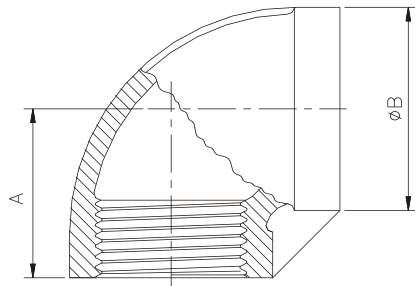


# Elbow 90°



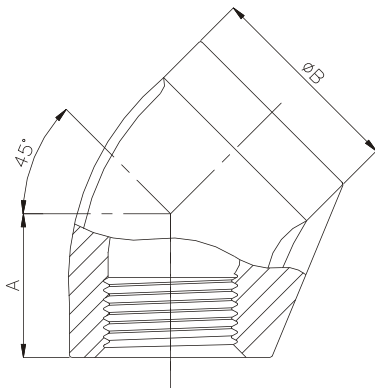
**F01**

Class  
**150**

| SIZE | 1/8" |      | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2" |      | 2-1/2" |      | 3"  |      |
|------|------|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|----|------|--------|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm | in   | mm     | in   | mm  | in   |
| A    | 17   | 0.67 | 19   | 0.75 | 21.5 | 0.85 | 27   | 1.06 | 30   | 1.18 | 35 | 1.38 | 43     | 1.69 | 45     | 1.77 | 54 | 2.12 | 64     | 2.52 | 72  | 2.83 |
| B    | 16   | 0.63 | 19   | 0.75 | 22.5 | 0.89 | 29   | 1.14 | 34   | 1.34 | 42 | 1.65 | 50     | 1.97 | 57     | 2.24 | 70 | 2.76 | 88     | 3.46 | 101 | 3.97 |

Tolerance : ± 0.8mm

# Elbow 45°



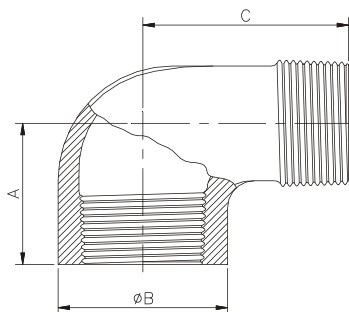
**F02**

Class  
**150**

|   | 1/8" |     | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2" |      | 2-1/2" |      | 3"  |      | 4"  |      |
|---|------|-----|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|----|------|--------|------|-----|------|-----|------|
|   | mm   | in  | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm | in   | mm     | in   | mm  | in   | mm  | in   |
| A | 15   | 0.6 | 16   | 0.63 | 18   | 0.71 | 20   | 0.79 | 24   | 0.94 | 27 | 1.06 | 31     | 1.22 | 34     | 1.34 | 39 | 1.53 | 46     | 1.81 | 52  | 2.05 | 63  | 2.48 |
| B | 15   | 0.6 | 19   | 0.75 | 22.5 | 0.89 | 29   | 1.14 | 34   | 1.34 | 42 | 1.65 | 50.6   | 1.99 | 57.5   | 2.26 | 71 | 2.8  | 90     | 3.54 | 101 | 3.98 | 128 | 5.04 |

Tolerance : A ± 1.5mm  
B ± 1.0mm

# Street Elbow 90° M/F



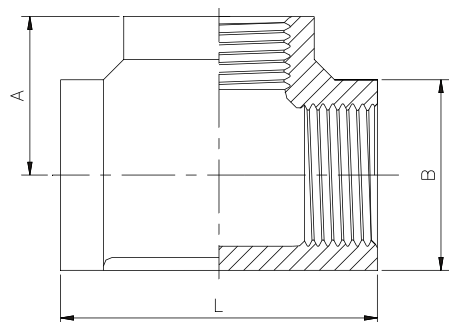
**F03**

Class  
**150**

| SIZE | 1/8" |      | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2"   |      | 2-1/2" |      | 3"  |      | 4"  |      |
|------|------|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|------|------|--------|------|-----|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm   | in   | mm     | in   | mm  | in   | mm  | in   |
| A    | 19   | 0.75 | 21.5 | 0.85 | 24.5 | 0.96 | 29   | 1.14 | 33.5 | 1.32 | 37 | 1.46 | 43     | 1.69 | 47     | 1.85 | 57.5 | 2.26 | 66     | 2.60 | 74  | 2.01 | 90  | 3.54 |
| B    | 15   | 0.59 | 18.2 | 0.72 | 22.5 | 0.89 | 28   | 1.10 | 33.5 | 1.32 | 42 | 1.65 | 52     | 2.05 | 59     | 2.32 | 72   | 2.83 | 87     | 3.43 | 101 | 3.98 | 128 | 5.04 |
| C    | 26.5 | 1.04 | 30.8 | 1.21 | 36.5 | 1.44 | 41   | 1.61 | 48   | 1.89 | 55 | 2.16 | 62     | 2.44 | 67     | 2.63 | 77.5 | 3.05 | 93     | 3.66 | 107 | 4.21 | 130 | 5.12 |

Tolerance : ± 1.0mm

# Tee



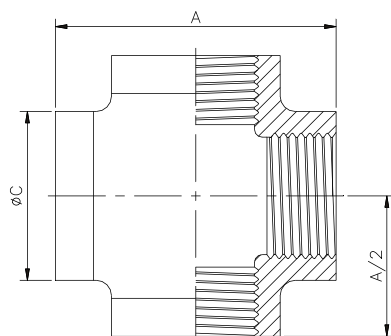
**F04**

Class  
**150**

| SIZE | 1/8" |      | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2"  |      | 2-1/2" |      | 3"  |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|------|--------|------|-----|------|--------|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm  | in   | mm     | in   | mm  | in   |
| A    | 17   | 0.67 | 19.6 | 0.77 | 23.5 | 0.93 | 27.5 | 1.08 | 32   | 1.26 | 36   | 1.42 | 43     | 1.69 | 45     | 1.77 | 54  | 2.13 | 64     | 2.52 | 72  | 2.83 |
| B    | 16   | 0.63 | 18.8 | 0.74 | 22.5 | 0.89 | 29   | 1.14 | 34   | 1.34 | 41.5 | 1.63 | 50     | 1.97 | 57     | 2.24 | 70  | 2.76 | 88     | 3.46 | 101 | 3.97 |
| L    | 34   | 1.34 | 39   | 1.54 | 46   | 1.81 | 55   | 2.17 | 62   | 2.44 | 72   | 2.83 | 86     | 3.38 | 90     | 3.54 | 108 | 4.25 | 128    | 5.04 | 143 | 5.63 |

Tolerance : ± 1.0mm

# Cross



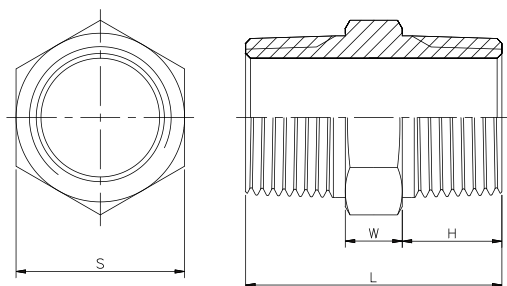
**F05**

Class  
**150**

| SIZE | 1/8" |      | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2"  |      |
|------|------|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm  | in   |
| A    | 35   | 1.38 | 39   | 1.54 | 44   | 1.73 | 55   | 2.45 | 63   | 2.48 | 73 | 2.87 | 85     | 3.35 | 90     | 3.54 | 108 | 4.25 |
| C    | 16   | 0.63 | 19   | 0.75 | 22.2 | 0.87 | 28   | 1.10 | 33.5 | 1.32 | 42 | 1.65 | 50     | 1.97 | 57     | 2.24 | 70  | 2.76 |

Tolerance : ± 1.0mm

# Hexagon Nipple



**F06**

Class  
**150**

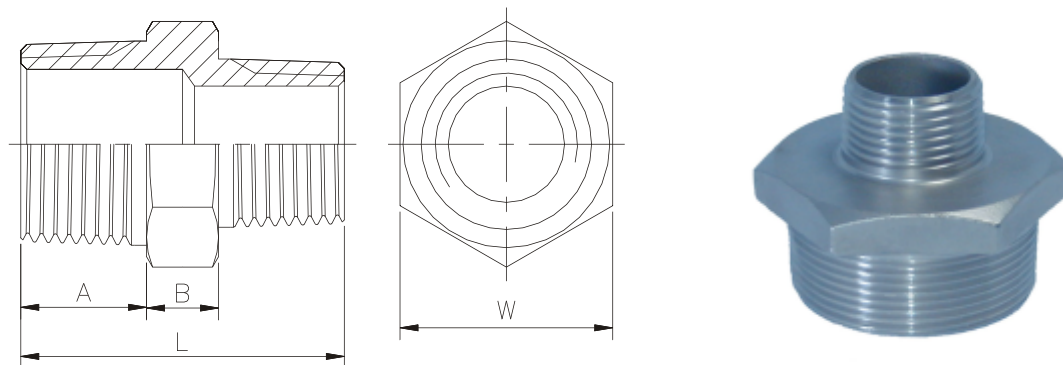
1/8"~2" Hexagon  
2-1/2"~4" Octagon

| SIZE | 1/8" |      | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2" |      | 2-1/2" |      | 3" |      | 4"  |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|------|--------|------|----|------|--------|------|----|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm | in   | mm     | in   | mm | in   | mm  | in   |
| H    | 12   | 0.47 | 13   | 0.51 | 13   | 0.51 | 16   | 0.63 | 17.5 | 0.69 | 19.5 | 0.77 | 21     | 0.82 | 21     | 0.82 | 23 | 0.9  | 25     | 0.98 | 28 | 1.1  | 30  | 1.18 |
| L    | 30   | 1.18 | 32   | 1.26 | 33   | 1.30 | 41   | 1.61 | 43.5 | 1.71 | 49   | 1.93 | 52     | 2.05 | 52     | 2.05 | 57 | 2.24 | 63     | 2.48 | 69 | 2.72 | 75  | 2.95 |
| S    | 13   | 0.51 | 15   | 0.59 | 18.5 | 0.73 | 22.5 | 0.89 | 29.0 | 1.14 | 35   | 1.38 | 45     | 1.77 | 50     | 1.97 | 62 | 2.44 | 78     | 3.07 | 91 | 3.58 | 118 | 4.64 |
| W    | 6    | 0.24 | 6    | 0.24 | 6    | 0.24 | 8    | 0.31 | 8.5  | 0.33 | 9    | 0.35 | 10     | 0.39 | 10     | 0.39 | 11 | 0.43 | 13     | 0.51 | 13 | 0.51 | 15  | 0.59 |

Tolerance : ± 1.0mm

# Reducing Nipple

**F07**  
Class  
**150**



| SIZE | 1/8x1/4 |      | 3/8x1/8 |      | 3/8x1/4 |      | 1/2x1/8 |      | 1/2x1/4 |      | 1/2x3/8 |      | 3/4x1/8 |      | 3/4x1/4 |      | 3/4x3/8 |      | 3/4x1/2 |      | 1x1/4 |      |
|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|-------|------|
|      | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm    | in   |
| A    | 13.5    | 0.53 | 15      | 0.59 | 15      | 0.59 | 16.5    | 0.65 | 16.5    | 0.65 | 16.5    | 0.65 | 17.5    | 0.69 | 17.5    | 0.69 | 17.5    | 0.69 | 17.5    | 0.69 | 20    | 0.79 |
| B    | 6       | 0.24 | 7       | 0.28 | 7       | 0.28 | 7       | 0.28 | 7       | 0.28 | 7       | 0.28 | 7       | 0.28 | 7       | 0.28 | 7       | 0.28 | 7       | 0.28 | 9     | 0.35 |
| W    | 15.5    | 0.61 | 19.7    | 0.78 | 19.7    | 0.78 | 23      | 0.90 | 23      | 0.90 | 23      | 0.90 | 28.7    | 1.13 | 28.7    | 1.13 | 28.7    | 1.13 | 28.7    | 1.13 | 36    | 1.42 |
| L    | 31      | 1.22 | 33      | 1.3  | 34.5    | 1.36 | 36.5    | 1.44 | 36.5    | 1.44 | 36.5    | 1.44 | 41      | 1.61 | 41      | 1.61 | 41      | 1.61 | 41      | 1.61 | 42    | 1.65 |

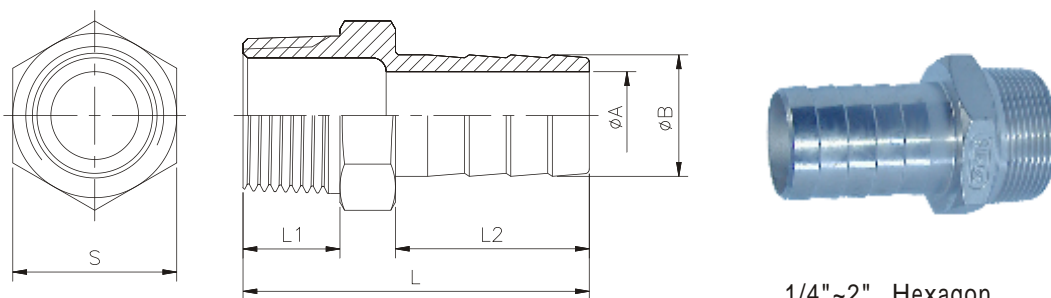
| SIZE | 1x3/8 |      | 1x1/2 |      | 1x3/4 |      | 1-1/4x1/4 |      | 1-1/4x3/8 |      | 1-1/4x1/2 |      | 1-1/4x3/4 |      | 1-1/4x1 |      | 1-1/2x1/4 |      | 1-1/2x3/8 |      | 1-1/2x1/2 |      |
|------|-------|------|-------|------|-------|------|-----------|------|-----------|------|-----------|------|-----------|------|---------|------|-----------|------|-----------|------|-----------|------|
|      | mm    | in   | mm    | in   | mm    | in   | mm        | in   | mm        | in   | mm        | in   | mm        | in   | mm      | in   | mm        | in   | mm        | in   | mm        | in   |
| A    | 20    | 0.79 | 20    | 0.79 | 20    | 0.79 | 21.8      | 0.86 | 21.8      | 0.86 | 21.8      | 0.86 | 21.8      | 0.86 | 21.8    | 0.86 | 21.6      | 0.86 | 21.6      | 0.86 | 21.6      | 0.86 |
| B    | 9     | 0.35 | 9     | 0.35 | 9     | 0.35 | 10.5      | 0.41 | 10.5      | 0.41 | 10.5      | 0.41 | 10.5      | 0.41 | 10.5    | 0.41 | 10.5      | 0.41 | 10.5      | 0.41 | 10.5      | 0.41 |
| W    | 36    | 1.42 | 36    | 1.42 | 36    | 1.42 | 45.5      | 1.79 | 45.5      | 1.79 | 45.5      | 1.79 | 45.5      | 1.79 | 45.5    | 1.79 | 51        | 2.00 | 51        | 2.00 | 51        | 2.00 |
| L    | 42    | 1.65 | 42    | 1.65 | 42    | 1.65 | 47        | 1.85 | 47        | 1.85 | 49        | 1.93 | 49        | 1.93 | 52.5    | 2.07 | 47        | 1.85 | 47        | 1.85 | 49        | 1.93 |

| SIZE | 1-1/2x3/4 |      | 1-1/2x1 |      | 1-1/2x1-1/4 |      | 2x3/8 |      | 2x1/2 |      | 2x3/4 |      | 2x1  |      | 2x1-1/4 |      | 2x2-1/2 |      |
|------|-----------|------|---------|------|-------------|------|-------|------|-------|------|-------|------|------|------|---------|------|---------|------|
|      | mm        | in   | mm      | in   | mm          | in   | mm    | in   | mm    | in   | mm    | in   | mm   | in   | mm      | in   | mm      | in   |
| A    | 21.6      | 0.86 | 21.6    | 0.86 | 21.6        | 0.86 | 24    | 0.94 | 24    | 0.94 | 24    | 0.94 | 24   | 0.94 | 24      | 0.94 | 24      | 0.94 |
| B    | 10.5      | 0.41 | 10.5    | 0.41 | 10.5        | 0.41 | 10.5  | 0.41 | 10.5  | 0.41 | 10.5  | 0.41 | 10.5 | 0.41 | 10.5    | 0.41 | 10.5    | 0.41 |
| W    | 51        | 2.00 | 51      | 2.00 | 51          | 2.00 | 63    | 2.48 | 63    | 2.48 | 63    | 2.48 | 63   | 2.48 | 63      | 2.48 | 63      | 2.48 |
| L    | 49        | 1.93 | 55      | 2.16 | 55          | 2.16 | 52    | 2.05 | 52    | 2.05 | 54    | 2.13 | 54   | 2.13 | 56      | 2.2  | 56      | 2.2  |

Tolerance : ± 1.0mm

# Hose Nipple

**F08**  
Class  
**150**

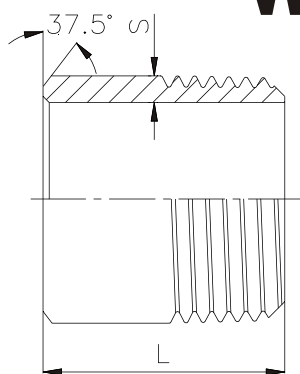


1/4"~2" Hexagon  
2-1/2"~4" Octagon

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2" |      | 2-1/2" |      | 3"   |      | 4"  |      |
|------|------|------|------|------|------|------|------|------|------|------|--------|------|--------|------|----|------|--------|------|------|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm | in   | mm     | in   | mm   | in   | mm  | in   |
| A    | 5    | 0.20 | 6.5  | 0.26 | 9    | 0.35 | 15   | 0.59 | 19.5 | 0.77 | 26     | 1.02 | 33     | 1.30 | 44 | 1.73 | 54     | 2.12 | 68   | 2.68 | 90  | 3.54 |
| B    | 8    | 0.31 | 10   | 0.39 | 13   | 0.51 | 19   | 0.75 | 25   | 0.98 | 32     | 1.26 | 40     | 1.57 | 50 | 1.97 | 63.5   | 2.50 | 76.5 | 3.01 | 100 | 3.94 |
| L1   | 11   | 0.43 | 13   | 0.51 | 17   | 0.67 | 17   | 0.67 | 20   | 0.79 | 23     | 0.91 | 23     | 0.91 | 24 | 0.94 | 29     | 1.14 | 30   | 1.18 | 32  | 1.26 |
| L2   | 29   | 1.14 | 33   | 1.30 | 39   | 1.54 | 37   | 1.46 | 40   | 1.57 | 39     | 1.54 | 51     | 2.0  | 57 | 2.24 | 65     | 2.56 | 73   | 2.87 | 82  | 3.23 |
| L    | 46   | 1.81 | 53   | 2.09 | 63   | 2.48 | 63   | 2.48 | 69   | 2.72 | 73     | 2.87 | 85     | 3.35 | 93 | 3.66 | 107    | 4.21 | 117  | 4.6  | 129 | 5.08 |
| S    | 15   | 0.59 | 19   | 0.75 | 23   | 0.91 | 29   | 1.14 | 37   | 1.46 | 45     | 1.77 | 51     | 2.00 | 63 | 2.48 | 79     | 3.11 | 91.5 | 3.60 | 118 | 4.64 |

Tolerance : ± 1.0mm

# Welding Nipple



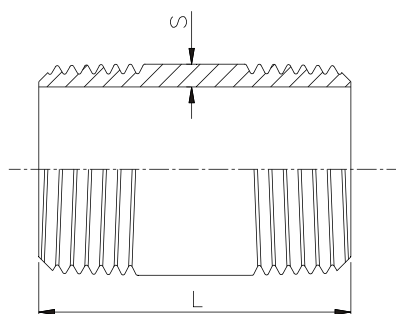
**F09**

Class  
**150**

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"  |      | 1-1/4" |      | 1-1/2" |      | 2"  |      | 2-1/2" |      | 3" |      | 4"  |      |
|------|------|------|------|------|------|------|------|------|-----|------|--------|------|--------|------|-----|------|--------|------|----|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm  | in   | mm     | in   | mm     | in   | mm  | in   | mm     | in   | mm | in   | mm  | in   |
| S    | 2    | 0.08 | 2    | 0.08 | 2.5  | 0.10 | 2.5  | 0.10 | 3.2 | 0.13 | 3.2    | 0.13 | 3.2    | 0.13 | 3.6 | 0.14 | 3.6    | 0.14 | 4  | 0.16 | 4.5 | 0.18 |
| L    | 30   | 1.18 | 30   | 1.18 | 35   | 1.38 | 40   | 1.57 | 40  | 1.57 | 50     | 2.00 | 50     | 2.00 | 50  | 2.00 | 60     | 2.36 | 70 | 2.76 | 80  | 3.15 |

Tolerance : ± 1.0mm

# Barrel Nipple



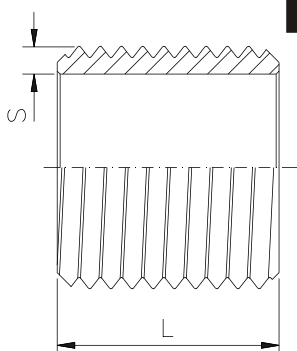
**F10**

Class  
**150**

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"  |      | 1-1/4" |      | 1-1/2" |      | 2"  |      | 2-1/2" |      | 3"  |      | 4"  |      |
|------|------|------|------|------|------|------|------|------|-----|------|--------|------|--------|------|-----|------|--------|------|-----|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm  | in   | mm     | in   | mm     | in   | mm  | in   | mm     | in   | mm  | in   | mm  | in   |
| S    | 2    | 0.08 | 2    | 0.08 | 2.5  | 0.10 | 2.5  | 0.10 | 3.2 | 0.13 | 3.2    | 0.13 | 3.2    | 0.13 | 3.6 | 0.14 | 3.6    | 0.14 | 4   | 0.16 | 4.5 | 0.18 |
| L    | 40   | 1.57 | 40   | 1.57 | 60   | 2.36 | 60   | 2.36 | 60  | 2.36 | 80     | 3.15 | 80     | 3.15 | 100 | 3.94 | 100    | 3.94 | 120 | 4.72 | 120 | 4.72 |

Tolerance : ± 1.0mm

# Thread Nipple



**F11**

Class  
**150**

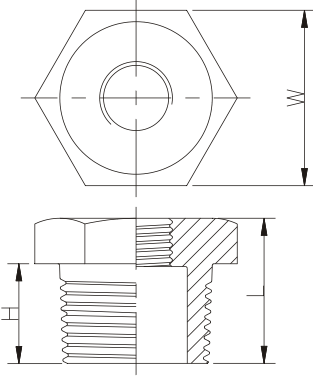
| SIZE | 3/8" |      | 1/2" |      | 3/4" |      | 1"  |      | 1-1/4" |      | 1-1/2" |      | 2"  |      | 2-1/2" |      | 3" |      |
|------|------|------|------|------|------|------|-----|------|--------|------|--------|------|-----|------|--------|------|----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm  | in   | mm     | in   | mm     | in   | mm  | in   | mm     | in   | mm | in   |
| S    | 1.9  | 0.07 | 2.3  | 0.09 | 2.5  | 0.10 | 3.2 | 0.13 | 3.2    | 0.13 | 3.2    | 0.13 | 3.6 | 0.14 | 3.6    | 0.14 | 4  | 0.16 |
| L    | 22   | 0.87 | 25   | 0.98 | 30   | 1.18 | 35  | 1.38 | 38     | 1.50 | 38     | 1.50 | 45  | 1.77 | 55     | 2.17 | 60 | 2.36 |

Tolerance : ± 1.0mm

# Hexagon Bushing

**F12**

Class  
**150**



1/4"-2" Hexagon  
2-1/2"-4" Octagon

| SIZE | 1/8x1/4 |      | 3/8x1/8 |      | 3/8x1/4 |      | 1/2x1/8 |      | 1/2x1/4 |      | 1/2x3/8 |      | 3/4x1/8 |      | 3/4x1/4 |      | 3/4x3/8 |      | 3/4x1/2 |      |    |      |
|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|----|------|
|      | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   |    |      |
| L    | 17      | 0.67 | 17.5    | 0.69 | 17.5    | 0.69 | 22      | 0.87 | 22      | 0.87 | 22      | 0.87 | 23      | 0.91 | 23      | 0.91 | 23      | 0.91 | 23      | 0.91 | 23 | 0.91 |
| H    | 12.5    | 0.49 | 12      | 0.47 | 12      | 0.47 | 16      | 0.63 | 16      | 0.63 | 16      | 0.63 | 17      | 0.67 | 17      | 0.67 | 17      | 0.67 | 17      | 0.67 | 17 | 0.67 |
| W    | 17      | 0.67 | 21      | 0.83 | 21      | 0.83 | 25      | 0.98 | 25      | 0.98 | 25      | 0.98 | 30      | 1.18 | 30      | 1.18 | 30      | 1.18 | 30      | 1.18 | 30 | 1.18 |

| SIZE | 1x1/4 |      | 1x3/8 |      | 1x1/2 |      | 1x3/4 |      | 1-1/4x1/2 |      | 1-1/4x3/4 |      | 1-1/4x1 |      | 1-1/2x1/2 |      | 1-1/2x3/4 |      | 1-1/2x1 |      |      |      |
|------|-------|------|-------|------|-------|------|-------|------|-----------|------|-----------|------|---------|------|-----------|------|-----------|------|---------|------|------|------|
|      | mm    | in   | mm    | in   | mm    | in   | mm    | in   | mm        | in   | mm        | in   | mm      | in   | mm        | in   | mm        | in   | mm      | in   |      |      |
| L    | 27.5  | 1.08 | 27.5  | 1.08 | 27.5  | 1.08 | 27.5  | 1.08 | 30        | 1.18 | 30        | 1.18 | 30      | 1.18 | 30.5      | 1.20 | 30.5      | 1.20 | 30.5    | 1.20 | 30.5 | 1.20 |
| H    | 20    | 0.79 | 20    | 0.79 | 20    | 0.79 | 20    | 0.79 | 21.5      | 0.85 | 21.5      | 0.85 | 21.5    | 0.85 | 22        | 0.87 | 22        | 0.87 | 22      | 0.87 | 22   | 0.87 |
| W    | 37    | 1.46 | 37    | 1.46 | 37    | 1.46 | 37    | 1.46 | 46        | 1.81 | 46        | 1.81 | 46      | 1.81 | 50        | 1.97 | 50        | 1.97 | 50      | 1.97 | 50   | 1.97 |

| SIZE | 1-1/2x1-1/4 |      | 2x3/4 |      | 2x1  |      | 2x1-1/4 |      | 2x1-1/2 |      | 2-1/2x1 |      | 2-1/2x1-1/4 |      | 2-1/2x1-1/2 |      | 2-1/2x2 |      | 3x1/2 |      |
|------|-------------|------|-------|------|------|------|---------|------|---------|------|---------|------|-------------|------|-------------|------|---------|------|-------|------|
|      | mm          | in   | mm    | in   | mm   | in   | mm      | in   | mm      | in   | mm      | in   | mm          | in   | mm          | in   | mm      | in   | mm    | in   |
| L    | 30.5        | 1.20 | 33.5  | 1.32 | 33.5 | 1.32 | 33.5    | 1.32 | 33.5    | 1.32 | 40      | 1.57 | 40          | 1.57 | 40          | 1.57 | 40      | 1.57 | 41    | 1.61 |
| H    | 22          | 0.87 | 23.5  | 0.93 | 23.5 | 0.93 | 23.5    | 0.93 | 23.5    | 0.93 | 29      | 1.14 | 29          | 1.14 | 29          | 1.14 | 29      | 1.14 | 29    | 1.14 |
| W    | 50          | 1.97 | 62    | 2.44 | 62   | 2.44 | 62      | 2.44 | 62      | 2.44 | 80      | 3.15 | 80          | 3.15 | 80          | 3.15 | 80      | 3.15 | 92    | 3.62 |

| SIZE | 3x3/4 |      | 3x1 |      | 3x1-1/4 |      | 3x1-1/2 |      | 3x2 |      | 3x2-1/2 |      | 4x1/2 |      | 4x3/4 |      | 4x1 |      | 4x1-1/4 |      |
|------|-------|------|-----|------|---------|------|---------|------|-----|------|---------|------|-------|------|-------|------|-----|------|---------|------|
|      | mm    | in   | mm  | in   | mm      | in   | mm      | in   | mm  | in   | mm      | in   | mm    | in   | mm    | in   | mm  | in   | mm      | in   |
| L    | 41    | 1.61 | 41  | 1.61 | 41      | 1.61 | 41      | 1.61 | 41  | 1.61 | 41      | 1.61 | 45    | 1.77 | 45    | 1.77 | 45  | 1.77 | 45      | 1.77 |
| H    | 29    | 1.14 | 29  | 1.14 | 29      | 1.14 | 29      | 1.14 | 29  | 1.14 | 29      | 1.14 | 31    | 1.22 | 31    | 1.22 | 31  | 1.22 | 31      | 1.22 |
| W    | 92    | 3.62 | 92  | 3.62 | 92      | 3.62 | 92      | 3.62 | 92  | 3.62 | 92      | 3.62 | 118   | 4.64 | 118   | 4.64 | 118 | 4.64 | 118     | 4.64 |

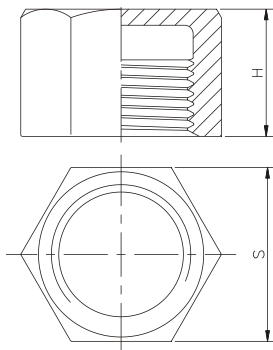
| SIZE | 4x1-1/2 |      | 4x2 |      | 4x2-1/2 |      | 4x3 |      |
|------|---------|------|-----|------|---------|------|-----|------|
|      | mm      | in   | mm  | in   | mm      | in   | mm  | in   |
| L    | 45      | 1.77 | 45  | 1.77 | 45      | 1.77 | 45  | 1.77 |
| H    | 31      | 1.22 | 31  | 1.22 | 31      | 1.22 | 31  | 1.22 |
| W    | 118     | 4.64 | 118 | 4.64 | 118     | 4.64 | 118 | 4.64 |

Tolerance : ± 1.0mm

# Hexagon Cap

**F13**

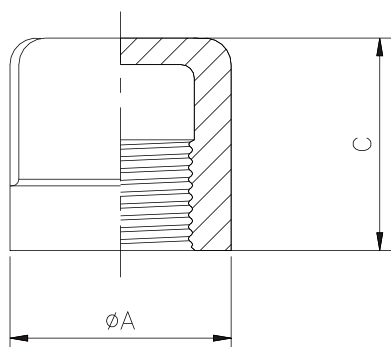
Class  
**150**



| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2" |      | 2-1/2" |      | 3" |      | 4"  |      |
|------|------|------|------|------|------|------|------|------|------|------|--------|------|--------|------|----|------|--------|------|----|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm | in   | mm     | in   | mm | in   | mm  | in   |
| S    | 17.5 | 0.69 | 21   | 0.83 | 26   | 1.02 | 31   | 1.22 | 38.5 | 1.52 | 47     | 1.85 | 54     | 2.13 | 66 | 2.60 | 83     | 3.27 | 96 | 3.78 | 123 | 4.84 |
| H    | 17   | 0.67 | 17   | 0.67 | 21   | 0.83 | 21   | 0.83 | 28   | 1.10 | 31.5   | 1.24 | 31.5   | 1.24 | 35 | 1.38 | 38     | 1.50 | 38 | 1.49 | 41  | 1.61 |

Tolerance : ± 1.0mm

# Round Cap



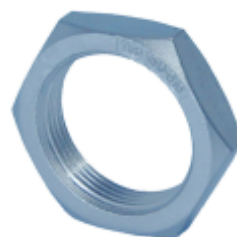
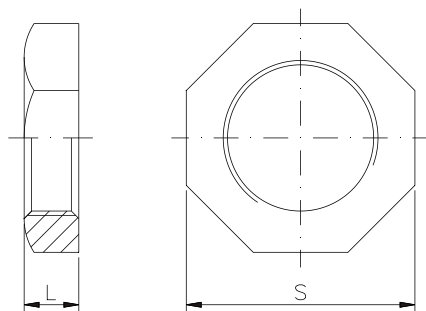
**F14**

Class  
**150**

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2" |      | 2-1/2" |      | 3"  |      | 4"  |      |
|------|------|------|------|------|------|------|------|------|------|------|--------|------|--------|------|----|------|--------|------|-----|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm | in   | mm     | in   | mm  | in   | mm  | in   |
| A    | 20   | 0.79 | 22.5 | 0.88 | 29   | 1.14 | 34   | 1.34 | 42.5 | 1.67 | 51     | 2.01 | 57.5   | 2.26 | 70 | 2.76 | 86     | 3.38 | 101 | 3.98 | 128 | 5.04 |
| C    | 17   | 0.67 | 18.5 | 0.73 | 20.5 | 0.81 | 21.5 | 0.85 | 27   | 1.06 | 28.5   | 1.12 | 28.5   | 1.12 | 31 | 1.22 | 39     | 1.53 | 40  | 1.57 | 41  | 1.61 |

Tolerance : ± 1.0mm

# Hexagon Nut



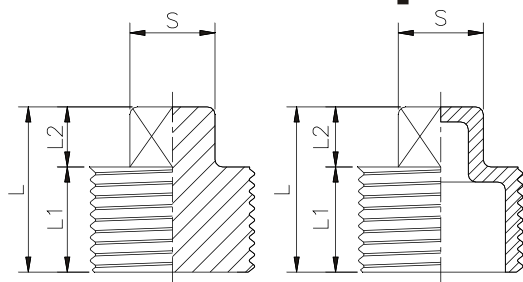
**F15**

Class  
**150**

| SIZE | 1/8" |      | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2" |      | 2-1/2" |      | 3"  |      | 4"  |      |
|------|------|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|----|------|--------|------|-----|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm | in   | mm     | in   | mm  | in   | mm  | in   |
| L    | 6.5  | 0.26 | 7    | 0.28 | 7    | 0.28 | 8    | 0.31 | 9    | 0.35 | 9  | 0.35 | 11     | 0.43 | 12     | 0.47 | 13 | 0.51 | 15     | 0.59 | 17  | 0.67 | 18  | 0.71 |
| S    | 16   | 0.63 | 18   | 0.71 | 24   | 0.94 | 30   | 1.18 | 34.5 | 1.36 | 43 | 1.69 | 52     | 2.05 | 58     | 2.28 | 72 | 2.83 | 89     | 3.50 | 102 | 4.02 | 128 | 5.04 |

Tolerance : ± 1.0mm

# Square Plug



**F16**

Class  
**150**

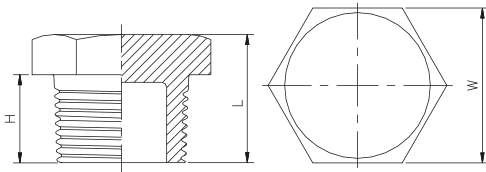
1/8"~1/4"

3/8"~4"

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2" |      | 2-1/2" |      | 3" |      | 4" |      |
|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|----|------|--------|------|----|------|----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm | in   | mm     | in   | mm | in   | mm | in   |
| S    | 8    | 0.31 | 10   | 0.39 | 13   | 0.51 | 16   | 0.63 | 19 | 0.75 | 22     | 0.87 | 25     | 0.98 | 29 | 1.4  | 39     | 1.54 | 44 | 1.73 | 58 | 2.28 |
| L    | 20   | 0.79 | 20   | 0.79 | 25   | 0.98 | 26.5 | 1.04 | 33 | 1.30 | 35     | 1.38 | 35     | 1.38 | 40 | 1.57 | 47     | 1.85 | 47 | 1.85 | 53 | 2.09 |
| L1   | 12   | 0.47 | 12   | 0.47 | 15   | 0.59 | 15.5 | 0.61 | 20 | 0.79 | 20     | 0.79 | 20     | 0.79 | 23 | 0.91 | 27     | 1.06 | 27 | 1.06 | 31 | 1.22 |
| L2   | 8    | 0.31 | 8    | 0.31 | 10   | 0.39 | 11   | 0.43 | 13 | 0.51 | 15     | 0.59 | 15     | 0.59 | 17 | 0.67 | 20     | 0.79 | 20 | 0.79 | 22 | 0.87 |

Tolerance : ± 1.0mm

# Hexagon Plug



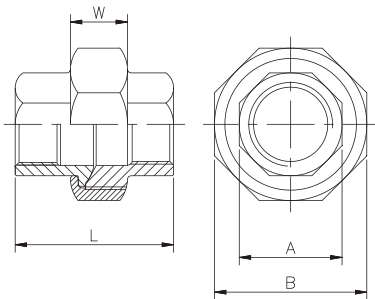
**F17**  
Class  
**150**

1/4"~2" Hexagon  
2-1/2"~4" Octagon

| SIZE | 1/8" |      | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2"   |      | 2-1/2" |      | 3"   |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|------|--------|------|------|------|--------|------|------|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm   | in   | mm     | in   | mm   | in   |
| H    | 10   | 0.39 | 12   | 0.47 | 13.5 | 0.53 | 16   | 0.63 | 16.5 | 0.65 | 19   | 0.75 | 21.5   | 0.85 | 22     | 0.87 | 23   | 0.91 | 29.5   | 1.16 | 30   | 1.18 |
| L    | 16   | 0.63 | 17.5 | 0.69 | 19.5 | 0.77 | 22   | 0.87 | 23.5 | 0.93 | 27   | 1.06 | 31     | 1.22 | 31.5   | 1.24 | 34   | 1.34 | 41     | 1.61 | 42   | 1.65 |
| W    | 13   | 0.51 | 16.5 | 0.65 | 19.5 | 0.77 | 25   | 0.98 | 30   | 1.18 | 37.2 | 1.46 | 46     | 1.81 | 51.5   | 2.03 | 63.5 | 2.50 | 80     | 3.15 | 92.5 | 3.64 |

Tolerance : ± 1.0mm

# Union F/F



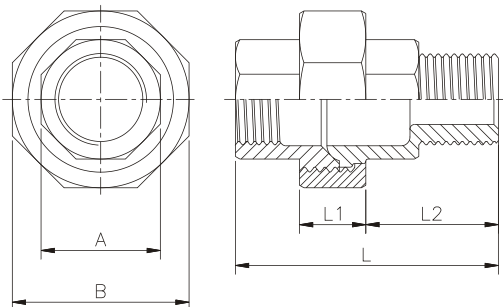
**F18**  
Class  
**150**

1/4"~3/8" Hexagon  
1/2"~1" Octagon  
1-1/4"~4" Decagon

| SIZE | 1/4" |      | 3/8"  |      | 1/2" |      | 3/4" |      | 1"    |      | 1-1/4" |      | 1-1/2" |      | 2"    |      | 2-1/2" |      | 3"     |      | 4"  |      |
|------|------|------|-------|------|------|------|------|------|-------|------|--------|------|--------|------|-------|------|--------|------|--------|------|-----|------|
|      | mm   | in   | mm    | in   | mm   | in   | mm   | in   | mm    | in   | mm     | in   | mm     | in   | mm    | in   | mm     | in   | mm     | in   | mm  | in   |
| L    | 34   | 1.34 | 38    | 1.50 | 40.5 | 1.59 | 45   | 1.77 | 51    | 2.01 | 58     | 2.28 | 59     | 2.32 | 64.01 | 2.52 | 71     | 2.80 | 84     | 3.31 | 97  | 3.82 |
| A    | 17.3 | 0.68 | 21.5  | 0.85 | 26.5 | 1.04 | 31   | 1.22 | 38    | 1.50 | 47     | 1.85 | 53     | 2.09 | 66.80 | 2.63 | 83     | 3.27 | 97.03  | 3.82 | 123 | 4.84 |
| B    | 28   | 1.1  | 34.54 | 1.36 | 39   | 1.54 | 45.8 | 1.80 | 55    | 2.17 | 63.2   | 2.49 | 71     | 2.8  | 86    | 3.39 | 106    | 4.17 | 123.95 | 4.88 | 154 | 6.06 |
| W    | 12   | 0.47 | 13.97 | 0.55 | 15   | 0.59 | 15   | 0.59 | 17.02 | 0.67 | 20     | 0.79 | 20     | 0.79 | 22    | 0.87 | 24     | 0.94 | 28     | 1.10 | 33  | 1.30 |

Tolerance : L ± 0.06mm  
A,B,W ± 0.02mm

# Union M/F



**F19**  
Class  
**150**

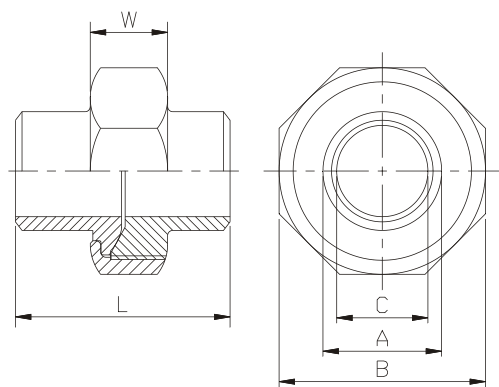
1/4"~3/8" Hexagon  
1/2"~1" Octagon  
1-1/4"~4" Decagon

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2"   |      | 2-1/2" |      | 3"  |      | 4"   |      |
|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|------|------|--------|------|-----|------|------|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm   | in   | mm     | in   | mm  | in   | mm   | in   |
| A    | 17.3 | 0.68 | 21.5 | 0.85 | 26.5 | 1.04 | 31   | 1.22 | 38 | 1.50 | 47     | 1.85 | 53     | 2.09 | 66.8 | 2.63 | 83     | 3.27 | 97  | 3.82 | 123  | 4.84 |
| B    | 28   | 1.1  | 34.5 | 1.36 | 39   | 1.54 | 46   | 1.81 | 55 | 2.17 | 63.2   | 2.49 | 71     | 2.79 | 86   | 3.39 | 106    | 4.17 | 124 | 4.88 | 154  | 6.06 |
| L    | 45   | 1.77 | 53   | 2.09 | 53   | 2.09 | 60   | 2.36 | 66 | 2.60 | 74     | 2.91 | 74     | 2.91 | 83   | 3.27 | 92     | 3.62 | 104 | 4.09 | 114  | 4.49 |
| L1   | 12   | 0.47 | 14.5 | 0.57 | 15   | 0.59 | 15   | 0.59 | 17 | 0.67 | 20     | 0.79 | 20     | 0.79 | 22   | 0.87 | 24     | 0.94 | 28  | 1.10 | 33   | 1.30 |
| L2   | 21   | 0.83 | 26   | 1.02 | 26   | 1.02 | 29   | 1.14 | 32 | 1.26 | 34.5   | 1.36 | 34.5   | 1.36 | 39   | 1.54 | 43     | 1.69 | 48  | 1.89 | 49.5 | 1.95 |

Tolerance : L ± 1.5mm  
A,B,L1,L2 ± 0.5mm

# Welding Union BW

**F20**  
Class  
**150**



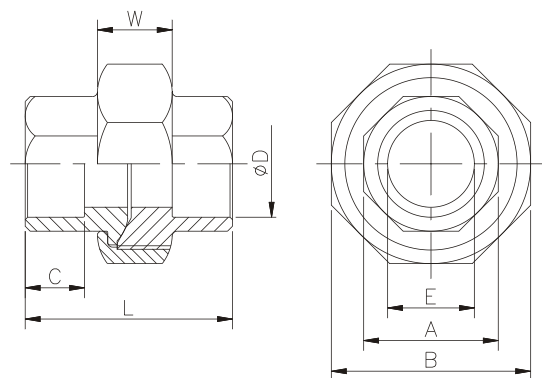
1/4"~3/8" Hexagon  
1/2"~1" Octagon  
1-1/4"~3" Decagon

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2"   |      | 2-1/2" |      | 3"   |      |
|------|------|------|------|------|------|------|------|------|------|------|--------|------|--------|------|------|------|--------|------|------|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm   | in   | mm     | in   | mm   | in   |
| L    | 34   | 1.34 | 38   | 1.50 | 40   | 1.57 | 47.5 | 1.87 | 49.5 | 1.95 | 54     | 2.13 | 56     | 2.2  | 59   | 2.32 | 69.5   | 2.74 | 81.5 | 3.21 |
| A    | 13.5 | 0.53 | 17.3 | 0.68 | 21.6 | 0.85 | 27.1 | 1.07 | 33.8 | 1.33 | 42.8   | 1.69 | 48.6   | 1.91 | 60.6 | 2.39 | 76.3   | 3.00 | 89.1 | 3.51 |
| B    | 28   | 1.1  | 34.5 | 1.36 | 39   | 1.54 | 46   | 1.81 | 55   | 2.17 | 63.2   | 2.49 | 71     | 2.8  | 86   | 3.39 | 106    | 4.17 | 124  | 4.88 |
| C    | 8.5  | 0.33 | 12.6 | 0.5  | 16   | 0.63 | 21.5 | 0.85 | 27   | 1.06 | 36     | 1.42 | 41.8   | 1.64 | 52.7 | 2.07 | 67     | 2.64 | 80   | 3.15 |
| W    | 12   | 0.47 | 14   | 0.55 | 15   | 0.59 | 15   | 0.59 | 17   | 0.67 | 20     | 0.79 | 20     | 0.79 | 22   | 0.87 | 23.5   | 0.93 | 27   | 1.06 |

Tolerance : L ± 1.5mm  
A,B,C,W ± 0.5mm

# Welding Union sw

**F21**  
Class  
**150**



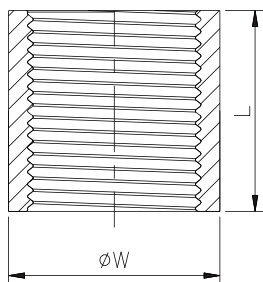
1/4"~3/8" Hexagon  
1/2"~1" Octagon  
1-1/4"~3" Decagon

| SIZE | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2"   |      | 2-1/2" |      | 3"   |      |
|------|------|------|------|------|------|------|--------|------|--------|------|------|------|--------|------|------|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm   | in   | mm     | in   | mm   | in   |
| L    | 40.5 | 1.59 | 45   | 1.77 | 51   | 2.01 | 55     | 2.17 | 57.5   | 2.26 | 64   | 2.52 | 71     | 2.8  | 84   | 3.31 |
| A    | 26.5 | 1.04 | 31   | 1.22 | 38   | 1.5  | 48.5   | 1.91 | 54.5   | 2.15 | 66.8 | 2.63 | 83     | 3.27 | 97   | 3.82 |
| B    | 39   | 1.54 | 45.8 | 1.8  | 55   | 2.17 | 65.5   | 2.58 | 74     | 2.91 | 86   | 3.39 | 106    | 4.17 | 124  | 4.88 |
| W    | 15   | 0.59 | 15   | 0.59 | 17   | 0.67 | 21     | 0.83 | 21     | 0.83 | 22   | 0.87 | 24     | 0.94 | 28   | 1.1  |
| C    | 9.5  | 0.37 | 10   | 0.39 | 13   | 0.51 | 13     | 0.51 | 13     | 0.51 | 13   | 0.51 | 18     | 0.71 | 19   | 0.75 |
| D    | 22   | 0.87 | 27.2 | 1.07 | 34.3 | 1.35 | 43     | 1.69 | 49     | 1.93 | 60.8 | 2.39 | 74     | 2.91 | 89.5 | 3.52 |
| E    | 18.5 | 0.73 | 23.5 | 0.93 | 29.5 | 1.16 | 38     | 1.5  | 44     | 1.73 | 55.7 | 2.19 | 66.5   | 2.62 | 82.5 | 3.25 |

Tolerance : L ± 1.5mm  
A,B,W,C,D,E ± 0.5mm



# Coupling

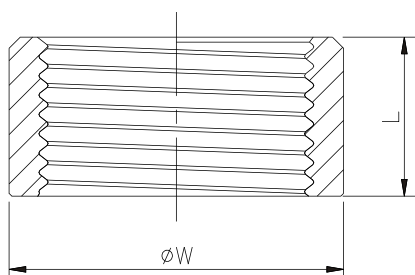


**F22**  
Class  
**150**

| SIZE | 1/8" |      | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2"   |      | 2-1/2" |      | 3" |      | 4"  |      |
|------|------|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|------|------|--------|------|----|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm   | in   | mm     | in   | mm | in   | mm  | in   |
| L    | 20   | 0.79 | 25   | 0.98 | 25   | 0.98 | 33   | 1.3  | 35   | 1.38 | 42 | 1.65 | 47     | 1.85 | 47     | 1.85 | 56   | 2.20 | 65     | 2.56 | 70 | 2.76 | 80  | 3.15 |
| W    | 14   | 0.55 | 18.5 | 0.73 | 21.5 | 0.85 | 26   | 1.02 | 32   | 1.26 | 39 | 1.53 | 48     | 1.89 | 54     | 2.12 | 66.5 | 2.62 | 82     | 3.23 | 95 | 3.74 | 122 | 4.8  |

Tolerance :  $\pm 1.0\text{mm}$

# Half Coupling



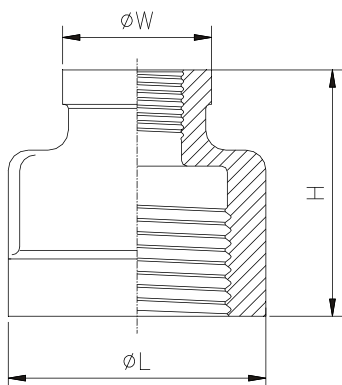
**F23**  
Class  
**150**

| SIZE | 1/8" |      | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2"   |      | 2-1/2" |      | 3" |      | 4"  |     |
|------|------|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|------|------|--------|------|----|------|-----|-----|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm   | in   | mm     | in   | mm | in   | mm  | in  |
| L    | 11   | 0.43 | 11   | 0.43 | 14   | 0.55 | 16   | 0.63 | 18   | 0.71 | 20 | 0.79 | 23     | 0.91 | 23     | 0.91 | 27   | 1.06 | 32     | 1.26 | 35 | 1.38 | 38  | 1.5 |
| W    | 14   | 0.55 | 18.5 | 0.73 | 21.5 | 0.96 | 26   | 1.02 | 32   | 1.26 | 39 | 1.53 | 48     | 1.89 | 54     | 2.12 | 66.5 | 2.62 | 82     | 3.23 | 95 | 3.74 | 122 | 4.8 |

Tolerance : L  $\pm 1.5\text{mm}$   
W  $\pm 1.0\text{mm}$

# Reducing Socket

**F24**  
Class  
**150**



| SIZE | 3/8x1/8 |      | 3/8x1/4 |      | 1/2x1/8 |      | 1/2x1/4 |      | 1/2x3/8 |      | 3/4x3/8 |      | 3/4x1/2 |      | 1x3/8 |      |
|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|---------|------|-------|------|
|      | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm      | in   | mm    | in   |
| L    | 22      | 0.87 | 22      | 0.87 | 28      | 1.1  | 28      | 1.1  | 28      | 1.1  | 34      | 1.4  | 34      | 1.4  | 42    | 1.65 |
| H    | 29      | 1.2  | 29      | 1.2  | 34      | 1.34 | 34      | 1.34 | 34      | 1.34 | 36      | 1.42 | 36      | 1.42 | 41    | 1.6  |
| W    | 18.3    | 0.72 | 18.3    | 0.72 | 19.5    | 0.77 | 19.5    | 0.77 | 23      | 0.91 | 28      | 1.1  | 28      | 1.1  | 28    | 1.1  |

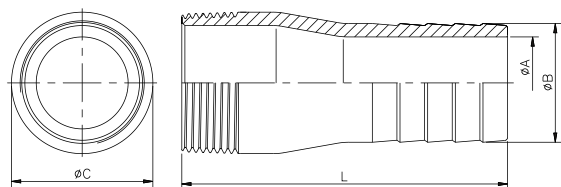
| SIZE | 1x1/2 |      | 1x3/4 |      | 1-1/4x1/2 |      | 1-1/4x3/4 |      | 1-1/4x1 |      | 1-1/2x1/2 |      | 1-1/2x3/4 |      | 1-1/2x1 |      |
|------|-------|------|-------|------|-----------|------|-----------|------|---------|------|-----------|------|-----------|------|---------|------|
|      | mm    | in   | mm    | in   | mm        | in   | mm        | in   | mm      | in   | mm        | in   | mm        | in   | mm      | in   |
| L    | 42    | 1.65 | 42    | 1.65 | 50        | 1.97 | 50        | 1.97 | 50      | 1.97 | 57        | 2.24 | 57        | 2.24 | 57      | 2.24 |
| H    | 41    | 1.60 | 42    | 1.65 | 46        | 1.81 | 46        | 1.81 | 47      | 1.85 | 47        | 1.85 | 47.5      | 1.87 | 49      | 1.93 |
| W    | 28    | 1.1  | 33.8  | 1.33 | 33.8      | 1.33 | 34        | 1.34 | 41.5    | 1.63 | 34        | 1.34 | 34        | 1.34 | 41.5    | 1.63 |

| SIZE | 1-1/2x1-1/4 |      | 2x3/4 |      | 2x1  |      | 2x1-1/4 |      | 2x1-1/2 |      | 2-1/2x1-1/4 |      | 2-1/2x1-1/2 |      | 2-1/2x2 |      |
|------|-------------|------|-------|------|------|------|---------|------|---------|------|-------------|------|-------------|------|---------|------|
|      | mm          | in   | mm    | in   | mm   | in   | mm      | in   | mm      | in   | mm          | in   | mm          | in   | mm      | in   |
| L    | 57          | 2.24 | 70    | 2.76 | 70   | 2.76 | 70      | 2.76 | 70      | 2.76 | 88          | 3.46 | 88          | 3.46 | 88      | 3.46 |
| H    | 51          | 2.01 | 55    | 2.17 | 55   | 2.17 | 59      | 2.32 | 59      | 2.32 | 58.7        | 2.31 | 61          | 2.40 | 61      | 2.4  |
| W    | 50          | 1.97 | 41.5  | 1.63 | 41.5 | 1.63 | 57      | 2.24 | 57      | 2.24 | 50.5        | 1.99 | 57          | 2.24 | 70      | 2.76 |

Tolerance : ± 1.0mm

# Barrel Hose Nipple

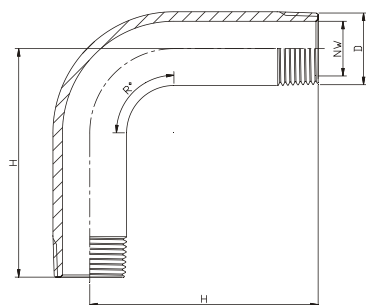
**F25**  
Class  
**150**



| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2"    |      | 2-1/2" |      | 3"    |      | 4"    |      |
|------|------|------|------|------|------|------|------|------|------|------|--------|------|--------|------|-------|------|--------|------|-------|------|-------|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm    | in   | mm     | in   | mm    | in   | mm    | in   |
| A    | 3.96 | 0.16 | 5.94 | 0.23 | 9.12 | 0.36 | 15.6 | 0.61 | 19.1 | 0.75 | 25.4   | 1.00 | 31.75  | 1.25 | 44.45 | 1.75 | 54.7   | 2.15 | 67.5  | 2.66 | 94.5  | 3.72 |
| B    | 6.48 | 0.26 | 9.56 | 0.38 | 13.6 | 0.54 | 19.6 | 0.77 | 26.1 | 1.03 | 33     | 1.30 | 39     | 1.54 | 51.6  | 2.03 | 64.2   | 2.53 | 77.4  | 3.05 | 102.6 | 4.04 |
| C    | 13.8 | 0.54 | 17.2 | 0.68 | 21.3 | 0.84 | 26.7 | 1.05 | 33.4 | 1.31 | 42.2   | 1.66 | 48.3   | 1.90 | 60.3  | 2.37 | 73     | 2.87 | 88.9  | 3.50 | 114.3 | 4.50 |
| L    | 54   | 2.13 | 57.2 | 2.25 | 70   | 2.76 | 80   | 3.15 | 90.5 | 3.56 | 94.3   | 3.71 | 106.2  | 4.18 | 119.4 | 4.70 | 139.7  | 5.50 | 152.4 | 6.00 | 184.5 | 7.26 |

Tolerance : ± 1.0mm

# Bend



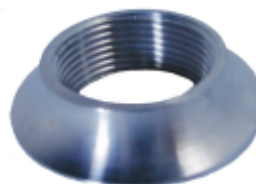
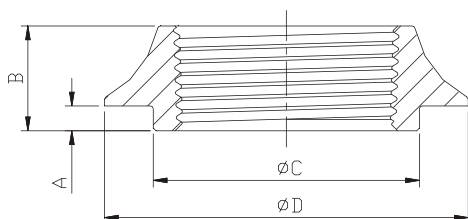
**F26**

Class  
**150**

| SIZE | 1/8" |      | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2"   |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|--------|------|--------|------|------|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm   | in   |
| H    | 64   | 2.52 | 67   | 2.63 | 80   | 3.15 | 105  | 4.13 | 120  | 4.72 | 134  | 5.28 | 170    | 6.7  | 185    | 7.28 | 244  | 9.60 |
| D    | 10.2 | 0.40 | 13.5 | 0.53 | 17.2 | 0.67 | 21.3 | 0.83 | 26.9 | 1.06 | 33.7 | 1.32 | 42.4   | 1.67 | 48.3   | 1.9  | 60.3 | 2.37 |
| R    | 30   |      | 30   |      | 40   |      | 62   |      | 68   |      | 70   |      | 97     |      | 99     |      | 129  |      |
| NW   | 6    |      | 8    |      | 10   |      | 15   |      | 20   |      | 25   |      | 32     |      | 40     |      | 50   |      |

Tolerance : ± 1.0mm

# Weld Spud



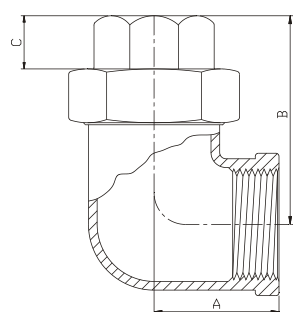
**F27**

Class  
**150**

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2"   |      | 2-1/2" |      | 3"  |      | 4"  |      |
|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|------|------|--------|------|-----|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm   | in   | mm     | in   | mm  | in   | mm  | in   |
| A    | 4    | 0.16 | 4    | 0.16 | 4    | 0.16 | 4.5  | 0.18 | 5  | 0.20 | 5      | 0.20 | 5      | 0.20 | 5    | 0.20 | 5      | 0.20 | 5   | 0.20 | 5   | 0.20 |
| B    | 11   | 0.43 | 12   | 0.47 | 14   | 0.55 | 15   | 0.59 | 17 | 0.67 | 18.5   | 0.73 | 19     | 0.75 | 20.5 | 0.81 | 26     | 1.02 | 27  | 1.06 | 29  | 1.14 |
| C    | 18   | 0.71 | 22   | 0.87 | 26   | 1.02 | 32   | 1.26 | 39 | 1.54 | 48     | 1.89 | 55     | 2.17 | 67   | 2.64 | 82     | 3.23 | 97  | 3.82 | 124 | 4.88 |
| D    | 34   | 1.34 | 38   | 1.50 | 43   | 1.69 | 48   | 1.89 | 55 | 2.17 | 64     | 2.52 | 71     | 2.80 | 83   | 3.27 | 101    | 3.98 | 113 | 4.45 | 145 | 5.71 |

Tolerance : ± 1.0mm

# Elbow Union F/F



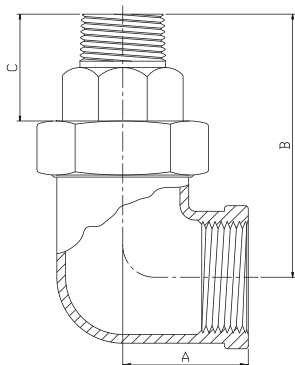
**F28**

Class  
**150**

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2" |      |
|------|------|------|------|------|------|------|------|------|------|------|--------|------|--------|------|----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm | in   |
| A    | 25   | 0.98 | 27   | 1.06 | 27   | 1.06 | 33.3 | 1.31 | 39.7 | 1.56 | 47.5   | 1.87 | 51.5   | 2.03 | 62 | 2.44 |
| B    | 40   | 1.57 | 44.5 | 1.75 | 52.3 | 2.06 | 54.5 | 2.15 | 66   | 2.6  | 73     | 2.87 | 77.5   | 3.05 | 87 | 3.43 |
| C    | 11   | 0.43 | 11.5 | 0.45 | 12.5 | 0.49 | 15   | 0.59 | 17   | 0.67 | 19     | 0.75 | 19.5   | 0.77 | 21 | 0.83 |

Tolerance : ± 1.5mm

# Elbow Union M/F



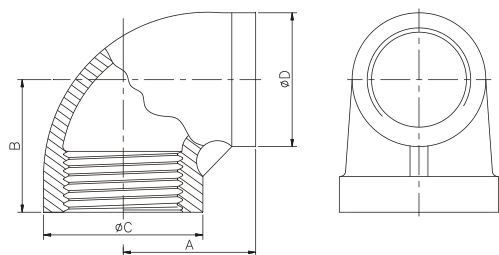
**F29**

Class  
**150**

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2"  |      |
|------|------|------|------|------|------|------|------|------|------|------|--------|------|--------|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm  | in   |
| A    | 25   | 0.98 | 27   | 1.06 | 27   | 1.06 | 33.3 | 1.31 | 39.7 | 1.56 | 47.5   | 1.87 | 51.5   | 2.03 | 62  | 2.44 |
| B    | 51.5 | 2.03 | 60.3 | 2.37 | 66   | 2.60 | 68.5 | 2.70 | 81   | 3.19 | 88     | 3.46 | 92     | 3.62 | 105 | 4.13 |
| C    | 22   | 0.87 | 26   | 1.02 | 25.5 | 1.00 | 29   | 1.14 | 31   | 1.22 | 34     | 1.34 | 34     | 1.34 | 39  | 1.54 |

Tolerance : ± 1.5mm

# Red. Elbow 90°



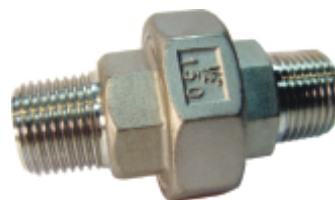
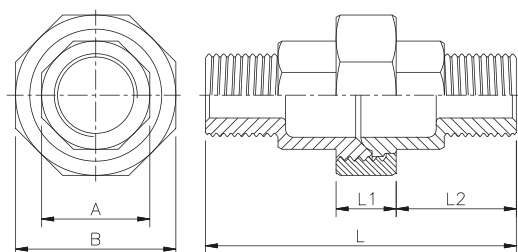
**F30**

Class  
**150**

| SIZE      | A  |      | B  |      | C  |      | D  |      |
|-----------|----|------|----|------|----|------|----|------|
|           | mm | in   | mm | in   | mm | in   | mm | in   |
| 3/4"x1/2" | 30 | 1.18 | 30 | 1.18 | 34 | 1.34 | 29 | 1.14 |
| 1" x 3/4" | 34 | 1.34 | 33 | 1.30 | 42 | 1.65 | 34 | 1.34 |

Tolerance : A,B ± 1.0mm  
C,D ± 0.6mm

# Union M/M

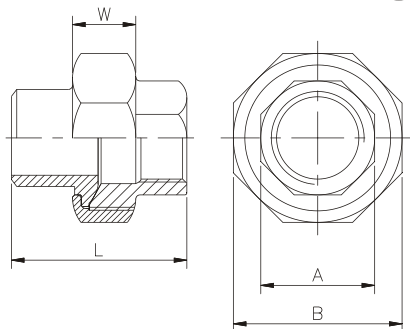


**F31**

Class  
**150**

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2"   |      | 2-1/2" |      | 3"  |      |
|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|------|------|--------|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm   | in   | mm     | in   | mm  | in   |
| A    | 17.3 | 0.68 | 21.5 | 0.85 | 26.5 | 1.04 | 31   | 1.22 | 38 | 1.50 | 47     | 1.85 | 53     | 2.09 | 66.8 | 2.63 | 83.5   | 3.29 | 97  | 3.82 |
| B    | 28   | 1.10 | 34.5 | 1.36 | 39   | 1.54 | 45.7 | 1.80 | 55 | 2.17 | 63.2   | 2.49 | 71     | 2.80 | 86   | 3.39 | 106    | 4.17 | 124 | 4.88 |
| L    | 54   | 2.13 | 66   | 2.60 | 67   | 2.64 | 73   | 2.87 | 81 | 3.19 | 89     | 3.50 | 89     | 3.50 | 100  | 3.94 | 110    | 4.33 | 124 | 4.88 |
| L1   | 12   | 0.47 | 14   | 0.55 | 15   | 0.60 | 15   | 0.60 | 17 | 0.67 | 20     | 0.79 | 20     | 0.79 | 22   | 0.87 | 24     | 0.94 | 28  | 1.10 |
| L2   | 21   | 0.83 | 26   | 1.02 | 26   | 1.02 | 29   | 1.14 | 32 | 1.26 | 34.5   | 1.36 | 34.5   | 1.36 | 39   | 1.54 | 43     | 1.69 | 48  | 1.89 |

# Union BW/F



1/4"~3/8" Hexagon  
1/2" ~ 1" Octagon  
1-1/4" ~ 3" Decagon

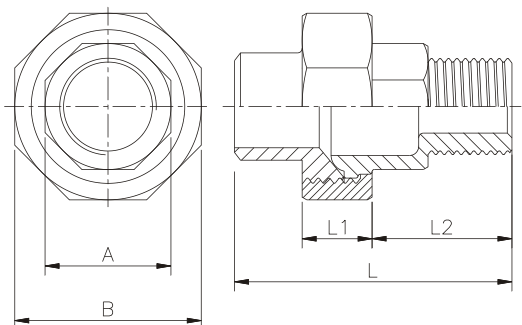
**F32**

Class  
**150**

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2"   |      | 2-1/2" |      | 3"  |      |
|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|------|------|--------|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm   | in   | mm     | in   | mm  | in   |
| L    | 34   | 1.34 | 38   | 1.50 | 40.5 | 1.59 | 45   | 1.77 | 51 | 2.01 | 58     | 2.28 | 59     | 2.32 | 64   | 2.52 | 71     | 2.80 | 84  | 3.31 |
| A    | 17.3 | 0.68 | 21.5 | 0.85 | 26.5 | 1.04 | 31   | 1.22 | 38 | 1.50 | 47     | 1.85 | 53     | 2.09 | 66.8 | 2.63 | 83     | 3.27 | 97  | 3.82 |
| B    | 28   | 1.1  | 34.5 | 1.36 | 39   | 1.54 | 45.8 | 1.80 | 55 | 2.17 | 63.2   | 2.49 | 71     | 2.8  | 86   | 3.39 | 106    | 4.17 | 124 | 4.88 |
| W    | 12   | 0.47 | 14   | 0.55 | 15   | 0.59 | 15   | 0.59 | 17 | 0.67 | 20     | 0.79 | 20     | 0.79 | 22   | 0.87 | 24     | 0.94 | 28  | 1.10 |

Tolerance : L ± 0.06mm  
A,B,W ± 0.02mm

# Union BW/M



1/4"~3/8" Hexagon  
1/2" ~ 1" Octagon  
1-1/4" ~ 3" Decagon

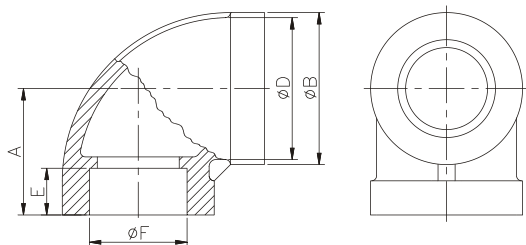
**F33**

Class  
**150**

| SIZE | 1/4" |      | 3/8" |      | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2"   |      | 2-1/2" |      | 3"  |      |
|------|------|------|------|------|------|------|------|------|----|------|--------|------|--------|------|------|------|--------|------|-----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm   | in   | mm     | in   | mm  | in   |
| A    | 17.3 | 0.68 | 21.5 | 0.85 | 26.5 | 1.04 | 31   | 1.22 | 38 | 1.50 | 47     | 1.85 | 53     | 2.09 | 66.8 | 2.63 | 83     | 3.27 | 97  | 3.82 |
| B    | 28   | 1.1  | 34.5 | 1.36 | 39   | 1.54 | 46   | 1.81 | 55 | 2.17 | 63.2   | 2.49 | 71     | 2.79 | 86   | 3.39 | 106    | 4.17 | 124 | 4.88 |
| L    | 45   | 1.77 | 53   | 2.09 | 53   | 2.09 | 60   | 2.36 | 66 | 2.60 | 74     | 2.91 | 74     | 2.91 | 83   | 3.27 | 92     | 3.62 | 104 | 4.09 |
| L1   | 12   | 0.47 | 14.5 | 0.57 | 15   | 0.59 | 15   | 0.59 | 17 | 0.67 | 20     | 0.79 | 20     | 0.79 | 22   | 0.87 | 24     | 0.94 | 28  | 1.10 |
| L2   | 21   | 0.83 | 26   | 1.02 | 26   | 1.02 | 29   | 1.14 | 32 | 1.26 | 34.5   | 1.36 | 34.5   | 1.36 | 39   | 1.54 | 43     | 1.69 | 48  | 1.89 |

Tolerance : L ± 1.5mm  
A,B,L1,L2 ± 0.5mm

# Socket Weld 90° Elbow



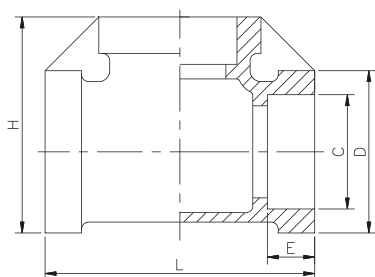
**F34**

Class  
**150**

| SIZE | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2"   |      |
|------|------|------|------|------|----|------|--------|------|--------|------|------|------|
|      | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm   | in   |
| A    | 27   | 1.06 | 29.5 | 1.16 | 36 | 1.42 | 43     | 1.69 | 47     | 1.85 | 54.5 | 2.15 |
| B    | 29   | 1.14 | 34   | 1.34 | 42 | 1.65 | 50.5   | 1.99 | 58.2   | 2.29 | 70.5 | 2.78 |
| D    | 25.8 | 1.02 | 30.5 | 1.20 | 39 | 1.54 | 47     | 1.85 | 55     | 2.17 | 66.5 | 2.62 |
| E    | 9    | 0.35 | 9.5  | 0.37 | 12 | 0.47 | 14     | 0.55 | 14     | 0.55 | 14   | 0.55 |
| F    | 22   | 0.87 | 27.3 | 1.07 | 34 | 1.34 | 43.3   | 1.70 | 49     | 1.93 | 61   | 2.40 |

Tolerance : A,B ± 1.0mm  
D,E ± 0.8mm  
F ± 0.3mm

# Socket Weld Tee

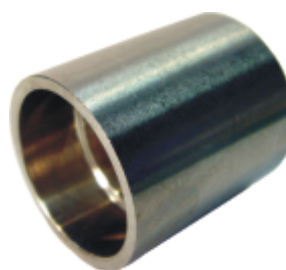
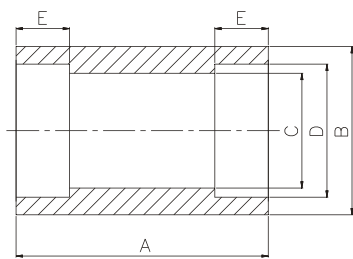


**F35**  
Class  
**150**

| SIZE | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2"  |      |
|------|------|------|------|------|----|------|--------|------|--------|------|-----|------|
|      | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm  | in   |
| L    | 52   | 2.05 | 62   | 2.44 | 72 | 2.83 | 90     | 3.54 | 94.5   | 3.72 | 114 | 4.49 |
| H    | 41   | 1.61 | 48.5 | 1.91 | 58 | 2.28 | 71     | 2.80 | 77     | 3.03 | 92  | 3.62 |
| C    | 22   | 0.87 | 27.3 | 1.07 | 34 | 1.34 | 43.3   | 1.70 | 49     | 1.93 | 61  | 2.40 |
| D    | 29   | 1.14 | 34   | 1.34 | 42 | 1.65 | 51     | 2.01 | 57.6   | 2.27 | 72  | 2.83 |
| E    | 9    | 0.35 | 9.5  | 0.37 | 12 | 0.47 | 14     | 0.55 | 14     | 0.55 | 14  | 0.55 |

Tolerance : D,H ± 1.0mm  
L ± 1.5mm  
E ± 0.8mm  
F ± 0.3mm

# Socket Weld Coupling

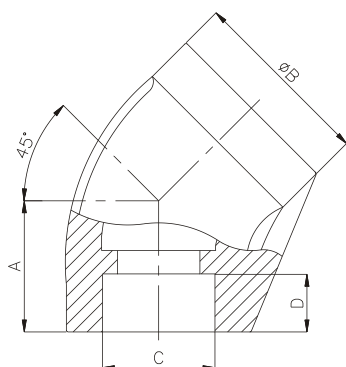


**F36**  
Class  
**150**

| SIZE | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2"   |      |
|------|------|------|------|------|------|------|--------|------|--------|------|------|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm   | in   |
| A    | 34   | 1.34 | 36   | 1.42 | 43   | 1.69 | 48     | 1.89 | 48     | 1.89 | 56   | 2.2  |
| B    | 26.5 | 1.04 | 32   | 1.26 | 39.5 | 1.56 | 48.5   | 1.91 | 54.5   | 2.15 | 66.5 | 2.62 |
| C    | 18.5 | 0.73 | 23   | 0.91 | 29   | 1.14 | 38     | 1.5  | 42     | 1.65 | 55   | 2.17 |
| D    | 22   | 0.87 | 27.3 | 1.07 | 34   | 1.34 | 43.3   | 1.7  | 49     | 1.93 | 61   | 2.4  |
| E    | 10   | 0.39 | 12   | 0.47 | 14   | 0.55 | 16     | 0.63 | 16     | 0.63 | 18   | 0.71 |

Tolerance : A ± 2.0mm  
B ± 0.5mm  
C ± 2.0mm  
D ± 0.3mm  
E ± 0.8mm

# Socket Weld 45° Elbow

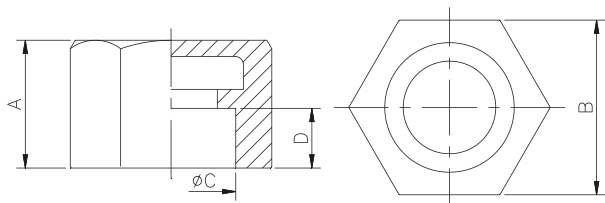


**F37**  
Class  
**150**

| SIZE | 1/2" |      | 3/4" |      | 1" |      | 1-1/4" |      | 1-1/2" |      | 2" |      |
|------|------|------|------|------|----|------|--------|------|--------|------|----|------|
|      | mm   | in   | mm   | in   | mm | in   | mm     | in   | mm     | in   | mm | in   |
| A    | 20   | 0.79 | 24   | 0.94 | 27 | 1.06 | 31     | 1.22 | 34     | 1.34 | 39 | 1.54 |
| B    | 29   | 1.14 | 34   | 1.34 | 42 | 1.65 | 50.6   | 1.99 | 57.5   | 2.26 | 71 | 2.80 |
| C    | 22   | 0.87 | 27.3 | 1.07 | 34 | 1.34 | 43.3   | 1.70 | 49     | 1.93 | 61 | 2.40 |
| D    | 9    | 0.35 | 9.5  | 0.37 | 12 | 0.47 | 14     | 0.55 | 14     | 0.55 | 14 | 0.55 |

Tolerance : A ± 1.0mm  
B ± 1.0mm  
C ± 0.3mm  
D ± 1.0mm

# Hexagon Cap SW

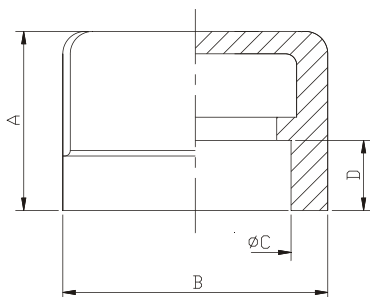


**F38**  
Class  
**150**

| SIZE | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2" |      |
|------|------|------|------|------|------|------|--------|------|--------|------|----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm | in   |
| A    | 21   | 0.83 | 21   | 0.83 | 28   | 1.10 | 31.5   | 1.24 | 31.5   | 1.24 | 35 | 1.38 |
| B    | 26   | 1.02 | 31   | 1.22 | 38.5 | 1.52 | 47     | 1.85 | 54     | 2.13 | 66 | 2.60 |
| C    | 22   | 0.87 | 27.3 | 1.07 | 34   | 1.34 | 43.3   | 1.70 | 49     | 1.93 | 61 | 2.40 |
| D    | 9    | 0.35 | 9.5  | 0.37 | 12   | 0.47 | 14     | 0.55 | 14     | 0.55 | 14 | 0.55 |

Tolerance : A ± 1.0mm  
B ± 1.0mm  
C ± 0.3mm  
D ± 1.0mm

# Round Cap sw

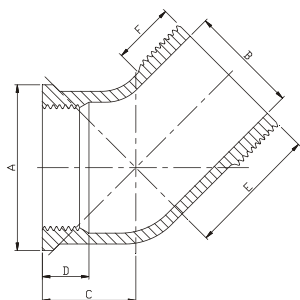


**F39**  
Class  
**150**

| SIZE | 1/2" |      | 3/4" |      | 1"   |      | 1-1/4" |      | 1-1/2" |      | 2" |      |
|------|------|------|------|------|------|------|--------|------|--------|------|----|------|
|      | mm   | in   | mm   | in   | mm   | in   | mm     | in   | mm     | in   | mm | in   |
| A    | 20.5 | 0.81 | 21.5 | 0.85 | 27   | 1.06 | 28.5   | 1.12 | 28.5   | 1.12 | 31 | 1.22 |
| B    | 29   | 1.14 | 34.5 | 1.36 | 42.5 | 1.67 | 51     | 2.01 | 57.5   | 2.26 | 70 | 2.76 |
| C    | 22   | 0.87 | 27.3 | 1.07 | 34   | 1.34 | 43.3   | 1.70 | 49     | 1.93 | 61 | 2.40 |
| D    | 9    | 0.35 | 9.5  | 0.37 | 12   | 0.47 | 14     | 0.55 | 14     | 0.55 | 14 | 0.55 |

Tolerance : A ± 1.0mm  
B ± 1.0mm  
C ± 0.3mm  
D ± 1.0mm

# Street Elbow 45° M/F



**F40**  
Class  
**150**

| SIZE   | A    |      | B    |      | C    |      |
|--------|------|------|------|------|------|------|
|        | mm   | in   | mm   | in   | mm   | in   |
| 1/4"   | 17   | 0.67 | 16.5 | 0.65 | 18.1 | 0.71 |
| 3/8"   | 19.5 | 0.77 | 18.5 | 0.73 | 21.5 | 0.85 |
| 1/2"   | 20.5 | 0.81 | 21   | 0.83 | 27.5 | 1.08 |
| 3/4"   | 23.5 | 0.93 | 24.5 | 0.96 | 34   | 1.34 |
| 1"     | 27.5 | 1.08 | 27.5 | 1.1  | 42.5 | 1.67 |
| 1-1/4" | 30   | 1.18 | 33   | 1.3  | 50.5 | 1.99 |
| 1-1/2" | 29.5 | 1.16 | 36.5 | 1.44 | 58.5 | 2.3  |
| 2"     | 33   | 1.3  | 40.5 | 1.59 | 72   | 2.83 |