | 1.15 (0.52) |    |

| Nominal Size | Type | Item No.  | D          | L        | Weight lbs  | kg |
|--------------|------|-----------|------------|----------|-------------|----|
| ¾            | XW   | 07E-XW-42 | 1.44 (36)  | 6 (152)  | 0.22 (0.10) |    |
| 1            | XW   | 10E-XW-42 | 1.70 (43)  | 6 (152)  | 0.29 (0.13) |    |
| 1¼           | XW   | 12E-XW-42 | 2.05 (52)  | 6 (152)  | 0.36 (0.16) |    |
| 1½           | XW   | 15E-XW-42 | 2.29 (58)  | 6 (152)  | 0.39 (0.18) |    |
| 2            | XW   | 20F-XW-42 | 2.52 (64)  | 6 (152)  | 0.53 (0.24) |    |
| 2½           | XW   | 25F-XW-42 | 3.03 (77)  | 6 (152)  | 0.77 (0.35) |    |
| 3            | XW   | 30F-XW-42 | 3.52 (89)  | 6 (152)  | 0.75 (0.34) |    |
| 3½           | XW   | 35F-XW-42 | 4.03 (102) | 6 (152)  | 1.12 (0.51) |    |
| 4            | XW   | 40F-XW-42 | 4.52 (115) | 10 (254) | 1.50 (0.68) |    |
| 5            | XW   | 50F-XW-42 | 5.52 (140) | 10 (254) | 2.08 (0.94) |    |
| 6            | XW   | 60F-XW-42 | 6.52 (166) | 10 (254) | 2.50 (1.13) |    |



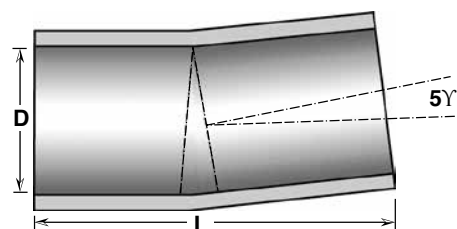
## STOP COUPLING

Stop coupling is sometimes referred to as a double bell coupling.

| Nominal Size | Type | IPS Item No. | D          | L       | Weight lbs  | kg |
|--------------|------|--------------|------------|---------|-------------|----|
| ¾            | SW   | 07E-SW-40    | 1.06 (27)  | 6 (152) | 0.07 (0.03) |    |
| 1            | SW   | 10E-SW-40    | 1.32 (34)  | 6 (152) | 0.08 (0.04) |    |
| 1¼           | SW   | 12E-SW-40    | 1.67 (42)  | 6 (152) | 0.09 (0.04) |    |
| 1½           | SW   | 15E-SW-40    | 1.91 (49)  | 6 (152) | 0.11 (0.05) |    |
| 2            | SW   | 20E-SW-40    | 2.40 (61)  | 6 (152) | 0.20 (0.10) |    |
| 3            | SW   | 30E-SW-40    | 3.52 (89)  | 6 (152) | 0.30 (0.14) |    |
| 4            | SW   | 40E-SW-40    | 4.47 (114) | 6 (152) | 0.43 (0.20) |    |
| 4            | HW   | 40E-HW-40    | 4.52 (115) | 6 (152) | 0.58 (0.26) |    |
| 5            | MW   | 50E-MW-40    | 5.59 (142) | 6 (152) | 0.70 (0.31) |    |
| 5            | HW   | 50E-HW-40    | 5.63 (143) | 6 (152) | 0.90 (0.41) |    |
| 6            | MW   | 60E-MW-40    | 6.66 (169) | 6 (152) | 0.85 (0.39) |    |
| 6            | HW   | 60E-HW-40    | 6.69 (170) | 6 (152) | 0.95 (0.43) |    |

| Nominal Size | Type | ID Item No. | D          | L       | Weight lbs  | kg |
|--------------|------|-------------|------------|---------|-------------|----|
| 2            | SW   | 20F-SW-40   | 2.16 (55)  | 6 (152) | 0.20 (0.09) |    |
| 2½           | SW   | 25F-SW-40   | 2.66 (68)  | 6 (152) | 0.25 (0.11) |    |
| 3            | SW   | 30F-SW-40   | 3.16 (80)  | 6 (152) | 0.30 (0.14) |    |
| 3½           | SW   | 35F-SW-40   | 3.66 (93)  | 6 (152) | 0.35 (0.16) |    |
| 4            | SW   | 40F-SW-40   | 4.16 (106) | 6 (152) | 0.40 (0.18) |    |
| 4            | HW   | 40F-HW-40   | 4.20 (107) | 6 (152) | 0.54 (0.25) |    |
| 4½           | SW   | 45F-SW-40   | 4.66 (118) | 6 (152) | 0.45 (0.20) |    |
| 4½           | HW   | 45F-HW-40   | 4.70 (119) | 6 (152) | 0.60 (0.27) |    |
| 5            | MW   | 50F-MW-40   | 5.20 (132) | 6 (152) | 0.68 (0.31) |    |
| 5            | HW   | 50F-HW-40   | 5.24 (133) | 6 (152) | 0.80 (0.36) |    |
| 6            | MW   | 60F-MW-40   | 6.20 (157) | 6 (152) | 0.80 (0.36) |    |
| 6            | HW   | 60F-HW-40   | 6.24 (158) | 6 (152) | 0.92 (0.42) |    |

| Nominal Size | Type | Item No.  | D          | L        | Weight lbs  | kg |
|--------------|------|-----------|------------|----------|-------------|----|
| ¾            | XW   | 07E-XW-40 | 1.44 (36)  | 6 (152)  | 0.22 (0.10) |    |
| 1            | XW   | 10E-XW-40 | 1.70 (43)  | 6 (152)  | 0.29 (0.13) |    |
| 1¼           | XW   | 12E-XW-40 | 2.05 (52)  | 6 (152)  | 0.36 (0.16) |    |
| 1½           | XW   | 15E-XW-40 | 2.29 (58)  | 6 (152)  | 0.39 (0.18) |    |
| 2            | XW   | 20F-XW-40 | 2.52 (64)  | 6 (152)  | 0.65 (0.29) |    |
| 2½           | XW   | 25F-XW-40 | 3.03 (77)  | 6 (152)  | 0.77 (0.35) |    |
| 3            | XW   | 30F-XW-40 | 3.52 (89)  | 6 (152)  | 0.95 (0.43) |    |
| 3½           | XW   | 35F-XW-40 | 4.03 (102) | 6 (152)  | 1.12 (0.51) |    |
| 4            | XW   | 40F-XW-40 | 4.52 (115) | 10 (254) | 2.00 (0.91) |    |
| 5            | XW   | 50F-XW-40 | 5.52 (140) | 10 (254) | 2.50 (1.13) |    |
| 6            | XW   | 60F-XW-40 | 6.52 (166) | 10 (254) | 2.90 (1.32) |    |



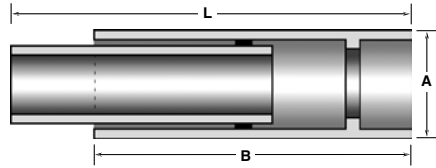
## 5° DOUBLE BELL COUPLING

Other angles can also be manufactured, such as 2.5° etc. Please contact factory for consultation.

| Nominal Size | Type | IPS Item No. | D          | L       | Weight lbs  | kg |
|--------------|------|--------------|------------|---------|-------------|----|
| ¾            | SW   | 07E-SW-44    | 1.06 (27)  | 6 (152) | 0.07 (0.03) |    |
| 1            | SW   | 10E-SW-44    | 1.32 (34)  | 6 (152) | 0.09 (0.04) |    |
| 1¼           | SW   | 12E-SW-44    | 1.67 (42)  | 6 (152) | 0.11 (0.05) |    |
| 1½           | SW   | 15E-SW-44    | 1.91 (49)  | 6 (165) | 0.13 (0.06) |    |
| 2            | SW   | 20E-SW-44    | 2.40 (61)  | 6 (152) | 0.22 (0.10) |    |
| 3            | SW   | 30E-SW-44    | 3.52 (89)  | 6 (152) | 0.32 (0.46) |    |
| 4            | SW   | 40E-SW-44    | 4.47 (114) | 6 (152) | 0.40 (0.18) |    |
| 4            | HW   | 40E-HW-44    | 4.52 (115) | 6 (152) | 0.60 (0.27) |    |
| 5            | MW   | 50E-MW-44    | 5.59 (142) | 6 (152) | 0.65 (0.30) |    |
| 5            | HW   | 50E-HW-44    | 5.63 (143) | 6 (152) | 0.75 (0.34) |    |
| 6            | MW   | 60E-MW-44    | 6.66 (169) | 6 (152) | 0.85 (0.39) |    |
| 6            | HW   | 60E-HW-44    | 6.69 (170) | 6 (152) | 0.95 (0.43) |    |

| Nominal Size | Type | ID Item No. | D          | L       | Weight lbs  | kg |
|--------------|------|-------------|------------|---------|-------------|----|
| 2            | SW   | 20F-SW-44   | 2.16 (55)  | 6 (152) | 0.18 (0.08) |    |
| 2½           | SW   | 25F-SW-44   | 2.66 (68)  | 6 (152) | 0.22 (0.10) |    |
| 3            | SW   | 30F-SW-44   | 3.16 (80)  | 6 (152) | 0.25 (0.11) |    |
| 3½           | SW   | 35F-SW-44   | 3.66 (93)  | 6 (152) | 0.32 (0.15) |    |
| 4            | SW   | 40F-SW-44   | 4.16 (106) | 6 (152) | 0.36 (0.16) |    |
| 4            | HW   | 40F-HW-44   | 4.20 (107) | 6 (152) | 0.48 (0.22) |    |
| 4½           | SW   | 45F-SW-44   | 4.66 (118) | 6 (152) | 0.40 (0.18) |    |
| 4½           | HW   | 45F-HW-44   | 4.70 (119) | 6 (152) | 0.56 (0.25) |    |
| 5            | MW   | 50F-MW-44   | 5.20 (132) | 6 (152) | 0.63 (0.29) |    |
| 5            | HW   | 50F-HW-44   | 5.24 (133) | 6 (152) | 0.73 (0.33) |    |
| 6            | MW   | 60F-MW-44   | 6.20 (157) | 6 (152) | 0.85 (0.39) |    |
| 6            | HW   | 60F-HW-44   | 6.24 (158) | 6 (152) | 1.20 (0.55) |    |

| Nominal Size | Type | Item No.  | D          | L        | Weight lbs  | kg |
|--------------|------|-----------|------------|----------|-------------|----|
| ¾            | XW   | 07E-XW-44 | 1.44 (36)  | 6 (152)  | 0.22 (0.10) |    |
| 1            | XW   | 10E-XW-44 | 1.70 (43)  | 6 (152)  | 0.29 (0.13) |    |
| 1¼           | XW   | 12E-XW-44 | 2.05 (52)  | 6 (152)  | 0.36 (0.16) |    |
| 1½           | XW   | 15E-XW-44 | 2.29 (58)  | 6 (152)  | 0.39 (0.18) |    |
| 2            | XW   | 20F-XW-44 | 2.52 (64)  | 6 (152)  | 0.55 (0.25) |    |
| 2½           | XW   | 25F-XW-44 | 3.03 (77)  | 6 (152)  | 0.77 (0.35) |    |
| 3            | XW   | 30F-XW-44 | 3.52 (89)  | 6 (152)  | 0.89 (0.40) |    |
| 3½           | XW   | 35F-XW-44 | 4.03 (102) | 6 (152)  | 1.02 (0.51) |    |
| 4            | XW   | 40F-XW-44 | 4.52 (115) | 10 (254) | 1.53 (0.67) |    |
| 5            | XW   | 50F-XW-44 | 5.52 (140) | 10 (254) | 2.17 (0.98) |    |
| 6            | XW   | 60F-XW-44 | 6.52 (166) | 10 (254) | 2.55 (1.16) |    |

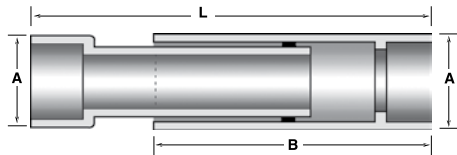


## SINGLE EXPANSION JOINT SOCKET X SPIGOT WITH O-RING

Installation of Expansion Joints:

- When the duct is shorter than 100 ft., no Expansion Joint needed
- When the duct is between 100 ft. up to 300 ft., install one Expansion Joint at the mid point
- If the duct is longer than 300 ft., install one Expansion Joint every 300 ft. apart

*Note: All Expansion Joints have a yellow line on the nipple end of the joint for proper installation.*



## SINGLE EXPANSION JOINT SOCKET X SOCKET WITH O-RING

Installation of Expansion Joints:

- When the duct is shorter than 100 ft., no Expansion Joint needed
- When the duct is between 100 ft. up to 300 ft., install one Expansion Joint at the mid point
- If the duct is longer than 300 ft., install one Expansion Joint every 300 ft. apart

*Note: All Expansion Joints have a yellow line on the nipple end of the joint for proper installation.*

| Nominal Size | Type | IPS Item No. | A          | B        | L - Min  | L - Max  | Weight lbs  | kg |
|--------------|------|--------------|------------|----------|----------|----------|-------------|----|
| ¾            | SW   | 07E-SW-36    | 1.20 (30)  | 12 (305) | 15 (381) | 23 (584) | 0.39 (0.18) |    |
| 1            | SW   | 10E-SW-36    | 1.46 (37)  | 12 (305) | 15 (381) | 23 (584) | 0.44 (0.20) |    |
| 1¼           | SW   | 12E-SW-36    | 1.81 (46)  | 12 (305) | 15 (381) | 23 (584) | 0.53 (0.24) |    |
| 1½           | SW   | 15E-SW-36    | 2.04 (52)  | 12 (305) | 15 (381) | 23 (584) | 0.76 (0.35) |    |
| 2            | SW   | 20E-SW-36    | 2.54 (65)  | 12 (305) | 15 (381) | 23 (584) | 0.87 (0.40) |    |
| 3            | SW   | 30E-SW-36    | 3.66 (93)  | 12 (305) | 15 (381) | 23 (584) | 1.38 (0.63) |    |
| 4            | SW   | 40E-SW-36    | 4.61 (117) | 12 (305) | 15 (381) | 23 (584) | 1.66 (0.75) |    |
| 4            | HW   | 40E-HW-36    | 4.69 (119) | 12 (305) | 15 (381) | 23 (584) | 2.23 (1.01) |    |
| 5            | MW   | 50E-MW-36    | 5.79 (147) | 12 (305) | 15 (381) | 23 (584) | 2.76 (1.25) |    |
| 5            | HW   | 50E-HW-36    | 5.85 (149) | 12 (305) | 15 (381) | 23 (584) | 2.99 (1.36) |    |
| 6            | MW   | 60E-MW-36    | 6.85 (174) | 12 (305) | 15 (381) | 23 (584) | 3.27 (1.49) |    |
| 6            | HW   | 60E-HW-36    | 6.91 (176) | 12 (305) | 15 (381) | 23 (584) | 3.75 (1.70) |    |

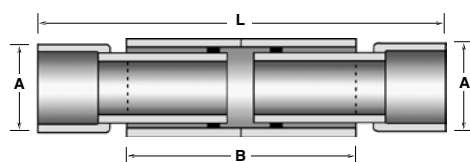
| Nominal Size | Type | ID Item No. | A          | B        | L - Min  | L - Max  | Weight lbs  | kg |
|--------------|------|-------------|------------|----------|----------|----------|-------------|----|
| 2            | SW   | 20F-SW-36   | 2.30 (58)  | 12 (305) | 15 (381) | 23 (584) | 0.78 (0.35) |    |
| 2½           | SW   | 25F-SW-36   | 2.80 (71)  | 12 (305) | 15 (381) | 23 (584) | 0.97 (0.44) |    |
| 3            | SW   | 30F-SW-36   | 3.30 (84)  | 12 (305) | 15 (381) | 23 (584) | 1.10 (0.50) |    |
| 3½           | SW   | 35F-SW-36   | 3.80 (96)  | 12 (305) | 15 (381) | 23 (584) | 1.38 (0.63) |    |
| 4            | SW   | 40F-SW-36   | 4.30 (109) | 12 (305) | 15 (381) | 23 (584) | 1.59 (0.72) |    |
| 4            | HW   | 40F-HW-36   | 4.39 (111) | 12 (305) | 15 (381) | 23 (584) | 2.12 (0.96) |    |
| 4½           | SW   | 45F-SW-36   | 4.80 (122) | 12 (305) | 15 (381) | 23 (584) | 1.73 (0.79) |    |
| 4½           | HW   | 45F-HW-36   | 4.89 (124) | 12 (305) | 15 (381) | 23 (584) | 2.39 (1.09) |    |
| 5            | MW   | 50F-MW-36   | 5.39 (137) | 12 (305) | 15 (381) | 23 (584) | 2.60 (1.18) |    |
| 5            | HW   | 50F-HW-36   | 5.42 (138) | 12 (305) | 15 (381) | 23 (584) | 2.99 (1.36) |    |
| 6            | MW   | 60F-MW-36   | 6.39 (162) | 12 (305) | 15 (381) | 23 (584) | 3.11 (1.41) |    |
| 6            | HW   | 60F-HW-36   | 6.42 (163) | 12 (305) | 15 (381) | 23 (584) | 3.63 (1.65) |    |

| Nominal Size | Type | Item No.  | A          | B        | L - Min  | L - Max  | Weight lbs   | kg |
|--------------|------|-----------|------------|----------|----------|----------|--------------|----|
| ¾            | XW   | 07E-XW-36 | 1.94 (54)  | 12 (305) | 15 (381) | 23 (584) | 1.40 (0.64)  |    |
| 1            | XW   | 10E-XW-36 | 2.20 (61)  | 12 (305) | 15 (381) | 23 (584) | 1.57 (0.71)  |    |
| 1¼           | XW   | 12E-XW-36 | 2.55 (65)  | 12 (305) | 15 (381) | 23 (584) | 1.89 (0.86)  |    |
| 1½           | XW   | 15E-XW-36 | 2.79 (71)  | 12 (305) | 15 (381) | 23 (584) | 2.72 (1.23)  |    |
| 2            | XW   | 20F-XW-36 | 3.00 (76)  | 12 (305) | 15 (381) | 23 (584) | 2.90 (1.32)  |    |
| 2½           | XW   | 25F-XW-36 | 3.53 (90)  | 12 (305) | 15 (381) | 23 (584) | 3.56 (1.61)  |    |
| 3            | XW   | 30F-XW-36 | 4.00 (102) | 12 (305) | 15 (381) | 23 (584) | 4.19 (1.90)  |    |
| 3½           | XW   | 35F-XW-36 | 4.53 (115) | 12 (305) | 15 (381) | 23 (584) | 4.83 (2.19)  |    |
| 4            | XW   | 40F-XW-36 | 5.00 (127) | 14 (356) | 19 (482) | 27 (686) | 6.42 (2.92)  |    |
| 5            | XW   | 50F-XW-36 | 6.00 (152) | 14 (356) | 19 (482) | 27 (686) | 7.94 (3.60)  |    |
| 6            | XW   | 60F-XW-36 | 7.00 (178) | 14 (356) | 19 (482) | 27 (686) | 10.06 (4.57) |    |

| Nominal Size | Type | IPS Item No. | A          | B        | L - Min  | L - Max  | Weight lbs  | kg |
|--------------|------|--------------|------------|----------|----------|----------|-------------|----|
| ¾            | SW   | 07E-SW-37    | 1.20 (30)  | 12 (305) | 18 (457) | 26 (660) | 0.49 (0.22) |    |
| 1            | SW   | 10E-SW-37    | 1.46 (37)  | 12 (305) | 18 (457) | 26 (660) | 0.55 (0.25) |    |
| 1¼           | SW   | 12E-SW-37    | 1.81 (46)  | 12 (305) | 18 (457) | 26 (660) | 0.66 (0.30) |    |
| 1½           | SW   | 15E-SW-37    | 2.04 (52)  | 12 (305) | 18 (457) | 26 (660) | 0.76 (0.35) |    |
| 2            | SW   | 20E-SW-37    | 2.54 (65)  | 12 (305) | 18 (457) | 26 (660) | 1.09 (0.50) |    |
| 3            | SW   | 30E-SW-37    | 3.66 (93)  | 12 (305) | 18 (457) | 26 (660) | 1.73 (0.79) |    |
| 4            | SW   | 40E-SW-37    | 4.61 (117) | 12 (305) | 18 (457) | 26 (660) | 2.07 (0.94) |    |
| 4            | HW   | 40E-HW-37    | 4.69 (119) | 12 (305) | 18 (457) | 26 (660) | 2.79 (1.27) |    |
| 5            | MW   | 50E-MW-37    | 5.79 (147) | 12 (305) | 18 (457) | 26 (660) | 3.45 (1.57) |    |
| 5            | HW   | 50E-HW-37    | 5.85 (149) | 12 (305) | 18 (457) | 26 (660) | 3.74 (1.70) |    |
| 6            | MW   | 60E-MW-37    | 6.85 (174) | 12 (305) | 18 (457) | 26 (660) | 4.08 (1.85) |    |
| 6            | HW   | 60E-HW-37    | 6.91 (176) | 12 (305) | 18 (457) | 26 (660) | 4.69 (2.13) |    |

| Nominal Size | Type | ID Item No. | A          | B        | L - Min  | L - Max  | Weight lbs  | kg |
|--------------|------|-------------|------------|----------|----------|----------|-------------|----|
| 2            | SW   | 20F-SW-37   | 2.30 (58)  | 12 (305) | 18 (457) | 26 (660) | 0.98 (0.45) |    |
| 2½           | SW   | 25F-SW-37   | 2.80 (71)  | 12 (305) | 18 (457) | 26 (660) | 1.21 (0.55) |    |
| 3            | SW   | 30F-SW-37   | 3.30 (84)  | 12 (305) | 18 (457) | 26 (660) | 1.38 (0.63) |    |
| 3½           | SW   | 35F-SW-37   | 3.80 (96)  | 12 (305) | 18 (457) | 26 (660) | 1.73 (0.79) |    |
| 4            | SW   | 40F-SW-37   | 4.30 (109) | 12 (305) | 18 (457) | 26 (660) | 1.98 (0.90) |    |
| 4            | HW   | 40F-HW-37   | 4.39 (111) | 12 (305) | 18 (457) | 26 (660) | 2.65 (1.20) |    |
| 4½           | SW   | 45F-SW-37   | 4.80 (122) | 12 (305) | 18 (457) | 26 (660) | 2.16 (0.98) |    |
| 4½           | HW   | 45F-HW-37   | 4.89 (124) | 12 (305) | 18 (457) | 26 (660) | 2.99 (1.36) |    |
| 5            | MW   | 50F-MW-37   | 5.39 (137) | 12 (305) | 18 (457) | 26 (660) | 3.25 (1.48) |    |
| 5            | HW   | 50F-HW-37   | 5.42 (138) | 12 (305) | 18 (457) | 26 (660) | 3.80 (1.73) |    |
| 6            | MW   | 60F-MW-37   | 6.39 (162) | 12 (305) | 18 (457) | 26 (660) | 3.88 (1.76) |    |
| 6            | HW   | 60F-HW-37   | 6.42 (163) | 12 (305) | 18 (457) | 26 (660) | 4.54 (2.06) |    |

| Nominal Size | Type | Item No.  | A          | B        | L - Min  | L - Max  | Weight lbs   | kg |
|--------------|------|-----------|------------|----------|----------|----------|--------------|----|
| ¾            | XW   | 07E-XW-37 | 1.94 (54)  | 12 (305) | 15 (381) | 23 (584) | 1.76 (0.80)  |    |
| 1            | XW   | 10E-XW-37 | 2.20 (61)  | 12 (305) | 15 (381) | 23 (584) | 1.97 (0.89)  |    |
| 1¼           | XW   | 12E-XW-37 | 2.55 (65)  | 12 (305) | 15 (381) | 23 (584) | 2.35 (1.07)  |    |
| 1½           | XW   | 15E-XW-37 | 2.79 (71)  | 12 (305) | 15 (381) | 23 (584) | 2.72 (1.23)  |    |
| 2            | XW   | 20F-XW-37 | 3.00 (76)  | 12 (305) | 18 (457) | 26 (660) | 3.62 (1.64)  |    |
| 3            | XW   | 30F-XW-37 | 4.00 (102) | 12 (305) | 18 (457) | 26 (660) | 5.23 (2.37)  |    |
| 4            | XW   | 40F-XW-37 | 5.00 (127) | 14 (356) | 22 (559) | 32 (812) | 7.89 (3.58)  |    |
| 5            | XW   | 50F-XW-37 | 6.00 (152) | 14 (356) | 22 (559) | 32 (812) | 9.75 (4.43)  |    |
| 6            | XW   | 60F-XW-37 | 7.00 (178) | 14 (356) | 22 (559) | 32 (812) | 12.08 (5.48) |    |
| 8            | XW   | 80E-XW-37 | 9.42 (239) | 14 (356) | 22 (559) | 32 (812) | 16.56 (7.52) |    |



## DOUBLE EXPANSION JOINT WITH O-RING

Double expansion joint is sometimes referred to as back-to-back expansion joint.

Installation of Expansion Joints:

- When the duct is shorter than 100 ft., no Expansion Joint needed
- When the duct is between 100 ft. up to 300 ft., install one Expansion Joint at the mid point
- If the duct is longer than 300 ft., install one Expansion Joint every 300 ft. apart

*Note: All Expansion Joints have a yellow line on the nipple end of the joint for proper installation.*

| Nominal Size | Type | IPS Item No. | A          | B        | L - Min  | L - Max   | Weight lbs  | kg |
|--------------|------|--------------|------------|----------|----------|-----------|-------------|----|
| ¾            | SW   | 07E-SW-39    | 1.20 (30)  | 17 (432) | 29 (737) | 45 (1143) | 0.84 (0.38) |    |
| 1            | SW   | 10E-SW-39    | 1.46 (37)  | 17 (432) | 29 (737) | 45 (1143) | 0.94 (0.43) |    |
| 1¼           | SW   | 12E-SW-39    | 1.81 (46)  | 17 (432) | 29 (737) | 45 (1143) | 1.14 (0.52) |    |
| 1½           | SW   | 15E-SW-39    | 2.04 (52)  | 17 (432) | 29 (737) | 45 (1143) | 1.63 (0.74) |    |
| 2            | SW   | 20E-SW-39    | 2.54 (65)  | 17 (432) | 29 (737) | 45 (1143) | 1.88 (0.85) |    |
| 3            | SW   | 30E-SW-39    | 3.66 (93)  | 17 (432) | 29 (737) | 45 (1143) | 2.97 (1.35) |    |
| 4            | SW   | 40E-SW-39    | 4.61 (117) | 17 (432) | 29 (737) | 45 (1143) | 3.56 (1.62) |    |
| 4            | HW   | 40E-HW-39    | 4.69 (119) | 17 (432) | 29 (737) | 45 (1143) | 4.80 (2.18) |    |
| 5            | MW   | 50E-MW-39    | 5.79 (147) | 17 (432) | 29 (737) | 45 (1143) | 5.94 (2.70) |    |
| 5            | HW   | 50E-HW-39    | 5.85 (149) | 17 (432) | 29 (737) | 45 (1143) | 6.44 (2.92) |    |
| 6            | MW   | 60E-MW-39    | 6.85 (174) | 17 (432) | 29 (737) | 45 (1143) | 7.03 (3.19) |    |
| 6            | HW   | 60E-HW-39    | 6.91 (176) | 17 (432) | 29 (737) | 45 (1143) | 8.07 (3.66) |    |

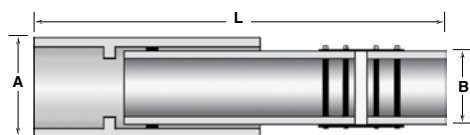
| Nominal Size | Type | ID Item No. | A          | B        | L - Min  | L - Max   | Weight lbs  | kg |
|--------------|------|-------------|------------|----------|----------|-----------|-------------|----|
| 2            | SW   | 20F-SW-39   | 2.30 (58)  | 17 (432) | 29 (737) | 45 (1143) | 1.68 (0.76) |    |
| 2½           | SW   | 25F-SW-39   | 2.80 (71)  | 17 (432) | 29 (737) | 45 (1143) | 2.08 (0.94) |    |
| 3            | SW   | 30F-SW-39   | 3.30 (84)  | 17 (432) | 29 (737) | 45 (1143) | 2.38 (1.08) |    |
| 3½           | SW   | 35F-SW-39   | 3.80 (96)  | 17 (432) | 29 (737) | 45 (1143) | 2.97 (1.35) |    |
| 4            | SW   | 40F-SW-39   | 4.30 (109) | 17 (432) | 29 (737) | 45 (1143) | 3.42 (1.55) |    |
| 4            | HW   | 40F-HW-39   | 4.39 (111) | 17 (432) | 29 (737) | 45 (1143) | 4.55 (2.07) |    |
| 4½           | SW   | 45F-SW-39   | 4.80 (122) | 17 (432) | 29 (737) | 45 (1143) | 3.71 (1.68) |    |
| 4½           | HW   | 45F-HW-39   | 4.89 (124) | 17 (432) | 29 (737) | 45 (1143) | 5.15 (2.34) |    |
| 5            | MW   | 50F-MW-39   | 5.39 (137) | 17 (432) | 29 (737) | 45 (1143) | 5.59 (2.54) |    |
| 5            | HW   | 50F-HW-39   | 5.42 (138) | 17 (432) | 29 (737) | 45 (1143) | 6.53 (2.97) |    |
| 6            | MW   | 60F-MW-39   | 6.39 (162) | 17 (432) | 29 (737) | 45 (1143) | 6.68 (3.03) |    |
| 6            | HW   | 60F-HW-39   | 6.42 (163) | 17 (432) | 29 (737) | 45 (1143) | 7.82 (3.55) |    |

| Nominal Size | Type | Item No.  | A          | B        | L - Min  | L - Max   | Weight lbs   | kg |
|--------------|------|-----------|------------|----------|----------|-----------|--------------|----|
| ¾            | XW   | 07E-XW-39 | 1.94 (54)  | 17 (432) | 29 (737) | 45 (1143) | 3.01 (1.37)  |    |
| 1            | XW   | 10E-XW-39 | 2.20 (61)  | 17 (432) | 29 (737) | 45 (1143) | 3.36 (1.53)  |    |
| 1¼           | XW   | 12E-XW-39 | 2.55 (65)  | 17 (432) | 29 (737) | 45 (1143) | 4.06 (1.84)  |    |
| 1½           | XW   | 15E-XW-39 | 2.79 (71)  | 17 (432) | 29 (737) | 45 (1143) | 5.83 (2.65)  |    |
| 2            | XW   | 20F-XW-39 | 3.00 (76)  | 17 (432) | 29 (737) | 45 (1143) | 6.24 (2.83)  |    |
| 2½           | XW   | 25F-XW-39 | 3.53 (90)  | 17 (432) | 29 (737) | 45 (1143) | 7.63 (3.46)  |    |
| 3            | XW   | 30F-XW-39 | 4.00 (102) | 17 (432) | 29 (737) | 45 (1143) | 9.01 (4.09)  |    |
| 3½           | XW   | 35F-XW-39 | 4.53 (115) | 17 (432) | 29 (737) | 45 (1143) | 10.42 (4.72) |    |
| 4            | XW   | 40F-XW-39 | 5.00 (127) | 17 (432) | 29 (737) | 45 (1143) | 11.78 (5.35) |    |
| 5            | XW   | 50F-XW-39 | 6.00 (152) | 17 (432) | 29 (737) | 45 (1143) | 14.55 (6.61) |    |
| 6            | XW   | 60F-XW-39 | 7.00 (178) | 17 (432) | 29 (737) | 45 (1143) | 19.25 (8.74) |    |

| Nominal Size | Type | IPS Item No. | A          | B         | L - Min  | L - Max   | Weight lbs   | kg |
|--------------|------|--------------|------------|-----------|----------|-----------|--------------|----|
| ¾            | SW   | 07E-SW-31    | 1.20 (30)  | 1.1 (27)  | 37 (940) | 51 (1295) | 1.19 (0.54)  |    |
| 1            | SW   | 10E-SW-31    | 1.46 (37)  | 1.3 (34)  | 37 (940) | 51 (1295) | 1.33 (0.60)  |    |
| 1¼           | SW   | 12E-SW-31    | 1.81 (46)  | 1.7 (42)  | 37 (940) | 51 (1295) | 1.61 (0.73)  |    |
| 1½           | SW   | 15E-SW-31    | 2.04 (52)  | 1.9 (49)  | 37 (940) | 51 (1295) | 2.31 (1.05)  |    |
| 2            | SW   | 20E-SW-31    | 2.54 (65)  | 2.4 (61)  | 37 (940) | 51 (1295) | 2.66 (1.21)  |    |
| 3            | SW   | 30E-SW-31    | 3.66 (93)  | 3.5 (89)  | 37 (940) | 51 (1295) | 4.20 (1.91)  |    |
| 4            | SW   | 40E-SW-31    | 4.61 (117) | 4.5 (114) | 37 (940) | 51 (1295) | 5.04 (2.29)  |    |
| 4            | HW   | 40E-HW-31    | 4.69 (119) | 4.5 (115) | 37 (940) | 51 (1295) | 6.79 (3.08)  |    |
| 5            | MW   | 50E-MW-31    | 5.79 (147) | 5.6 (142) | 37 (940) | 51 (1295) | 8.40 (3.81)  |    |
| 5            | HW   | 50E-HW-31    | 5.85 (149) | 5.6 (143) | 37 (940) | 51 (1295) | 9.10 (4.13)  |    |
| 6            | MW   | 60E-MW-31    | 6.85 (174) | 6.6 (167) | 37 (940) | 51 (1295) | 9.94 (4.51)  |    |
| 6            | HW   | 60E-HW-31    | 6.91 (176) | 6.6 (168) | 37 (940) | 51 (1295) | 11.41 (5.18) |    |

| Nominal Size | Type | ID Item No. | A          | B         | L - Min  | L - Max   | Weight lbs   | kg |
|--------------|------|-------------|------------|-----------|----------|-----------|--------------|----|
| 2            | SW   | 20F-SW-31   | 2.30 (58)  | 2.2 (55)  | 37 (940) | 51 (1295) | 2.38 (1.08)  |    |
| 2½           | SW   | 25F-SW-31   | 2.80 (71)  | 2.7 (68)  | 37 (940) | 51 (1295) | 2.94 (1.34)  |    |
| 3            | SW   | 30F-SW-31   | 3.30 (84)  | 3.2 (80)  | 37 (940) | 51 (1295) | 3.36 (1.53)  |    |
| 3½           | SW   | 35F-SW-31   | 3.80 (96)  | 3.7 (93)  | 37 (940) | 51 (1295) | 4.20 (1.97)  |    |
| 4            | SW   | 40F-SW-31   | 4.30 (109) | 4.2 (106) | 37 (940) | 51 (1295) | 4.83 (2.19)  |    |
| 4            | HW   | 40F-HW-31   | 4.39 (111) | 4.2 (107) | 37 (940) | 51 (1295) | 6.44 (2.92)  |    |
| 4½           | SW   | 45F-SW-31   | 4.80 (122) | 4.7 (118) | 37 (940) | 51 (1295) | 5.25 (2.38)  |    |
| 4½           | HW   | 45F-HW-31   | 4.89 (124) | 4.7 (119) | 37 (940) | 51 (1295) | 7.28 (3.31)  |    |
| 5            | MW   | 50F-MW-31   | 5.39 (137) | 5.2 (132) | 37 (940) | 51 (1295) | 7.91 (3.59)  |    |
| 5            | HW   | 50F-HW-31   | 5.42 (138) | 5.2 (133) | 37 (940) | 51 (1295) | 9.24 (4.20)  |    |
| 6            | MW   | 60F-MW-31   | 6.39 (162) | 6.2 (157) | 37 (940) | 51 (1295) | 9.45 (4.29)  |    |
| 6            | HW   | 60F-HW-31   | 6.42 (163) | 6.2 (158) | 37 (940) | 51 (1295) | 11.06 (5.02) |    |

| Nominal Size | Type | Item No.  | A          | B           | L - Min  | L - Max   | Weight lbs    | kg |
|--------------|------|-----------|------------|-------------|----------|-----------|---------------|----|
| ¾            | XW   | 07E-XW-31 | 1.94 (54)  | 1.410 (36)  | 37 (940) | 51 (1295) | 4.27 (1.94)   |    |
| 1            | XW   | 10E-XW-31 | 2.20 (61)  | 1.675 (43)  | 37 (940) | 51 (1295) | 4.76 (2.16)   |    |
| 1¼           | XW   | 12E-XW-31 | 2.55 (65)  | 2.020 (51)  | 37 (940) | 51 (1295) | 5.74 (2.60)   |    |
| 1½           | XW   | 15E-XW-31 | 2.79 (71)  | 2.260 (57)  | 37 (940) | 51 (1295) | 8.26 (3.75)   |    |
| 2            | XW   | 20F-XW-31 | 3.00 (76)  | 2.500 (64)  | 37 (940) | 51 (1295) | 8.82 (4.00)   |    |
| 2½           | XW   | 25F-XW-31 | 3.53 (90)  | 3.000 (76)  | 37 (940) | 51 (1295) | 10.78 (4.89)  |    |
| 3            | XW   | 30F-XW-31 | 4.00 (102) | 3.500 (89)  | 37 (940) | 51 (1295) | 12.74 (5.78)  |    |
| 3½           | XW   | 35F-XW-31 | 4.53 (115) | 4.000 (102) | 37 (940) | 51 (1295) | 14.70 (6.67)  |    |
| 4            | XW   | 40F-XW-31 | 5.00 (127) | 4.500 (114) | 37 (940) | 51 (1295) | 16.66 (7.56)  |    |
| 5            | XW   | 50F-XW-31 | 6.00 (152) | 5.500 (140) | 37 (940) | 51 (1295) | 20.58 (9.34)  |    |
| 6            | XW   | 60F-XW-31 | 7.00 (178) | 6.500 (165) | 37 (940) | 51 (1295) | 24.50 (11.12) |    |

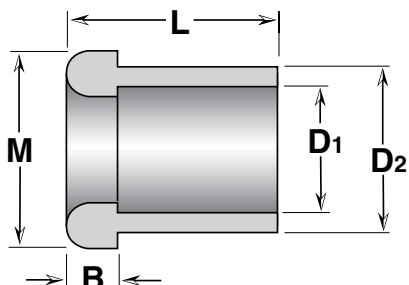


## ALIGNMENT/EXPANSION FITTING, WITH O-RINGS

Alignment/Expansion fitting is sometimes referred to as an Expansion/Deflection joint.

*(The clamps holding the rubber sleeve connecting the two nipples are made from stainless steel for corrosion protection.)*

*Same instructions & note as above*



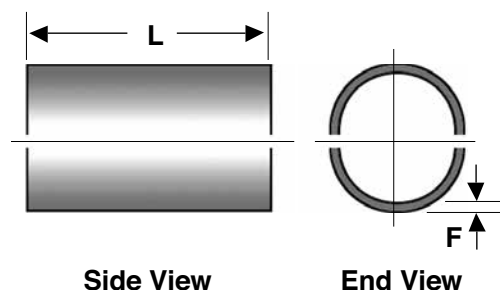
## END BELLS-SOCKET TYPE

End bells are used for creating a permanent termination into a box as well as having a smooth surface that the cable can be pulled over.

| Nominal Size | Type | IPS Item No. | D1         | D2         | L         | M          | Weight lbs kg |
|--------------|------|--------------|------------|------------|-----------|------------|---------------|
| ¾            | SW   | 07E-SW-29    | 1.06 (27)  | 1.20 (30)  | 1.60 (41) | 1.50 (38)  | 0.10 (0.05)   |
| 1            | SW   | 10E-SW-29    | 1.32 (34)  | 1.46 (37)  | 1.60 (41) | 1.80 (46)  | 0.10 (0.05)   |
| 1¼           | SW   | 12E-SW-29    | 1.67 (42)  | 1.81 (46)  | 1.60 (41) | 2.20 (56)  | 0.15 (0.07)   |
| 1½           | SW   | 15E-SW-29    | 1.91 (49)  | 2.04 (52)  | 1.60 (41) | 2.40 (61)  | 0.20 (0.09)   |
| 2            | SW   | 20E-SW-29    | 2.40 (61)  | 2.54 (61)  | 3.00 (76) | 2.94 (75)  | 0.40 (0.18)   |
| 3            | SW   | 30E-SW-29    | 3.52 (89)  | 3.66 (93)  | 3.00 (76) | 4.06 (103) | 0.45 (0.20)   |
| 4            | SW   | 40E-SW-29    | 4.47 (114) | 4.61 (117) | 3.00 (76) | 5.01 (127) | 0.80 (0.36)   |
| 4            | HW   | 40E-HW-29    | 4.52 (115) | 4.69 (119) | 3.00 (76) | 5.09 (129) | 0.85 (0.38)   |
| 5            | MW   | 50E-MW-29    | 5.59 (142) | 5.79 (147) | 3.00 (76) | 6.19 (157) | 0.95 (0.43)   |
| 5            | HW   | 50E-HW-29    | 5.63 (143) | 5.85 (149) | 3.00 (76) | 6.25 (159) | 1.00 (0.45)   |
| 6            | MW   | 60E-MW-29    | 6.66 (169) | 6.79 (172) | 3.00 (76) | 7.19 (183) | 1.10 (0.50)   |
| 6            | HW   | 60E-HW-29    | 6.69 (170) | 6.85 (174) | 3.00 (76) | 7.25 (184) | 1.15 (0.52)   |

| Nominal Size | Type | ID Item No. | D1         | D2         | L         | M          | Weight lbs kg |
|--------------|------|-------------|------------|------------|-----------|------------|---------------|
| 2            | SW   | 20F-SW-29   | 2.16 (55)  | 2.30 (58)  | 3.00 (76) | 2.70 (69)  | 0.40 (0.18)   |
| 2½           | SW   | 25F-SW-29   | 2.66 (68)  | 2.80 (71)  | 3.00 (76) | 3.20 (81)  | 0.45 (0.20)   |
| 3            | SW   | 30F-SW-29   | 3.16 (80)  | 3.30 (84)  | 3.00 (76) | 3.70 (94)  | 0.55 (0.25)   |
| 3½           | SW   | 35F-SW-29   | 3.66 (93)  | 3.80 (96)  | 3.00 (76) | 4.20 (107) | 0.60 (0.27)   |
| 4            | SW   | 40F-SW-29   | 4.16 (106) | 4.30 (109) | 3.00 (76) | 4.70 (119) | 0.78 (0.35)   |
| 4            | HW   | 40F-HW-29   | 4.20 (107) | 4.39 (111) | 3.00 (76) | 4.79 (122) | 0.95 (0.43)   |
| 4½           | SW   | 45F-SW-29   | 4.66 (118) | 4.80 (122) | 3.00 (76) | 5.20 (132) | 0.85 (0.38)   |
| 4½           | HW   | 45F-HW-29   | 4.70 (119) | 4.89 (124) | 3.00 (76) | 5.29 (134) | 0.90 (0.41)   |
| 5            | MW   | 50F-MW-29   | 5.20 (132) | 5.39 (137) | 3.00 (76) | 5.79 (147) | 0.85 (0.39)   |
| 5            | HW   | 50F-HW-29   | 5.24 (133) | 5.42 (138) | 3.00 (76) | 5.82 (148) | 0.87 (0.40)   |
| 6            | MW   | 60F-MW-29   | 6.20 (157) | 6.39 (162) | 3.00 (76) | 6.79 (172) | 1.15 (0.52)   |
| 6            | HW   | 60F-HW-29   | 6.24 (158) | 6.42 (163) | 3.00 (76) | 6.82 (173) | 1.25 (0.57)   |

| Nominal Size | Type | Item No.  | D1         | D2          | L          | M          | Weight lbs kg |
|--------------|------|-----------|------------|-------------|------------|------------|---------------|
| ¾            | XW   | 07E-XW-29 | 1.44 (36)  | 1.935 (54)  | 1.60 (45)  | 2.48 (63)  | 0.63 (0.28)   |
| 1            | XW   | 10E-XW-29 | 1.70 (43)  | 2.200 (61)  | 1.60 (45)  | 2.70 (68)  | 0.70 (0.32)   |
| 1¼           | XW   | 12E-XW-29 | 2.05 (52)  | 2.545 (65)  | 1.60 (45)  | 3.11 (79)  | 0.85 (0.38)   |
| 1½           | XW   | 15E-XW-29 | 2.29 (58)  | 2.785 (71)  | 1.60 (45)  | 3.35 (85)  | 1.22 (0.55)   |
| 2            | XW   | 20F-XW-29 | 2.52 (64)  | 3.02 (76)   | 3.00 (76)  | 3.62 (92)  | 1.30 (0.59)   |
| 2½           | XW   | 25F-XW-29 | 3.03 (77)  | 3.525 (90)  | 3.00 (76)  | 4.22 (107) | 1.59 (0.72)   |
| 3            | XW   | 30F-XW-29 | 3.52 (89)  | 4.02 (102)  | 3.00 (76)  | 4.62 (117) | 1.90 (0.86)   |
| 3½           | XW   | 35F-XW-29 | 4.03 (102) | 4.525 (115) | 3.00 (76)  | 5.48 (139) | 2.17 (0.98)   |
| 4            | XW   | 40F-XW-29 | 4.52 (115) | 5.02 (128)  | 5.00 (127) | 5.62 (143) | 2.40 (1.09)   |
| 5            | XW   | 50F-XW-29 | 5.52 (140) | 6.02 (153)  | 5.00 (127) | 6.62 (168) | 2.42 (1.10)   |
| 6            | XW   | 60F-XW-29 | 6.52 (166) | 7.02 (178)  | 5.00 (127) | 7.62 (194) | 2.50 (1.13)   |

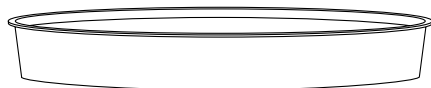


## SPLIT ANCHOR RINGS

Split anchor rings are supplied in pairs and are used to create fixed points. The split anchor rings are placed around the support system, close to the mid point between two expansion joints. One pair of split anchor rings is placed on each side of the support system. Split anchor rings are bonded to the outside of the conduit with FLAME SHIELD® Mix.

| Nominal Size | Type | IPS Item No. | ID Item No. | F        | L        | Weight lbs kg |
|--------------|------|--------------|-------------|----------|----------|---------------|
| ¾            | SW   | 07E-SW-28    | —           | 0.25 (6) | 3.0 (76) | 0.18 (0.08)   |
| 1            | SW   | 10E-SW-28    | —           | 0.25 (6) | 3.0 (76) | 0.21 (0.10)   |
| 1¼           | SW   | 12E-SW-28    | —           | 0.25 (6) | 3.0 (76) | 0.26 (0.12)   |
| 1½           | SW   | 15E-SW-28    | —           | 0.25 (6) | 3.0 (76) | 0.36 (0.16)   |
| 2            | SW   | 20E-SW-28    | 20F-SW-28   | 0.25 (6) | 3.0 (76) | 0.42 (0.19)   |
| 2½           | SW   | 25E-SW-28    | 25F-SW-28   | 0.25 (6) | 3.0 (76) | 0.48 (0.22)   |
| 3            | SW   | 30E-SW-28    | 30F-SW-28   | 0.25 (6) | 3.0 (76) | 0.67 (0.30)   |
| 3½           | SW   | —            | 35F-SW-28   | 0.25 (6) | 3.0 (76) | 0.76 (0.34)   |
| 4            | SW   | 40E-SW-28    | 40F-SW-28   | 0.25 (6) | 3.0 (76) | 0.80 (0.36)   |
| 4            | HW   | 40E-HW-28    | 40F-HW-28   | 0.25 (6) | 3.0 (76) | 0.80 (0.36)   |
| 4½           | SW   | —            | 45F-SW-28   | 0.25 (6) | 3.0 (76) | 0.91 (0.41)   |
| 4½           | HW   | —            | 45F-HW-28   | 0.25 (6) | 3.0 (76) | 0.91 (0.41)   |
| 5            | MW   | 50E-MW-28    | 50F-MW-28   | 0.25 (6) | 3.0 (76) | 1.06 (0.48)   |
| 5            | HW   | 50E-HW-28    | 50F-HW-28   | 0.25 (6) | 3.0 (76) | 1.06 (0.48)   |
| 6            | MW   | 60E-MW-28    | 60F-MW-28   | 0.25 (6) | 3.0 (76) | 1.15 (0.52)   |
| 6            | HW   | 60E-HW-28    | 60F-HW-28   | 0.25 (6) | 3.0 (76) | 1.15 (0.52)   |

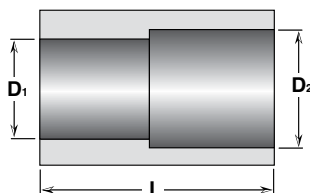
| Nominal Size | Type | Item No.  | F        | L      | Weight lbs kg |
|--------------|------|-----------|----------|--------|---------------|
| ¾            | XW   | 07E-XW-28 | 0.25 (6) | 3 (76) | 0.25 (0.11)   |
| 1            | XW   | 10E-XW-28 | 0.25 (6) | 3 (76) | 0.28 (0.13)   |
| 1¼           | XW   | 12E-XW-28 | 0.25 (6) | 3 (76) | 0.34 (0.15)   |
| 1½           | XW   | 15E-XW-28 | 0.25 (6) | 3 (76) | 0.49 (0.22)   |
| 2            | XW   | 20F-XW-28 | 0.25 (6) | 3 (76) | 0.52 (0.24)   |
| 2½           | XW   | 25F-XW-28 | 0.25 (6) | 3 (76) | 0.64 (0.29)   |
| 3            | XW   | 30F-XW-28 | 0.25 (6) | 3 (76) | 0.80 (0.36)   |
| 3½           | XW   | 35F-XW-28 | 0.25 (6) | 3 (76) | 0.87 (0.39)   |
| 4            | XW   | 40F-XW-28 | 0.25 (6) | 3 (76) | 0.98 (0.44)   |
| 5            | XW   | 50F-XW-28 | 0.25 (6) | 3 (76) | 1.15 (0.52)   |
| 6            | XW   | 60F-XW-28 | 0.25 (6) | 3 (76) | 1.25 (0.57)   |



## THERMOPLASTIC PLUG

| Nominal Size | Type | IPS Item No. | ID Item No. | Weight lbs | kg      |
|--------------|------|--------------|-------------|------------|---------|
| ¾            | SW   | 07C-SW-26    | —           | 0.01       | (0.005) |
| 1            | SW   | 10C-SW-26    | —           | 0.01       | (0.005) |
| 1¼           | SW   | 12C-SW-26    | —           | 0.01       | (0.005) |
| 1½           | SW   | 15C-SW-26    | —           | 0.01       | (0.005) |
| 2            | SW   | 20C-SW-26    | 20D-SW-26   | 0.01       | (0.005) |
| 2½           | SW   | 25C-SW-26    | 25D-SW-26   | 0.01       | (0.005) |
| 3            | SW   | 30C-SW-26    | 30D-SW-26   | 0.03       | (0.014) |
| 3½           | SW   | —            | 35D-SW-26   | 0.03       | (0.014) |
| 4            | SW   | 40C-SW-26    | 40D-SW-26   | 0.03       | (0.014) |
| 4            | HW   | 40C-HW-26    | 40D-HW-26   | 0.03       | (0.014) |
| 4½           | SW   | —            | 45D-SW-26   | 0.05       | (0.023) |
| 4½           | HW   | —            | 45D-HW-26   | 0.05       | (0.023) |
| 5            | MW   | 50C-MW-26    | 50D-MW-26   | 0.06       | (0.027) |
| 5            | HW   | 50C-HW-26    | 50D-HW-26   | 0.06       | (0.027) |
| 6            | MW   | 60C-MW-26    | 60D-MW-26   | 0.07       | (0.032) |
| 6            | HW   | 60C-HW-26    | 60D-HW-26   | 0.07       | (0.032) |

| Nominal Size | Type | Item No.  | Weight lbs | kg      |
|--------------|------|-----------|------------|---------|
| ¾            | XW   | 07C-XW-26 | 0.01       | (0.005) |
| 1            | XW   | 10C-XW-26 | 0.01       | (0.005) |
| 1¼           | XW   | 12C-XW-26 | 0.01       | (0.005) |
| 1½           | XW   | 15C-XW-26 | 0.01       | (0.005) |
| 2            | XW   | 20D-XW-26 | 0.01       | (0.005) |
| 2½           | XW   | 25D-XW-26 | 0.01       | (0.005) |
| 3            | XW   | 30D-XW-26 | 0.03       | (0.014) |
| 3½           | XW   | 35D-XW-26 | 0.03       | (0.014) |
| 4            | XW   | 40D-XW-26 | 0.03       | (0.014) |
| 5            | XW   | 50D-XW-26 | 0.06       | (0.027) |
| 6            | XW   | 60D-XW-26 | 0.07       | (0.032) |

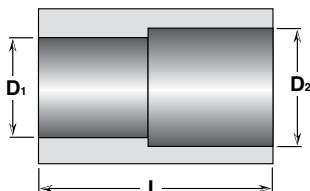


## REDUCING ADAPTER

Transition adapter from ID/tubular phenolic conduit to IPS type.

| Nominal Size | Type | Item No.  | D1         | D2         | L       | Weight lbs | kg     |
|--------------|------|-----------|------------|------------|---------|------------|--------|
| 2            | SW   | 20F-SW-27 | 2.16 (55)  | 2.40 (61)  | 6 (152) | 0.30       | (0.14) |
| 3            | SW   | 30F-SW-27 | 3.16 (80)  | 3.52 (89)  | 6 (152) | 0.50       | (0.23) |
| 4            | SW   | 40F-SW-27 | 4.16 (106) | 4.47 (114) | 6 (152) | 0.60       | (0.27) |
| 4            | HW   | 40F-HW-27 | 4.20 (107) | 4.52 (115) | 6 (152) | 0.70       | (0.32) |
| 5            | MW   | 50F-MW-27 | 5.20 (132) | 5.59 (142) | 6 (152) | 0.90       | (0.41) |
| 5            | HW   | 50F-HW-27 | 5.24 (133) | 5.63 (143) | 6 (152) | 1.00       | (0.45) |
| 6            | MW   | 60F-MW-27 | 6.20 (157) | 6.66 (169) | 6 (152) | 1.10       | (0.50) |
| 6            | HW   | 60F-HW-27 | 6.24 (158) | 6.69 (170) | 6 (152) | 1.20       | (0.55) |

Note: These are just examples of some reducing adapters.  
Contact Champion Fiberglass directly for other reducers.

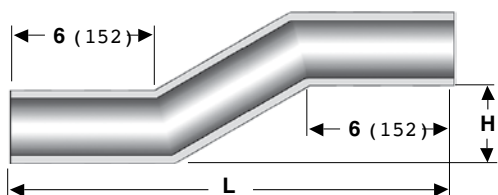


## REDUCING ADAPTER

This adapter is used for transition between different diameters of IPS phenolic conduit.

| Nominal Size  | IPS Item No.     | D1         | D2         | L       | Weight lbs | kg     |
|---------------|------------------|------------|------------|---------|------------|--------|
| 1 SW - ¾ SW   | 10E-SW-25-07E-SW | 1.06 (27)  | 1.32 (34)  | 4 (101) | 0.35       | (0.16) |
| 1¼ SW - ¾ SW  | 12E-SW-25-07E-SW | 1.06 (27)  | 1.67 (42)  | 4 (101) | 0.45       | (0.20) |
| 1¼ SW - 1 SW  | 12E-SW-25-10E-SW | 1.32 (34)  | 1.67 (42)  | 4 (101) | 0.40       | (0.18) |
| 1½ SW - ¾ SW  | 15E-SW-25-07E-SW | 1.06 (27)  | 1.91 (48)  | 4 (101) | 0.38       | (0.17) |
| 1½ SW - 1 SW  | 15E-SW-25-10E-SW | 1.32 (34)  | 1.91 (48)  | 4 (101) | 0.40       | (0.18) |
| 1½ SW - 1¼ SW | 15E-SW-25-12E-SW | 1.67 (42)  | 1.91 (48)  | 6 (152) | 0.37       | (0.17) |
| 2 SW - ¾ SW   | 20E-SW-25-07E-SW | 1.06 (27)  | 2.40 (61)  | 6 (152) | 0.60       | (0.27) |
| 2 SW - 1 SW   | 20E-SW-25-10E-SW | 1.32 (34)  | 2.40 (61)  | 6 (152) | 0.55       | (0.25) |
| 2 SW - 1¼ SW  | 20E-SW-25-12E-SW | 1.67 (42)  | 2.40 (61)  | 6 (152) | 0.50       | (0.23) |
| 2 SW - 1½ SW  | 20E-SW-25-15E-SW | 1.91 (48)  | 2.40 (61)  | 6 (152) | 0.47       | (0.21) |
| 3 SW - 2 SW   | 30E-SW-25-20E-SW | 2.40 (61)  | 3.52 (89)  | 6 (152) | 0.65       | (0.32) |
| 4 SW - 2 SW   | 40E-SW-25-20E-SW | 2.40 (61)  | 4.47 (113) | 6 (152) | 0.80       | (0.36) |
| 4 SW - 3 SW   | 40E-SW-25-30E-SW | 3.52 (89)  | 4.47 (113) | 6 (152) | 0.90       | (0.41) |
| 5 MW - 3 SW   | 50E-MW-25-30E-SW | 3.52 (89)  | 5.59 (142) | 6 (152) | 1.30       | (0.59) |
| 5 MW - 4 SW   | 50E-MW-25-40E-SW | 4.47 (114) | 5.59 (142) | 6 (152) | 0.85       | (0.39) |
| 6 MW - 4 SW   | 60E-MW-25-40E-SW | 4.47 (114) | 6.61 (166) | 6 (152) | 1.70       | (0.77) |
| 6 MW - 5 MW   | 60E-MW-25-50E-MW | 5.59 (142) | 6.61 (166) | 6 (152) | 1.90       | (0.86) |

Note: These are just examples of some reducing adapters.  
Contact Champion Fiberglass directly for other reducers.

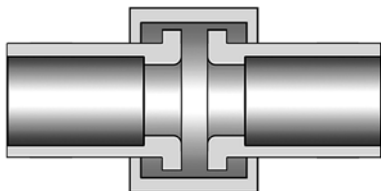


## OFFSET BEND

When manufacturing offset bends, the vertical offset dimension, H and the horizontal offset dimension, L, need to be specified.

All offset bends are supplied with 6" **(152mm)** straight ends. [Item numbers for offset bends end with the suffix - 47]

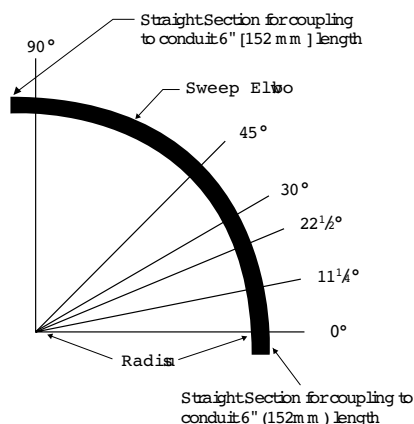
Contact your local sales representative or Champion Fiberglass directly for information.



## WOBBLE COUPLING

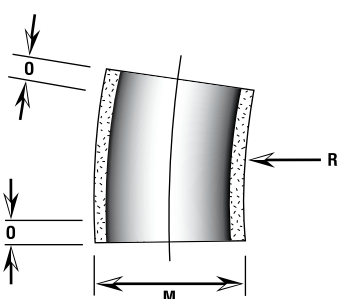
Wobble couplings are used for minor vertical and horizontal offsets for above ground installations. [Item numbers for wobble couplings end with the suffix - 48]

For further information regarding dimensions, etc., please contact your local sales representative or Champion Fiberglass directly.



## ELBOWS

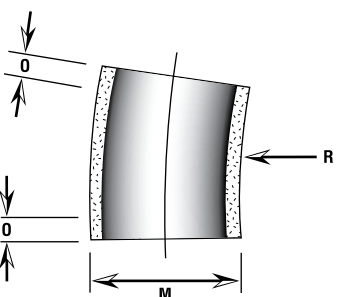
Radii listed are available and larger radii can be supplied. Contact your local representative for more information. All bends are supplied with plain ends. To enhance installation, bends can be supplied with one or two bonded on couplings. Please specify if such an arrangement is required.



| Nominal Size | Type | IPS Item No. | M         | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|-----------|-----------------|------------------|---------------|
| 3/4          | SW   | 07E-SW-50-P  | 1.05 (27) | 6 (152)         | 12 (305)         | 0.20 (0.09)   |
| 1            | SW   | 10E-SW-50-P  | 1.32 (33) | 6 (152)         | 12 (305)         | 0.22 (0.10)   |
| 1 1/4        | SW   | 12E-SW-50-P  | 1.66 (42) | 6 (152)         | 12 (305)         | 0.27 (0.12)   |
| 1 1/2        | SW   | 15E-SW-50-P  | 1.90 (48) | 6 (152)         | 12 (305)         | 0.39 (0.18)   |
| 2            | SW   | 20E-SW-50-P  | 2.37 (60) | 6 (152)         | 12 (305)         | 0.44 (0.20)   |
| 2 1/2        | SW   | 25E-SW-50-P  | 2.88 (73) | 6 (152)         | 12 (305)         | 0.54 (0.25)   |

| Nominal Size | Type | ID Item No. | M         | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|-----------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-50-P | 2.14 (54) | 6 (152)         | 12 (305)         | 0.40 (0.18)   |
| 2 1/2        | SW   | 25F-SW-50-P | 2.64 (67) | 6 (152)         | 12 (305)         | 0.49 (0.22)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 3/4          | XW   | 07E-XW-50-P | 1.41 (36)  | 6 (152)         | 12 (305)         | 0.71 (0.32)   |
| 1            | XW   | 10E-XW-50-P | 1.68 (43)  | 6 (152)         | 12 (305)         | 0.79 (0.36)   |
| 1 1/4        | XW   | 12E-XW-50-P | 2.02 (51)  | 6 (152)         | 12 (305)         | 0.96 (0.43)   |
| 1 1/2        | XW   | 15E-XW-50-P | 2.26 (57)  | 6 (152)         | 12 (305)         | 1.38 (0.63)   |
| 2            | XW   | 20F-XW-50-P | 2.50 (63)  | 6 (152)         | 12 (305)         | 1.47 (0.67)   |
| 2 1/2        | XW   | 25F-XW-50-P | 3.00 (76)  | 6 (152)         | 12 (305)         | 1.80 (0.82)   |
| 3            | XW   | 30F-XW-50-P | 3.50 (89)  | 6 (152)         | 12 (305)         | 2.18 (0.99)   |
| 3 1/2        | XW   | 35F-XW-50-P | 4.00 (102) | 6 (152)         | 12 (305)         | 2.45 (1.11)   |

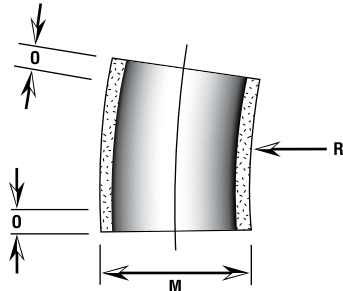


| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| 3/4          | SW   | 07E-SW-51-P  | 1.05 (27)  | 6 (152)         | 24 (610)         | 0.24 (0.11)   |
| 1            | SW   | 10E-SW-51-P  | 1.32 (33)  | 6 (152)         | 24 (610)         | 0.27 (0.12)   |
| 1 1/4        | SW   | 12E-SW-51-P  | 1.66 (42)  | 6 (152)         | 24 (610)         | 0.33 (0.15)   |
| 1 1/2        | SW   | 15E-SW-51-P  | 1.90 (48)  | 6 (152)         | 24 (610)         | 0.47 (0.21)   |
| 2            | SW   | 20E-SW-51-P  | 2.37 (60)  | 6 (152)         | 24 (610)         | 0.54 (0.25)   |
| 2 1/2        | SW   | 25E-SW-51-P  | 2.88 (73)  | 6 (152)         | 24 (610)         | 0.65 (0.30)   |
| 3            | SW   | 30E-SW-51-P  | 3.50 (89)  | 6 (152)         | 24 (610)         | 0.85 (0.38)   |
| 4            | SW   | 40E-SW-51-P  | 4.46 (113) | 6 (152)         | 24 (610)         | 1.02 (0.46)   |
| 4            | HW   | 40E-HW-51-P  | 4.51 (114) | 6 (152)         | 24 (610)         | 1.37 (0.61)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-51-P | 2.14 (54)  | 6 (152)         | 24 (610)         | 0.48 (0.22)   |
| 2 1/2        | SW   | 25F-SW-51-P | 2.64 (67)  | 6 (152)         | 24 (610)         | 0.60 (0.27)   |
| 3            | SW   | 30F-SW-51-P | 3.14 (80)  | 6 (152)         | 24 (610)         | 0.68 (0.25)   |
| 3 1/2        | SW   | 35F-SW-51-P | 3.64 (92)  | 6 (152)         | 24 (610)         | 0.86 (0.39)   |
| 4            | SW   | 40F-SW-51-P | 4.14 (105) | 6 (152)         | 24 (610)         | 0.98 (0.45)   |
| 4            | HW   | 40F-HW-51-P | 4.19 (106) | 6 (152)         | 24 (610)         | 1.48 (0.67)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 3/4          | XW   | 07E-XW-51-P | 1.41 (36)  | 6 (152)         | 24 (610)         | 0.87 (0.39)   |
| 1            | XW   | 10E-XW-51-P | 1.68 (43)  | 6 (152)         | 24 (610)         | 0.97 (0.44)   |
| 1 1/4        | XW   | 12E-XW-51-P | 2.02 (51)  | 6 (152)         | 24 (610)         | 1.16 (0.53)   |
| 1 1/2        | XW   | 15E-XW-51-P | 2.26 (57)  | 6 (152)         | 24 (610)         | 1.68 (0.76)   |
| 2            | XW   | 20F-XW-51-P | 2.50 (63)  | 6 (152)         | 24 (610)         | 1.79 (0.81)   |
| 2 1/2        | XW   | 25F-XW-51-P | 3.00 (76)  | 6 (152)         | 24 (610)         | 2.19 (0.99)   |
| 3            | XW   | 30F-XW-51-P | 3.50 (89)  | 6 (152)         | 24 (610)         | 2.58 (1.17)   |
| 3 1/2        | XW   | 35F-XW-51-P | 4.00 (102) | 6 (152)         | 24 (610)         | 2.98 (1.35)   |
| 4            | XW   | 40F-XW-51-P | 4.50 (114) | 6 (152)         | 24 (610)         | 3.38 (1.53)   |

# PHENOLIC ELBOWS



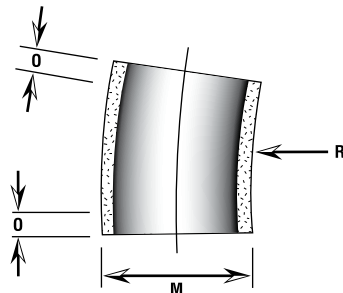
**11 1/4° X 36"**

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| 3/4          | SW   | 07E-SW-52-P  | 1.05 (27)  | 6 (152)         | 36 (914)         | 0.27 (0.12)   |
| 1            | SW   | 10E-SW-52-P  | 1.32 (33)  | 6 (152)         | 36 (914)         | 0.30 (0.14)   |
| 1 1/4        | SW   | 12E-SW-52-P  | 1.66 (42)  | 6 (152)         | 36 (914)         | 0.36 (0.16)   |
| 1 1/2        | SW   | 15E-SW-52-P  | 1.90 (48)  | 6 (152)         | 36 (914)         | 0.52 (0.24)   |
| 2            | SW   | 20E-SW-52-P  | 2.37 (60)  | 6 (152)         | 36 (914)         | 0.60 (0.27)   |
| 2 1/2        | SW   | 25E-SW-52-P  | 2.88 (73)  | 6 (152)         | 36 (914)         | 0.73 (0.33)   |
| 3            | SW   | 30E-SW-52-P  | 3.50 (89)  | 6 (152)         | 36 (914)         | 0.95 (0.43)   |
| 4            | SW   | 40E-SW-52-P  | 4.46 (113) | 6 (152)         | 36 (914)         | 1.14 (0.52)   |
| 4            | HW   | 40E-HW-52-P  | 4.51 (114) | 6 (152)         | 36 (914)         | 1.54 (0.70)   |
| 5            | MW   | 50E-MW-52-P  | 5.57 (141) | 6 (152)         | 36 (914)         | 1.90 (0.86)   |
| 5            | HW   | 50E-HW-52-P  | 5.60 (152) | 6 (152)         | 36 (914)         | 2.10 (0.95)   |
| 6            | MW   | 60E-MW-52-P  | 6.63 (168) | 6 (152)         | 36 (914)         | 2.25 (1.02)   |
| 6            | HW   | 60E-HW-52-P  | 6.66 (169) | 6 (152)         | 36 (914)         | 2.59 (1.17)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-52-P | 2.14 (54)  | 6 (152)         | 36 (914)         | 0.54 (0.25)   |
| 2 1/2        | SW   | 25F-SW-52-P | 2.64 (67)  | 6 (152)         | 36 (914)         | 0.67 (0.30)   |
| 3            | SW   | 30F-SW-52-P | 3.14 (80)  | 6 (152)         | 36 (914)         | 0.76 (0.35)   |
| 3 1/2        | SW   | 35F-SW-52-P | 3.64 (92)  | 6 (152)         | 36 (914)         | 0.95 (0.43)   |
| 4            | SW   | 40F-SW-52-P | 4.14 (105) | 6 (152)         | 36 (914)         | 1.09 (0.50)   |
| 4            | HW   | 40F-HW-52-P | 4.19 (106) | 6 (152)         | 36 (914)         | 1.46 (0.66)   |
| 4 1/2        | SW   | 45F-SW-52-P | 4.64 (117) | 6 (152)         | 36 (914)         | 1.19 (0.54)   |
| 4 1/2        | HW   | 45F-HW-52-P | 4.69 (118) | 6 (152)         | 36 (914)         | 1.65 (0.75)   |
| 5            | MW   | 50F-MW-52-P | 5.19 (132) | 6 (152)         | 36 (914)         | 1.78 (0.81)   |
| 5            | HW   | 50F-HW-52-P | 5.22 (132) | 6 (152)         | 36 (914)         | 2.05 (0.93)   |
| 6            | MW   | 60F-MW-52-P | 6.19 (157) | 6 (152)         | 36 (914)         | 2.13 (0.97)   |
| 6            | HW   | 60F-HW-52-P | 6.22 (158) | 6 (152)         | 36 (914)         | 2.50 (1.10)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 3/4          | XW   | 07E-XW-52-P | 1.41 (36)  | 6 (152)         | 36 (914)         | 0.97 (0.44)   |
| 1            | XW   | 10E-XW-52-P | 1.68 (43)  | 6 (152)         | 36 (914)         | 1.08 (0.49)   |
| 1 1/4        | XW   | 12E-XW-52-P | 2.02 (51)  | 6 (152)         | 36 (914)         | 1.30 (0.59)   |
| 1 1/2        | XW   | 15E-XW-52-P | 2.26 (57)  | 6 (152)         | 36 (914)         | 1.87 (0.85)   |
| 2            | XW   | 20F-XW-52-P | 2.50 (64)  | 6 (152)         | 36 (914)         | 2.00 (0.91)   |
| 2 1/2        | XW   | 25F-XW-52-P | 3.00 (76)  | 6 (152)         | 36 (914)         | 2.44 (1.11)   |
| 3            | XW   | 30F-XW-52-P | 3.50 (89)  | 6 (152)         | 36 (914)         | 2.88 (1.31)   |
| 3 1/2        | XW   | 35F-XW-52-P | 4.00 (102) | 6 (152)         | 36 (914)         | 3.33 (1.51)   |
| 4            | XW   | 40F-XW-52-P | 4.50 (114) | 6 (152)         | 36 (914)         | 3.77 (3.77)   |
| 5            | XW   | 50F-XW-52-P | 5.50 (140) | 6 (152)         | 36 (914)         | 4.64 (2.11)   |
| 6            | XW   | 60F-XW-52-P | 6.50 (165) | 6 (152)         | 36 (914)         | 5.53 (2.51)   |

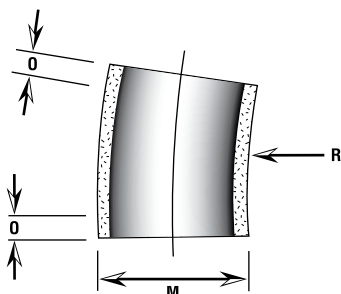
| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| 3/4          | SW   | 07E-SW-53-P  | 1.05 (27)  | 6 (152)         | 48 (1,219)       | 0.31 (0.14)   |
| 1            | SW   | 10E-SW-53-P  | 1.32 (33)  | 6 (152)         | 48 (1,219)       | 0.35 (0.16)   |
| 1 1/4        | SW   | 12E-SW-53-P  | 1.66 (42)  | 6 (152)         | 48 (1,219)       | 0.42 (0.19)   |
| 1 1/2        | SW   | 15E-SW-53-P  | 1.90 (48)  | 6 (152)         | 48 (1,219)       | 0.61 (0.28)   |
| 2            | SW   | 20E-SW-53-P  | 2.37 (60)  | 6 (152)         | 48 (1,219)       | 0.70 (0.32)   |
| 2 1/2        | SW   | 25E-SW-53-P  | 2.88 (73)  | 6 (152)         | 48 (1,219)       | 0.84 (0.38)   |
| 3            | SW   | 30E-SW-53-P  | 3.50 (89)  | 6 (152)         | 48 (1,219)       | 1.10 (0.50)   |
| 4            | SW   | 40E-SW-53-P  | 4.46 (113) | 6 (152)         | 48 (1,219)       | 1.32 (0.60)   |
| 4            | HW   | 40E-HW-53-P  | 4.51 (114) | 6 (152)         | 48 (1,219)       | 1.78 (0.81)   |
| 5            | MW   | 50E-MW-53-P  | 5.57 (141) | 6 (152)         | 48 (1,219)       | 2.20 (1.00)   |
| 5            | HW   | 50E-HW-53-P  | 5.60 (142) | 6 (152)         | 48 (1,219)       | 2.38 (1.08)   |
| 6            | MW   | 60E-MW-53-P  | 6.63 (168) | 6 (152)         | 60 (1,524)       | 2.60 (1.18)   |
| 6            | HW   | 60E-HW-53-P  | 6.66 (169) | 6 (152)         | 60 (1,524)       | 2.98 (1.35)   |



**11 1/4° X 48"**

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-53-P | 2.14 (54)  | 6 (152)         | 48 (1,219)       | 0.62 (0.36)   |
| 2 1/2        | SW   | 25F-SW-53-P | 2.64 (67)  | 6 (152)         | 48 (1,219)       | 0.77 (0.45)   |
| 3            | SW   | 30F-SW-53-P | 3.14 (80)  | 6 (152)         | 48 (1,219)       | 0.88 (0.55)   |
| 3 1/2        | SW   | 35F-SW-53-P | 3.64 (92)  | 6 (152)         | 48 (1,219)       | 1.10 (0.55)   |
| 4            | SW   | 40F-SW-53-P | 4.14 (105) | 6 (152)         | 48 (1,219)       | 1.27 (0.64)   |
| 4            | HW   | 40F-HW-53-P | 4.19 (106) | 6 (152)         | 48 (1,219)       | 1.69 (0.86)   |
| 4 1/2        | SW   | 45F-SW-53-P | 4.64 (117) | 6 (152)         | 48 (1,219)       | 1.38 (0.73)   |
| 4 1/2        | HW   | 45F-HW-53-P | 4.69 (118) | 6 (152)         | 48 (1,219)       | 1.91 (0.95)   |
| 5            | MW   | 50F-MW-53-P | 5.19 (132) | 6 (152)         | 48 (1,219)       | 2.07 (1.14)   |
| 5            | HW   | 50F-HW-53-P | 5.22 (133) | 6 (152)         | 48 (1,219)       | 2.42 (1.27)   |
| 6            | MW   | 60F-MW-53-P | 6.19 (157) | 6 (152)         | 48 (1,219)       | 3.34 (1.52)   |
| 6            | HW   | 60F-HW-53-P | 6.22 (158) | 6 (152)         | 48 (1,219)       | 4.36 (1.98)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 3/4          | XW   | 07E-XW-53-P | 1.41 (36)  | 6 (152)         | 48 (1,219)       | 1.09 (0.50)   |
| 1            | XW   | 10E-XW-53-P | 1.68 (43)  | 6 (152)         | 48 (1,219)       | 1.21 (0.55)   |
| 1 1/4        | XW   | 12E-XW-53-P | 2.02 (51)  | 6 (152)         | 48 (1,219)       | 1.46 (0.66)   |
| 1 1/2        | XW   | 15E-XW-53-P | 2.26 (57)  | 6 (152)         | 48 (1,219)       | 2.11 (0.95)   |
| 2            | XW   | 20F-XW-53-P | 2.50 (64)  | 6 (152)         | 48 (1,219)       | 2.29 (1.04)   |
| 2 1/2        | XW   | 25F-XW-53-P | 3.00 (76)  | 6 (152)         | 48 (1,219)       | 2.83 (1.29)   |
| 3            | XW   | 30F-XW-53-P | 3.50 (89)  | 6 (152)         | 48 (1,219)       | 3.34 (1.51)   |
| 3 1/2        | XW   | 35F-XW-53-P | 4.00 (102) | 6 (152)         | 48 (1,219)       | 3.86 (1.75)   |
| 4            | XW   | 40F-XW-53-P | 4.50 (114) | 6 (152)         | 48 (1,219)       | 4.38 (1.99)   |
| 5            | XW   | 50F-XW-53-P | 5.50 (140) | 6 (152)         | 48 (1,219)       | 5.41 (2.46)   |
| 6            | XW   | 60F-XW-53-P | 6.50 (165) | 6 (152)         | 48 (1,219)       | 6.44 (2.92)   |

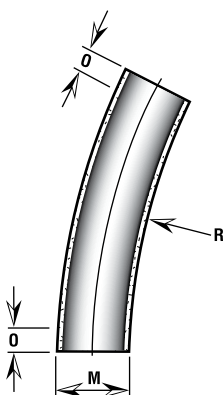


11 1/4" X 60"

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| 3/4          | SW   | 07E-SW-54-P  | 1.05 (27)  | 6 (152)         | 60 (1,524)       | 0.34 (0.15)   |
| 1            | SW   | 10E-SW-54-P  | 1.32 (33)  | 6 (152)         | 60 (1,524)       | 0.38 (0.17)   |
| 1 1/4        | SW   | 12E-SW-54-P  | 1.66 (42)  | 6 (152)         | 60 (1,524)       | 0.46 (0.21)   |
| 1 1/2        | SW   | 15E-SW-54-P  | 1.90 (48)  | 6 (152)         | 60 (1,524)       | 0.66 (0.30)   |
| 2            | SW   | 20E-SW-54-P  | 2.37 (60)  | 6 (152)         | 60 (1,524)       | 0.76 (0.35)   |
| 2 1/2        | SW   | 25E-SW-54-P  | 2.88 (73)  | 6 (152)         | 60 (1,524)       | 0.92 (0.42)   |
| 3            | SW   | 30E-SW-54-P  | 3.50 (89)  | 6 (152)         | 60 (1,524)       | 1.20 (0.55)   |
| 4            | SW   | 40E-SW-54-P  | 4.46 (113) | 6 (152)         | 60 (1,524)       | 1.44 (0.65)   |
| 4            | HW   | 40E-HW-54-P  | 4.51 (115) | 6 (152)         | 60 (1,524)       | 1.94 (0.88)   |
| 5            | MW   | 50E-MW-54-P  | 5.57 (141) | 6 (152)         | 60 (1,524)       | 2.40 (1.09)   |
| 5            | HW   | 50E-HW-54-P  | 5.60 (142) | 6 (152)         | 60 (1,524)       | 2.60 (1.18)   |
| 6            | MW   | 60E-MW-54-P  | 6.63 (168) | 6 (152)         | 60 (1,524)       | 2.84 (1.29)   |
| 6            | HW   | 60E-HW-54-P  | 6.66 (169) | 6 (152)         | 60 (1,524)       | 3.26 (1.48)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-54-P | 2.14 (54)  | 6 (152)         | 60 (1,524)       | 0.68 (0.31)   |
| 2 1/2        | SW   | 25F-SW-54-P | 2.64 (67)  | 6 (152)         | 60 (1,524)       | 0.84 (0.38)   |
| 3            | SW   | 30F-SW-54-P | 3.14 (80)  | 6 (152)         | 60 (1,524)       | 0.96 (0.44)   |
| 3 1/2        | SW   | 35F-SW-54-P | 3.64 (92)  | 6 (152)         | 60 (1,524)       | 1.20 (0.55)   |
| 4            | SW   | 40F-SW-54-P | 4.14 (105) | 6 (152)         | 60 (1,524)       | 1.38 (0.63)   |
| 4            | HW   | 40F-HW-54-P | 4.19 (106) | 6 (152)         | 60 (1,524)       | 1.84 (0.83)   |
| 4 1/2        | SW   | 45F-SW-54-P | 4.64 (117) | 6 (152)         | 60 (1,524)       | 1.50 (0.68)   |
| 4 1/2        | HW   | 45F-HW-54-P | 4.69 (118) | 6 (152)         | 60 (1,524)       | 2.08 (0.94)   |
| 5            | MW   | 50F-MW-54-P | 5.19 (132) | 6 (152)         | 60 (1,524)       | 2.26 (1.03)   |
| 5            | HW   | 50F-HW-54-P | 5.22 (132) | 6 (152)         | 60 (1,524)       | 2.64 (1.20)   |
| 6            | MW   | 60F-MW-54-P | 6.19 (157) | 6 (152)         | 60 (1,524)       | 2.70 (1.23)   |
| 6            | HW   | 60F-HW-54-P | 6.22 (158) | 6 (152)         | 60 (1,524)       | 3.16 (1.44)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 3/4          | XW   | 07E-XW-54-P | 1.41 (36)  | 6 (152)         | 60 (1,524)       | 1.21 (0.55)   |
| 1            | XW   | 10E-XW-54-P | 1.68 (43)  | 6 (152)         | 60 (1,524)       | 1.35 (0.61)   |
| 1 1/4        | XW   | 12E-XW-54-P | 2.02 (51)  | 6 (152)         | 60 (1,524)       | 1.62 (0.73)   |
| 1 1/2        | XW   | 15E-XW-54-P | 2.26 (57)  | 6 (152)         | 60 (1,524)       | 2.34 (1.05)   |
| 2            | XW   | 20F-XW-54-P | 2.50 (65)  | 6 (152)         | 60 (1,524)       | 2.52 (1.14)   |
| 2 1/2        | XW   | 25F-XW-54-P | 3.00 (76)  | 6 (152)         | 60 (1,524)       | 3.08 (1.40)   |
| 3            | XW   | 30F-XW-54-P | 3.50 (89)  | 6 (152)         | 60 (1,524)       | 3.64 (1.65)   |
| 3 1/2        | XW   | 35F-XW-54-P | 4.00 (102) | 6 (152)         | 60 (1,524)       | 4.20 (1.91)   |
| 4            | XW   | 40F-XW-54-P | 4.50 (114) | 6 (152)         | 60 (1,524)       | 4.76 (2.16)   |
| 5            | XW   | 50F-XW-54-P | 5.50 (140) | 6 (152)         | 60 (1,524)       | 5.88 (2.67)   |
| 6            | XW   | 60F-XW-54-P | 6.50 (165) | 6 (152)         | 60 (1,524)       | 7.00 (3.18)   |

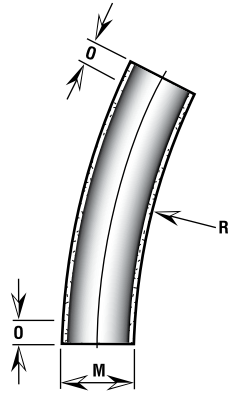


22 1/2" X 12"

| Nominal Size | Type | IPS Item No. | M         | O-Tangent (min.) | R-Radius (min.) | Weight lbs kg |
|--------------|------|--------------|-----------|------------------|-----------------|---------------|
| 3/4          | SW   | 07E-SW-60-P  | 1.05 (27) | 6 (152)          | 12 (305)        | 0.24 (0.11)   |
| 1            | SW   | 10E-SW-60-P  | 1.32 (33) | 6 (152)          | 12 (305)        | 0.27 (0.12)   |
| 1 1/4        | SW   | 12E-SW-60-P  | 1.66 (42) | 6 (152)          | 12 (305)        | 0.33 (0.15)   |
| 1 1/2        | SW   | 15E-SW-60-P  | 1.90 (48) | 6 (152)          | 12 (305)        | 0.47 (0.21)   |
| 2            | SW   | 20E-SW-60-P  | 2.37 (60) | 6 (152)          | 12 (305)        | 0.54 (0.25)   |
| 2 1/2        | SW   | 25E-SW-60-P  | 2.88 (73) | 6 (152)          | 12 (305)        | 0.65 (0.30)   |

| Nominal Size | Type | ID Item No. | M         | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|-----------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-60-P | 2.14 (54) | 6 (152)         | 12 (305)         | 0.48 (0.22)   |
| 2 1/2        | SW   | 25F-SW-60-P | 2.64 (67) | 6 (152)         | 12 (305)         | 0.60 (0.27)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 3/4          | XW   | 07E-XW-60-P | 1.41 (36)  | 6 (152)         | 12 (305)         | 0.87 (0.39)   |
| 1            | XW   | 10E-XW-60-P | 1.68 (43)  | 6 (152)         | 12 (305)         | 0.97 (0.44)   |
| 1 1/4        | XW   | 12E-XW-60-P | 2.02 (51)  | 6 (152)         | 12 (305)         | 1.16 (0.53)   |
| 1 1/2        | XW   | 15E-XW-60-P | 2.26 (57)  | 6 (152)         | 12 (305)         | 1.68 (0.76)   |
| 2            | XW   | 20F-XW-60-P | 2.50 (63)  | 6 (152)         | 12 (305)         | 1.79 (0.81)   |
| 2 1/2        | XW   | 25F-XW-60-P | 3.00 (76)  | 6 (152)         | 12 (305)         | 2.19 (0.99)   |
| 3            | XW   | 30F-XW-60-P | 3.50 (89)  | 6 (152)         | 12 (305)         | 2.58 (1.17)   |
| 3 1/2        | XW   | 35F-XW-60-P | 4.00 (102) | 6 (152)         | 12 (305)         | 2.98 (1.35)   |

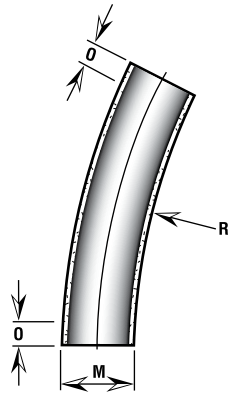


22 1/2° X 24°

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min.) | R-Radius (min.) | Weight lbs kg |
|--------------|------|--------------|------------|------------------|-----------------|---------------|
| 3/4          | SW   | 07E-SW-61-P  | 1.05 (27)  | 6 (152)          | 24 (610)        | 0.30 (0.14)   |
| 1            | SW   | 10E-SW-61-P  | 1.32 (33)  | 6 (152)          | 24 (610)        | 0.33 (0.15)   |
| 1 1/4        | SW   | 12E-SW-61-P  | 1.66 (42)  | 6 (152)          | 24 (610)        | 0.40 (0.18)   |
| 1 1/2        | SW   | 15E-SW-61-P  | 1.90 (48)  | 6 (152)          | 24 (610)        | 0.58 (0.26)   |
| 2            | SW   | 20E-SW-61-P  | 2.37 (60)  | 6 (152)          | 24 (610)        | 0.67 (0.30)   |
| 2 1/2        | SW   | 25E-SW-61-P  | 2.88 (73)  | 6 (152)          | 24 (610)        | 0.81 (0.37)   |
| 3            | SW   | 30E-SW-61-P  | 3.50 (89)  | 6 (152)          | 24 (610)        | 1.06 (0.48)   |
| 4            | SW   | 40E-SW-61-P  | 4.46 (113) | 6 (152)          | 24 (610)        | 1.27 (0.58)   |
| 4            | HW   | 40E-HW-61-P  | 4.51 (114) | 6 (152)          | 24 (610)        | 1.71 (0.78)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-61-P | 2.14 (54)  | 6 (152)         | 24 (610)         | 0.60 (0.27)   |
| 2 1/2        | SW   | 25F-SW-61-P | 2.64 (67)  | 6 (152)         | 24 (610)         | 0.74 (0.34)   |
| 3            | SW   | 30F-SW-61-P | 3.14 (80)  | 6 (152)         | 24 (610)         | 0.85 (0.38)   |
| 3 1/2        | SW   | 35F-SW-61-P | 3.64 (92)  | 6 (152)         | 24 (610)         | 1.06 (0.48)   |
| 4            | SW   | 40F-SW-61-P | 4.14 (105) | 6 (152)         | 24 (610)         | 1.22 (0.55)   |
| 4            | HW   | 40F-HW-61-P | 4.19 (106) | 6 (152)         | 24 (610)         | 1.62 (0.74)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 3/4          | XW   | 07E-XW-61-P | 1.41 (36)  | 6 (152)         | 24 (610)         | 1.07 (0.48)   |
| 1            | XW   | 10E-XW-61-P | 1.68 (43)  | 6 (152)         | 24 (610)         | 1.19 (0.54)   |
| 1 1/4        | XW   | 12E-XW-61-P | 2.02 (51)  | 6 (152)         | 24 (610)         | 1.44 (0.65)   |
| 1 1/2        | XW   | 15E-XW-61-P | 2.26 (57)  | 6 (152)         | 24 (610)         | 2.07 (0.94)   |
| 2            | XW   | 20F-XW-61-P | 2.50 (65)  | 6 (152)         | 24 (610)         | 2.21 (1.00)   |
| 2 1/2        | XW   | 25F-XW-61-P | 3.00 (76)  | 6 (152)         | 24 (610)         | 2.70 (1.23)   |
| 3            | XW   | 30F-XW-61-P | 3.50 (89)  | 6 (152)         | 24 (610)         | 3.32 (1.51)   |
| 3 1/2        | XW   | 35F-XW-61-P | 4.00 (102) | 6 (152)         | 24 (610)         | 3.83 (1.74)   |
| 4            | XW   | 40F-XW-61-P | 4.50 (114) | 6 (152)         | 24 (610)         | 4.34 (1.97)   |

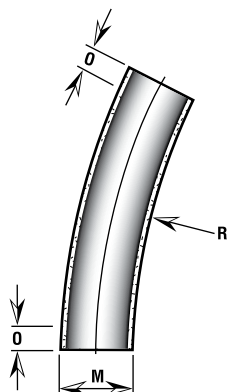


22 1/2° X 36°

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| 3/4          | SW   | 07E-SW-62-P  | 1.05 (27)  | 6 (152)         | 36 (914)         | 0.35 (0.16)   |
| 1            | SW   | 10E-SW-62-P  | 1.32 (33)  | 6 (152)         | 36 (914)         | 0.40 (0.18)   |
| 1 1/4        | SW   | 12E-SW-62-P  | 1.66 (42)  | 6 (152)         | 36 (914)         | 0.48 (0.22)   |
| 1 1/2        | SW   | 15E-SW-62-P  | 1.90 (48)  | 6 (152)         | 36 (914)         | 0.69 (0.31)   |
| 2            | SW   | 20E-SW-62-P  | 2.37 (60)  | 6 (152)         | 36 (914)         | 0.79 (0.36)   |
| 2 1/2        | SW   | 25E-SW-62-P  | 2.88 (73)  | 6 (152)         | 36 (914)         | 0.96 (0.44)   |
| 3            | SW   | 30E-SW-62-P  | 3.50 (89)  | 6 (152)         | 36 (914)         | 1.25 (0.57)   |
| 4            | SW   | 40E-SW-62-P  | 4.46 (113) | 6 (152)         | 36 (914)         | 1.50 (0.68)   |
| 4            | HW   | 40E-HW-62-P  | 4.51 (114) | 6 (152)         | 36 (914)         | 2.02 (0.91)   |
| 5            | MW   | 50E-MW-62-P  | 5.57 (141) | 6 (152)         | 36 (914)         | 2.50 (1.14)   |
| 5            | HW   | 50E-HW-62-P  | 5.60 (152) | 6 (152)         | 36 (914)         | 2.75 (1.25)   |
| 6            | MW   | 60E-MW-62-P  | 6.63 (168) | 6 (152)         | 36 (914)         | 2.96 (1.34)   |
| 6            | HW   | 60E-HW-62-P  | 6.66 (169) | 6 (152)         | 36 (914)         | 3.40 (1.54)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-62-P | 2.14 (54)  | 6 (152)         | 36 (914)         | 0.71 (0.32)   |
| 2 1/2        | SW   | 25F-SW-62-P | 2.64 (67)  | 6 (152)         | 36 (914)         | 0.88 (0.40)   |
| 3            | SW   | 30F-SW-62-P | 3.14 (80)  | 6 (152)         | 36 (914)         | 1.00 (0.45)   |
| 3 1/2        | SW   | 35F-SW-62-P | 3.64 (92)  | 6 (152)         | 36 (914)         | 1.25 (0.57)   |
| 4            | SW   | 40F-SW-62-P | 4.14 (105) | 6 (152)         | 36 (914)         | 1.44 (0.65)   |
| 4            | HW   | 40F-HW-62-P | 4.19 (106) | 6 (152)         | 36 (914)         | 1.92 (0.87)   |
| 4 1/2        | SW   | 45F-SW-62-P | 4.64 (117) | 6 (152)         | 36 (914)         | 1.56 (0.71)   |
| 4 1/2        | HW   | 45F-HW-62-P | 4.69 (118) | 6 (152)         | 36 (914)         | 2.17 (0.99)   |
| 5            | MW   | 50F-MW-62-P | 5.19 (132) | 6 (152)         | 36 (914)         | 2.36 (1.07)   |
| 5            | HW   | 50F-HW-62-P | 5.22 (132) | 6 (152)         | 36 (914)         | 2.71 (1.23)   |
| 6            | MW   | 60F-MW-62-P | 6.19 (157) | 6 (152)         | 36 (914)         | 2.82 (1.28)   |
| 6            | HW   | 60F-HW-62-P | 6.22 (158) | 6 (152)         | 36 (914)         | 3.30 (1.50)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 3/4          | XW   | 07E-XW-62-P | 1.41 (36)  | 6 (152)         | 36 (914)         | 1.27 (0.58)   |
| 1            | XW   | 10E-XW-62-P | 1.68 (43)  | 6 (152)         | 36 (914)         | 1.42 (0.64)   |
| 1 1/4        | XW   | 12E-XW-62-P | 2.02 (51)  | 6 (152)         | 36 (914)         | 1.71 (0.77)   |
| 1 1/2        | XW   | 15E-XW-62-P | 2.26 (57)  | 6 (152)         | 36 (914)         | 2.46 (1.12)   |
| 2            | XW   | 20F-XW-62-P | 2.50 (65)  | 6 (152)         | 36 (914)         | 2.63 (1.19)   |
| 2 1/2        | XW   | 25F-XW-62-P | 3.00 (76)  | 6 (152)         | 36 (914)         | 3.21 (1.46)   |
| 3            | XW   | 30F-XW-62-P | 3.50 (89)  | 6 (152)         | 36 (914)         | 3.79 (1.72)   |
| 3 1/2        | XW   | 35F-XW-62-P | 4.00 (102) | 6 (152)         | 36 (914)         | 4.38 (1.99)   |
| 4            | XW   | 40F-XW-62-P | 4.50 (114) | 6 (152)         | 36 (914)         | 4.96 (2.25)   |
| 5            | XW   | 50F-XW-62-P | 5.50 (140) | 6 (152)         | 36 (914)         | 6.13 (2.78)   |
| 6            | XW   | 60F-XW-62-P | 6.50 (165) | 6 (152)         | 36 (914)         | 7.29 (3.31)   |

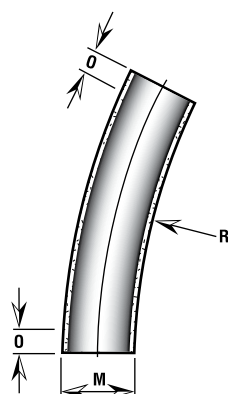


**22 1/2° X 48"**

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| 3/4          | SW   | 07E-SW-63-P  | 1.05 (27)  | 6 (152)         | 48 (1,219)       | 0.43 (0.20)   |
| 1            | SW   | 10E-SW-63-P  | 1.32 (33)  | 6 (152)         | 48 (1,219)       | 0.48 (0.22)   |
| 1 1/4        | SW   | 12E-SW-63-P  | 1.66 (42)  | 6 (152)         | 48 (1,219)       | 0.58 (0.26)   |
| 1 1/2        | SW   | 15E-SW-63-P  | 1.90 (48)  | 6 (152)         | 48 (1,219)       | 0.83 (0.38)   |
| 2            | SW   | 20E-SW-63-P  | 2.37 (60)  | 6 (152)         | 48 (1,219)       | 0.95 (0.43)   |
| 2 1/2        | SW   | 25E-SW-63-P  | 2.88 (73)  | 6 (152)         | 48 (1,219)       | 1.15 (0.52)   |
| 3            | SW   | 30E-SW-63-P  | 3.50 (89)  | 6 (152)         | 48 (1,219)       | 1.50 (0.68)   |
| 4            | SW   | 40E-SW-63-P  | 4.46 (113) | 6 (152)         | 48 (1,219)       | 1.80 (0.82)   |
| 4            | HW   | 40E-HW-63-P  | 4.51 (114) | 6 (152)         | 48 (1,219)       | 2.43 (1.10)   |
| 5            | MW   | 50E-MW-63-P  | 5.57 (141) | 6 (152)         | 48 (1,219)       | 3.00 (1.36)   |
| 5            | HW   | 50E-HW-63-P  | 5.60 (142) | 6 (152)         | 48 (1,219)       | 3.25 (1.48)   |
| 6            | MW   | 60E-MW-63-P  | 6.63 (168) | 6 (152)         | 48 (1,219)       | 2.84 (1.29)   |
| 6            | HW   | 60E-HW-63-P  | 6.66 (170) | 6 (152)         | 48 (1,219)       | 3.26 (1.48)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-63-P | 2.14 (54)  | 6 (152)         | 48 (1,219)       | 0.85 (0.50)   |
| 2 1/2        | SW   | 25F-SW-63-P | 2.64 (67)  | 6 (152)         | 48 (1,219)       | 1.05 (0.64)   |
| 3            | SW   | 30F-SW-63-P | 3.14 (80)  | 6 (152)         | 48 (1,219)       | 1.20 (0.77)   |
| 3 1/2        | SW   | 35F-SW-63-P | 3.64 (92)  | 6 (152)         | 48 (1,219)       | 1.50 (0.77)   |
| 4            | SW   | 40F-SW-63-P | 4.14 (105) | 6 (152)         | 48 (1,219)       | 1.73 (0.95)   |
| 4            | HW   | 40F-HW-63-P | 4.19 (106) | 6 (152)         | 48 (1,219)       | 2.30 (1.23)   |
| 4 1/2        | SW   | 45F-SW-63-P | 4.64 (117) | 6 (152)         | 48 (1,219)       | 1.88 (1.73)   |
| 4 1/2        | HW   | 45F-HW-63-P | 4.69 (118) | 6 (152)         | 48 (1,219)       | 2.60 (2.00)   |
| 5            | MW   | 50F-MW-63-P | 5.19 (132) | 6 (152)         | 48 (1,219)       | 2.83 (1.59)   |
| 5            | HW   | 50F-HW-63-P | 5.22 (133) | 6 (152)         | 48 (1,219)       | 3.30 (1.86)   |
| 6            | MW   | 60F-MW-63-P | 6.19 (157) | 6 (152)         | 48 (1,219)       | 2.84 (1.29)   |
| 6            | HW   | 60F-HW-63-P | 6.22 (158) | 6 (152)         | 48 (1,219)       | 3.26 (1.48)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 3/4          | XW   | 07E-XW-63-P | 1.41 (36)  | 6 (152)         | 48 (1,219)       | 1.57 (0.72)   |
| 1            | XW   | 10E-XW-63-P | 1.68 (43)  | 6 (152)         | 48 (1,219)       | 1.75 (0.80)   |
| 1 1/4        | XW   | 12E-XW-63-P | 2.02 (51)  | 6 (152)         | 48 (1,219)       | 2.11 (0.95)   |
| 1 1/2        | XW   | 15E-XW-63-P | 2.26 (57)  | 6 (152)         | 48 (1,219)       | 3.03 (1.36)   |
| 2            | XW   | 20F-XW-63-P | 2.50 (65)  | 6 (152)         | 48 (1,219)       | 3.15 (1.43)   |
| 2 1/2        | XW   | 25F-XW-63-P | 3.00 (76)  | 6 (152)         | 48 (1,219)       | 3.85 (1.75)   |
| 3            | XW   | 30F-XW-63-P | 3.50 (89)  | 6 (152)         | 48 (1,219)       | 4.55 (2.07)   |
| 3 1/2        | XW   | 35F-XW-63-P | 4.00 (102) | 6 (152)         | 48 (1,219)       | 5.25 (2.38)   |
| 4            | XW   | 40F-XW-63-P | 4.50 (114) | 6 (152)         | 48 (1,219)       | 5.95 (2.70)   |
| 5            | XW   | 50F-XW-63-P | 5.50 (140) | 6 (152)         | 48 (1,219)       | 7.35 (3.34)   |
| 6            | XW   | 60F-XW-63-P | 6.50 (165) | 6 (152)         | 48 (1,219)       | 8.75 (3.97)   |



**22 1/2° X 60"**

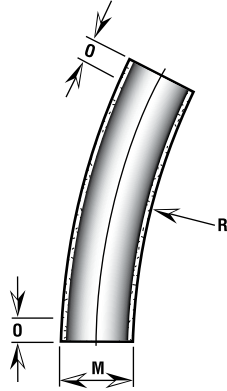
| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| 3/4          | SW   | 07E-SW-64-P  | 1.05 (27)  | 6 (152)         | 60 (1,524)       | 0.50 (0.23)   |
| 1            | SW   | 10E-SW-64-P  | 1.32 (33)  | 6 (152)         | 60 (1,524)       | 0.55 (0.25)   |
| 1 1/4        | SW   | 12E-SW-64-P  | 1.66 (42)  | 6 (152)         | 60 (1,524)       | 0.67 (0.30)   |
| 1 1/2        | SW   | 15E-SW-64-P  | 1.90 (48)  | 6 (152)         | 60 (1,524)       | 0.96 (0.44)   |
| 2            | SW   | 20E-SW-64-P  | 2.37 (60)  | 6 (152)         | 60 (1,524)       | 1.11 (0.50)   |
| 2 1/2        | SW   | 25E-SW-64-P  | 2.88 (73)  | 6 (152)         | 60 (1,524)       | 1.34 (0.61)   |
| 3            | SW   | 30E-SW-64-P  | 3.50 (89)  | 6 (152)         | 60 (1,524)       | 1.75 (0.80)   |
| 4            | SW   | 40E-SW-64-P  | 4.46 (113) | 6 (152)         | 60 (1,524)       | 2.10 (0.95)   |
| 4            | HW   | 40E-HW-64-P  | 4.51 (115) | 6 (152)         | 60 (1,524)       | 2.83 (1.29)   |
| 5            | MW   | 50E-MW-64-P  | 5.57 (141) | 6 (152)         | 60 (1,524)       | 3.50 (1.59)   |
| 5            | HW   | 50E-HW-64-P  | 5.60 (142) | 6 (152)         | 60 (1,524)       | 3.79 (1.72)   |
| 6            | MW   | 60E-MW-64-P  | 6.63 (168) | 6 (152)         | 60 (1,524)       | 4.14 (1.88)   |
| 6            | HW   | 60E-HW-64-P  | 6.66 (170) | 6 (152)         | 60 (1,524)       | 4.75 (2.16)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-64-P | 2.14 (54)  | 6 (152)         | 60 (1,524)       | 0.99 (0.45)   |
| 2 1/2        | SW   | 25F-SW-64-P | 2.64 (67)  | 6 (152)         | 60 (1,524)       | 1.23 (0.56)   |
| 3            | SW   | 30F-SW-64-P | 3.14 (80)  | 6 (152)         | 60 (1,524)       | 1.40 (0.64)   |
| 3 1/2        | SW   | 35F-SW-64-P | 3.64 (92)  | 6 (152)         | 60 (1,524)       | 1.75 (0.80)   |
| 4            | SW   | 40F-SW-64-P | 4.14 (105) | 6 (152)         | 60 (1,524)       | 2.01 (0.91)   |
| 4            | HW   | 40F-HW-64-P | 4.19 (106) | 6 (152)         | 60 (1,524)       | 2.68 (1.22)   |
| 4 1/2        | SW   | 45F-SW-64-P | 4.64 (117) | 6 (152)         | 60 (1,524)       | 2.19 (0.99)   |
| 4 1/2        | HW   | 45F-HW-64-P | 4.69 (118) | 6 (152)         | 60 (1,524)       | 3.03 (1.38)   |
| 5            | MW   | 50F-MW-64-P | 5.19 (132) | 6 (152)         | 60 (1,524)       | 3.30 (1.50)   |
| 5            | HW   | 50F-HW-64-P | 5.22 (132) | 6 (152)         | 60 (1,524)       | 3.85 (1.75)   |
| 6            | MW   | 60F-MW-64-P | 6.19 (157) | 6 (152)         | 60 (1,524)       | 3.94 (1.79)   |
| 6            | HW   | 60F-HW-64-P | 6.22 (158) | 6 (152)         | 60 (1,524)       | 4.61 (2.09)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 3/4          | XW   | 07E-XW-64-P | 1.41 (36)  | 6 (152)         | 60 (1,524)       | 1.81 (0.83)   |
| 1            | XW   | 10E-XW-64-P | 1.68 (43)  | 6 (152)         | 60 (1,524)       | 2.01 (0.92)   |
| 1 1/4        | XW   | 12E-XW-64-P | 2.02 (51)  | 6 (152)         | 60 (1,524)       | 2.43 (1.10)   |
| 1 1/2        | XW   | 15E-XW-64-P | 2.26 (57)  | 6 (152)         | 60 (1,524)       | 3.50 (1.57)   |
| 2            | XW   | 20F-XW-64-P | 2.50 (65)  | 6 (152)         | 60 (1,524)       | 3.68 (1.67)   |
| 3            | XW   | 30F-XW-64-P | 3.50 (89)  | 6 (152)         | 60 (1,524)       | 5.31 (2.41)   |
| 4            | XW   | 40F-XW-64-P | 4.50 (114) | 6 (152)         | 60 (1,524)       | 6.94 (3.15)   |
| 5            | XW   | 50F-XW-64-P | 5.50 (140) | 6 (152)         | 60 (1,524)       | 8.58 (3.90)   |
| 6            | XW   | 60F-XW-64-P | 6.50 (165) | 6 (152)         | 60 (1,524)       | 10.21 (4.64)  |

# PHENOLIC ELBOWS

30° X 12"

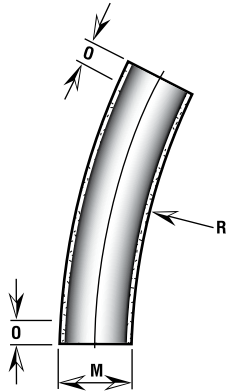


| Nominal Size | Type | IPS Item No. | M         | O-Tangent (min.) | R-Radius (min.) | Weight lbs kg |
|--------------|------|--------------|-----------|------------------|-----------------|---------------|
| ¾            | SW   | 07E-SW-70-P  | 1.05 (27) | 6 (152)          | 12 (305)        | 0.27 (0.12)   |
| 1            | SW   | 10E-SW-70-P  | 1.32 (33) | 6 (152)          | 12 (305)        | 0.30 (0.14)   |
| 1¼           | SW   | 12E-SW-70-P  | 1.66 (42) | 6 (152)          | 12 (305)        | 0.36 (0.16)   |
| 1½           | SW   | 15E-SW-70-P  | 1.90 (48) | 6 (152)          | 12 (305)        | 0.52 (0.24)   |
| 2            | SW   | 20E-SW-70-P  | 2.37 (60) | 6 (152)          | 12 (305)        | 0.60 (0.27)   |
| 2½           | SW   | 25E-SW-70-P  | 2.88 (73) | 6 (152)          | 12 (305)        | 0.73 (0.33)   |

| Nominal Size | Type | ID Item No. | M         | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|-----------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-70-P | 2.14 (54) | 6 (152)         | 12 (305)         | 0.54 (0.25)   |
| 2½           | SW   | 25F-SW-70-P | 2.64 (67) | 6 (152)         | 12 (305)         | 0.67 (0.30)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| ¾            | XW   | 07E-XW-70-P | 1.41 (36)  | 6 (152)         | 12 (305)         | 0.97 (0.44)   |
| 1            | XW   | 10E-XW-70-P | 1.68 (43)  | 6 (152)         | 12 (305)         | 1.08 (0.49)   |
| 1¼           | XW   | 12E-XW-70-P | 2.02 (51)  | 6 (152)         | 12 (305)         | 1.30 (0.59)   |
| 1½           | XW   | 15E-XW-70-P | 2.26 (57)  | 6 (152)         | 12 (305)         | 1.87 (0.85)   |
| 2            | XW   | 20F-XW-70-P | 2.50 (63)  | 6 (152)         | 12 (305)         | 2.00 (0.91)   |
| 2½           | XW   | 25F-XW-70-P | 3.00 (76)  | 6 (152)         | 12 (305)         | 2.44 (1.11)   |
| 3            | XW   | 30F-XW-70-P | 3.50 (89)  | 6 (152)         | 12 (305)         | 2.89 (1.31)   |
| 3½           | XW   | 35F-XW-70-P | 4.00 (102) | 6 (152)         | 12 (305)         | 3.33 (1.51)   |

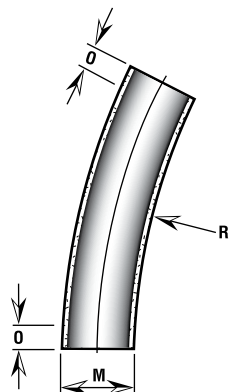
30° X 24"



| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| ¾            | SW   | 07E-SW-71-P  | 1.05 (27)  | 6 (152)         | 24 (610)         | 0.34 (0.15)   |
| 1            | SW   | 10E-SW-71-P  | 1.32 (33)  | 6 (152)         | 24 (610)         | 0.38 (0.17)   |
| 1¼           | SW   | 12E-SW-71-P  | 1.66 (42)  | 6 (152)         | 24 (610)         | 0.46 (0.21)   |
| 1½           | SW   | 15E-SW-71-P  | 1.90 (48)  | 6 (152)         | 24 (610)         | 0.66 (0.30)   |
| 2            | SW   | 20E-SW-71-P  | 2.37 (60)  | 6 (152)         | 24 (610)         | 0.76 (0.35)   |
| 2½           | SW   | 25E-SW-71-P  | 2.88 (73)  | 6 (152)         | 24 (610)         | 0.92 (0.42)   |
| 3            | SW   | 30E-SW-71-P  | 3.50 (89)  | 6 (152)         | 24 (610)         | 1.20 (0.54)   |
| 4            | SW   | 40E-SW-71-P  | 4.46 (113) | 6 (152)         | 24 (610)         | 1.44 (0.65)   |
| 4            | HW   | 40E-HW-71-P  | 4.51 (114) | 6 (152)         | 24 (610)         | 1.94 (0.88)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-71-P | 2.14 (54)  | 6 (152)         | 24 (610)         | 0.68 (0.31)   |
| 2½           | SW   | 25F-SW-71-P | 2.64 (67)  | 6 (152)         | 24 (610)         | 0.84 (0.38)   |
| 3            | SW   | 30F-SW-71-P | 3.14 (80)  | 6 (152)         | 24 (610)         | 0.96 (0.44)   |
| 3½           | SW   | 35F-SW-71-P | 3.64 (92)  | 6 (152)         | 24 (610)         | 1.20 (0.54)   |
| 4            | SW   | 40F-SW-71-P | 4.14 (105) | 6 (152)         | 24 (610)         | 1.38 (0.63)   |
| 4            | HW   | 40F-HW-71-P | 4.19 (106) | 6 (152)         | 24 (610)         | 1.84 (0.84)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| ¾            | XW   | 07E-XW-71-P | 1.41 (36)  | 6 (152)         | 24 (610)         | 1.22 (0.55)   |
| 1            | XW   | 10E-XW-71-P | 1.68 (43)  | 6 (152)         | 24 (610)         | 1.36 (0.62)   |
| 1¼           | XW   | 12E-XW-71-P | 2.02 (51)  | 6 (152)         | 24 (610)         | 1.64 (0.74)   |
| 1½           | XW   | 15E-XW-71-P | 2.26 (57)  | 6 (152)         | 24 (610)         | 2.36 (1.07)   |
| 2            | XW   | 20F-XW-71-P | 2.50 (65)  | 6 (152)         | 24 (610)         | 2.52 (1.14)   |
| 2½           | XW   | 25F-XW-71-P | 3.00 (76)  | 6 (152)         | 24 (610)         | 3.08 (1.40)   |
| 3            | XW   | 30F-XW-71-P | 3.50 (89)  | 6 (152)         | 24 (610)         | 3.72 (1.69)   |
| 3½           | XW   | 35F-XW-71-P | 4.00 (102) | 6 (152)         | 24 (610)         | 4.30 (1.95)   |
| 4            | XW   | 40F-XW-71-P | 4.50 (114) | 6 (152)         | 24 (610)         | 4.87 (2.21)   |

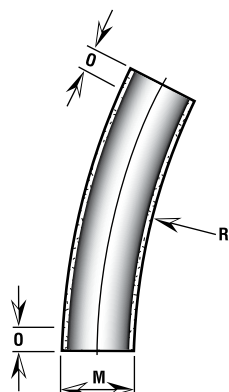


**30° X 36"**

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs  | kg |
|--------------|------|--------------|------------|-----------------|------------------|-------------|----|
| ¾            | SW   | 07E-SW-72-P  | 1.05 (27)  | 6 (152)         | 36 (914)         | 0.43 (0.15) |    |
| 1            | SW   | 10E-SW-72-P  | 1.32 (33)  | 6 (152)         | 36 (914)         | 0.48 (0.17) |    |
| 1¼           | SW   | 12E-SW-72-P  | 1.66 (42)  | 6 (152)         | 36 (914)         | 0.58 (0.21) |    |
| 1½           | SW   | 15E-SW-72-P  | 1.90 (48)  | 6 (152)         | 36 (914)         | 0.83 (0.30) |    |
| 2            | SW   | 20E-SW-72-P  | 2.37 (60)  | 6 (152)         | 36 (914)         | 0.95 (0.50) |    |
| 2½           | SW   | 25E-SW-72-P  | 2.88 (73)  | 6 (152)         | 36 (914)         | 1.15 (0.42) |    |
| 3            | SW   | 30E-SW-72-P  | 3.50 (89)  | 6 (152)         | 36 (914)         | 1.50 (0.77) |    |
| 4            | SW   | 40E-SW-72-P  | 4.46 (113) | 6 (152)         | 36 (914)         | 1.80 (0.77) |    |
| 4            | HW   | 40E-HW-72-P  | 4.51 (115) | 6 (152)         | 36 (914)         | 2.43 (0.95) |    |
| 5            | MW   | 50E-MW-72-P  | 5.57 (141) | 6 (152)         | 36 (914)         | 3.00 (1.36) |    |
| 5            | HW   | 50E-HW-72-P  | 5.60 (152) | 6 (152)         | 36 (914)         | 3.31 (1.50) |    |
| 6            | MW   | 60E-MW-72-P  | 6.63 (168) | 6 (152)         | 36 (914)         | 3.56 (1.62) |    |
| 6            | HW   | 60E-HW-72-P  | 6.66 (169) | 6 (152)         | 36 (914)         | 4.08 (1.85) |    |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs  | kg |
|--------------|------|-------------|------------|-----------------|------------------|-------------|----|
| 2            | SW   | 20F-SW-72-P | 2.14 (54)  | 6 (152)         | 36 (914)         | 0.85 (0.39) |    |
| 2½           | SW   | 25F-SW-72-P | 2.64 (67)  | 6 (152)         | 36 (914)         | 1.05 (0.48) |    |
| 3            | SW   | 30F-SW-72-P | 3.14 (80)  | 6 (152)         | 36 (914)         | 1.20 (0.55) |    |
| 3½           | SW   | 35F-SW-72-P | 3.64 (92)  | 6 (152)         | 36 (914)         | 1.50 (0.68) |    |
| 4            | SW   | 40F-SW-72-P | 4.14 (105) | 6 (152)         | 36 (914)         | 1.73 (0.79) |    |
| 4            | HW   | 40F-HW-72-P | 4.19 (106) | 6 (152)         | 36 (914)         | 2.30 (1.04) |    |
| 4½           | SW   | 45F-SW-72-P | 4.64 (117) | 6 (152)         | 36 (914)         | 1.88 (0.85) |    |
| 4½           | HW   | 45F-HW-72-P | 4.69 (118) | 6 (152)         | 36 (914)         | 2.60 (1.18) |    |
| 5            | MW   | 50F-MW-72-P | 5.19 (132) | 6 (152)         | 36 (914)         | 2.83 (1.28) |    |
| 5            | HW   | 50F-HW-72-P | 5.22 (132) | 6 (152)         | 36 (914)         | 3.25 (1.48) |    |
| 6            | MW   | 60F-MW-72-P | 6.19 (157) | 6 (152)         | 36 (914)         | 3.38 (1.54) |    |
| 6            | HW   | 60F-HW-72-P | 6.22 (158) | 6 (152)         | 36 (914)         | 3.96 (1.80) |    |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs  | kg |
|--------------|------|-------------|------------|-----------------|------------------|-------------|----|
| ¾            | XW   | 07E-XW-72-P | 1.41 (36)  | 6 (152)         | 36 (914)         | 1.52 (0.69) |    |
| 1            | XW   | 10E-XW-72-P | 1.68 (43)  | 6 (152)         | 36 (914)         | 1.70 (0.77) |    |
| 1¼           | XW   | 12E-XW-72-P | 2.02 (51)  | 6 (152)         | 36 (914)         | 2.05 (0.93) |    |
| 1½           | XW   | 15E-XW-72-P | 2.26 (57)  | 6 (152)         | 36 (914)         | 2.95 (1.34) |    |
| 2            | XW   | 20F-XW-72-P | 2.50 (65)  | 6 (152)         | 36 (914)         | 3.15 (1.43) |    |
| 2½           | XW   | 25F-XW-72-P | 3.00 (76)  | 6 (152)         | 36 (914)         | 3.85 (1.75) |    |
| 3            | XW   | 30F-XW-72-P | 3.50 (89)  | 6 (152)         | 36 (914)         | 4.55 (2.07) |    |
| 3½           | XW   | 35F-XW-72-P | 4.00 (102) | 6 (152)         | 36 (914)         | 5.25 (2.38) |    |
| 4            | XW   | 40F-XW-72-P | 4.50 (114) | 6 (152)         | 36 (914)         | 5.95 (2.70) |    |
| 5            | XW   | 50F-XW-72-P | 5.50 (140) | 6 (152)         | 36 (914)         | 7.35 (3.34) |    |
| 6            | XW   | 60F-XW-72-P | 6.50 (165) | 6 (152)         | 36 (914)         | 8.75 (3.97) |    |

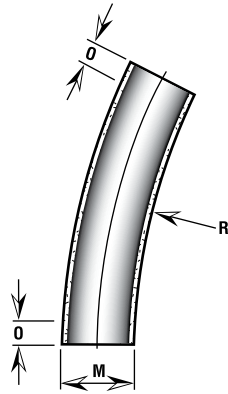


**30° X 48"**

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs  | kg |
|--------------|------|--------------|------------|-----------------|------------------|-------------|----|
| ¾            | SW   | 07E-SW-73-P  | 1.05 (27)  | 6 (152)         | 48 (1,219)       | 0.52 (0.24) |    |
| 1            | SW   | 10E-SW-73-P  | 1.32 (33)  | 6 (152)         | 48 (1,219)       | 0.59 (0.27) |    |
| 1¼           | SW   | 12E-SW-73-P  | 1.66 (42)  | 6 (152)         | 48 (1,219)       | 0.71 (0.32) |    |
| 1½           | SW   | 15E-SW-73-P  | 1.90 (48)  | 6 (152)         | 48 (1,219)       | 1.02 (0.46) |    |
| 2            | SW   | 20E-SW-73-P  | 2.37 (60)  | 6 (152)         | 48 (1,219)       | 1.17 (0.53) |    |
| 2½           | SW   | 25E-SW-73-P  | 2.88 (73)  | 6 (152)         | 48 (1,219)       | 1.42 (0.65) |    |
| 3            | SW   | 30E-SW-73-P  | 3.50 (89)  | 6 (152)         | 48 (1,219)       | 1.85 (0.84) |    |
| 4            | SW   | 40E-SW-73-P  | 4.46 (113) | 6 (152)         | 48 (1,219)       | 2.22 (1.01) |    |
| 4            | HW   | 40E-HW-73-P  | 4.51 (114) | 6 (152)         | 48 (1,219)       | 2.99 (1.36) |    |
| 5            | MW   | 50E-MW-73-P  | 5.57 (141) | 6 (152)         | 48 (1,219)       | 3.70 (1.68) |    |
| 5            | HW   | 50E-HW-73-P  | 5.60 (142) | 6 (152)         | 48 (1,219)       | 4.01 (1.82) |    |
| 6            | MW   | 60E-MW-73-P  | 6.63 (168) | 6 (152)         | 48 (1,219)       | 4.38 (1.99) |    |
| 6            | HW   | 60E-HW-73-P  | 6.66 (169) | 6 (152)         | 48 (1,219)       | 5.03 (2.28) |    |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs  | kg |
|--------------|------|-------------|------------|-----------------|------------------|-------------|----|
| 2            | SW   | 20F-SW-73-P | 2.14 (54)  | 6 (152)         | 48 (1,219)       | 1.05 (0.48) |    |
| 2½           | SW   | 25F-SW-73-P | 2.64 (67)  | 6 (152)         | 48 (1,219)       | 1.30 (0.59) |    |
| 3            | SW   | 30F-SW-73-P | 3.14 (80)  | 6 (152)         | 48 (1,219)       | 1.48 (0.67) |    |
| 3½           | SW   | 35F-SW-73-P | 3.64 (92)  | 6 (152)         | 48 (1,219)       | 1.85 (0.84) |    |
| 4            | SW   | 40F-SW-73-P | 4.14 (105) | 6 (152)         | 48 (1,219)       | 2.13 (0.97) |    |
| 4            | HW   | 40F-HW-73-P | 4.19 (106) | 6 (152)         | 48 (1,219)       | 2.84 (1.29) |    |
| 4½           | SW   | 45F-SW-73-P | 4.64 (117) | 6 (152)         | 48 (1,219)       | 2.31 (1.05) |    |
| 4½           | HW   | 45F-HW-73-P | 4.69 (118) | 6 (152)         | 48 (1,219)       | 3.21 (1.46) |    |
| 5            | MW   | 50F-MW-73-P | 5.19 (132) | 6 (152)         | 48 (1,219)       | 3.48 (1.58) |    |
| 5            | HW   | 50F-HW-73-P | 5.22 (133) | 6 (152)         | 48 (1,219)       | 4.07 (1.85) |    |
| 6            | MW   | 60F-MW-73-P | 6.19 (157) | 6 (152)         | 48 (1,219)       | 4.16 (1.89) |    |
| 6            | HW   | 60F-HW-73-P | 6.22 (158) | 6 (152)         | 48 (1,219)       | 4.87 (2.21) |    |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs   | kg |
|--------------|------|-------------|------------|-----------------|------------------|--------------|----|
| ¾            | XW   | 07E-XW-73-P | 1.41 (36)  | 6 (152)         | 48 (1,219)       | 1.89 (0.87)  |    |
| 1            | XW   | 10E-XW-73-P | 1.68 (43)  | 6 (152)         | 48 (1,219)       | 2.10 (0.96)  |    |
| 1¼           | XW   | 12E-XW-73-P | 2.02 (51)  | 6 (152)         | 48 (1,219)       | 2.54 (1.14)  |    |
| 1½           | XW   | 15E-XW-73-P | 2.26 (57)  | 6 (152)         | 48 (1,219)       | 3.65 (1.64)  |    |
| 2            | XW   | 20F-XW-73-P | 2.50 (65)  | 6 (152)         | 48 (1,219)       | 3.89 (1.77)  |    |
| 2½           | XW   | 25F-XW-73-P | 3.00 (76)  | 6 (152)         | 48 (1,219)       | 4.75 (2.16)  |    |
| 3            | XW   | 30F-XW-73-P | 3.50 (89)  | 6 (152)         | 48 (1,219)       | 5.61 (2.55)  |    |
| 3½           | XW   | 35F-XW-73-P | 4.00 (102) | 6 (152)         | 48 (1,219)       | 6.47 (2.94)  |    |
| 4            | XW   | 40F-XW-73-P | 4.50 (114) | 6 (152)         | 48 (1,219)       | 7.34 (3.33)  |    |
| 5            | XW   | 50F-XW-73-P | 5.50 (140) | 6 (152)         | 48 (1,219)       | 9.07 (4.12)  |    |
| 6            | XW   | 60F-XW-73-P | 6.50 (165) | 6 (152)         | 48 (1,219)       | 10.79 (4.90) |    |

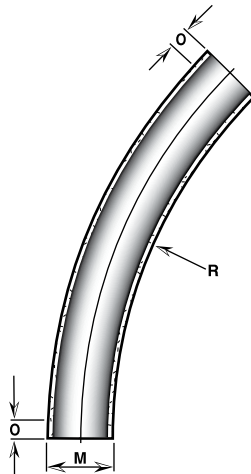


**30° X 60°**

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| ¾            | SW   | 07E-SW-74-P  | 1.05 (27)  | 6 (152)         | 60 (1,524)       | 0.61 (0.28)   |
| 1            | SW   | 10E-SW-74-P  | 1.32 (33)  | 6 (152)         | 60 (1,524)       | 0.68 (0.31)   |
| 1¼           | SW   | 12E-SW-74-P  | 1.66 (42)  | 6 (152)         | 60 (1,524)       | 0.82 (0.37)   |
| 1½           | SW   | 15E-SW-74-P  | 1.90 (48)  | 6 (152)         | 60 (1,524)       | 1.18 (0.54)   |
| 2            | SW   | 20E-SW-74-P  | 2.37 (60)  | 6 (152)         | 60 (1,524)       | 1.36 (0.62)   |
| 2½           | SW   | 25E-SW-74-P  | 2.88 (73)  | 6 (152)         | 60 (1,524)       | 1.65 (0.75)   |
| 3            | SW   | 30E-SW-74-P  | 3.50 (89)  | 6 (152)         | 60 (1,524)       | 2.15 (0.98)   |
| 4            | SW   | 40E-SW-74-P  | 4.46 (113) | 6 (152)         | 60 (1,524)       | 2.58 (1.17)   |
| 4            | HW   | 40E-HW-74-P  | 4.51 (115) | 6 (152)         | 60 (1,524)       | 3.48 (1.58)   |
| 5            | MW   | 50E-MW-74-P  | 5.57 (141) | 6 (152)         | 60 (1,524)       | 4.30 (1.95)   |
| 5            | HW   | 50E-HW-74-P  | 5.60 (142) | 6 (152)         | 60 (1,524)       | 4.66 (2.12)   |
| 6            | MW   | 60E-MW-74-P  | 6.63 (168) | 6 (152)         | 60 (1,524)       | 5.09 (2.31)   |
| 6            | HW   | 60E-HW-74-P  | 6.66 (169) | 6 (152)         | 60 (1,524)       | 5.84 (2.65)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-74-P | 2.14 (54)  | 6 (152)         | 60 (1,524)       | 1.22 (0.55)   |
| 2½           | SW   | 25F-SW-74-P | 2.64 (67)  | 6 (152)         | 60 (1,524)       | 1.51 (0.69)   |
| 3            | SW   | 30F-SW-74-P | 3.14 (80)  | 6 (152)         | 60 (1,524)       | 1.72 (0.78)   |
| 3½           | SW   | 35F-SW-74-P | 3.64 (92)  | 6 (152)         | 60 (1,524)       | 2.15 (0.98)   |
| 4            | SW   | 40F-SW-74-P | 4.14 (105) | 6 (152)         | 60 (1,524)       | 2.47 (1.12)   |
| 4            | HW   | 40F-HW-74-P | 4.19 (106) | 6 (152)         | 60 (1,524)       | 3.30 (1.50)   |
| 4½           | SW   | 45F-SW-74-P | 4.64 (117) | 6 (152)         | 60 (1,524)       | 2.69 (1.22)   |
| 4½           | HW   | 45F-HW-74-P | 4.69 (118) | 6 (152)         | 60 (1,524)       | 3.73 (1.69)   |
| 5            | MW   | 50F-MW-74-P | 5.19 (132) | 6 (152)         | 60 (1,524)       | 4.05 (1.84)   |
| 5            | HW   | 50F-HW-74-P | 5.22 (132) | 6 (152)         | 60 (1,524)       | 4.73 (2.15)   |
| 6            | MW   | 60F-MW-74-P | 6.19 (157) | 6 (152)         | 60 (1,524)       | 4.84 (2.20)   |
| 6            | HW   | 60F-HW-74-P | 6.22 (158) | 6 (152)         | 60 (1,524)       | 5.66 (2.57)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| ¾            | XW   | 07E-XW-74-P | 1.41 (36)  | 6 (152)         | 60 (1,524)       | 2.21 (1.01)   |
| 1            | XW   | 10E-XW-74-P | 1.68 (43)  | 6 (152)         | 60 (1,524)       | 2.46 (1.12)   |
| 1¼           | XW   | 12E-XW-74-P | 2.02 (51)  | 6 (152)         | 60 (1,524)       | 2.97 (1.34)   |
| 1½           | XW   | 15E-XW-74-P | 2.26 (57)  | 6 (152)         | 60 (1,524)       | 4.27 (1.92)   |
| 2            | XW   | 20F-XW-74-P | 2.50 (65)  | 6 (152)         | 60 (1,524)       | 4.52 (2.05)   |
| 3            | XW   | 30F-XW-74-P | 3.50 (89)  | 6 (152)         | 60 (1,524)       | 6.52 (2.96)   |
| 4            | XW   | 40F-XW-74-P | 4.50 (114) | 6 (152)         | 60 (1,524)       | 8.53 (3.87)   |
| 5            | XW   | 50F-XW-74-P | 5.50 (140) | 6 (152)         | 60 (1,524)       | 10.54 (4.79)  |
| 6            | XW   | 60F-XW-74-P | 6.50 (165) | 6 (152)         | 60 (1,524)       | 12.55 (5.70)  |

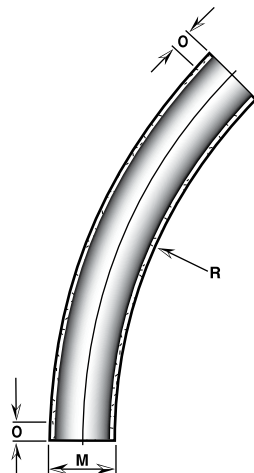


**45° X 12°**

| Nominal Size | Type | IPS Item No. | M         | O-Tangent (min.) | R-Radius (min.) | Weight lbs kg |
|--------------|------|--------------|-----------|------------------|-----------------|---------------|
| ¾            | SW   | 07E-SW-80-P  | 1.05 (27) | 6 (152)          | 12 (305)        | 0.30 (0.14)   |
| 1            | SW   | 10E-SW-80-P  | 1.32 (33) | 6 (152)          | 12 (305)        | 0.33 (0.15)   |
| 1¼           | SW   | 12E-SW-80-P  | 1.66 (42) | 6 (152)          | 12 (305)        | 0.40 (0.18)   |
| 1½           | SW   | 15E-SW-80-P  | 1.90 (48) | 6 (152)          | 12 (305)        | 0.58 (0.26)   |
| 2            | SW   | 20E-SW-80-P  | 2.37 (60) | 6 (152)          | 12 (305)        | 0.67 (0.30)   |
| 2½           | SW   | 25E-SW-80-P  | 2.88 (73) | 6 (152)          | 12 (305)        | 0.81 (0.37)   |

| Nominal Size | Type | ID Item No. | M         | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|-----------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-80-P | 2.14 (54) | 6 (152)         | 12 (305)         | 0.60 (0.27)   |
| 2½           | SW   | 25F-SW-80-P | 2.64 (67) | 6 (152)         | 12 (305)         | 0.74 (0.34)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| ¾            | XW   | 07E-XW-80-P | 1.41 (36)  | 6 (152)         | 12 (305)         | 1.07 (0.48)   |
| 1            | XW   | 10E-XW-80-P | 1.68 (43)  | 6 (152)         | 12 (305)         | 1.19 (0.54)   |
| 1¼           | XW   | 12E-XW-80-P | 2.02 (51)  | 6 (152)         | 12 (305)         | 1.44 (0.65)   |
| 1½           | XW   | 15E-XW-80-P | 2.26 (57)  | 6 (152)         | 12 (305)         | 2.07 (0.94)   |
| 2            | XW   | 20F-XW-80-P | 2.50 (63)  | 6 (152)         | 12 (305)         | 2.21 (1.00)   |
| 2½           | XW   | 25F-XW-80-P | 3.00 (76)  | 6 (152)         | 12 (305)         | 2.70 (1.22)   |
| 3            | XW   | 30F-XW-80-P | 3.50 (89)  | 6 (152)         | 12 (305)         | 2.89 (1.31)   |
| 3½           | XW   | 35F-XW-80-P | 4.00 (102) | 6 (152)         | 12 (305)         | 3.68 (1.67)   |

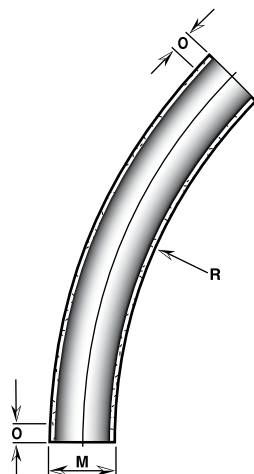


**45° X 24"**

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min.) | R-Radius (min.) | Weight lbs kg |
|--------------|------|--------------|------------|------------------|-----------------|---------------|
| ¾            | SW   | 07E-SW-81-P  | 1.05 (27)  | 6 (152)          | 24 (610)        | 0.43 (0.20)   |
| 1            | SW   | 10E-SW-81-P  | 1.32 (33)  | 6 (152)          | 24 (610)        | 0.48 (0.22)   |
| 1¼           | SW   | 12E-SW-81-P  | 1.66 (42)  | 6 (152)          | 24 (610)        | 0.58 (0.26)   |
| 1½           | SW   | 15E-SW-81-P  | 1.90 (48)  | 6 (152)          | 24 (610)        | 0.83 (0.38)   |
| 2            | SW   | 20E-SW-81-P  | 2.37 (60)  | 6 (152)          | 24 (610)        | 0.95 (0.43)   |
| 2½           | SW   | 25E-SW-81-P  | 2.88 (73)  | 6 (152)          | 24 (610)        | 1.15 (0.52)   |
| 3            | SW   | 30E-SW-81-P  | 3.50 (89)  | 6 (152)          | 24 (610)        | 1.96 (0.89)   |
| 4            | SW   | 40E-SW-81-P  | 4.46 (113) | 6 (152)          | 24 (610)        | 2.35 (1.07)   |
| 4            | HW   | 40E-HW-81-P  | 4.51 (114) | 6 (152)          | 24 (610)        | 3.17 (1.44)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-81-P | 2.14 (54)  | 6 (152)         | 24 (610)         | 0.85 (0.39)   |
| 2½           | SW   | 25F-SW-81-P | 2.64 (67)  | 6 (152)         | 24 (610)         | 1.05 (0.48)   |
| 3            | SW   | 30F-SW-81-P | 3.14 (80)  | 6 (152)         | 24 (610)         | 1.57 (0.71)   |
| 3½           | SW   | 35F-SW-81-P | 3.64 (92)  | 6 (152)         | 24 (610)         | 1.96 (0.89)   |
| 4            | SW   | 40F-SW-81-P | 4.14 (105) | 6 (152)         | 24 (610)         | 2.25 (1.02)   |
| 4            | HW   | 40F-HW-81-P | 4.19 (106) | 6 (152)         | 24 (610)         | 3.00 (1.36)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| ¾            | XW   | 07E-XW-81-P | 1.41 (36)  | 6 (152)         | 24 (610)         | 1.52 (0.69)   |
| 1            | XW   | 10E-XW-81-P | 1.68 (43)  | 6 (152)         | 24 (610)         | 1.70 (0.77)   |
| 1¼           | XW   | 12E-XW-81-P | 2.02 (51)  | 6 (152)         | 24 (610)         | 2.05 (0.93)   |
| 1½           | XW   | 15E-XW-81-P | 2.26 (57)  | 6 (152)         | 24 (610)         | 2.95 (1.34)   |
| 2            | XW   | 20F-XW-81-P | 2.50 (65)  | 6 (152)         | 24 (610)         | 3.15 (1.43)   |
| 2½           | XW   | 25F-XW-81-P | 3.00 (76)  | 6 (152)         | 24 (610)         | 3.85 (1.75)   |
| 3            | XW   | 30F-XW-81-P | 3.50 (89)  | 6 (152)         | 24 (610)         | 4.55 (2.07)   |
| 3½           | XW   | 35F-XW-81-P | 4.00 (102) | 6 (152)         | 24 (610)         | 5.24 (2.38)   |
| 4            | XW   | 40F-XW-81-P | 4.50 (114) | 6 (152)         | 24 (610)         | 5.95 (2.70)   |



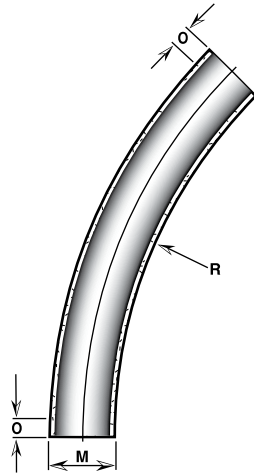
**45° X 36"**

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| ¾            | SW   | 07E-SW-82-P  | 1.05 (27)  | 6 (152)         | 36 (914)         | 0.57 (0.26)   |
| 1            | SW   | 10E-SW-82-P  | 1.32 (33)  | 6 (152)         | 36 (914)         | 0.63 (0.29)   |
| 1¼           | SW   | 12E-SW-82-P  | 1.66 (42)  | 6 (152)         | 36 (914)         | 0.77 (0.35)   |
| 1½           | SW   | 15E-SW-82-P  | 1.90 (48)  | 6 (152)         | 36 (914)         | 1.10 (0.50)   |
| 2            | SW   | 20E-SW-82-P  | 2.37 (60)  | 6 (152)         | 36 (914)         | 1.27 (0.58)   |
| 2½           | SW   | 25E-SW-82-P  | 2.88 (73)  | 6 (152)         | 36 (914)         | 1.53 (0.70)   |
| 3            | SW   | 30E-SW-82-P  | 3.50 (89)  | 6 (152)         | 36 (914)         | 2.00 (0.91)   |
| 4            | SW   | 40E-SW-82-P  | 4.46 (113) | 6 (152)         | 36 (914)         | 2.40 (1.09)   |
| 4            | HW   | 40E-HW-82-P  | 4.50 (114) | 6 (152)         | 36 (914)         | 3.23 (1.47)   |
| 5            | MW   | 50E-MW-82-P  | 5.57 (141) | 6 (152)         | 36 (914)         | 4.00 (1.81)   |
| 5            | HW   | 50E-HW-82-P  | 5.60 (152) | 6 (152)         | 36 (914)         | 4.39 (2.00)   |
| 6            | MW   | 60E-MW-82-P  | 6.63 (168) | 6 (152)         | 36 (914)         | 4.73 (2.15)   |
| 6            | HW   | 60E-HW-82-P  | 6.66 (169) | 6 (152)         | 36 (914)         | 5.43 (2.46)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-82-P | 2.14 (54)  | 6 (152)         | 36 (914)         | 1.13 (0.51)   |
| 2½           | SW   | 25F-SW-82-P | 2.64 (67)  | 6 (152)         | 36 (914)         | 1.40 (0.64)   |
| 3            | SW   | 30F-SW-82-P | 3.14 (80)  | 6 (152)         | 36 (914)         | 1.60 (0.73)   |
| 3½           | SW   | 35F-SW-82-P | 3.64 (92)  | 6 (152)         | 36 (914)         | 2.00 (0.91)   |
| 4            | SW   | 40F-SW-82-P | 4.14 (105) | 6 (152)         | 36 (914)         | 2.30 (1.04)   |
| 4            | HW   | 40F-HW-82-P | 4.19 (106) | 6 (152)         | 36 (914)         | 3.07 (1.39)   |
| 4½           | SW   | 45F-SW-82-P | 4.64 (117) | 6 (152)         | 36 (914)         | 3.65 (1.66)   |
| 4½           | HW   | 45F-HW-82-P | 4.69 (118) | 6 (152)         | 36 (914)         | 4.00 (1.82)   |
| 5            | MW   | 50F-MW-82-P | 5.19 (132) | 6 (152)         | 36 (914)         | 3.76 (1.71)   |
| 5            | HW   | 50F-HW-82-P | 5.22 (132) | 6 (152)         | 36 (914)         | 4.33 (1.96)   |
| 6            | MW   | 60F-MW-82-P | 6.19 (157) | 6 (152)         | 36 (914)         | 4.50 (2.04)   |
| 6            | HW   | 60F-HW-82-P | 6.22 (158) | 6 (152)         | 36 (914)         | 5.26 (2.39)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| ¾            | XW   | 07E-XW-82-P | 1.41 (36)  | 6 (152)         | 36 (914)         | 2.03 (0.92)   |
| 1            | XW   | 10E-XW-82-P | 1.68 (43)  | 6 (152)         | 36 (914)         | 2.27 (1.03)   |
| 1¼           | XW   | 12E-XW-82-P | 2.02 (51)  | 6 (152)         | 36 (914)         | 2.73 (1.24)   |
| 1½           | XW   | 15E-XW-82-P | 2.26 (57)  | 6 (152)         | 36 (914)         | 3.93 (1.78)   |
| 2            | XW   | 20F-XW-82-P | 2.50 (65)  | 6 (152)         | 36 (914)         | 4.20 (1.91)   |
| 2½           | XW   | 25F-XW-82-P | 3.00 (76)  | 6 (152)         | 36 (914)         | 5.13 (2.33)   |
| 3            | XW   | 30F-XW-82-P | 3.50 (89)  | 6 (152)         | 36 (914)         | 6.07 (2.76)   |
| 3½           | XW   | 35F-XW-82-P | 4.00 (102) | 6 (152)         | 36 (914)         | 6.99 (3.18)   |
| 4            | XW   | 40F-XW-82-P | 4.59 (114) | 6 (152)         | 36 (914)         | 7.93 (3.60)   |
| 5            | XW   | 50F-XW-82-P | 5.50 (140) | 6 (152)         | 36 (914)         | 9.79 (4.44)   |
| 6            | XW   | 60F-XW-82-P | 6.50 (165) | 6 (152)         | 36 (914)         | 11.65 (5.29)  |

# PHENOLIC ELBOWS



45° X 48"

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| ¾            | SW   | 07E-SW-83-P  | 1.05 (27)  | 6 (152)         | 48 (1,219)       | 0.69 (0.31)   |
| 1            | SW   | 10E-SW-83-P  | 1.32 (33)  | 6 (152)         | 48 (1,219)       | 0.78 (0.35)   |
| 1¼           | SW   | 12E-SW-83-P  | 1.66 (42)  | 6 (152)         | 48 (1,219)       | 0.94 (0.43)   |
| 1½           | SW   | 15E-SW-83-P  | 1.90 (48)  | 6 (152)         | 48 (1,219)       | 1.35 (0.61)   |
| 2            | SW   | 20E-SW-83-P  | 2.37 (60)  | 6 (152)         | 48 (1,219)       | 1.55 (0.70)   |
| 2½           | SW   | 25E-SW-83-P  | 2.88 (73)  | 6 (152)         | 48 (1,219)       | 1.88 (0.85)   |
| 3            | SW   | 30E-SW-83-P  | 3.50 (89)  | 6 (152)         | 48 (1,219)       | 2.45 (1.11)   |
| 4            | SW   | 40E-SW-83-P  | 4.46 (113) | 6 (152)         | 48 (1,219)       | 2.94 (1.34)   |
| 4            | HW   | 40E-HW-83-P  | 4.51 (114) | 6 (152)         | 48 (1,219)       | 3.96 (1.80)   |
| 5            | MW   | 50E-MW-83-P  | 5.57 (141) | 6 (152)         | 48 (1,219)       | 4.90 (2.23)   |
| 5            | HW   | 50E-HW-83-P  | 5.60 (142) | 6 (152)         | 48 (1,219)       | 5.31 (2.41)   |
| 6            | MW   | 60E-MW-83-P  | 6.63 (168) | 6 (152)         | 48 (1,219)       | 5.80 (2.63)   |
| 6            | HW   | 60E-HW-83-P  | 6.66 (169) | 6 (152)         | 48 (1,219)       | 6.66 (3.02)   |

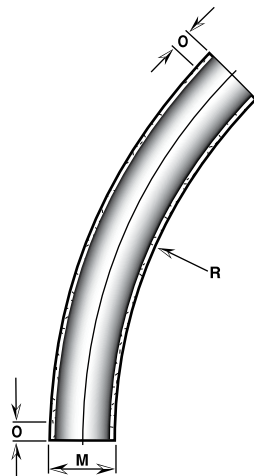
| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-83-P | 2.14 (54)  | 6 (152)         | 48 (1,219)       | 1.39 (0.63)   |
| 2½           | SW   | 25F-SW-83-P | 2.64 (67)  | 6 (152)         | 48 (1,219)       | 1.72 (0.78)   |
| 3            | SW   | 30F-SW-83-P | 3.14 (80)  | 6 (152)         | 48 (1,219)       | 1.96 (0.89)   |
| 3½           | SW   | 35F-SW-83-P | 3.64 (92)  | 6 (152)         | 48 (1,219)       | 2.45 (1.11)   |
| 4            | SW   | 40F-SW-83-P | 4.14 (105) | 6 (152)         | 48 (1,219)       | 2.82 (1.28)   |
| 4            | HW   | 40F-HW-83-P | 4.19 (106) | 6 (152)         | 48 (1,219)       | 3.76 (1.71)   |
| 4½           | SW   | 45F-SW-83-P | 4.64 (117) | 6 (152)         | 48 (1,219)       | 3.06 (1.39)   |
| 4½           | HW   | 45F-HW-83-P | 4.69 (118) | 6 (152)         | 48 (1,219)       | 4.25 (1.93)   |
| 5            | MW   | 50F-MW-83-P | 5.19 (132) | 6 (152)         | 48 (1,219)       | 4.61 (2.09)   |
| 5            | HW   | 50F-HW-83-P | 5.22 (133) | 6 (152)         | 48 (1,219)       | 5.39 (2.45)   |
| 6            | MW   | 60F-MW-83-P | 6.19 (157) | 6 (152)         | 48 (1,219)       | 5.51 (2.50)   |
| 6            | HW   | 60F-HW-83-P | 6.22 (158) | 6 (152)         | 48 (1,219)       | 6.45 (2.93)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| ¾            | XW   | 07E-XW-83-P | 1.41 (36)  | 6 (152)         | 48 (1,219)       | 2.53 (1.16)   |
| 1            | XW   | 10E-XW-83-P | 1.68 (43)  | 6 (152)         | 48 (1,219)       | 2.82 (1.28)   |
| 1¼           | XW   | 12E-XW-83-P | 2.02 (51)  | 6 (152)         | 48 (1,219)       | 3.40 (1.53)   |
| 1½           | XW   | 15E-XW-83-P | 2.26 (57)  | 6 (152)         | 48 (1,219)       | 4.89 (2.19)   |
| 2            | XW   | 20F-XW-83-P | 2.50 (65)  | 6 (152)         | 48 (1,219)       | 5.15 (2.34)   |
| 2½           | XW   | 25F-XW-83-P | 3.00 (76)  | 6 (152)         | 48 (1,219)       | 6.29 (2.85)   |
| 3            | XW   | 30F-XW-83-P | 3.50 (89)  | 6 (152)         | 48 (1,219)       | 7.43 (3.37)   |
| 3½           | XW   | 35F-XW-83-P | 4.00 (102) | 6 (152)         | 48 (1,219)       | 8.57 (3.89)   |
| 4            | XW   | 40F-XW-83-P | 4.50 (114) | 6 (152)         | 48 (1,219)       | 9.72 (4.41)   |
| 5            | XW   | 50F-XW-83-P | 5.50 (140) | 6 (152)         | 48 (1,219)       | 12.01 (5.45)  |
| 6            | XW   | 60F-XW-83-P | 6.50 (165) | 6 (152)         | 48 (1,219)       | 14.29 (6.49)  |

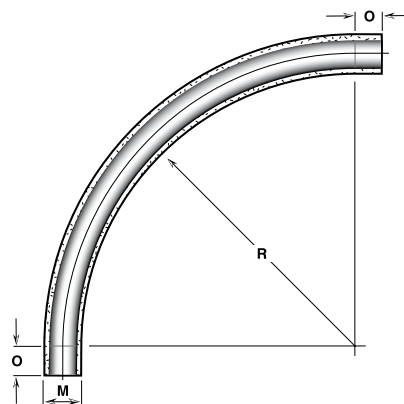
| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| ¾            | SW   | 07E-SW-84-P  | 1.05 (27)  | 6 (152)         | 60 (1,524)       | 0.85 (0.39)   |
| 1            | SW   | 10E-SW-84-P  | 1.32 (33)  | 6 (152)         | 60 (1,524)       | 0.95 (0.43)   |
| 1¼           | SW   | 12E-SW-84-P  | 1.66 (42)  | 6 (152)         | 60 (1,524)       | 1.15 (0.52)   |
| 1½           | SW   | 15E-SW-84-P  | 1.90 (48)  | 6 (152)         | 60 (1,524)       | 1.65 (0.75)   |
| 2            | SW   | 20E-SW-84-P  | 2.37 (60)  | 6 (152)         | 60 (1,524)       | 1.90 (0.86)   |
| 2½           | SW   | 25E-SW-84-P  | 2.88 (73)  | 6 (152)         | 60 (1,524)       | 2.30 (1.04)   |
| 3            | SW   | 30E-SW-84-P  | 3.50 (89)  | 6 (152)         | 60 (1,524)       | 3.00 (1.36)   |
| 4            | SW   | 40E-SW-84-P  | 4.46 (113) | 6 (152)         | 60 (1,524)       | 3.60 (1.63)   |
| 4            | HW   | 40E-HW-84-P  | 4.51 (115) | 6 (152)         | 60 (1,524)       | 4.85 (2.20)   |
| 5            | MW   | 50E-MW-84-P  | 5.57 (141) | 6 (152)         | 60 (1,524)       | 6.00 (2.72)   |
| 5            | HW   | 50E-HW-84-P  | 5.60 (142) | 6 (152)         | 60 (1,524)       | 6.50 (2.95)   |
| 6            | MW   | 60E-MW-84-P  | 6.63 (168) | 6 (152)         | 60 (1,524)       | 7.10 (3.22)   |
| 6            | HW   | 60E-HW-84-P  | 6.66 (169) | 6 (152)         | 60 (1,524)       | 8.15 (3.70)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-84-P | 2.14 (54)  | 6 (152)         | 60 (1,524)       | 1.70 (0.77)   |
| 2½           | SW   | 25F-SW-84-P | 2.64 (67)  | 6 (152)         | 60 (1,524)       | 2.10 (0.95)   |
| 3            | SW   | 30F-SW-84-P | 3.14 (80)  | 6 (152)         | 60 (1,524)       | 2.40 (1.09)   |
| 3½           | SW   | 35F-SW-84-P | 3.64 (92)  | 6 (152)         | 60 (1,524)       | 3.00 (1.36)   |
| 4            | SW   | 40F-SW-84-P | 4.14 (105) | 6 (152)         | 60 (1,524)       | 3.45 (1.57)   |
| 4            | HW   | 40F-HW-84-P | 4.19 (106) | 6 (152)         | 60 (1,524)       | 4.60 (2.09)   |
| 4½           | SW   | 45F-SW-84-P | 4.64 (117) | 6 (152)         | 60 (1,524)       | 3.75 (1.70)   |
| 4½           | HW   | 45F-HW-84-P | 4.69 (118) | 6 (152)         | 60 (1,524)       | 5.20 (2.36)   |
| 5            | MW   | 50F-MW-84-P | 5.19 (132) | 6 (152)         | 60 (1,524)       | 5.65 (2.57)   |
| 5            | HW   | 50F-HW-84-P | 5.22 (132) | 6 (152)         | 60 (1,524)       | 6.60 (3.00)   |
| 6            | MW   | 60F-MW-84-P | 6.19 (157) | 6 (152)         | 60 (1,524)       | 6.75 (3.07)   |
| 6            | HW   | 60F-HW-84-P | 6.22 (158) | 6 (152)         | 60 (1,524)       | 7.90 (3.59)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| ¾            | XW   | 07E-XW-84-P | 1.41 (36)  | 6 (152)         | 60 (1,524)       | 3.01 (1.38)   |
| 1            | XW   | 10E-XW-84-P | 1.68 (43)  | 6 (152)         | 60 (1,524)       | 3.35 (1.53)   |
| 1¼           | XW   | 12E-XW-84-P | 2.02 (51)  | 6 (152)         | 60 (1,524)       | 4.04 (1.82)   |
| 1½           | XW   | 15E-XW-84-P | 2.26 (57)  | 6 (152)         | 60 (1,524)       | 5.81 (2.61)   |
| 2            | XW   | 20F-XW-84-P | 2.50 (65)  | 6 (152)         | 60 (1,524)       | 6.30 (2.86)   |
| 2½           | XW   | 25F-XW-84-P | 3.00 (76)  | 6 (152)         | 60 (1,524)       | 7.70 (3.50)   |
| 3            | XW   | 30F-XW-84-P | 3.50 (89)  | 6 (152)         | 60 (1,524)       | 9.10 (4.13)   |
| 3½           | XW   | 35F-XW-84-P | 4.00 (102) | 6 (152)         | 60 (1,524)       | 10.50 (4.77)  |
| 4            | XW   | 40F-XW-84-P | 4.50 (114) | 6 (152)         | 60 (1,524)       | 11.90 (5.40)  |
| 5            | XW   | 50F-XW-84-P | 5.50 (140) | 6 (152)         | 60 (1,524)       | 14.70 (6.67)  |
| 6            | XW   | 60F-XW-84-P | 6.50 (165) | 6 (152)         | 60 (1,524)       | 17.50 (7.94)  |



45° X 60"

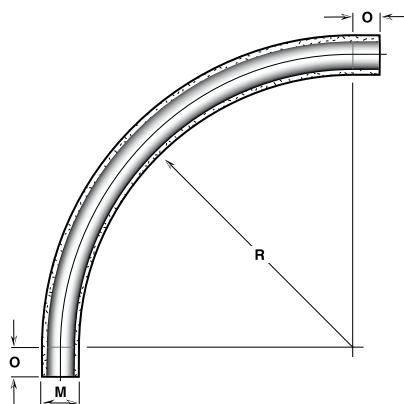


**90° X 12"**

| Nominal Size | Type | IPS Item No. | M         | O-Tangent (min.) | R-Radius (min.) | Weight lbs kg |
|--------------|------|--------------|-----------|------------------|-----------------|---------------|
| ¾            | SW   | 07E-SW-90-P  | 1.05 (27) | 6 (152)          | 12 (305)        | 0.43 (0.20)   |
| 1            | SW   | 10E-SW-90-P  | 1.32 (33) | 6 (152)          | 12 (305)        | 0.48 (0.22)   |
| 1¼           | SW   | 12E-SW-90-P  | 1.66 (42) | 6 (152)          | 12 (305)        | 0.58 (0.26)   |
| 1½           | SW   | 15E-SW-90-P  | 1.90 (48) | 6 (152)          | 12 (305)        | 0.83 (0.38)   |
| 2            | SW   | 20E-SW-90-P  | 2.37 (60) | 6 (152)          | 12 (305)        | 0.95 (0.43)   |
| 2½           | SW   | 25E-SW-90-P  | 2.88 (73) | 6 (152)          | 12 (305)        | 1.15 (0.52)   |

| Nominal Size | Type | ID Item No. | M         | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|-----------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-90-P | 2.14 (54) | 6 (152)         | 12 (305)         | 0.85 (0.39)   |
| 2½           | SW   | 25F-SW-90-P | 2.64 (67) | 6 (152)         | 12 (305)         | 1.05 (0.48)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| ¾            | XW   | 07E-XW-90-P | 1.41 (36)  | 6 (152)         | 12 (305)         | 1.52 (0.69)   |
| 1            | XW   | 10E-XW-90-P | 1.68 (43)  | 6 (152)         | 12 (305)         | 1.70 (0.77)   |
| 1¼           | XW   | 12E-XW-90-P | 2.02 (51)  | 6 (152)         | 12 (305)         | 2.05 (0.93)   |
| 1½           | XW   | 15E-XW-90-P | 2.26 (57)  | 6 (152)         | 12 (305)         | 2.95 (1.34)   |
| 2            | XW   | 20F-XW-90-P | 2.50 (63)  | 6 (152)         | 12 (305)         | 3.15 (1.43)   |
| 2½           | XW   | 25F-XW-90-P | 3.00 (76)  | 6 (152)         | 12 (305)         | 3.85 (1.75)   |
| 3            | XW   | 30F-XW-90-P | 3.50 (89)  | 6 (152)         | 12 (305)         | 4.55 (2.06)   |
| 3½           | XW   | 35F-XW-90-P | 4.00 (102) | 6 (152)         | 12 (305)         | 5.25 (2.38)   |



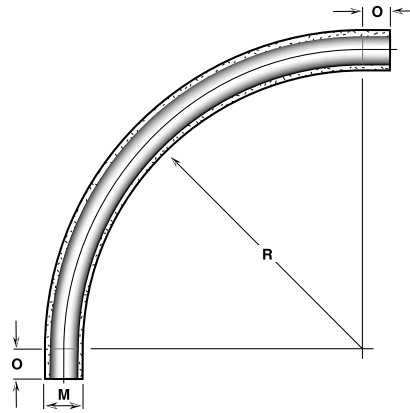
**90° X 24"**

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min.) | R-Radius (min.) | Weight lbs kg |
|--------------|------|--------------|------------|------------------|-----------------|---------------|
| ¾            | SW   | 07E-SW-91-P  | 1.05 (27)  | 6 (152)          | 24 (610)        | 0.71 (0.32)   |
| 1            | SW   | 10E-SW-91-P  | 1.32 (33)  | 6 (152)          | 24 (610)        | 0.79 (0.36)   |
| 1¼           | SW   | 12E-SW-91-P  | 1.66 (42)  | 6 (152)          | 24 (610)        | 0.96 (0.44)   |
| 1½           | SW   | 15E-SW-91-P  | 1.90 (48)  | 6 (152)          | 24 (610)        | 1.38 (0.63)   |
| 2            | SW   | 20E-SW-91-P  | 2.37 (60)  | 6 (152)          | 24 (610)        | 1.58 (0.72)   |
| 2½           | SW   | 25E-SW-91-P  | 2.88 (73)  | 6 (152)          | 24 (610)        | 1.92 (0.87)   |
| 3            | SW   | 30E-SW-91-P  | 3.50 (89)  | 6 (152)          | 24 (610)        | 2.50 (1.14)   |
| 4            | SW   | 40E-SW-91-P  | 4.46 (113) | 6 (152)          | 24 (610)        | 3.00 (1.36)   |
| 4            | HW   | 40E-HW-91-P  | 4.51 (115) | 6 (152)          | 24 (610)        | 4.04 (1.83)   |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-91-P | 2.14 (54)  | 6 (152)         | 24 (610)         | 1.42 (0.65)   |
| 2½           | SW   | 25F-SW-91-P | 2.64 (67)  | 6 (152)         | 24 (610)         | 1.75 (0.80)   |
| 3            | SW   | 30F-SW-91-P | 3.14 (80)  | 6 (152)         | 24 (610)         | 2.00 (0.91)   |
| 4            | SW   | 40F-SW-91-P | 4.14 (105) | 6 (152)         | 24 (610)         | 2.88 (1.30)   |
| 4            | HW   | 40F-HW-91-P | 4.19 (106) | 6 (152)         | 24 (610)         | 3.84 (1.74)   |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| ¾            | XW   | 07E-XW-91-P | 1.41 (36)  | 6 (152)         | 24 (610)         | 2.54 (1.15)   |
| 1            | XW   | 10E-XW-91-P | 1.68 (43)  | 6 (152)         | 24 (610)         | 2.83 (1.29)   |
| 1¼           | XW   | 12E-XW-91-P | 2.02 (51)  | 6 (152)         | 24 (610)         | 3.42 (1.55)   |
| 1½           | XW   | 15E-XW-91-P | 2.26 (57)  | 6 (152)         | 24 (610)         | 4.92 (2.23)   |
| 2            | XW   | 20F-XW-91-P | 2.50 (65)  | 6 (152)         | 24 (610)         | 5.25 (2.38)   |
| 2½           | XW   | 25F-XW-91-P | 3.00 (76)  | 6 (152)         | 24 (610)         | 6.42 (2.92)   |
| 3            | XW   | 30F-XW-91-P | 3.50 (89)  | 6 (152)         | 24 (610)         | 7.58 (3.44)   |
| 3½           | XW   | 35F-XW-91-P | 4.00 (102) | 6 (152)         | 24 (610)         | 8.76 (3.98)   |
| 4            | XW   | 40F-XW-91-P | 4.50 (114) | 6 (152)         | 24 (610)         | 9.92 (4.50)   |

# PHENOLIC ELBOWS

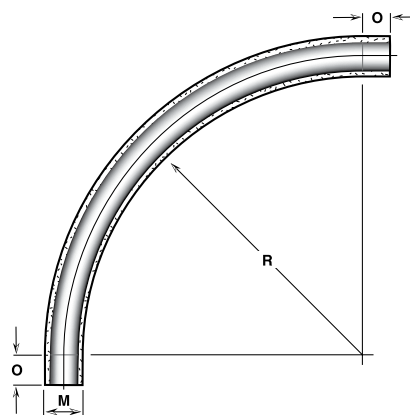


90° X 36"

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs  | kg |
|--------------|------|--------------|------------|-----------------|------------------|-------------|----|
| ¾            | SW   | 07E-SW-92-P  | 1.05 (27)  | 6 (152)         | 36 (914)         | 0.96 (0.44) |    |
| 1            | SW   | 10E-SW-92-P  | 1.32 (33)  | 6 (152)         | 36 (914)         | 1.08 (0.49) |    |
| 1¼           | SW   | 12E-SW-92-P  | 1.66 (42)  | 6 (152)         | 36 (914)         | 1.30 (0.59) |    |
| 1½           | SW   | 15E-SW-92-P  | 1.90 (48)  | 6 (152)         | 36 (914)         | 1.87 (0.85) |    |
| 2            | SW   | 20E-SW-92-P  | 2.37 (60)  | 6 (152)         | 36 (914)         | 2.15 (0.98) |    |
| 2½           | SW   | 25E-SW-92-P  | 2.88 (73)  | 6 (152)         | 36 (914)         | 2.61 (1.19) |    |
| 3            | SW   | 30E-SW-92-P  | 3.50 (89)  | 6 (152)         | 36 (914)         | 3.40 (1.54) |    |
| 4            | SW   | 40E-SW-92-P  | 4.46 (113) | 6 (152)         | 36 (914)         | 4.08 (1.85) |    |
| 4            | HW   | 40E-HW-92-P  | 4.51 (115) | 6 (152)         | 36 (914)         | 5.50 (2.50) |    |
| 5            | MW   | 50E-MW-92-P  | 5.57 (141) | 6 (152)         | 36 (914)         | 6.85 (3.08) |    |
| 5            | HW   | 50E-HW-92-P  | 5.60 (142) | 6 (152)         | 36 (914)         | 7.54 (3.42) |    |
| 6            | MW   | 60E-MW-92-P  | 6.63 (168) | 6 (152)         | 36 (914)         | 8.11 (3.65) |    |
| 6            | HW   | 60E-HW-92-P  | 6.66 (169) | 6 (152)         | 36 (914)         | 9.31 (4.19) |    |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs  | kg |
|--------------|------|-------------|------------|-----------------|------------------|-------------|----|
| 2            | SW   | 20F-SW-92-P | 2.14 (54)  | 6 (152)         | 36 (914)         | 1.93 (1.14) |    |
| 2½           | SW   | 25F-SW-92-P | 2.64 (67)  | 6 (152)         | 36 (914)         | 2.38 (1.36) |    |
| 3            | SW   | 30F-SW-92-P | 3.14 (80)  | 6 (152)         | 36 (914)         | 2.72 (1.59) |    |
| 3½           | SW   | 35F-SW-92-P | 3.64 (92)  | 6 (152)         | 36 (914)         | 3.40 (1.63) |    |
| 4            | SW   | 40F-SW-92-P | 4.14 (105) | 6 (152)         | 36 (914)         | 3.91 (1.68) |    |
| 4            | HW   | 40F-HW-92-P | 4.19 (106) | 6 (152)         | 36 (914)         | 5.21 (2.09) |    |
| 4½           | SW   | 45F-SW-92-P | 4.64 (117) | 6 (152)         | 36 (914)         | 4.25 (1.86) |    |
| 4½           | HW   | 45F-HW-92-P | 4.69 (118) | 6 (152)         | 36 (914)         | 5.89 (2.27) |    |
| 5            | MW   | 50F-MW-92-P | 5.19 (132) | 6 (152)         | 36 (914)         | 6.45 (2.90) |    |
| 5            | HW   | 50F-HW-92-P | 5.22 (132) | 6 (152)         | 36 (914)         | 7.42 (3.34) |    |
| 6            | MW   | 60F-MW-92-P | 6.19 (157) | 6 (152)         | 36 (914)         | 7.71 (3.47) |    |
| 6            | HW   | 60F-HW-92-P | 6.22 (158) | 6 (152)         | 36 (914)         | 9.02 (4.06) |    |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs   | kg |
|--------------|------|-------------|------------|-----------------|------------------|--------------|----|
| ¾            | XW   | 07E-XW-92-P | 1.41 (36)  | 6 (152)         | 36 (914)         | 3.46 (1.57)  |    |
| 1            | XW   | 10E-XW-92-P | 1.68 (43)  | 6 (152)         | 36 (914)         | 3.85 (1.75)  |    |
| 1¼           | XW   | 12E-XW-92-P | 2.02 (51)  | 6 (152)         | 36 (914)         | 4.65 (2.11)  |    |
| 1½           | XW   | 15E-XW-92-P | 2.26 (57)  | 6 (152)         | 36 (914)         | 6.69 (3.04)  |    |
| 2            | XW   | 20F-XW-92-P | 2.50 (65)  | 6 (152)         | 36 (914)         | 7.14 (3.24)  |    |
| 2½           | XW   | 25F-XW-92-P | 3.00 (76)  | 6 (152)         | 36 (914)         | 8.73 (3.96)  |    |
| 3            | XW   | 30F-XW-92-P | 3.50 (89)  | 6 (152)         | 36 (914)         | 10.31 (4.68) |    |
| 3½           | XW   | 35F-XW-92-P | 4.00 (102) | 6 (152)         | 36 (914)         | 11.90 (5.40) |    |
| 4            | XW   | 40F-XW-92-P | 4.50 (114) | 6 (152)         | 36 (914)         | 13.49 (6.12) |    |
| 5            | XW   | 50F-XW-92-P | 5.50 (140) | 6 (152)         | 36 (914)         | 16.79 (7.56) |    |
| 6            | XW   | 60F-XW-92-P | 6.50 (165) | 6 (152)         | 36 (914)         | 19.99 (9.00) |    |

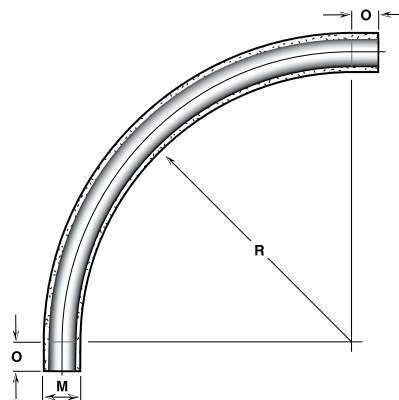


90° X 48"

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs   | kg |
|--------------|------|--------------|------------|-----------------|------------------|--------------|----|
| ¾            | SW   | 07E-SW-93-P  | 1.05 (27)  | 6 (152)         | 48 (1,219)       | 1.36 (0.62)  |    |
| 1            | SW   | 10E-SW-93-P  | 1.32 (33)  | 6 (152)         | 48 (1,219)       | 1.52 (0.69)  |    |
| 1¼           | SW   | 12E-SW-93-P  | 1.66 (42)  | 6 (152)         | 48 (1,219)       | 1.84 (0.84)  |    |
| 1½           | SW   | 15E-SW-93-P  | 1.90 (48)  | 6 (152)         | 48 (1,219)       | 2.64 (1.20)  |    |
| 2            | SW   | 20E-SW-93-P  | 2.37 (60)  | 6 (152)         | 48 (1,219)       | 3.04 (1.38)  |    |
| 2½           | SW   | 25E-SW-93-P  | 2.88 (73)  | 6 (152)         | 48 (1,219)       | 3.68 (1.67)  |    |
| 3            | SW   | 30E-SW-93-P  | 3.50 (89)  | 6 (152)         | 48 (1,219)       | 4.80 (2.18)  |    |
| 4            | SW   | 40E-SW-93-P  | 4.46 (113) | 6 (152)         | 48 (1,219)       | 5.76 (2.62)  |    |
| 4            | HW   | 40E-HW-93-P  | 4.51 (114) | 6 (152)         | 48 (1,219)       | 7.76 (3.52)  |    |
| 5            | MW   | 50E-MW-93-P  | 5.57 (141) | 6 (152)         | 48 (1,219)       | 9.60 (4.36)  |    |
| 5            | HW   | 50E-HW-93-P  | 5.60 (142) | 6 (152)         | 48 (1,219)       | 10.40 (4.72) |    |
| 6            | MW   | 60E-MW-93-P  | 6.63 (168) | 6 (152)         | 48 (1,219)       | 11.52 (5.23) |    |
| 6            | HW   | 60E-HW-93-P  | 6.66 (169) | 6 (152)         | 48 (1,219)       | 12.67 (5.75) |    |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs   | kg |
|--------------|------|-------------|------------|-----------------|------------------|--------------|----|
| 2            | SW   | 20F-SW-93-P | 2.14 (54)  | 6 (152)         | 48 (1,219)       | 2.72 (1.24)  |    |
| 2½           | SW   | 25F-SW-93-P | 2.64 (67)  | 6 (152)         | 48 (1,219)       | 3.36 (1.53)  |    |
| 3            | SW   | 30F-SW-93-P | 3.14 (80)  | 6 (152)         | 48 (1,219)       | 3.84 (1.74)  |    |
| 3½           | SW   | 35F-SW-93-P | 3.64 (92)  | 6 (152)         | 48 (1,219)       | 4.80 (2.18)  |    |
| 4            | SW   | 40F-SW-93-P | 4.14 (105) | 6 (152)         | 48 (1,219)       | 5.52 (2.51)  |    |
| 4            | HW   | 40F-HW-93-P | 4.19 (106) | 6 (152)         | 48 (1,219)       | 7.36 (3.34)  |    |
| 4½           | SW   | 45F-SW-93-P | 4.64 (117) | 6 (152)         | 48 (1,219)       | 6.00 (2.72)  |    |
| 4½           | HW   | 45F-HW-93-P | 4.69 (118) | 6 (152)         | 48 (1,219)       | 8.32 (3.78)  |    |
| 5            | MW   | 50F-MW-93-P | 5.19 (132) | 6 (152)         | 48 (1,219)       | 9.04 (4.10)  |    |
| 5            | HW   | 50F-HW-93-P | 5.22 (133) | 6 (152)         | 48 (1,219)       | 10.56 (4.79) |    |
| 6            | MW   | 60F-MW-93-P | 6.19 (157) | 6 (152)         | 48 (1,219)       | 10.85 (4.92) |    |
| 6            | HW   | 60F-HW-93-P | 6.22 (158) | 6 (152)         | 48 (1,219)       | 12.48 (5.66) |    |

| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs    | kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|----|
| ¾            | XW   | 07E-XW-93-P | 1.41 (36)  | 6 (152)         | 48 (1,219)       | 4.44 (2.04)   |    |
| 1            | XW   | 10E-XW-93-P | 1.68 (43)  | 6 (152)         | 48 (1,219)       | 4.95 (2.26)   |    |
| 1¼           | XW   | 12E-XW-93-P | 2.02 (51)  | 6 (152)         | 48 (1,219)       | 5.97 (2.69)   |    |
| 1½           | XW   | 15E-XW-93-P | 2.26 (57)  | 6 (152)         | 48 (1,219)       | 8.59 (3.86)   |    |
| 2            | XW   | 20F-XW-93-P | 2.50 (65)  | 6 (152)         | 48 (1,219)       | 10.08 (4.58)  |    |
| 2½           | XW   | 25F-XW-93-P | 3.00 (76)  | 6 (152)         | 48 (1,219)       | 12.32 (5.59)  |    |
| 3            | XW   | 30F-XW-93-P | 3.50 (89)  | 6 (152)         | 48 (1,219)       | 14.56 (6.61)  |    |
| 3½           | XW   | 35F-XW-93-P | 4.00 (102) | 6 (152)         | 48 (1,219)       | 16.80 (7.63)  |    |
| 4            | XW   | 40F-XW-93-P | 4.50 (114) | 6 (152)         | 48 (1,219)       | 19.04 (8.64)  |    |
| 5            | XW   | 50F-XW-93-P | 5.50 (140) | 6 (152)         | 48 (1,219)       | 23.52 (10.68) |    |
| 6            | XW   | 60F-XW-93-P | 6.50 (165) | 6 (152)         | 48 (1,219)       | 28.00 (12.71) |    |



**90° X 60"**

| Nominal Size | Type | IPS Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|--------------|------------|-----------------|------------------|---------------|
| ¾            | SW   | 07E-SW-94-P  | 1.05 (27)  | 6 (152)         | 60 (1,524)       | 1.50 (0.68)   |
| 1            | SW   | 10E-SW-94-P  | 1.32 (33)  | 6 (152)         | 60 (1,524)       | 1.68 (0.76)   |
| 1¼           | SW   | 12E-SW-94-P  | 1.66 (42)  | 6 (152)         | 60 (1,524)       | 2.03 (0.92)   |
| 1½           | SW   | 15E-SW-94-P  | 1.90 (48)  | 6 (152)         | 60 (1,524)       | 2.92 (1.33)   |
| 2            | SW   | 20E-SW-94-P  | 2.37 (60)  | 6 (152)         | 60 (1,524)       | 3.36 (1.53)   |
| 2½           | SW   | 25E-SW-94-P  | 2.88 (73)  | 6 (152)         | 60 (1,524)       | 4.06 (1.84)   |
| 3            | SW   | 30E-SW-94-P  | 3.50 (89)  | 6 (152)         | 60 (1,524)       | 5.30 (2.41)   |
| 4            | SW   | 40E-SW-94-P  | 4.46 (113) | 6 (152)         | 60 (1,524)       | 6.36 (2.89)   |
| 4            | HW   | 40E-HW-94-P  | 4.51 (115) | 6 (152)         | 60 (1,524)       | 8.57 (3.89)   |
| 5            | MW   | 50E-MW-94-P  | 5.57 (141) | 6 (152)         | 60 (1,524)       | 10.60 (4.81)  |
| 5            | HW   | 50E-HW-94-P  | 5.60 (142) | 6 (152)         | 60 (1,524)       | 11.48 (5.21)  |
| 6            | MW   | 60E-MW-94-P  | 6.63 (168) | 6 (152)         | 60 (1,524)       | 12.54 (5.69)  |
| 6            | HW   | 60E-HW-94-P  | 6.66 (169) | 6 (152)         | 60 (1,524)       | 14.40 (6.54)  |

| Nominal Size | Type | ID Item No. | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| 2            | SW   | 20F-SW-94-P | 2.14 (54)  | 6 (152)         | 60 (1,524)       | 3.00 (1.36)   |
| 2½           | SW   | 25F-SW-94-P | 2.64 (67)  | 6 (152)         | 60 (1,524)       | 3.71 (1.68)   |
| 3            | SW   | 30F-SW-94-P | 3.14 (80)  | 6 (152)         | 60 (1,524)       | 4.24 (1.93)   |
| 3½           | SW   | 35F-SW-94-P | 3.64 (92)  | 6 (152)         | 60 (1,524)       | 5.30 (2.41)   |
| 4            | SW   | 40F-SW-94-P | 4.14 (105) | 6 (152)         | 60 (1,524)       | 6.10 (2.77)   |
| 4            | HW   | 40F-HW-94-P | 4.19 (106) | 6 (152)         | 60 (1,524)       | 8.13 (3.69)   |
| 4½           | SW   | 45F-SW-94-P | 4.64 (117) | 6 (152)         | 60 (1,524)       | 6.63 (3.01)   |
| 4½           | HW   | 45F-HW-94-P | 4.69 (118) | 6 (152)         | 60 (1,524)       | 9.19 (4.17)   |
| 5            | MW   | 50F-MW-94-P | 5.19 (132) | 6 (152)         | 60 (1,524)       | 9.98 (4.53)   |
| 5            | HW   | 50F-HW-94-P | 5.22 (132) | 6 (152)         | 60 (1,524)       | 11.66 (5.29)  |
| 6            | MW   | 60F-MW-94-P | 6.19 (157) | 6 (152)         | 60 (1,524)       | 11.93 (5.42)  |
| 6            | HW   | 60F-HW-94-P | 6.22 (158) | 6 (152)         | 60 (1,524)       | 13.96 (6.34)  |

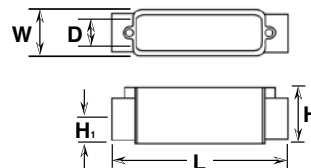
| Nominal Size | Type | Item No.    | M          | O-Tangent (min) | R - Radius (min) | Weight lbs kg |
|--------------|------|-------------|------------|-----------------|------------------|---------------|
| ¾            | XW   | 07E-XW-94-P | 1.41 (36)  | 6 (152)         | 60 (1,524)       | 5.40 (2.48)   |
| 1            | XW   | 10E-XW-94-P | 1.68 (43)  | 6 (152)         | 60 (1,524)       | 6.02 (2.74)   |
| 1¼           | XW   | 12E-XW-94-P | 2.02 (51)  | 6 (152)         | 60 (1,524)       | 7.26 (3.28)   |
| 1½           | XW   | 15E-XW-94-P | 2.26 (57)  | 6 (152)         | 60 (1,524)       | 10.45 (4.69)  |
| 2            | XW   | 20F-XW-94-P | 2.50 (65)  | 6 (152)         | 60 (1,524)       | 11.13 (5.05)  |
| 2½           | XW   | 25F-XW-94-P | 3.00 (76)  | 6 (152)         | 60 (1,524)       | 13.61 (6.18)  |
| 3            | XW   | 30F-XW-94-P | 3.50 (89)  | 6 (152)         | 60 (1,524)       | 16.08 (7.30)  |
| 3½           | XW   | 35F-XW-94-P | 4.00 (102) | 6 (152)         | 60 (1,524)       | 18.55 (8.42)  |
| 4            | XW   | 40F-XW-94-P | 4.50 (114) | 6 (152)         | 60 (1,524)       | 21.02 (9.54)  |
| 5            | XW   | 50F-XW-94-P | 5.50 (140) | 6 (152)         | 60 (1,524)       | 25.97 (11.79) |
| 6            | XW   | 60F-XW-94-P | 6.50 (165) | 6 (152)         | 60 (1,524)       | 30.92 (14.04) |

Note: For different radii, degree and/or length for any elbows listed in this catalog, please contact your local sales rep. or the Champion Fiberglass office.

For technical information regarding fittings and elbows for 8", 10", and 12" conduit, please contact your local sales rep. or the Champion Fiberglass Spring, Texas office.

## CONDUIT BODIES

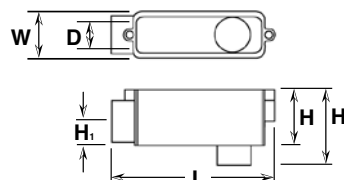
All conduit bodies are manufactured by compression molding for ultimate strength. The conduit bodies are made from phenolic resin with high glass content and meet the same flame and smoke standards as the conduit itself. Each conduit body is supplied with a high performance rubber gasket to provide a water tight seal between the cover and conduit body. All hardware is stainless steel.



### TYPE C

| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | H <sub>1</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | SW   | 07E-SW-C                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 1.075 (27)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | SW   | 10E-SW-C                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 1.340 (34)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | SW   | 12E-SW-C                 | 10.125 (257)   | 2.875 (73)     | 2.540 (64)     | 1.188 (30)                  | 1.685 (43)     | 32.00 (524)                        | 1.20 (0.54)        |
| 1½           | SW   | 15E-SW-C                 | 10.125 (257)   | 2.875 (73)     | 2.540 (64)     | 1.188 (30)                  | 1.910 (48)     | 32.00 (524)                        | 1.10 (0.50)        |
| 2            | SW   | 20E-SW-C                 | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 1.812 (46)                  | 2.390 (61)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 2½           | SW   | 25F-SW-C                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3            | SW   | 30E-SW-C                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | SW   | 40E-SW-C                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 4.508 (114)    | 425.00 (6964)                      | 4.24 (1.92)        |

| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | H <sub>1</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | XW   | 07E-XW-C                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 1.435 (36)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | XW   | 10E-XW-C                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 1.700 (43)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | XW   | 12E-XW-C                 | 10.125 (257)   | 2.875 (73)     | 2.540 (64)     | 1.188 (30)                  | 2.045 (52)     | 32.00 (524)                        | 1.20 (0.54)        |
| 1½           | XW   | 15E-XW-C                 | 10.125 (257)   | 2.875 (73)     | 2.540 (64)     | 1.188 (30)                  | 2.285 (58)     | 32.00 (524)                        | 1.10 (0.50)        |
| 2            | XW   | 20F-XW-C                 | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 1.812 (46)                  | 2.520 (64)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 2½           | XW   | 25F-XW-C                 | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 1.812 (46)                  | 3.025 (77)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 3            | XW   | 30F-XW-C                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 3.520 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3½           | XW   | 35F-XW-C                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 4.025 (102)    | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | XW   | 40F-XW-C                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 4.520 (115)    | 425.00 (6964)                      | 4.24 (1.92)        |

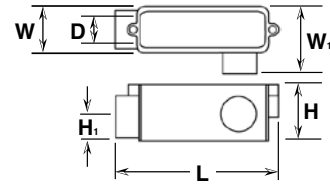


### TYPE LB

| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | H <sub>1</sub><br>inch (mm) | H <sub>2</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | SW   | 07E-SW-LB                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 3.900 (99)                  | 1.075 (27)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | SW   | 10E-SW-LB                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 3.900 (99)                  | 1.340 (34)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | SW   | 12E-SW-LB                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 1.188 (30)                  | 4.875 (124)                 | 1.685 (43)     | 32.00 (524)                        | 1.20 (0.54)        |
| 1½           | SW   | 15E-SW-LB                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 1.188 (30)                  | 4.875 (124)                 | 1.910 (48)     | 32.00 (524)                        | 1.10 (0.50)        |
| 2            | SW   | 20E-SW-LB                | 11.250 (286)   | 4.000 (102)    | 3.040 (77)     | 1.812 (46)                  | 6.687 (170)                 | 2.390 (61)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 2½           | SW   | 25C-SW-LB                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3            | SW   | 30E-SW-LB                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | SW   | 40E-SW-LB                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 4.508 (114)    | 425.00 (6964)                      | 4.24 (1.92)        |

| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | H <sub>1</sub><br>inch (mm) | H <sub>2</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | XW   | 07E-XW-LB                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 3.900 (99)                  | 1.435 (36)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | XW   | 10E-XW-LB                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 3.900 (99)                  | 1.700 (43)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | XW   | 12E-XW-LB                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 1.188 (30)                  | 4.875 (124)                 | 2.045 (52)     | 32.00 (524)                        | 1.20 (0.54)        |
| 1½           | XW   | 15E-XW-LB                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 1.188 (30)                  | 4.875 (124)                 | 2.285 (58)     | 32.00 (524)                        | 1.10 (0.50)        |
| 2            | XW   | 20F-XW-LB                | 11.250 (286)   | 4.000 (102)    | 3.040 (77)     | 1.812 (46)                  | 6.687 (170)                 | 2.520 (64)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 2½           | XW   | 25F-XW-LB                | 11.250 (286)   | 4.000 (102)    | 3.040 (77)     | 1.812 (46)                  | 6.687 (170)                 | 3.025 (77)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 3            | XW   | 30F-XW-LB                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 3.520 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3½           | XW   | 35F-XW-LB                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 4.025 (102)    | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | XW   | 40F-XW-LB                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 4.520 (115)    | 425.00 (6964)                      | 4.24 (1.92)        |

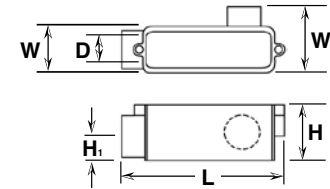
## TYPE LL



| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | W <sub>1</sub><br>inch (mm) | H <sub>1</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | SW   | 07E-SW-LL                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.075 (27)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | SW   | 10E-SW-LL                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.340 (34)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | SW   | 12E-SW-LL                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 4.500 (114)                 | 1.188 (30)                  | 1.685 (43)     | 32.00 (524)                        | 1.20 (0.54)        |
| 1½           | SW   | 15E-SW-LL                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 4.500 (114)                 | 1.188 (30)                  | 1.910 (48)     | 32.00 (524)                        | 1.10 (0.50)        |
| 2            | SW   | 20E-SW-LL                | 11.250 (286)   | 4.000 (102)    | 3.040 (77)     | 5.500 (140)                 | 1.812 (46)                  | 2.390 (61)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 2½           | SW   | 25C-SW-LL                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3            | SW   | 30E-SW-LL                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | SW   | 40E-SW-LL                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 4.508 (114)    | 425.00 (6964)                      | 4.24 (1.92)        |

| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | W <sub>1</sub><br>inch (mm) | H <sub>1</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | XW   | 07E-XW-LL                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.435 (36)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | XW   | 10E-XW-LL                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.700 (43)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | XW   | 12E-XW-LL                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 4.500 (114)                 | 1.188 (30)                  | 2.045 (52)     | 32.00 (524)                        | 1.20 (0.54)        |
| 1½           | XW   | 15E-XW-LL                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 4.500 (114)                 | 1.188 (30)                  | 2.285 (58)     | 32.00 (524)                        | 1.10 (0.50)        |
| 2            | XW   | 20F-XW-LL                | 11.250 (286)   | 4.000 (102)    | 3.040 (77)     | 5.500 (140)                 | 1.812 (46)                  | 2.520 (64)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 2½           | XW   | 25F-XW-LL                | 11.250 (286)   | 4.000 (102)    | 3.040 (77)     | 5.500 (140)                 | 1.812 (46)                  | 3.025 (77)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 3            | XW   | 30F-XW-LL                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 3.520 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3½           | XW   | 35F-XW-LL                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 4.025 (102)    | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | XW   | 40F-XW-LL                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 4.520 (115)    | 425.00 (6964)                      | 4.24 (1.92)        |

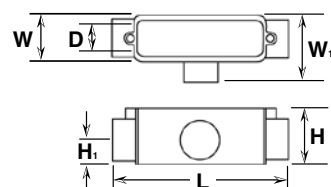
## TYPE LR



| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | W <sub>1</sub><br>inch (mm) | H <sub>1</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | SW   | 07E-SW-LR                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.075 (27)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | SW   | 10E-SW-LR                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.340 (34)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | SW   | 12E-SW-LR                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 4.500 (114)                 | 1.188 (30)                  | 1.685 (43)     | 32.00 (524)                        | 1.20 (0.54)        |
| 1½           | SW   | 15E-SW-LR                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 4.500 (114)                 | 1.188 (30)                  | 1.910 (48)     | 32.00 (524)                        | 1.10 (0.50)        |
| 2            | SW   | 20E-SW-LR                | 11.250 (286)   | 4.000 (102)    | 3.040 (77)     | 5.500 (140)                 | 1.812 (46)                  | 2.390 (61)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 2½           | SW   | 25C-SW-LR                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3            | SW   | 30E-SW-LR                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | SW   | 40E-SW-LR                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 4.508 (114)    | 425.00 (6964)                      | 4.24 (1.92)        |

| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | W <sub>1</sub><br>inch (mm) | H <sub>1</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | XW   | 07E-XW-LR                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.435 (36)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | XW   | 10E-XW-LR                | 7.375 (187)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.700 (43)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | XW   | 12E-XW-LR                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 4.500 (114)                 | 1.188 (30)                  | 2.045 (52)     | 32.00 (524)                        | 1.20 (0.54)        |
| 1½           | XW   | 15E-XW-LR                | 9.000 (229)    | 2.875 (73)     | 2.540 (64)     | 4.500 (114)                 | 1.188 (30)                  | 2.285 (58)     | 32.00 (524)                        | 1.10 (0.50)        |
| 2            | XW   | 20F-XW-LR                | 11.250 (286)   | 4.000 (102)    | 3.040 (77)     | 5.500 (140)                 | 1.812 (46)                  | 2.520 (64)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 2½           | XW   | 25F-XW-LR                | 11.250 (286)   | 4.000 (102)    | 3.040 (77)     | 5.500 (140)                 | 1.812 (46)                  | 3.025 (77)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 3            | XW   | 30F-XW-LR                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 3.520 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3½           | XW   | 35F-XW-LR                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 4.025 (102)    | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | XW   | 40F-XW-LR                | 16.125 (410)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 4.520 (115)    | 425.00 (6964)                      | 4.24 (1.92)        |

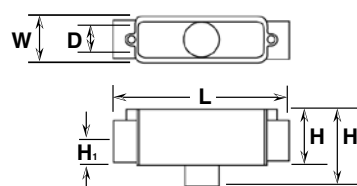
## TYPE T



| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | W <sub>1</sub><br>inch (mm) | H <sub>1</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | SW   | 07E-SW-T                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.075 (27)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | SW   | 10E-SW-T                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.340 (34)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | SW   | 12E-SW-T                 | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 4.437 (113)                 | 1.188 (30)                  | 1.685 (43)     | 32.00 (524)                        | 1.40 (0.64)        |
| 1½           | SW   | 15E-SW-T                 | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 4.437 (113)                 | 1.188 (30)                  | 1.910 (48)     | 32.00 (524)                        | 1.30 (0.59)        |
| 2            | SW   | 20E-SW-T                 | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 5.500 (140)                 | 1.812 (46)                  | 2.390 (61)     | 70.75 (1160)                       | 2.80 (1.27)        |
| 2½           | SW   | 25C-SW-T                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3            | SW   | 30E-SW-T                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | SW   | 40E-SW-T                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 4.508 (114)    | 425.00 (6964)                      | 4.24 (1.92)        |

| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | W <sub>1</sub><br>inch (mm) | H <sub>1</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | XW   | 07E-XW-T                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.435 (36)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | XW   | 10E-XW-T                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 3.500 (89)                  | 1.000 (25)                  | 1.700 (43)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | XW   | 12E-XW-T                 | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 4.437 (113)                 | 1.188 (30)                  | 2.045 (52)     | 32.00 (524)                        | 1.40 (0.64)        |
| 1½           | XW   | 15E-XW-T                 | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 4.437 (113)                 | 1.188 (30)                  | 2.285 (58)     | 32.00 (524)                        | 1.30 (0.59)        |
| 2            | XW   | 20F-XW-T                 | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 5.500 (140)                 | 1.812 (46)                  | 2.520 (64)     | 70.75 (1160)                       | 2.80 (1.27)        |
| 2½           | XW   | 25F-XW-T                 | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 5.500 (140)                 | 1.812 (46)                  | 3.025 (77)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 3            | XW   | 30F-XW-T                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 3.520 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3½           | XW   | 35F-XW-T                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 4.025 (102)    | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | XW   | 40F-XW-T                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 8.750 (222)                 | 3.000 (76)                  | 4.520 (115)    | 425.00 (6964)                      | 4.24 (1.92)        |

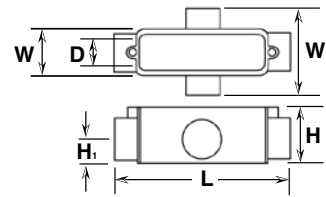
## TYPE TB



| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | H <sub>1</sub><br>inch (mm) | H <sub>2</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | SW   | 07E-SW-TB                | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 3.900 (99)                  | 1.075 (27)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | SW   | 10E-SW-TB                | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 3.900 (99)                  | 1.340 (34)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | SW   | 12E-SW-TB                | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 1.188 (30)                  | 4.875 (124)                 | 1.685 (43)     | 32.00 (524)                        | 1.40 (0.64)        |
| 1½           | SW   | 15E-SW-TB                | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 1.188 (30)                  | 4.875 (124)                 | 1.910 (48)     | 32.00 (524)                        | 1.30 (0.59)        |
| 2            | SW   | 20E-SW-TB                | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 1.812 (46)                  | 6.687 (170)                 | 2.390 (61)     | 70.75 (1160)                       | 2.80 (1.27)        |
| 2½           | SW   | 25C-SW-TB                | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3            | SW   | 30E-SW-TB                | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | SW   | 40E-SW-TB                | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 4.508 (114)    | 425.00 (6964)                      | 4.24 (1.92)        |

| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | H <sub>1</sub><br>inch (mm) | H <sub>2</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | XW   | 07E-XW-TB                | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 3.900 (99)                  | 1.435 (36)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | XW   | 10E-XW-TB                | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 1.000 (25)                  | 3.900 (99)                  | 1.700 (43)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | XW   | 12E-XW-TB                | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 1.188 (30)                  | 4.875 (124)                 | 2.045 (52)     | 32.00 (524)                        | 1.40 (0.64)        |
| 1½           | XW   | 15E-XW-TB                | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 1.188 (30)                  | 4.875 (124)                 | 2.285 (58)     | 32.00 (524)                        | 1.30 (0.59)        |
| 2            | XW   | 20F-XW-TB                | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 1.812 (46)                  | 6.687 (170)                 | 2.520 (64)     | 70.75 (1160)                       | 2.80 (1.27)        |
| 2½           | XW   | 25F-XW-TB                | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 1.812 (46)                  | 6.687 (170)                 | 3.025 (77)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 3            | XW   | 30F-XW-TB                | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 3.520 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3½           | XW   | 35F-XW-TB                | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 4.025 (102)    | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | XW   | 40F-XW-TB                | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 3.000 (76)                  | 8.750 (222)                 | 4.520 (115)    | 425.00 (6964)                      | 4.24 (1.92)        |

## TYPE X



| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | W <sub>1</sub><br>inch (mm) | H <sub>1</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | SW   | 07E-SW-X                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 4.750 (121)                 | 1.000 (25)                  | 1.075 (27)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | SW   | 10E-SW-X                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 4.750 (121)                 | 1.000 (25)                  | 1.340 (34)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | SW   | 12E-SW-X                 | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 6.437 (163)                 | 1.188 (30)                  | 1.685 (43)     | 32.00 (524)                        | 1.60 (0.73)        |
| 1½           | SW   | 15E-SW-X                 | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 6.437 (163)                 | 1.188 (30)                  | 1.910 (48)     | 32.00 (524)                        | 1.50 (0.68)        |
| 2            | SW   | 20E-SW-X                 | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 7.188 (182)                 | 1.812 (46)                  | 2.390 (61)     | 70.75 (1160)                       | 3.00 (1.36)        |
| 2½           | SW   | 25C-SW-X                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 11.500 (292)                | 3.000 (76)                  | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3            | SW   | 30E-SW-X                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 11.500 (292)                | 3.000 (76)                  | 3.508 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | SW   | 40E-SW-X                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 11.500 (292)                | 3.000 (76)                  | 4.508 (114)    | 425.00 (6964)                      | 4.24 (1.92)        |

| Nominal Size | Type | IPS Item No. Aboveground | L<br>inch (mm) | H<br>inch (mm) | W<br>inch (mm) | W <sub>1</sub><br>inch (mm) | H <sub>1</sub><br>inch (mm) | D<br>inch (mm) | Volume<br>cu in (cm <sup>3</sup> ) | Weight<br>lbs (kg) |
|--------------|------|--------------------------|----------------|----------------|----------------|-----------------------------|-----------------------------|----------------|------------------------------------|--------------------|
| ¾            | XW   | 07E-XW-X                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 4.750 (121)                 | 1.000 (25)                  | 1.435 (36)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1            | XW   | 10E-XW-X                 | 8.375 (213)    | 2.375 (60)     | 1.840 (47)     | 4.750 (121)                 | 1.000 (25)                  | 1.700 (43)     | 13.90 (228)                        | 0.70 (0.32)        |
| 1¼           | XW   | 12E-XW-X                 | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 6.437 (163)                 | 1.188 (30)                  | 2.045 (52)     | 32.00 (524)                        | 1.60 (0.73)        |
| 1½           | XW   | 15E-XW-X                 | 10.125 (257)   | 3.000 (76)     | 2.540 (64)     | 6.437 (163)                 | 1.188 (30)                  | 2.285 (58)     | 32.00 (524)                        | 1.50 (0.68)        |
| 2            | XW   | 20F-XW-X                 | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 7.188 (182)                 | 1.812 (46)                  | 2.520 (64)     | 70.75 (1160)                       | 3.00 (1.36)        |
| 2½           | XW   | 25F-XW-X                 | 13.375 (340)   | 4.000 (102)    | 3.040 (77)     | 7.188 (182)                 | 1.812 (46)                  | 3.025 (77)     | 70.75 (1160)                       | 2.50 (1.13)        |
| 3            | XW   | 30F-XW-X                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 11.500 (292)                | 3.000 (76)                  | 3.520 (89)     | 425.00 (6964)                      | 4.24 (1.92)        |
| 3½           | XW   | 35F-XW-X                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 11.500 (292)                | 3.000 (76)                  | 4.025 (102)    | 425.00 (6964)                      | 4.24 (1.92)        |
| 4            | XW   | 40F-XW-X                 | 21.750 (552)   | 6.000 (152)    | 5.875 (149)    | 11.500 (292)                | 3.000 (76)                  | 4.520 (115)    | 425.00 (6964)                      | 4.24 (1.92)        |

## CHAMPION FLAME SHIELD® MIX (PHENOLIC CONDUIT ADHESIVE)

Champion Fiberglass Flame Shield Mix is a single component, high temperature adhesive designed to permanently bond Champion Phenolic conduit, fittings and joints. The Flame Shield adhesive is used to permanently bond phenolic conduit joints that will be subjected to temperatures up to 1850°F for two hours or less. Flame Shield Mix is a water based adhesive that is environmentally safe, non-flammable and contains no volatile organic compounds.

Champion Flame Shield Mix is available in two sizes, a 16 oz. container or a 1 gallon container for larger applications.

### Part Numbers:

- FM1670 - 16 oz. Container
- FM12870 - 1 Gallon Container

| Estimated Number of Joints Per 16 oz. Container |           |     |           |     |           |    |           |
|-------------------------------------------------|-----------|-----|-----------|-----|-----------|----|-----------|
| ¾"                                              | 80 Joints | 1½" | 50 Joints | 3"  | 30 Joints | 5" | 19 Joints |
| 1"                                              | 68 Joints | 2"  | 42 Joints | 3½" | 26 Joints | 6" | 16 Joints |
| 1¼"                                             | 58 Joints | 2½" | 36 Joints | 4"  | 22 Joints |    |           |

| Estimated Number of Joints Per Gallon (128 oz.) Container |            |     |            |     |            |    |            |
|-----------------------------------------------------------|------------|-----|------------|-----|------------|----|------------|
| ¾"                                                        | 640 Joints | 1½" | 400 Joints | 3"  | 240 Joints | 5" | 152 Joints |
| 1"                                                        | 544 Joints | 2"  | 336 Joints | 3½" | 208 Joints | 6" | 128 Joints |
| 1¼"                                                       | 464 Joints | 2½" | 288 Joints | 4"  | 176 Joints |    |            |

## GENERAL

- Conduit shall be phenolic fiberglass as manufactured by Champion Fiberglass, Inc. using the single circuit filament winding process.
- Conduit, elbows and fittings shall be manufactured from a phenol based resin and hardener with an appropriate E-glass roving manufactured by the same single circuit filament winding process. Resin shall be free of fillers.
- Conduit shall be supplied with either an integral wound bell and machined spigot or a bonded coupling and a machined spigot.
- Conduit, elbows, fittings, and adhesive are specified for use throughout a temperature range of -60°F **(-51°C)** to 1850°F **(1010°C)**.
- Conduit, elbows, fittings, and adhesive shall be constructed of noncombustible materials in accordance with the requirements of ASTM E136.
- Conduit shall be wound on steel mandrels at a helix winding angle to the longitudinal axis appropriate to produce conduit that meets the physical requirements of this specification. Mandrels shall be straight and true so as to produce a non-tapered conduit. Tapering is allowed at the belled end.
- Conduit shall be free from all defects including indentations, delamination, pinholes, foreign inclusions, and resin-starved areas. The conduit shall be round. The bore of the conduit shall be smooth and uniform. All conduit ends shall be cut at right angles to the axis of the conduit.
- Conduit shall not be manufactured with a condensation reaction of phenol and formaldehyde. This is so that there is no residual formaldehyde or any corrosive by-products.

## ELECTRICAL PROPERTIES

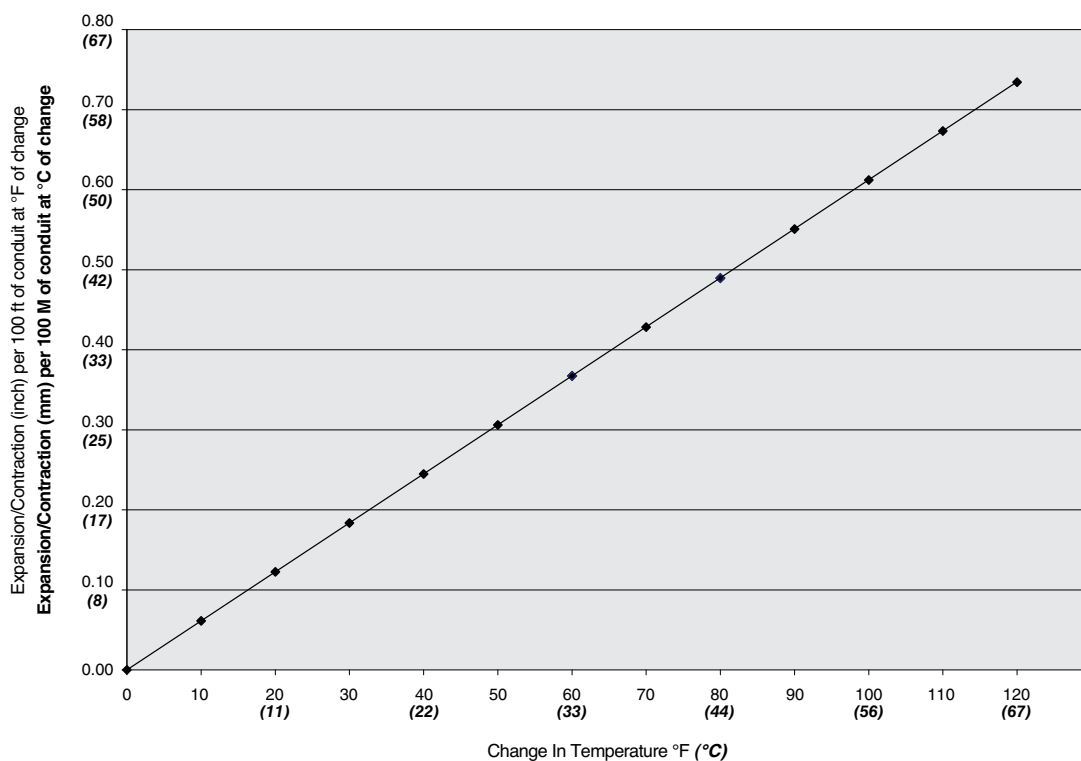
- |                       |                                   |            |
|-----------------------|-----------------------------------|------------|
| • Dielectric Strength | 150 volts/mil. <b>(5.9 kv/mm)</b> | ASTM D 149 |
|-----------------------|-----------------------------------|------------|

## PHYSICAL AND MECHANICAL PROPERTIES

- |                                      |                                                            |                            |
|--------------------------------------|------------------------------------------------------------|----------------------------|
| • Tensile Strength (Axial)           | 7,000 psi <b>(62 MPa)</b>                                  | ASTM D 2105                |
| • Modulus of Elasticity (4" conduit) | 1.2 X 10 <sup>6</sup> psi <b>(8.3 GPa)</b>                 | ASTM D 2105                |
| • Thermal Conductivity               | 1.67 BTU/(ft <sup>2</sup> )(hr.)(°F/in) <b>(0.24 mk/W)</b> | ASTM D 5930-01             |
| • Specific Gravity                   | 1.70-1.75                                                  | ASTM D 792                 |
| • Glass Content                      | 70% ± 5%                                                   | API SPEC 15 LR             |
| • Water Absorption                   | Less than 1.0%                                             | ASTM D 570                 |
| • Barcol Hardness                    | 70 ± 2                                                     | ASTM D2583                 |
| • Temperature Range                  | -60°F to +1850°F                                           | ASTM E119 (1850°F 2 hours) |
| • Vertical Flame Test FT4            | Passed                                                     | CSA 22.2                   |

**PHYSICAL AND MECHANICAL PROPERTIES (CONT.)**

|                                        |                                                                 |           |
|----------------------------------------|-----------------------------------------------------------------|-----------|
| • Surface Flammability                 | <2                                                              | ASTM E162 |
| • Tunnel Test, Flame Spread            | <1                                                              | ASTM E84  |
| • Tunnel Test, Smoke Density           | <1                                                              | ASTM E84  |
| • Smoke Density, $D_{S4}$ min          | <1                                                              | ASTM E662 |
| • Smoke Density, $D_{max}$ flaming     | <30                                                             | ASTM E662 |
| • Smoke Density, $D_{max}$ non-flaming | <20                                                             | ASTM E662 |
| • Coefficient of Thermal Expansion     | $5.1 \times 10^{-6}$ in/in/°F ( $9.27 \times 10^{-6}$ mm/mm/°C) | ASTM D696 |

**HEAT DEFLECTION**

The minimum heat deflection temperature shall be 500°F (**260°C**) when tested at 264 psi in accordance with ASTM D 648.

## TOXICITY

CHAMPION FLAME SHIELD® conduit does not contain any compounds that can release halogens - bromine or chlorine - when burning.

| Gases              | Values (max P.P.M.) |
|--------------------|---------------------|
| Hydrogen Chloride  | 0                   |
| Hydrogen Bromide   | 0                   |
| Hydrogen Cyanide   | <1                  |
| Hydrogen Sulphide  | 0                   |
| Ammonia            | 0                   |
| Oxides of Nitrogen | <5                  |
| Carbon Dioxide     | <10,500             |
| Carbon Monoxide    | <350                |

## COLOR

Natural color is dark reddish brown, almost black.

## DEFLECTION

Deflection is always determined at midspan.

The empirical formula for deflection is:

$$D = \frac{131 \cdot W \cdot L^4}{E(OD^4 - ID^4)}$$

Where: D = Midspan deflection (in.)

OD = Outside diameter of conduit (in.)

ID = Inside diameter of conduit (in.)

E = Modulus of elasticity of conduit (psi), which is 1,200,000 for phenolic fiberglass conduit

L = Distance between hangers (ft.)

W = Total weight of cable and conduit (lbs/ft.)

It is recommended that midspan deflection never exceeds  $\frac{5}{16}$  inches **(16 mm)**.

## IMPACT RESISTANCE

The minimum impact resistance values for the conduit shall be as shown in the table below when tested in accordance with ASTM D2444.

| Nominal Size | At 73.4°F (23°C)                |         |         |           | At 32.4°F (0°C)                 |         |         |           |
|--------------|---------------------------------|---------|---------|-----------|---------------------------------|---------|---------|-----------|
|              | Impact Resistance lbs. ft. (Nm) |         |         |           | Impact Resistance lbs. ft. (Nm) |         |         |           |
|              | SW                              | MW      | HW      | XW        | SW                              | MW      | HW      | XW        |
| ¾            | 8 (11)                          | -- --   | -- --   | 50 (68)   | 8 (11)                          | -- --   | -- --   | 50 (68)   |
| 1            | 12 (16)                         | -- --   | -- --   | 160 (215) | 12 (16)                         | -- --   | -- --   | 160 (215) |
| 1¼           | 12 (16)                         | -- --   | -- --   | 160 (215) | 12 (16)                         | -- --   | -- --   | 160 (215) |
| 1½           | 14 (19)                         | -- --   | -- --   | 175 (235) | 14 (19)                         | -- --   | -- --   | 175 (235) |
| 2            | 16 (22)                         | -- --   | -- --   | 200 (270) | 16 (22)                         | -- --   | -- --   | 200 (270) |
| 2½           | 19 (26)                         | -- --   | -- --   | 210 (285) | 19 (26)                         | -- --   | -- --   | 210 (285) |
| 3            | 22 (30)                         | -- --   | -- --   | 245 (330) | 22 (30)                         | -- --   | -- --   | 245 (330) |
| 3½           | 28 (38)                         | -- --   | -- --   | 300 (405) | 28 (38)                         | -- --   | -- --   | 300 (405) |
| 4            | 32 (43)                         | -- --   | 40 (54) | 350 (470) | 32 (43)                         | -- --   | 40 (54) | 350 (470) |
| 5            | -- --                           | 54 (73) | 60 (81) | 420 (565) | -- --                           | 54 (73) | 60 (81) | 420 (565) |
| 6            | -- --                           | 66 (89) | 72 (98) | 455 (615) | -- --                           | 66 (89) | 72 (98) | 455 (615) |

## STIFFNESS

The minimum conduit stiffness at five percent deflection for all sizes of conduit shall not be less than the values given in table below when tested in accordance with ASTM D2412

| Pipe Stiffness (PS) = (F/ΔY) |                          |           |           |             |                          |           |           |             |
|------------------------------|--------------------------|-----------|-----------|-------------|--------------------------|-----------|-----------|-------------|
| Nominal Size                 | At 73.4°F (23°C)         |           |           |             | At 32°F (0°C)            |           |           |             |
|                              | lb/in <sup>2</sup> (MPa) |           |           |             | lb/in <sup>2</sup> (MPa) |           |           |             |
|                              | SW                       | MW        | HW        | XW          | SW                       | MW        | HW        | XW          |
| ¾                            | 270 (1.9)                | -- --     | -- --     | 1,300 (9.1) | 270 (1.9)                | -- --     | -- --     | 1,300 (9.1) |
| 1                            | 220 (1.5)                | -- --     | -- --     | 1,100 (7.7) | 220 (1.5)                | -- --     | -- --     | 1,100 (7.7) |
| 1¼                           | 175 (1.2)                | -- --     | -- --     | 875 (6.1)   | 175 (1.2)                | -- --     | -- --     | 875 (6.1)   |
| 1½                           | 155 (1.1)                | -- --     | -- --     | 775 (5.4)   | 155 (1.1)                | -- --     | -- --     | 775 (5.4)   |
| 2                            | 105 (0.70)               | -- --     | -- --     | 525 (3.7)   | 105 (0.70)               | -- --     | -- --     | 525 (3.7)   |
| 2½                           | 65 (0.40)                | -- --     | -- --     | 325 (2.3)   | 65 (0.40)                | -- --     | -- --     | 325 (2.3)   |
| 3                            | 45 (0.32)                | -- --     | -- --     | 225 (1.6)   | 45 (0.32)                | -- --     | -- --     | 225 (1.6)   |
| 3½                           | 40 (0.28)                | -- --     | -- --     | 200 (1.4)   | 40 (0.28)                | -- --     | -- --     | 200 (1.4)   |
| 4                            | 35 (0.24)                | -- --     | 50 (0.35) | 175 (1.2)   | 35 (0.24)                | -- --     | 50 (0.35) | 175 (1.2)   |
| 5                            | -- --                    | 35 (0.24) | 38 (0.26) | 125 (0.88)  | -- --                    | 35 (0.24) | 38 (0.26) | 125 (0.88)  |
| 6                            | -- --                    | 25 (0.18) | 28 (0.19) | 50 (0.35)   | -- --                    | 25 (0.18) | 28 (0.19) | 50 (0.35)   |

## WIRE FILL

Maximum allowable percentage wire fill per Table 1, Chapter 9, National Electric Code 2008

| IPS sizes     |                                 |                                |                                                             |                                           |                                                |
|---------------|---------------------------------|--------------------------------|-------------------------------------------------------------|-------------------------------------------|------------------------------------------------|
| Trade<br>Size | Internal<br>Diameter<br>in (mm) | Total<br>Area<br>sq in (sq mm) | Percent of cross section of conduit & tubing for conductors |                                           |                                                |
|               |                                 |                                | 1 conductor<br>53% fill<br>sq in (sq mm)                    | 2 conductors<br>31% fill<br>sq in (sq mm) | Over 2 conductors<br>40% fill<br>sq in (sq mm) |
| ¾ (19)        | 0.910 (23)                      | 0.650 (419)                    | 0.345 (222)                                                 | 0.202 (130)                               | 0.260 (168)                                    |
| 1 (25)        | 1.175 (30)                      | 1.084 (699)                    | 0.574 (371)                                                 | 0.336 (217)                               | 0.434 (280)                                    |
| 1¼ (32)       | 1.520 (39)                      | 1.814 (1170)                   | 0.961 (620)                                                 | 0.562 (363)                               | 0.725 (468)                                    |
| 1½ (38)       | 1.760 (45)                      | 2.432 (1569)                   | 1.289 (831)                                                 | 0.754 (486)                               | 0.973 (628)                                    |
| 2 (51)        | 2.235 (57)                      | 3.921 (2530)                   | 2.078 (1341)                                                | 1.216 (784)                               | 1.569 (1012)                                   |
| 3 (76)        | 3.360 (85)                      | 8.862 (5718)                   | 4.697 (3030)                                                | 2.747 (1772)                              | 3.545 (2287)                                   |
| 4 (102)       | 4.320 (110)                     | 14.650 (9452)                  | 7.764 (5009)                                                | 4.541 (2930)                              | 5.860 (3781)                                   |
| 5 (127)       | 5.380 (137)                     | 22.721 (14659)                 | 12.042 (7769)                                               | 7.044 (4544)                              | 9.089 (5864)                                   |
| 6 (152)       | 6.380 (162)                     | 31.953 (20615)                 | 16.935 (10926)                                              | 9.905 (6391)                              | 12.781 (8246)                                  |

| ID sizes      |                                 |                                |                                                             |                                           |                                                |
|---------------|---------------------------------|--------------------------------|-------------------------------------------------------------|-------------------------------------------|------------------------------------------------|
| Trade<br>Size | Internal<br>Diameter<br>in (mm) | Total<br>Area<br>sq in (sq mm) | Percent of cross section of conduit & tubing for conductors |                                           |                                                |
|               |                                 |                                | 1 conductor<br>53% fill<br>sq in (sq mm)                    | 2 conductors<br>31% fill<br>sq in (sq mm) | Over 2 conductors<br>40% fill<br>sq in (sq mm) |
| 2 (51)        | 2.00 (51)                       | 3.140 (2026)                   | 1.664 (1074)                                                | 0.973 (328)                               | 1.256 (810)                                    |
| 2½ (64)       | 2.500 (64)                      | 7.906 (3165)                   | 2.600 (1678)                                                | 1.521 (981)                               | 1.963 (1266)                                   |
| 3 (76)        | 3.000 (76)                      | 7.065 (4558)                   | 3.744 (2416)                                                | 2.190 (1413)                              | 2.826 (1823)                                   |
| 3½ (89)       | 3.500 (89)                      | 9.616 (6204)                   | 5.097 (3288)                                                | 2.981 (1923)                              | 3.847 (2482)                                   |
| 4 (102)       | 4.000 (102)                     | 12.560 (8103)                  | 7.764 (5009)                                                | 3.894 (2512)                              | 5.024 (3241)                                   |
| 5 (127)       | 5.000 (127)                     | 19.625 (12661)                 | 12.042 (7769)                                               | 6.084 (3925)                              | 7.850 (5065)                                   |
| 6 (152)       | 6.000 (152)                     | 28.260 (18232)                 | 16.935 (10926)                                              | 8.761 (5652)                              | 11.304 (7293)                                  |

## CORROSION RESISTANCE GUIDE

The corrosion guidelines tests were performed by analyzing phenolic conduit coupons for 30 days in the chemical vapors at the temperature shown. It has been shown that **CHAMPION FLAME SHIELD®** can often be used for chemicals listed as “Not Recommended” (NR). Real cases often are limited to fumes, vapors and occasional splashes at the temperatures indicated.

This information is provided solely as a guide since it is impossible to anticipate all individual site conditions. For specific applications which are not covered in this guide (may require screening tests), consultation with Champion Fiberglass, Inc. is recommended.

| Chemical                                 | Concentration | Vapor °F | Vapor °C   | Chemical                     | Concentration | Vapor °F | Vapor °C   |
|------------------------------------------|---------------|----------|------------|------------------------------|---------------|----------|------------|
| Acetic Acid                              | All           | 140      | <b>60</b>  | Heavy Aromatic Naphtha (HAN) | 100           | 150      | <b>66</b>  |
| Acetic Acid, Glacial                     | All           | 150      | <b>66</b>  | Hydrochloric Acid            | 37            | 120      | <b>49</b>  |
| Acetone                                  | All           | 80       | <b>27</b>  | Hydrogen Chloride (Gas)      | —             | 180      | <b>82</b>  |
| Aluminum Chloride                        | All           | 180      | <b>82</b>  | Hydrogen Sulfide (Gas)       | —             | 180      | <b>82</b>  |
| Aluminum Hydroxide (1)                   | All           | 120      | <b>49</b>  | Isopropyl Alcohol            | All           | 125      | <b>52</b>  |
| Aluminum Sulphate                        | All           | 250      | <b>121</b> | Magnesium Hydroxide (1)      | All           | 120      | <b>49</b>  |
| Ammonia Aqueous (1)                      | 10%           | NR       | <b>NR</b>  | Methyl Alcohol (Methanol)    | 100           | 125      | <b>52</b>  |
| Ammonium Bicarbonate (1)                 | All           | 150      | <b>66</b>  | Methyl Ethyl Ketone          | 100           | 80       | <b>27</b>  |
| Ammonium Chloride                        | All           | 150      | <b>66</b>  | Naphtha                      | All           | (*)      | (*)        |
| Ammonium Hydroxide (1)                   | All           | NR       | <b>NR</b>  | Nitric Acid                  | —             | (*)      | (*)        |
| Ammonium Phosphate                       | All           | 150      | <b>66</b>  | Perchloroethylene            | All           | 80       | <b>27</b>  |
| Benzene                                  | 100           | 150      | <b>66</b>  | Phenol (Carbolic Acid)       | All           | 100      | <b>38</b>  |
| Benzyl Alcohol                           | 100           | 125      | <b>52</b>  | Phosphoric Acid              | All           | 150      | <b>66</b>  |
| Benzyl Chloride                          | All           | 150      | <b>66</b>  | Potassium Carbonate (1)      | All           | 120      | <b>49</b>  |
| Calcium Chloride                         | All           | 150      | <b>66</b>  | Potassium Permanganate       | All           | 150      | <b>66</b>  |
| Calcium Hydroxide (1)                    | All           | 120      | <b>49</b>  | Sodium Bicarbonate (1)       | All           | 150      | <b>66</b>  |
| Calcium Hypochlorite                     | All           | (*)      | (*)        | Sodium Carbonate (1)         | All           | 150      | <b>66</b>  |
| Carbon Dioxide Gas                       | —             | 250      | <b>121</b> | Sodium Chloride              | All           | 150      | <b>66</b>  |
| Carbon Tetrachloride                     | 100           | 150      | <b>66</b>  | Sodium Hydroxide (1)         | All           | (*)      | (*)        |
| Chlorine (Liquid)                        | All           | NR       | <b>NR</b>  | Sodium Hypochlorite          | All           | 250      | <b>121</b> |
| Chlorobenzene                            | 100           | 150      | <b>66</b>  | Sodium Sulfate               | All           | 150      | <b>66</b>  |
| Chloroform                               | 100           | 150      | <b>66</b>  | Sodium Tripolyphosphate      | 100           | 150      | <b>66</b>  |
| Chloroethylene                           | 100           | 150      | <b>66</b>  | Styrene                      | All           | 150      | <b>66</b>  |
| Chlorotoluene                            | 100           | 150      | <b>66</b>  | Sulfur Dioxide               | All           | NR       | <b>NR</b>  |
| Citric Acid                              | 30            | 120      | <b>49</b>  | Sulfuric Acid                | 93            | 150      | <b>66</b>  |
| Ethyl Alcohol (Ethanol)<br>(Denaturated) | 100           | 150      | <b>66</b>  | Sulfurous Acid 25% min.      | All           | 150      | <b>66</b>  |
| Ethylene Glycol                          | 100           | 180      | <b>82</b>  | Toluene                      | 100           | 150      | <b>66</b>  |
| Furfuryl Alcohol                         | 100           | 125      | <b>52</b>  | Trichlorethylene             | All           | 120      | <b>49</b>  |
| Glycol                                   | 100           | 180      | <b>82</b>  | Xylene                       | 100           | 150      | <b>66</b>  |

**NR = Not Recommended (\*) - Contact Champion Fiberglass**

*(1) - All alkaline materials will attack phenolics to some extent. Resistance is dependent upon humidity of the environment. Material is conditionally recommended for continuous exposure to dry vapor only with occasional wetting. Duct system must be designed to eliminate condensation or pooling. If condensates can be expected from vapors, contact Champion Fiberglass.*

Information in this table is based on data supplied by raw material suppliers and collected from many years of similar industrial applications.

Temperatures represent standard test conditions and are not minimums or maximums. **CHAMPION FLAME SHIELD®** products may be acceptable at other temperatures for some chemicals, but should be tested to determine specific suitability.

The recommendations or suggestions contained in this table are made without guarantee or representation as to results. We suggest that you evaluate these recommendations and suggestions in your own laboratory or field trial prior to use.



## NFPA 130

Fixed Guideway Transit and Passenger Rail Systems  
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### From Chapter 5, Stations

#### 5.4 Wiring Requirements.

**5.4.1** All wiring materials and installations within stations other than for traction power shall conform to requirements of NFPA 70 and, in addition, shall satisfy the requirements of 5.4.2 through 5.4.9.

**5.4.2** Conduits, raceways, ducts, boxes, cabinets, and equipment enclosures shall be constructed of noncombustible materials in accordance with the requirements of ASTM E136

**5.4.2.1** Other materials when encased in concrete shall be acceptable.

**5.4.3** All conductors shall be insulated.

**5.4.3.1** Ground wires installed in a metallic raceway shall be insulated.

**5.4.3.2** Other ground wires shall be permitted to be bare.

**5.4.4** All insulations shall conform to NFPA 70 and shall be moisture- and heat-resistant types carrying temperature ratings corresponding to either of the following conditions:

- (1) 75°C (167°F) for listed fire-resistive cables
- (2) 90°C (194°F) for all other application

### From Chapter 6, Trainways

#### 6.3.3 Wiring Requirements. *(See Section 5.4.)*

##### 6.3.3.2 Underground (Subways).

**6.3.3.2.1** All wiring materials and installations within trainways, other than for traction power, shall conform to the requirements of NFPA 70 and, in addition, shall satisfy the requirements of 6.3.3.2.2 through 6.3.3.2.9.

**6.3.3.2.2** Conduits, raceways, ducts, boxes, cabinets, and equipment enclosures shall be constructed of noncombustible materials in accordance with the requirements of ASTM E136.

**6.3.3.2.3** All conductors shall be insulated.

**6.3.3.2.3.1** Ground wires installed in a metallic raceway shall be insulated.

**6.3.3.2.3.2** Other ground wires shall be permitted to be bare.

**6.3.3.2.4** All insulations shall conform to NFPA 70 and shall be moisture- and heat-resistant types carrying temperature ratings corresponding to either of the following conditions:

- (1) 75°C (167°F) for listed fire-resistive cables
- (2) 90°C (194°F) for all other application.

### From Chapter 7, Emergency Ventilation System

#### 7.7 Power and Wiring.

**7.7.1** The design of the power for the emergency ventilation system shall comply with the requirements of Article 700 of NFPA 70.

**7.7.1.1** Alternately, the design of the power for the emergency ventilation system shall be permitted to be based upon the results of the electrical reliability analysis as per 7.2.3(6) as approved.

**7.7.2** All wiring materials and installations shall conform to the requirements of NFPA 70 and, in addition, shall satisfy the requirements of 7.7.3 through 7.7.8.

**7.7.3** Conduits, raceways, ducts, boxes, cabinets, and equipment enclosures shall be constructed of noncombustible materials in accordance with the requirements of ASTM E136.

**7.7.4** All conductors shall be insulated.

**7.7.4.1** Ground wires installed in a metallic raceway shall be insulated.

**7.7.4.2** Other ground wires shall be permitted to be bare.

**7.7.4.3** All thicknesses of jackets shall conform to NFPA 70

**7.7.5** All insulations shall conform to NFPA 70 and shall be moisture- and heat-resistant types carrying temperature ratings corresponding to either of the following conditions:

- (1) 75°C (167°F) for listed fire-resistive cables
- (2) 90°C (194°F) for all other application

### Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

#### A.6.3.3.2.6 and A.7.7.7

The trainway, although used for ventilation, should not be considered as an air plenum for purposes of mounting electrical appurtenances.

## LIMITED WARRANTY

This warranty covers any Champion Fiberglass, Inc. ("Champion") electrical conduit products ("Product").

Subject to the terms and conditions of this warranty, Champion warrants that the Product is free from defects in workmanship and materials for a period of one (1) year from the date of purchase. During the applicable terms of this warranty, and subject to the terms and conditions thereof, in the event that the Product is proven to be defective and the defect is not caused by any misuse or damage to the Product while in the possession of the user, Champion will remedy the failure or defect without charge to the user except for labor. The remedy will consist of repair or replacement of the Product and or defective part, at Champion's option. Repair will be made, at Champion's option, either at user's location or at a facility designated by Champion. Any replacement part provided under this warranty assumed as its warranty period only the unexpired term of this warranty, which is fixed when such part replaces a defective part. This warranty does not cover defects, failure or damages caused by normal wear and tear, act of God, accident, misuse or unreasonable use of the Product, lack of proper maintenance, fire, flood, or any circumstances or events beyond Champion's control.

Champion's sole obligation under this warranty is to repair or replace the product, as provided herein. Champion shall have no liability for any direct, incidental, special or consequential damages resulting from breach of this or any other warranty (no warranty being implied from this reference) on the product. Except to the extent prohibited by applicable law, any implied warranty, including without limitation, of merchantability or fitness for any particular purchase with respect to the product, is limited in duration to the term of this warranty. This warranty is in lieu of any other express warranties and of any other obligation on the part of Champion. Any other express warranties are expressly excluded and disclaimed. No Champion representative is authorized to give any warranty (other than this warranty) with respect to the product, and any such warranty given by a Champion representative shall not constitute a Champion warranty or be binding in any respect upon Champion.

Note: Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. Some states do not allow limitation on how long an implied warranty lasts, so the above limitations may not apply to you.

To obtain performance of any obligation of Champion under this warranty, the user must provide proof of the date of purchase, notify Champion of any warranty claim at the following address:

**CHAMPION FIBERGLASS, INC.**  
6400 Spring Stuebner Rd  
Spring, TX 77389  
Attention: Warranty Claims  
Telephone: (281) 655-8900

Notify the nearest Champion authorized representative for inspection of the Product. For the name of the nearest authorized representative, refer to our web site: [www.championfiberglass.com](http://www.championfiberglass.com) / Locate a Rep Tab / or you can contact our corporate offices for the appropriate Representative's contact information. Any written correspondence can be mailed to our corporate offices at the address above.

**This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.**







## CERTIFICATE OF REGISTRATION

This is to certify that

### **Champion Fiberglass Inc.**

6400 Spring Stuebner Rd., Spring, Texas 77389 USA

operates a

### **Quality Management System**

which complies with the requirements of

### **ISO 9001:2008**

for the following scope of registration

**Manufacture of fiberglass conduit and fittings.**

Certificate No.: CERT-0065909

File No.: 1058413

Issue Date: September 28, 2012

Original Certification Date: November 6, 2009

Current Certification Date: November 5, 2012

Certificate Expiry Date: November 4, 2015

Chris Jouppi  
President,  
QMI-SAI Canada Limited

Guillaume Gignac, ing.f  
Vice President, Corporate Operations, Accreditation & Quality  
QMI-SAI Canada Limited



ISO 9001



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SAI Global Certification Services Pty Ltd, 286 Sussex Street, Sydney NSW 2000 Australia with QMI-SAI Canada Limited, 20 Carlson Court, Suite 200,  
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