

# PIPE COVERING PROTECTION SADDLES

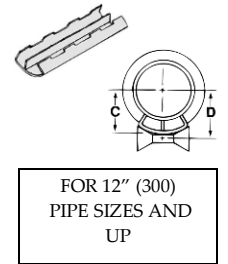
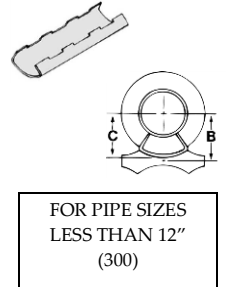


- FUNCTION:** Designed to protect insulation on high temperature pipe lines. The saddle is furnished with notches to minimize surface contact with the pipe, thereby keeping heat loss to a minimum.
- APPROVALS:** Complies with Federal Specifications A-A-1192A (Type 39) and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 39).
- MATERIAL:** Low carbon steel
- FINISH:** Plain or Electro-galvanized
- ORDERING:** Specify pipe size, insulation size and figure number.

## Fig. 651 PIPE SADDLE FOR 1" INSULATION

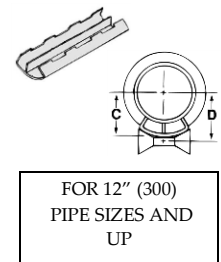
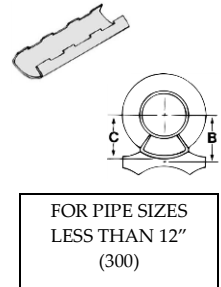
Available in stainless steel.  
To order, specify 304 or 316 and add suffix SS to figure number.  
Price on request.

| Pipe Size  |       | Pipe Roller Size     |            |                  |                  | Fig.<br>460, 480<br>483, 490<br>B |                  | Fig.<br>470<br>475<br>B |              | C           |  | Fig.<br>486<br>487<br>D |  | Actual<br>Thickness<br>Of<br>Covering |  | Max. Rec.<br>Load |    | Wt. Each |    |
|------------|-------|----------------------|------------|------------------|------------------|-----------------------------------|------------------|-------------------------|--------------|-------------|--|-------------------------|--|---------------------------------------|--|-------------------|----|----------|----|
|            |       | Use With Fig. No.    |            |                  |                  |                                   |                  |                         |              |             |  |                         |  |                                       |  | lbs.              | Kn | lbs.     | kg |
|            |       | 460, 480<br>483, 490 | 470<br>475 | 486<br>487       |                  |                                   |                  |                         |              |             |  |                         |  |                                       |  |                   |    |          |    |
| 3/4 (20)   | 2     | 2 1/2                | 2-3 1/2    | 2 1/16 (52.39)   | 2 1/8 (53.98)    | 1 5/8 (41.28)                     | 2 1/4 (57.15)    | 7/8 (22.23)             | 1200 (5.34)  | 1.41 (.64)  |  |                         |  |                                       |  |                   |    |          |    |
| 1 (25)     | 2 1/2 | 3                    | 2-3 1/2    | 2 5/16 (58.74)   | 2 1/4 (57.15)    | 1 13/16 (46.04)                   | 2 7/16 (61.91)   | 1 1/16 (26.99)          | 1200 (5.34)  | 1.41 (.64)  |  |                         |  |                                       |  |                   |    |          |    |
| 1 1/4 (32) | 2 1/2 | 3                    | 2-3 1/2    | 2 1/2 (63.50)    | 2 7/16 (61.91)   | 1 15/16 (49.21)                   | 2 9/16 (65.09)   | 7/8 (22.23)             | 1200 (5.34)  | 1.41 (.64)  |  |                         |  |                                       |  |                   |    |          |    |
| 1 1/2 (40) | 3     | 3 1/2                | 2-3 1/2    | 2 5/8 (66.68)    | 2 5/8 (66.68)    | 2 1/8 (53.98)                     | 2 11/16 (68.26)  | 1 (25.40)               | 1200 (5.34)  | 1.43 (.65)  |  |                         |  |                                       |  |                   |    |          |    |
| 2 (50)     | 3 1/2 | 4                    | 2-3 1/2    | 3 (76.20)        | 2 15/16 (74.61)  | 2 3/8 (60.33)                     | 3 1/16 (77.79)   | 1 1/16 (26.99)          | 1200 (5.34)  | 1.52 (.69)  |  |                         |  |                                       |  |                   |    |          |    |
| 2 1/2 (65) | 3 1/2 | 5                    | 2-3 1/2    | 3 1/4 (82.55)    | 3 1/4 (82.55)    | 2 11/16 (68.26)                   | 3 5/16 (84.14)   | 1 1/16 (26.99)          | 1200 (5.34)  | 1.52 (.69)  |  |                         |  |                                       |  |                   |    |          |    |
| 3 (80)     | 4     | 5                    | 2-3 1/2    | 3 1/2 (88.90)    | 3 1/2 (88.90)    | 2 15/16 (74.61)                   | 3 9/16 (90.49)   | 1 (25.40)               | 1200 (5.34)  | 1.63 (.74)  |  |                         |  |                                       |  |                   |    |          |    |
| 3 1/2 (90) | 5     | 6                    | 4-6        | 4 (101.60)       | 4 (101.60)       | 3 5/16 (84.14)                    | 3 15/16 (100.01) | 1 1/4 (31.75)           | 1200 (5.34)  | 1.98 (.90)  |  |                         |  |                                       |  |                   |    |          |    |
| 4 (100)    | 5     | 6                    | 4-6        | 4 1/4 (107.95)   | 4 1/4 (107.95)   | 3 9/16 (90.49)                    | 4 3/16 (106.36)  | 1 1/16 (26.99)          | 1800 (8.01)  | 1.98 (.90)  |  |                         |  |                                       |  |                   |    |          |    |
| 5 (125)    | 6     | 8                    | 4-6        | 4 13/16 (122.24) | 4 13/16 (122.24) | 4 1/8 (104.78)                    | 4 3/4 (120.65)   | 1 (25.40)               | 1800 (8.01)  | 1.98 (.90)  |  |                         |  |                                       |  |                   |    |          |    |
| 6 (150)    | 8     | 8                    | 4-6        | 5 3/8 (136.53)   | 5 3/8 (161.93)   | 4 1/2 (114.30)                    | 5 1/4 (133.35)   | 1 (25.40)               | 1800 (8.01)  | 3.91 (1.64) |  |                         |  |                                       |  |                   |    |          |    |
| 8 (200)    | 10    | 12                   | 8-10       | 7 1/16 (179.39)  | 7 1/16 (179.39)  | 6 (152.40)                        | 7 1/16 (179.39)  | 1 1/2 (38.10)           | 1800 (8.01)  | 4.75 (2.15) |  |                         |  |                                       |  |                   |    |          |    |
| 10 (250)   | 12    | 14                   | 8-10       | 8 5/16 (211.14)  | 8 1/2 (215.90)   | 7 1/4 (184.15)                    | 8 5/16 (211.14)  | 1 9/16 (39.69)          | 1800 (8.01)  | 4.75 (2.15) |  |                         |  |                                       |  |                   |    |          |    |
| 12 (300)   | 14    | 16                   | 12-14      | 8 15/16 (227.01) | 8 7/8 (225.43)   | 7 5/8 (193.68)                    | 8 13/16 (223.84) | 1 1/16 (26.99)          | 5000 (22.24) | 6.88 (3.12) |  |                         |  |                                       |  |                   |    |          |    |



## Fig. 653 PIPE SADDLE FOR 1 1/2" INSULATION

| Pipe Size  |       | Pipe Roller Size     |            |                  |                  | Fig.<br>460, 480<br>483, 490<br>B |                  | Fig.<br>470<br>475<br>B |                | C              |                | Fig.<br>486<br>487<br>D |            | Actual<br>Thickness<br>Of<br>Covering |  | Max. Rec.<br>Load |    | Wt. Each |    |
|------------|-------|----------------------|------------|------------------|------------------|-----------------------------------|------------------|-------------------------|----------------|----------------|----------------|-------------------------|------------|---------------------------------------|--|-------------------|----|----------|----|
|            |       | Use With Fig. No.    |            |                  |                  |                                   |                  |                         |                |                |                |                         |            |                                       |  | lbs.              | Kn | lbs.     | kg |
|            |       | 460, 480<br>483, 490 | 470<br>475 | 486<br>487       |                  |                                   |                  |                         |                |                |                |                         |            |                                       |  |                   |    |          |    |
| 3/4 (20)   | 3     | 3 1/2                | 2-3 1/2    | 2 3/4 (69.85)    | 2 3/4 (69.85)    | 2 3/16 (55.56)                    | 2 7/8 (73.03)    | 2 7/8 (73.03)           | 2 5/16 (58.74) | 3 (76.20)      | 1 7/16 (36.51) | 1200 (5.34)             | 1.85 (.84) |                                       |  |                   |    |          |    |
| 1 (25)     | 3     | 4                    | 2-3 1/2    | 2 7/8 (73.03)    | 2 7/8 (73.03)    | 2 5/16 (58.74)                    | 2 7/8 (73.03)    | 2 5/16 (58.74)          | 2 9/16 (65.09) | 3 3/16 (80.96) | 1 9/16 (39.69) | 1200 (5.34)             | 1.85 (.84) |                                       |  |                   |    |          |    |
| 1 1/4 (32) | 3 1/2 | 5                    | 2-3 1/2    | 3 1/16 (77.79)   | 3 1/16 (77.79)   | 2 9/16 (65.09)                    | 3 3/16 (80.96)   | 1 5/8 (41.28)           | 1200 (5.34)    | 1.85 (.84)     |                |                         |            |                                       |  |                   |    |          |    |
| 1 1/2 (40) | 3 1/2 | 5                    | 2-3 1/2    | 3 3/4 (82.55)    | 3 3/4 (82.55)    | 2 5/8 (66.68)                     | 3 5/16 (84.14)   | 1 1/2 (38.10)           | 1200 (5.34)    | 1.85 (.84)     |                |                         |            |                                       |  |                   |    |          |    |
| 2 (50)     | 4     | 5                    | 2-3 1/2    | 3 1/2 (88.90)    | 3 1/2 (88.90)    | 2 7/8 (73.03)                     | 3 9/16 (90.49)   | 1 9/16 (39.69)          | 1200 (5.34)    | 1.98 (.90)     |                |                         |            |                                       |  |                   |    |          |    |
| 2 1/2 (65) | 5     | 6                    | 4-6        | 4 (101.60)       | 4 (101.60)       | 3 5/16 (84.14)                    | 3 15/16 (100.01) | 1 7/8 (47.63)           | 1200 (5.34)    | 2.25 (1.02)    |                |                         |            |                                       |  |                   |    |          |    |
| 3 (80)     | 5     | 6                    | 4-6        | 4 5/16 (109.54)  | 4 5/16 (109.54)  | 3 5/8 (92.08)                     | 4 1/4 (107.95)   | 1 9/16 (39.69)          | 1200 (5.34)    | 2.25 (1.02)    |                |                         |            |                                       |  |                   |    |          |    |
| 3 1/2 (90) | 6     | 8                    | 4-6        | 4 9/16 (115.89)  | 4 9/16 (115.89)  | 3 11/16 (93.66)                   | 4 1/2 (114.30)   | 1 13/16 (46.04)         | 1200 (5.34)    | 2.50 (1.13)    |                |                         |            |                                       |  |                   |    |          |    |
| 4 (100)    | 6     | 8                    | 4-6        | 4 7/8 (123.83)   | 4 7/8 (123.83)   | 4 1/16 (103.19)                   | 4 3/4 (120.65)   | 1 9/16 (39.69)          | 1800 (8.01)    | 2.50 (1.13)    |                |                         |            |                                       |  |                   |    |          |    |
| 5 (125)    | 8     | 8                    | 4-6        | 5 1/2 (139.70)   | 5 1/2 (139.70)   | 4 11/16 (119.06)                  | 5 3/8 (136.53)   | 1 1/2 (38.10)           | 1800 (8.01)    | 2.50 (1.13)    |                |                         |            |                                       |  |                   |    |          |    |
| 6 (150)    | 8     | 10                   | 8-10       | 5 7/8 (149.23)   | 5 11/16 (144.46) | 5 1/16 (128.59)                   | 6 (152.40)       | 1 1/2 (38.10)           | 1800 (8.01)    | 4.25 (1.93)    |                |                         |            |                                       |  |                   |    |          |    |
| 8 (200)    | 10    | 12                   | 8-10       | 7 1/16 (179.39)  | 7 1/16 (179.39)  | 6 (152.40)                        | 7 1/16 (179.39)  | 1 1/2 (38.10)           | 1800 (8.01)    | 5.50 (2.49)    |                |                         |            |                                       |  |                   |    |          |    |
| 10 (250)   | 12    | 14                   | 8-10       | 8 5/16 (211.14)  | 8 1/2 (215.90)   | 7 1/4 (184.15)                    | 8 5/16 (211.14)  | 1 9/16 (39.69)          | 1800 (8.01)    | 5.50 (2.49)    |                |                         |            |                                       |  |                   |    |          |    |
| 12 (300)   | 14    | 16                   | 12-14      | 9 1/2 (241.30)   | 9 1/2 (241.30)   | 8 1/16 (204.79)                   | 9 1/4 (234.95)   | 1 9/16 (39.69)          | 5000 (22.24)   | 8.33 (3.78)    |                |                         |            |                                       |  |                   |    |          |    |
| 14 (350)   | 16    | 18                   | 12-14      | 10 3/16 (258.76) | 10 1/8 (257.18)  | 8 3/4 (222.25)                    | 10 1/16 (255.59) | 1 1/2 (38.10)           | 5000 (22.24)   | 8.33 (3.78)    |                |                         |            |                                       |  |                   |    |          |    |
| 16 (400)   | 18    | 20                   | 16-20      | 11 1/4 (285.75)  | 11 1/4 (285.75)  | 9 13/16 (249.24)                  | 11 1/8 (282.58)  | 1 1/2 (38.10)           | 5000 (22.24)   | 9.01 (4.09)    |                |                         |            |                                       |  |                   |    |          |    |
| 18 (450)   | 20    | 24                   | 16-20      | 12 5/16 (312.74) | --               | 10 13/16 (274.64)                 | 12 3/16 (309.56) | 1 1/2 (38.10)           | 5000 (22.24)   | 9.68 (4.39)    |                |                         |            |                                       |  |                   |    |          |    |
| 20 (500)   | 24    | 24                   | 24         | 13 9/16 (344.49) | --               | 11 5/8 (295.28)                   | 13 1/16 (331.79) | 1 1/2 (38.10)           | 7200 (32.03)   | 11.00 (4.99)   |                |                         |            |                                       |  |                   |    |          |    |
| 24 (600)   | 30    | --                   | 30         | 16 5/16 (414.34) | --               | 13 1/2 (342.90)                   | 15 1/4 (387.35)  | 1 1/2 (38.10)           | 7200 (32.03)   | 13.00 (5.90)   |                |                         |            |                                       |  |                   |    |          |    |



Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

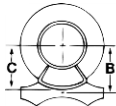


# PIPE COVERING PROTECTION SADDLES

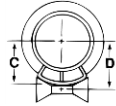
## Fig. 654 PIPE SADDLE FOR 2" INSULATION

Available in stainless steel. To order, specify 304 or 316 and add suffix SS to figure number. Price on request.

- FUNCTION:** Designed to protect insulation on high temperature pipe lines. The saddle is furnished with notches to minimize surface contact with the pipe, thereby keeping heat loss to a minimum.
- APPROVALS:** Complies with Federal Specifications A-A-1192A (Type 39) and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 39).
- MATERIAL:** Low carbon steel
- FINISH:** Plain or Electro-galvanized
- ORDERING:** Specify pipe size, insulation size and figure number.



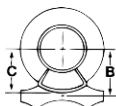
FOR PIPE SIZES  
LESS THAN 12"  
(300)



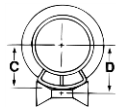
FOR 12" (300)  
PIPE SIZES AND  
UP

| Pipe Size  | Pipe Roller Size     |            |            |                  | Fig.<br>460, 480<br>483, 490<br>B |                  | Fig.<br>470<br>475<br>B |                 | C            |              | Fig.<br>486<br>487<br>D |  | Actual<br>Thickness<br>Of<br>Covering |  | Max. Rec.<br>Load |    | Wt. Each |    |
|------------|----------------------|------------|------------|------------------|-----------------------------------|------------------|-------------------------|-----------------|--------------|--------------|-------------------------|--|---------------------------------------|--|-------------------|----|----------|----|
|            | Use With Fig. No.    |            |            |                  |                                   |                  |                         |                 |              |              |                         |  |                                       |  | lbs.              | Kn | lbs.     | kg |
|            | 460, 480<br>483, 490 | 470<br>475 | 486<br>487 |                  |                                   |                  |                         |                 |              |              |                         |  |                                       |  |                   |    |          |    |
| 3/4 (20)   | 4                    | 5          | 2-3 1/2    | 3 5/16 (84.14)   | 3 5/16 (84.14)                    | 2 11/16 (68.26)  | 3 3/8 (85.73)           | 1 7/8 (47.63)   | 1200 (5.34)  | 2.58 (1.17)  |                         |  |                                       |  |                   |    |          |    |
| 1 (25)     | 4                    | 5          | 2-3 1/2    | 3 1/2 (88.90)    | 3 1/2 (88.90)                     | 2 7/8 (73.03)    | 3 1/2 (88.90)           | 2 1/8 (53.98)   | 1200 (5.34)  | 2.58 (1.17)  |                         |  |                                       |  |                   |    |          |    |
| 1 1/4 (32) | 4                    | 5          | 2-3 1/2    | 3 5/8 (92.08)    | 3 5/8 (92.08)                     | 3 (76.20)        | 3 11/16 (93.66)         | 1 15/16 (49.21) | 1200 (5.34)  | 2.58 (1.17)  |                         |  |                                       |  |                   |    |          |    |
| 1 1/2 (40) | 5                    | 6          | 4-6        | 4 (101.60)       | 4 (101.60)                        | 3 5/16 (84.14)   | 3 7/8 (98.43)           | 2 5/16 (58.74)  | 1800 (8.01)  | 2.85 (1.29)  |                         |  |                                       |  |                   |    |          |    |
| 2 (50)     | 5                    | 6          | 4-6        | 4 1/4 (107.95)   | 4 1/4 (107.95)                    | 3 9/16 (90.49)   | 4 3/16 (106.36)         | 2 1/8 (53.98)   | 1800 (8.01)  | 2.85 (1.29)  |                         |  |                                       |  |                   |    |          |    |
| 2 1/2 (65) | 6                    | 8          | 4-6        | 4 1/2 (114.30)   | 4 5/8 (117.48)                    | 3 7/8 (98.43)    | 4 1/2 (114.30)          | 2 5/16 (58.74)  | 1800 (8.01)  | 2.85 (1.29)  |                         |  |                                       |  |                   |    |          |    |
| 3 (80)     | 6                    | 8          | 4-6        | 4 13/16 (122.24) | 4 13/16 (122.24)                  | 4 1/8 (104.78)   | 4 11/16 (119.06)        | 2 1/16 (52.39)  | 1800 (8.01)  | 3.30 (1.50)  |                         |  |                                       |  |                   |    |          |    |
| 3 1/2 (90) | 8                    | 8          | 4-6        | 5 1/8 (130.18)   | 5 1/8 (130.18)                    | 4 5/16 (109.54)  | 5 (127.00)              | 2 1/4 (57.15)   | 1800 (8.01)  | 3.30 (1.50)  |                         |  |                                       |  |                   |    |          |    |
| 4 (100)    | 8                    | 8          | 4-6        | 5 3/8 (136.53)   | 5 3/8 (136.53)                    | 4 9/16 (115.89)  | 5 1/4 (133.35)          | 2 1/16 (52.39)  | 1800 (8.01)  | 3.30 (1.50)  |                         |  |                                       |  |                   |    |          |    |
| 5 (125)    | 8                    | 10         | 8-10       | 6 (152.40)       | 6 1/16 (153.99)                   | 5 3/16 (131.76)  | 6 1/8 (155.58)          | 2 (50.80)       | 1800 (8.01)  | 3.30 (1.50)  |                         |  |                                       |  |                   |    |          |    |
| 6 (150)    | 10                   | 10         | 8-10       | 6 7/16 (163.51)  | 6 7/16 (163.51)                   | 5 1/2 (139.70)   | 6 1/2 (165.10)          | 2 (50.80)       | 1800 (8.01)  | 5.25 (2.38)  |                         |  |                                       |  |                   |    |          |    |
| 8 (200)    | 10                   | 12         | 8-10       | 7 9/16 (192.09)  | 7 9/16 (192.09)                   | 6 1/2 (165.10)   | 7 9/16 (192.09)         | 2 (50.80)       | 1800 (8.01)  | 6.10 (2.77)  |                         |  |                                       |  |                   |    |          |    |
| 10 (250)   | 14                   | 16         | 12-14      | 9 1/16 (230.19)  | 9 (228.60)                        | 7 5/8 (193.68)   | 8 13/16 (223.84)        | 2 1/16 (52.39)  | 1800 (8.01)  | 7.05 (3.20)  |                         |  |                                       |  |                   |    |          |    |
| 12 (300)   | 16                   | 18         | 16-20      | 10 3/16 (258.76) | 10 1/16 (255.59)                  | 8 5/8 (219.08)   | 10 (254.00)             | 2 1/2 (63.50)   | 5000 (22.24) | 9.33 (4.23)  |                         |  |                                       |  |                   |    |          |    |
| 14 (350)   | 16                   | 18         | 16-20      | 10 7/8 (276.23)  | 10 13/16 (274.64)                 | 9 5/16 (236.54)  | 10 11/16 (271.46)       | 2 (50.80)       | 5000 (22.24) | 9.33 (4.23)  |                         |  |                                       |  |                   |    |          |    |
| 16 (400)   | 18                   | 20         | 16-20      | 11 3/16 (284.16) | 11 3/4 (285.75)                   | 10 3/16 (258.76) | 11 9/16 (293.69)        | 2 (50.80)       | 5000 (22.24) | 10.68 (4.84) |                         |  |                                       |  |                   |    |          |    |
| 18 (450)   | 20                   | 24         | 24         | 12 7/8 (327.03)  | --                                | 11 5/16 (287.34) | 12 11/16 (322.26)       | 2 (50.80)       | 7200 (32.03) | 10.68 (4.84) |                         |  |                                       |  |                   |    |          |    |
| 20 (500)   | 24                   | 24         | 24         | 13 9/16 (344.49) | --                                | 12 1/4 (311.15)  | 13 5/8 (346.08)         | 2 (50.80)       | 7200 (32.03) | 11.96 (5.42) |                         |  |                                       |  |                   |    |          |    |
| 24 (600)   | 30                   | --         | 30         | 16 5/16 (414.34) | --                                | 14 (355.60)      | 15 3/4 (400.05)         | 2 (50.80)       | 7200 (32.03) | 13.95 (6.33) |                         |  |                                       |  |                   |    |          |    |

## Fig. 655 PIPE SADDLE FOR 2 1/2" INSULATION



FOR PIPE SIZES  
LESS THAN 12"  
(300)



FOR 12" (300)  
PIPE SIZES AND  
UP

| Pipe Size | Pipe Roller Size     |            |            | Fig.<br>460, 480<br>483, 490<br>B |                 | Fig.<br>470<br>475<br>B |                  | C               |              | Fig.<br>486<br>487<br>D |              | Actual<br>Thickness<br>Of<br>Covering |  | Max. Rec.<br>Load |    | Wt. Each |    |
|-----------|----------------------|------------|------------|-----------------------------------|-----------------|-------------------------|------------------|-----------------|--------------|-------------------------|--------------|---------------------------------------|--|-------------------|----|----------|----|
|           | Use With Fig. No.    |            |            |                                   |                 |                         |                  |                 |              |                         |              |                                       |  | lbs.              | Kn | lbs.     | kg |
|           | 460, 480<br>483, 490 | 470<br>475 | 486<br>487 |                                   |                 |                         |                  |                 |              |                         |              |                                       |  |                   |    |          |    |
| 1¼ (32)   | 5                    | 6          | 4-6        | 4⅜ (111.13)                       | 4⅜ (111.13)     | 3¾ (95.25)              | 4⅜ (111.13)      | 27/16 (61.91)   | 1200 (5.34)  | 3.25 (1.47)             |              |                                       |  |                   |    |          |    |
| 1½ (40)   | 6                    | 8          | 4-6        | 4½ (114.30)                       | 4⅝ (117.48)     | 3⅞ (98.43)              | 4½ (114.30)      | 213/16 (71.44)  | 1800 (8.01)  | 3.25 (1.47)             |              |                                       |  |                   |    |          |    |
| 2 (50)    | 6                    | 8          | 4-6        | 4¾ (120.65)                       | 413/16 (122.24) | 41/16 (103.19)          | 4¾ (120.65)      | 25/8 (66.68)    | 1800 (8.01)  | 3.25 (1.47)             |              |                                       |  |                   |    |          |    |
| 2½ (65)   | 8                    | 8          | 4-6        | 5⅛ (130.18)                       | 5⅛ (130.18)     | 4¼ (107.95)             | 5 (127.00)       | 27/8 (73.03)    | 1800 (8.01)  | 3.61 (1.64)             |              |                                       |  |                   |    |          |    |
| 3 (80)    | 8                    | 8          | 4-6        | 57/16 (138.11)                    | 57/16 (138.11)  | 411/16 (119.06)         | 55/16 (134.94)   | 29/16 (65.09)   | 1800 (8.01)  | 3.61 (1.64)             |              |                                       |  |                   |    |          |    |
| 3½ (90)   | 8                    | 10         | 8-10       | 55/8 (142.88)                     | 55/8 (142.88)   | 411/16 (119.06)         | 511/16 (144.46)  | 2¾ (69.85)      | 1800 (8.01)  | 3.70 (1.68)             |              |                                       |  |                   |    |          |    |
| 4 (100)   | 8                    | 10         | 8-10       | 515/16 (150.81)                   | 515/16 (150.81) | 5 (127.00)              | 6 (152.40)       | 29/16 (65.09)   | 1800 (8.01)  | 3.70 (1.68)             |              |                                       |  |                   |    |          |    |
| 5 (125)   | 10                   | 10         | 8-10       | 69/16 (166.69)                    | 69/16 (166.69)  | 55/8 (142.88)           | 65/8 (168.28)    | 29/16 (65.09)   | 1800 (8.01)  | 3.70 (1.68)             |              |                                       |  |                   |    |          |    |
| 6 (150)   | 10                   | 12         | 8-10       | 7⅛ (180.98)                       | 73/16 (182.56)  | 63/16 (157.16)          | 7¼ (184.15)      | 2½ (63.50)      | 1800 (8.01)  | 6.10 (2.77)             |              |                                       |  |                   |    |          |    |
| 8 (200)   | 12                   | 14         | 8-10       | 85/16 (211.14)                    | 8½ (215.90)     | 7¼ (184.15)             | 85/16 (211.14)   | 211/16 (68.26)  | 1800 (8.01)  | 6.80 (3.08)             |              |                                       |  |                   |    |          |    |
| 10 (250)  | 14                   | 16         | 12-14      | 99/16 (242.89)                    | 99/16 (242.89)  | 8⅛ (206.38)             | 95/16 (236.54)   | 29/16 (65.09)   | 1800 (8.01)  | 7.10 (3.22)             |              |                                       |  |                   |    |          |    |
| 12 (300)  | 16                   | 18         | 16-20      | 1011/16 (271.46)                  | 109/16 (268.29) | 9⅛ (231.78)             | 10½ (266.70)     | 25/8 (66.68)    | 5000 (22.24) | 10.93 (4.96)            |              |                                       |  |                   |    |          |    |
| 14 (350)  | 18                   | 20         | 16-20      | 115/16 (287.34)                   | 113/8 (288.93)  | 97/8 (250.83)           | 113/16 (284.16)  | 2½ (63.50)      | 5000 (22.24) | 10.93 (4.96)            |              |                                       |  |                   |    |          |    |
| 16 (400)  | 20                   | 24         | 16-20      | 125/16 (312.74)                   | --              | --                      | 1013/16 (274.64) | 123/16 (309.56) | 2½ (63.50)   | 7200 (32.03)            | 11.64 (5.28) |                                       |  |                   |    |          |    |
| 18 (450)  | 24                   | 24         | 24         | 139/16 (344.49)                   | --              | --                      | 115/8 (295.28)   | 131/16 (331.79) | 2½ (63.50)   | 7200 (32.03)            | 12.92 (5.86) |                                       |  |                   |    |          |    |
| 20 (500)  | 24                   | --         | 24         | 1411/16 (373.06)                  | --              | --                      | 123/4 (323.85)   | 143/16 (360.36) | 2½ (63.50)   | 7200 (32.03)            | 12.92 (5.86) |                                       |  |                   |    |          |    |
| 24 (600)  | 30                   | --         | 30         | 17½ (444.50)                      | --              | --                      | 145/8 (371.48)   | 167/16 (417.51) | 2½ (63.50)   | 7200 (32.03)            | 14.91 (6.76) |                                       |  |                   |    |          |    |

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

# PIPE COVERING PROTECTION SADDLES



**FUNCTION:** Designed to protect insulation on high temperature pipe lines. The saddle is furnished with notches to minimize surface contact with the pipe, thereby keeping heat loss to a minimum.

**APPROVALS:** Complies with Federal Specifications A-A-1192A (Type 39) and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 39).

**MATERIAL:** Low carbon steel

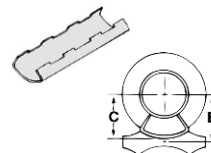
**FINISH:** Plain or Electro-galvanized

**ORDERING:** Specify pipe size, insulation size and figure number.

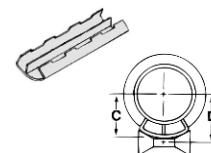
## Fig. 656 PIPE SADDLE FOR 3" INSULATION

Available in stainless steel. To order, specify 304 or 316 and add suffix SS to figure number. Price on request.

| Pipe Size | Pipe Roller Size     |            |            | Fig.<br>460, 480<br>483, 490<br>B        | Fig.<br>470<br>475<br>B                  | C                                        | Fig.<br>486<br>487<br>D                  | Actual<br>Thickness<br>Of<br>Covering  | Max. Rec. Load |              | Wt. Each |    |
|-----------|----------------------|------------|------------|------------------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|----------------------------------------|----------------|--------------|----------|----|
|           | Use With Fig. No.    |            |            |                                          |                                          |                                          |                                          |                                        | lbs.           | Kn           | lbs.     | kg |
|           | 460, 480<br>483, 490 | 470<br>475 | 486<br>487 |                                          |                                          |                                          |                                          |                                        |                |              |          |    |
| 2 (50)    | 8                    | 8          | 4-6        | 5 <sup>3</sup> / <sub>8</sub> (136.53)   | 5 <sup>3</sup> / <sub>8</sub> (136.53)   | 4 <sup>9</sup> / <sub>16</sub> (115.89)  | 5 <sup>1</sup> / <sub>4</sub> (133.35)   | 3 <sup>1</sup> / <sub>8</sub> (79.38)  | 1800 (8.01)    | 4.10 (1.86)  |          |    |
| 2½ (65)   | 8                    | 10         | 4-6        | 5 <sup>5</sup> / <sub>8</sub> (142.88)   | 5 <sup>3</sup> / <sub>4</sub> (146.05)   | 4 <sup>7</sup> / <sub>8</sub> (123.83)   | 5 <sup>1</sup> / <sub>2</sub> (139.70)   | 3 <sup>3</sup> / <sub>8</sub> (85.73)  | 1800 (8.01)    | 4.10 (1.86)  |          |    |
| 3 (80)    | 8                    | 10         | 8-10       | 6 (152.40)                               | 6 (152.40)                               | 5 <sup>1</sup> / <sub>16</sub> (128.59)  | 6 <sup>1</sup> / <sub>16</sub> (153.99)  | 3 <sup>1</sup> / <sub>16</sub> (77.79) | 1800 (8.01)    | 4.32 (1.96)  |          |    |
| 3½ (90)   | 10                   | 10         | 8-10       | 6 <sup>5</sup> / <sub>16</sub> (160.34)  | 6 <sup>5</sup> / <sub>16</sub> (160.34)  | 5 <sup>3</sup> / <sub>8</sub> (136.53)   | 6 <sup>3</sup> / <sub>8</sub> (161.93)   | 3 <sup>5</sup> / <sub>16</sub> (84.14) | 1800 (8.01)    | 4.32 (1.96)  |          |    |
| 4 (100)   | 10                   | 10         | 8-10       | 6 <sup>9</sup> / <sub>16</sub> (166.69)  | 6 <sup>9</sup> / <sub>16</sub> (166.69)  | 5 <sup>5</sup> / <sub>8</sub> (142.88)   | 6 <sup>5</sup> / <sub>8</sub> (168.28)   | 3 <sup>1</sup> / <sub>16</sub> (77.79) | 1800 (8.01)    | 4.32 (1.96)  |          |    |
| 5 (125)   | 10                   | 12         | 8-10       | 7 <sup>1</sup> / <sub>8</sub> (180.98)   | 7 <sup>1</sup> / <sub>4</sub> (184.15)   | 6 <sup>3</sup> / <sub>16</sub> (157.16)  | 7 <sup>1</sup> / <sub>4</sub> (184.15)   | 3 <sup>1</sup> / <sub>16</sub> (77.79) | 1800 (8.01)    | 4.32 (1.96)  |          |    |
| 6 (150)   | 12                   | 12         | 8-10       | 7 <sup>5</sup> / <sub>8</sub> (193.68)   | 7 <sup>5</sup> / <sub>8</sub> (193.68)   | 6 <sup>9</sup> / <sub>16</sub> (166.69)  | 7 <sup>5</sup> / <sub>8</sub> (193.68)   | 3 (76.20)                              | 1800 (8.01)    | 8.10 (3.67)  |          |    |
| 8 (200)   | 14                   | 16         | 12-14      | 9 (228.60)                               | 9 (228.60)                               | 7 <sup>11</sup> / <sub>16</sub> (195.26) | 8 <sup>3</sup> / <sub>4</sub> (222.25)   | 3 <sup>1</sup> / <sub>8</sub> (79.38)  | 1800 (8.01)    | 8.10 (3.67)  |          |    |
| 10 (250)  | 16                   | 18         | 16-20      | 10 <sup>1</sup> / <sub>8</sub> (257.18)  | 10 <sup>1</sup> / <sub>16</sub> (255.59) | 8 <sup>11</sup> / <sub>16</sub> (220.66) | 10 (254.00)                              | 3 <sup>1</sup> / <sub>16</sub> (77.79) | 1800 (8.01)    | 8.40 (3.81)  |          |    |
| 12 (300)  | 18                   | 20         | 16-20      | 11 <sup>1</sup> / <sub>8</sub> (282.58)  | 11 <sup>1</sup> / <sub>4</sub> (285.75)  | 9 <sup>5</sup> / <sub>8</sub> (244.48)   | 11 (279.40)                              | 3 <sup>1</sup> / <sub>16</sub> (77.79) | 5000 (22.24)   | 11.88 (5.39) |          |    |
| 14 (350)  | 18                   | 20         | 16-20      | 11 <sup>3</sup> / <sub>4</sub> (298.45)  | 11 <sup>3</sup> / <sub>4</sub> (298.45)  | 10 <sup>5</sup> / <sub>16</sub> (261.94) | 11 <sup>5</sup> / <sub>8</sub> (295.28)  | 3 (76.20)                              | 5000 (22.24)   | 11.88 (5.39) |          |    |
| 16 (400)  | 20                   | 24         | 24         | 12 <sup>7</sup> / <sub>8</sub> (327.03)  | --                                       | 11 <sup>1</sup> / <sub>16</sub> (280.99) | 12 <sup>7</sup> / <sub>16</sub> (315.91) | 3 (76.20)                              | 7200 (32.03)   | 13.87 (6.29) |          |    |
| 18 (450)  | 24                   | 24         | 24         | 14 <sup>3</sup> / <sub>16</sub> (360.36) | --                                       | 12 <sup>1</sup> / <sub>4</sub> (311.15)  | 13 <sup>5</sup> / <sub>8</sub> (346.08)  | 3 (76.20)                              | 7200 (32.03)   | 13.87 (6.29) |          |    |
| 20 (500)  | 24                   | --         | 24         | 15 <sup>1</sup> / <sub>4</sub> (387.35)  | --                                       | 13 <sup>5</sup> / <sub>16</sub> (338.14) | 14 <sup>3</sup> / <sub>4</sub> (374.65)  | 3 (76.20)                              | 7200 (32.03)   | 14.51 (6.58) |          |    |
| 24 (600)  | 30                   | --         | 30         | 18 <sup>1</sup> / <sub>16</sub> (458.79) | --                                       | 15 <sup>1</sup> / <sub>4</sub> (387.35)  | 17 (431.80)                              | 3 (76.20)                              | 7200 (32.03)   | 15.86 (7.19) |          |    |



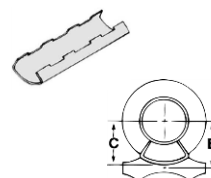
FOR PIPE SIZES  
LESS THAN 12"  
(300)



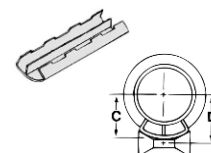
FOR 12" (300)  
PIPE SIZES AND  
UP

## Fig. 658 PIPE SADDLE FOR 4" INSULATION

| Pipe Size | Pipe Roller Size     |            |            |                                         | Fig.<br>460, 480<br>483, 490<br>B       |                                          | Fig.<br>470<br>475<br>B                   |                                          | Fig.<br>486<br>487<br>D                |              | Actual<br>Thickness<br>Of<br>Covering |    | Max. Rec.<br>Load |    | Wt. Each |  |
|-----------|----------------------|------------|------------|-----------------------------------------|-----------------------------------------|------------------------------------------|-------------------------------------------|------------------------------------------|----------------------------------------|--------------|---------------------------------------|----|-------------------|----|----------|--|
|           | Use With Fig. No.    |            |            |                                         |                                         |                                          |                                           |                                          |                                        |              |                                       |    |                   |    |          |  |
|           | 460, 480<br>483, 490 | 470<br>475 | 486<br>487 |                                         |                                         |                                          |                                           |                                          |                                        |              | lbs.                                  | Kn | lbs.              | kg |          |  |
| 4 (100)   | 10                   | 12         | 8-10       | 7 <sup>5</sup> / <sub>8</sub> (193.68)  | 7 <sup>5</sup> / <sub>8</sub> (193.68)  | 6 <sup>1</sup> / <sub>2</sub> (165.10)   | 7 <sup>9</sup> / <sub>16</sub> (192.09)   | 4 <sup>1</sup> / <sub>16</sub> (103.19)  | 1800 (8.01)                            | 5.90 (2.68)  |                                       |    |                   |    |          |  |
| 5 (125)   | 12                   | 14         | 8-10       | 8 <sup>3</sup> / <sub>16</sub> (207.96) | 8 <sup>3</sup> / <sub>8</sub> (212.73)  | 7 <sup>1</sup> / <sub>8</sub> (180.98)   | 8 <sup>3</sup> / <sub>16</sub> (207.96)   | 4 <sup>3</sup> / <sub>16</sub> (106.36)  | 1800 (8.01)                            | 5.90 (2.68)  |                                       |    |                   |    |          |  |
| 6 (150)   | 14                   | 16         | 12-14      | 9 (228.60)                              | 9 (228.60)                              | 7 <sup>9</sup> / <sub>16</sub> (192.09)  | 8 <sup>3</sup> / <sub>4</sub> (222.25)    | 4 <sup>1</sup> / <sub>8</sub> (104.78)   | 1800 (8.01)                            | 10.68 (4.84) |                                       |    |                   |    |          |  |
| 8 (200)   | 16                   | 18         | 12-14      | 10 <sup>1</sup> / <sub>8</sub> (257.18) | 10 <sup>1</sup> / <sub>8</sub> (257.18) | 8 <sup>11</sup> / <sub>16</sub> (220.66) | 9 <sup>7</sup> / <sub>8</sub> (250.83)    | 4 <sup>3</sup> / <sub>16</sub> (106.36)  | 1800 (8.01)                            | 10.68 (4.84) |                                       |    |                   |    |          |  |
| 10 (250)  | 18                   | 20         | 16-20      | 11 <sup>1</sup> / <sub>4</sub> (285.75) | 11 <sup>1</sup> / <sub>4</sub> (285.75) | 9 <sup>3</sup> / <sub>4</sub> (247.65)   | 11 <sup>1</sup> / <sub>8</sub> (282.58)   | 4 <sup>1</sup> / <sub>16</sub> (103.19)  | 1800 (8.01)                            | 11.40 (5.17) |                                       |    |                   |    |          |  |
| 12 (300)  | 20                   | 24         | 16-20      | 12 <sup>3</sup> / <sub>8</sub> (314.33) | --                                      | --                                       | 10 <sup>13</sup> / <sub>16</sub> (274.64) | 12 <sup>3</sup> / <sub>16</sub> (309.56) | 4 <sup>1</sup> / <sub>8</sub> (104.78) | 5000 (22.24) | 14.43 (6.55)                          |    |                   |    |          |  |
| 14 (350)  | 20                   | 24         | 24         | 12 <sup>7</sup> / <sub>8</sub> (327.03) | --                                      | --                                       | 11 <sup>5</sup> / <sub>16</sub> (287.34)  | 12 <sup>5</sup> / <sub>8</sub> (320.68)  | 4 (101.60)                             | 5000 (22.24) | 14.43 (6.55)                          |    |                   |    |          |  |
| 16 (400)  | 24                   | 24         | 24         | 14 <sup>1</sup> / <sub>8</sub> (358.78) | --                                      | --                                       | 13 <sup>5</sup> / <sub>8</sub> (346.08)   | 12 <sup>3</sup> / <sub>16</sub> (309.56) | 4 (101.60)                             | 7200 (32.03) | 15.79 (7.16)                          |    |                   |    |          |  |
| 18 (450)  | 24                   | --         | 24         | 15 <sup>1</sup> / <sub>4</sub> (387.35) | --                                      | --                                       | 13 <sup>5</sup> / <sub>16</sub> (338.14)  | 14 <sup>3</sup> / <sub>4</sub> (374.65)  | 4 (101.60)                             | 7200 (32.03) | 15.79 (7.16)                          |    |                   |    |          |  |
| 20 (500)  | 30                   | --         | 30         | 17 (431.80)                             | --                                      | --                                       | 14 <sup>1</sup> / <sub>8</sub> (358.78)   | 15 <sup>7</sup> / <sub>8</sub> (403.23)  | 4 (101.60)                             | 7200 (32.03) | 16.90 (7.67)                          |    |                   |    |          |  |
| 24 (600)  | 30                   | --         | 30         | 19 <sup>1</sup> / <sub>4</sub> (488.95) | --                                      | --                                       | 16 <sup>7</sup> / <sub>16</sub> (417.51)  | 19 <sup>1</sup> / <sub>4</sub> (488.95)  | 4 (101.60)                             | 7200 (32.03) | 17.78 (8.06)                          |    |                   |    |          |  |



FOR PIPE SIZES  
LESS THAN 12"  
(300)



FOR 12" (300)  
PIPE SIZES AND  
UP

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

# PIPE ROLLER SELECTION GUIDE



For use with pipe covering protection saddle figures 651-658 on pages 65-67.

| Pipe Size |       | Insulation Thickness |         | Pipe Roller Size     |            |            |
|-----------|-------|----------------------|---------|----------------------|------------|------------|
|           |       |                      |         | Use With Fig. No.    |            |            |
|           |       |                      |         | 460, 480<br>483, 490 | 470<br>475 | 486<br>487 |
| 1/2       | (15)  | 1                    | (25.4)  | 2                    | 2 1/2      | 2 - 3 1/2  |
|           |       | 1 1/2                | (38.1)  | 3                    | 3 1/2      | 2 - 3 1/2  |
|           |       | 2                    | (50.8)  | 4                    | 5          | 2 - 3 1/2  |
|           |       | 2 1/2                | (63.5)  | --                   | --         | --         |
|           |       | 3                    | (76.2)  | --                   | --         | --         |
| 3/4       | (20)  | 4                    | (101.6) | --                   | --         | --         |
|           |       | 1                    | (25.4)  | 2                    | 2 1/2      | 2 - 3 1/2  |
|           |       | 1 1/2                | (38.1)  | 3                    | 3 1/2      | 2 - 3 1/2  |
|           |       | 2                    | (50.8)  | 4                    | 5          | 2 - 3 1/2  |
|           |       | 2 1/2                | (63.5)  | --                   | --         | --         |
| 1         | (25)  | 3                    | (76.2)  | --                   | --         | --         |
|           |       | 4                    | (101.6) | --                   | --         | --         |
|           |       | 1                    | (25.4)  | 2 1/2                | 3          | 2 - 3 1/2  |
|           |       | 1 1/2                | (38.1)  | 3                    | 4          | 2 - 3 1/2  |
|           |       | 2                    | (50.8)  | 4                    | 5          | 2 - 3 1/2  |
| 1 1/4     | (32)  | 2 1/2                | (63.5)  | 5                    | 6          | 4 - 6      |
|           |       | 3                    | (76.2)  | --                   | --         | --         |
|           |       | 4                    | (101.6) | --                   | --         | --         |
|           |       | 1                    | (25.4)  | 3                    | 3 1/2      | 2 - 3 1/2  |
|           |       | 1 1/2                | (38.1)  | 3 1/2                | 5          | 2 - 3 1/2  |
| 1 1/2     | (40)  | 2                    | (50.8)  | 5                    | 6          | 4 - 6      |
|           |       | 2 1/2                | (63.5)  | 6                    | 8          | 4 - 6      |
|           |       | 3                    | (76.2)  | --                   | --         | --         |
|           |       | 4                    | (101.6) | --                   | --         | --         |
|           |       | 1                    | (25.4)  | 3 1/2                | 4          | 2 - 3 1/2  |
| 2         | (50)  | 1 1/2                | (38.1)  | 4                    | 5          | 2 - 3 1/2  |
|           |       | 2                    | (50.8)  | 5                    | 6          | 4 - 6      |
|           |       | 2 1/2                | (63.5)  | 6                    | 8          | 4 - 6      |
|           |       | 3                    | (76.2)  | 8                    | 8          | 4 - 6      |
|           |       | 4                    | (101.6) | --                   | --         | --         |
| 2 1/2     | (65)  | 1                    | (25.4)  | 3 1/2                | 5          | 2 - 3 1/2  |
|           |       | 1 1/2                | (38.1)  | 5                    | 6          | 4 - 6      |
|           |       | 2                    | (50.8)  | 6                    | 8          | 4 - 6      |
|           |       | 2 1/2                | (63.5)  | 8                    | 8          | 4 - 6      |
|           |       | 3                    | (76.2)  | 8                    | 10         | 4 - 6      |
| 3         | (80)  | 4                    | (101.6) | --                   | --         | --         |
|           |       | 1                    | (25.4)  | 4                    | 5          | 2 - 3 1/2  |
|           |       | 1 1/2                | (38.1)  | 5                    | 6          | 4 - 6      |
|           |       | 2                    | (50.8)  | 6                    | 8          | 4 - 6      |
|           |       | 2 1/2                | (63.5)  | 8                    | 8          | 4 - 6      |
| 3 1/2     | (90)  | 3                    | (76.2)  | 8                    | 10         | 8 - 10     |
|           |       | 4                    | (101.6) | --                   | --         | --         |
|           |       | 1                    | (25.4)  | 5                    | 6          | 4 - 6      |
|           |       | 1 1/2                | (38.1)  | 6                    | 8          | 4 - 6      |
|           |       | 2                    | (50.8)  | 8                    | 8          | 4 - 6      |
| 4         | (100) | 2 1/2                | (63.5)  | 8                    | 10         | 8 - 10     |
|           |       | 3                    | (76.2)  | 10                   | 10         | 8 - 10     |
|           |       | 4                    | (101.6) | 10                   | 12         | --         |
|           |       | 1                    | (25.4)  | 5                    | 6          | 4 - 6      |
|           |       | 1 1/2                | (38.1)  | 6                    | 8          | 4 - 6      |

| Pipe Size |       | Insulation Thickness |         | Pipe Roller Size     |            |            |
|-----------|-------|----------------------|---------|----------------------|------------|------------|
|           |       |                      |         | Use With Fig. No.    |            |            |
|           |       |                      |         | 460, 480<br>483, 490 | 470<br>475 | 486<br>487 |
| 5         | (125) | 1                    | (25.4)  | 6                    | 8          | 4 - 6      |
|           |       | 1 1/2                | (38.1)  | 8                    | 8          | 4 - 6      |
|           |       | 2                    | (50.8)  | 8                    | 10         | 8 - 10     |
|           |       | 2 1/2                | (63.5)  | 10                   | 10         | 8 - 10     |
|           |       | 3                    | (76.2)  | 10                   | 12         | 8 - 10     |
| 6         | (150) | 4                    | (101.6) | 12                   | 14         | 8 - 10     |
|           |       | 1                    | (25.4)  | 8                    | 8          | 4 - 6      |
|           |       | 1 1/2                | (38.1)  | 8                    | 10         | 8 - 10     |
|           |       | 2                    | (50.8)  | 10                   | 10         | 8 - 10     |
|           |       | 2 1/2                | (63.5)  | 10                   | 12         | 8 - 10     |
| 8         | (200) | 3                    | (76.2)  | 12                   | 12         | 8 - 10     |
|           |       | 4                    | (101.6) | 14                   | 16         | 12 - 14    |
|           |       | 1                    | (25.4)  | 10                   | 12         | 8 - 10     |
|           |       | 1 1/2                | (38.1)  | 10                   | 12         | 8 - 10     |
|           |       | 2                    | (50.8)  | 10                   | 12         | 8 - 10     |
| 10        | (250) | 2 1/2                | (63.5)  | 12                   | 14         | 8 - 10     |
|           |       | 3                    | (76.2)  | 14                   | 16         | 12 - 14    |
|           |       | 4                    | (101.6) | 16                   | 18         | 12 - 14    |
|           |       | 1                    | (25.4)  | 12                   | 14         | 8 - 10     |
|           |       | 1 1/2                | (38.1)  | 12                   | 14         | 8 - 10     |
| 12        | (300) | 2                    | (50.8)  | 14                   | 16         | 12 - 14    |
|           |       | 2 1/2                | (63.5)  | 14                   | 16         | 12 - 14    |
|           |       | 3                    | (76.2)  | 16                   | 18         | 16 - 20    |
|           |       | 4                    | (101.6) | 18                   | 20         | 16 - 20    |
|           |       | 1                    | (25.4)  | 14                   | 16         | 12 - 14    |
| 14        | (350) | 1 1/2                | (38.1)  | 14                   | 16         | 12 - 14    |
|           |       | 2                    | (50.8)  | 16                   | 18         | 16 - 20    |
|           |       | 2 1/2                | (63.5)  | 16                   | 18         | 16 - 20    |
|           |       | 3                    | (76.2)  | 18                   | 20         | 16 - 20    |
|           |       | 4                    | (101.6) | 20                   | --         | 24         |
| 16        | (400) | 1                    | (25.4)  | --                   | --         | --         |
|           |       | 1 1/2                | (38.1)  | 18                   | 20         | 16 - 20    |
|           |       | 2                    | (50.8)  | 18                   | 20         | 16 - 20    |
|           |       | 2 1/2                | (63.5)  | 20                   | --         | 16 - 20    |
|           |       | 3                    | (76.2)  | 20                   | --         | 24         |
| 18        | (450) | 4                    | (101.6) | 24                   | --         | 24         |
|           |       | 1                    | (25.4)  | --                   | --         | --         |
|           |       | 1 1/2                | (38.1)  | 20                   | --         | 16 - 20    |
|           |       | 2                    | (50.8)  | 20                   | --         | 24         |
|           |       | 2 1/2                | (63.5)  | 24                   | --         | 24         |
| 20        | (500) | 3                    | (76.2)  | 24                   | --         | 24         |
|           |       | 4                    | (101.6) | 24                   | --         | 24         |
|           |       | 1                    | (25.4)  | --                   | --         | --         |
|           |       | 1 1/2                | (38.1)  | 24                   | --         | 24         |
|           |       | 2                    | (50.8)  | 24                   | --         | 24         |
| 24        | (600) | 2 1/2                | (63.5)  | 24                   | --         | 24         |
|           |       | 3                    | (76.2)  | 30                   | --         | 30         |
|           |       | 4                    | (101.6) | 30                   | --         | 30         |
|           |       | 1                    | (25.4)  | --                   | --         | --         |
|           |       | 1 1/2                | (38.1)  | 30                   | --         | 30         |

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.