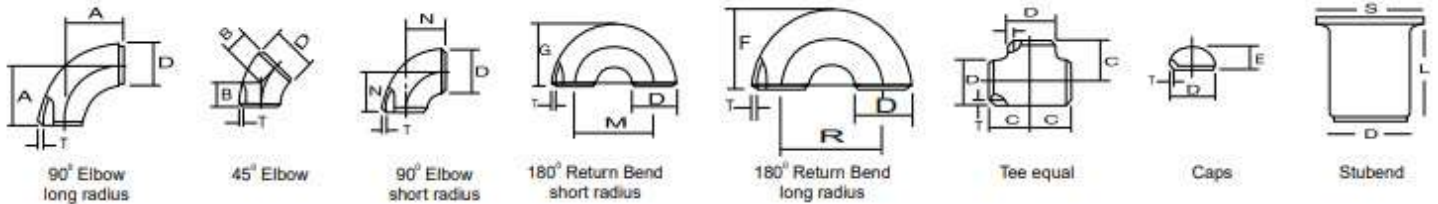




**BUTT WELDING PIPE FITTING DIMENSIONAL STANDARD
 ANSI B-16.9 / 16.28 / MSS SP-43**

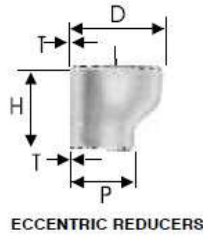
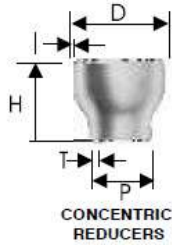
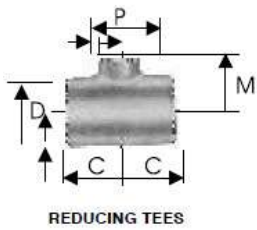


| Nominal Pipe Size | | Outside Diameter D | Center to Face | | | | Back to Face | | | Center to Center | | | Length 'L' | |
|-------------------|------|-----------------------|----------------|-----|-----|------|--------------|------|-----|------------------|------|-------|------------|-------------|
| Inch. | mm | | A | B | C | N | E | F | G | R | M | S | MSS SP43 | ANSI B 16.9 |
| 1/2 | 15 | 21.3 | 38 | 16 | 25 | - | 25 | 48 | - | 76 | - | 34.9 | 50.8 | 76.2 |
| 3/4 | 20 | 26.7 | 29 | 11 | 29 | - | 25 | 43 | - | 57 | - | 42.8 | 50.8 | 76.2 |
| 1 | 25 | 33.4 | 38 | 22 | 38 | 25 | 38 | 56 | 41 | 76 | 51 | 50.8 | 50.8 | 101.6 |
| 1 1/4 | 32 | 42.2 | 48 | 25 | 48 | 32 | 38 | 70 | 52 | 95 | 64 | 63.5 | 50.8 | 101.6 |
| 1 1/2 | 40 | 48.3 | 57 | 29 | 57 | 38 | 38 | 83 | 62 | 114 | 76 | 73.0 | 50.8 | 101.6 |
| 2 | 50 | 60.3 | 76 | 35 | 64 | 51 | 38 | 106 | 81 | 152 | 102 | 92.0 | 63.5 | 152.4 |
| 2 1/2 | 65 | 73.0 | 95 | 44 | 76 | 64 | 38 | 132 | 100 | 191 | 127 | 104.8 | 63.5 | 152.4 |
| 3 | 80 | 88.9 | 114 | 51 | 86 | 76 | 51 | 159 | 121 | 229 | 152 | 127.0 | 63.5 | 152.4 |
| 3 1/2 | 90 | 101.6 | 133 | 57 | 95 | 89 | 64 | 184 | 140 | 267 | 178 | 139.7 | 76.2 | 152.4 |
| 4 | 100 | 114.3 | 152 | 64 | 105 | 102 | 64 | 210 | 159 | 305 | 203 | 157.2 | 76.2 | 152.4 |
| 5 | 125 | 141.3 | 190 | 79 | 124 | 127 | 76 | 262 | 197 | 381 | 254 | 185.7 | 76.2 | 203.2 |
| 6 | 150 | 168.3 | 229 | 95 | 143 | 152 | 89 | 313 | 237 | 457 | 305 | 215.9 | 88.9 | 203.2 |
| 8 | 200 | 219.1 | 305 | 127 | 178 | 203 | 102 | 414 | 313 | 610 | 406 | 270.0 | 101.6 | 203.2 |
| 10 | 250 | 273.1 | 381 | 159 | 216 | 254 | 127 | 518 | 391 | 762 | 508 | 324.0 | 127.0 | 254.0 |
| 12 | 300 | 323.9 | 457 | 190 | 254 | 305 | 152 | 619 | 467 | 914 | 610 | 381.0 | 152.4 | 254.0 |
| 14 | 350 | 355.6 | 533 | 222 | 279 | 356 | 165 | 711 | 533 | 1067 | 711 | 412.8 | 152.4 | 305.0 |
| 16 | 400 | 406.4 | 610 | 254 | 305 | 406 | 178 | 813 | 610 | 1219 | 813 | 470.0 | 152.4 | 305.0 |
| 18 | 450 | 457.2 | 686 | 286 | 343 | 457 | 203 | 914 | 686 | 1372 | 914 | 533.4 | 152.4 | 305.0 |
| 20 | 500 | 508.0 | 762 | 318 | 381 | 508 | 229 | 1016 | 762 | 1524 | 1016 | 584.2 | 152.4 | 305.0 |
| 22 | 550 | 559.0 | 838 | 343 | 419 | 559 | 254 | 1118 | 838 | 1676 | 1118 | 614.4 | 152.4 | 305.0 |
| 24 | 600 | 610.0 | 914 | 381 | 432 | 610 | 267 | 1219 | 914 | 1829 | 1219 | 692.2 | 152.4 | 305.0 |
| 26 | 650 | 660.0 | 991 | 406 | 495 | 660 | 267 | - | - | - | - | - | - | - |
| 28 | 700 | 711.0 | 1067 | 438 | 521 | 711 | 267 | - | - | - | - | - | - | - |
| 30 | 750 | 762.0 | 1143 | 470 | 559 | 762 | 267 | - | - | - | - | - | - | - |
| 32 | 800 | 813.0 | 1219 | 502 | 597 | 813 | 267 | - | - | - | - | - | - | - |
| 34 | 850 | 864.0 | 1295 | 533 | 635 | 864 | 267 | - | - | - | - | - | - | - |
| 36 | 900 | 914.0 | 1372 | 565 | 673 | 914 | 267 | - | - | - | - | - | - | - |
| 38 | 950 | 965.0 | 1448 | 600 | 711 | 965 | 305 | - | - | - | - | - | - | - |
| 40 | 1000 | 1016.0 | 1524 | 632 | 749 | 1016 | 305 | - | - | - | - | - | - | - |
| 42 | 1050 | 1067.0 | 1600 | 660 | 762 | 1067 | 305 | - | - | - | - | - | - | - |
| 44 | 1100 | 1118.0 | 1676 | 695 | 813 | 1118 | 343 | - | - | - | - | - | - | - |
| 46 | 1150 | 1168.0 | 1753 | 727 | 851 | 1168 | 343 | - | - | - | - | - | - | - |
| 48 | 1200 | 1219.0 | 1829 | 759 | 889 | 1219 | 343 | - | - | - | - | - | - | - |





BUTT - WELDING PIPE FITTINGS ANSI B 16.9 / 16.28



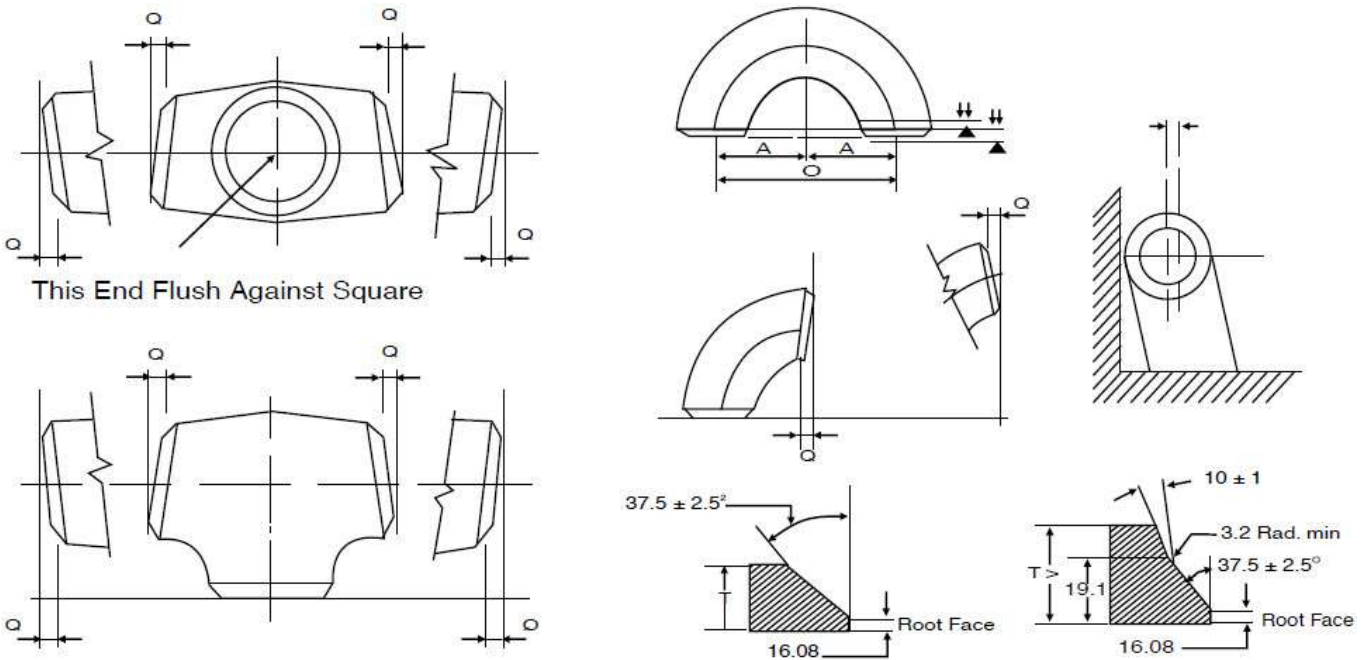
| Nominal Pipe Size | | Outside Diameter | | Center to End | | Length |
|-------------------|-----------|------------------|-------|---------------|-----|--------|
| Inch. | mm | D | P | C | M | H |
| 1/2 x 3/8 | 15 x 10 | 21.3 | 17.1 | 25 | 25 | - |
| 1/2 x 1/4 | 15 x 8 | 21.3 | 13.7 | 25 | 25 | - |
| 3/4 x 1/2 | 20 x 15 | 26.7 | 21.3 | 29 | 29 | 38 |
| 3/4 x 3/8 | 20 x 10 | 26.7 | 17.1 | 29 | 29 | 38 |
| 1 x 3/4 | 25 x 20 | 33.4 | 26.7 | 38 | 38 | 51 |
| 1 x 1/2 | 25 x 15 | 33.4 | 21.3 | 38 | 38 | 51 |
| 1 1/4 x 1 | 32 x 25 | 42.2 | 33.4 | 48 | 48 | 51 |
| 1 1/4 x 3/4 | 32 x 20 | 42.2 | 26.7 | 48 | 48 | 51 |
| 1 1/4 x 1/2 | 32 x 15 | 42.2 | 21.3 | 48 | 48 | 51 |
| 1 1/2 x 1 1/2 | 40 x 32 | 48.3 | 42.2 | 57 | 57 | 64 |
| 1 1/2 x 1 | 40 x 25 | 48.3 | 33.4 | 57 | 57 | 64 |
| 1 1/2 x 3/4 | 40 x 20 | 48.3 | 26.7 | 57 | 57 | 64 |
| 1 1/2 x 1/2 | 40 x 15 | 48.3 | 21.3 | 57 | 57 | 64 |
| 2 x 1 1/2 | 50 x 40 | 60.3 | 48.2 | 64 | 60 | 76 |
| 2 x 1 1/4 | 50 x 32 | 60.3 | 42.2 | 64 | 57 | 76 |
| 2 x 1 | 50 x 25 | 60.3 | 33.4 | 64 | 51 | 76 |
| 2 x 3/4 | 50 x 20 | 60.3 | 26.7 | 64 | 44 | 76 |
| 2 1/2 x 2 | 65 x 50 | 73.0 | 60.3 | 76 | 70 | 89 |
| 2 1/2 x 1 1/2 | 65 x 40 | 73.0 | 48.3 | 76 | 67 | 89 |
| 2 1/2 x 1 1/4 | 65 x 32 | 73.0 | 42.2 | 76 | 64 | 89 |
| 2 1/2 x 1 | 65 x 25 | 73.0 | 33.4 | 76 | 57 | 89 |
| 3 x 2 1/2 | 80 x 65 | 88.9 | 73.0 | 86 | 83 | 89 |
| 3 x 2 | 80 x 50 | 88.9 | 60.3 | 86 | 76 | 89 |
| 3 x 1 1/2 | 80 x 40 | 88.9 | 48.3 | 86 | 73 | 89 |
| 3 x 1 1/4 | 80 x 32 | 88.9 | 42.2 | 86 | 70 | 89 |
| 3 1/2 x 3 | 90 x 80 | 101.6 | 88.9 | 95 | 92 | 102 |
| 3 1/2 x 2 1/2 | 90 x 65 | 101.6 | 73.0 | 95 | 89 | 102 |
| 3 1/2 x 2 | 90 x 50 | 101.6 | 60.3 | 95 | 83 | 102 |
| 3 1/2 x 1 1/2 | 90 x 40 | 101.6 | 48.3 | 95 | 79 | 102 |
| 3 1/2 x 1 1/4 | 90 x 32 | 101.6 | 42.2 | - | - | 102 |
| 4 x 3 1/2 | 100 x 90 | 114.3 | 101.6 | 105 | 102 | 102 |
| 4 x 3 | 100 x 80 | 114.3 | 88.9 | 105 | 98 | 102 |
| 4 x 2 1/2 | 100 x 65 | 114.3 | 73.0 | 105 | 95 | 102 |
| 4 x 2 | 100 x 50 | 114.3 | 60.3 | 105 | 89 | 102 |
| 4 x 1 1/2 | 100 x 40 | 114.3 | 48.3 | 105 | 86 | 102 |
| 5 x 4 | 125 x 100 | 141.3 | 114.3 | 124 | 117 | 127 |
| 5 x 3 1/2 | 125 x 90 | 141.3 | 101.6 | 124 | 114 | 127 |
| 5 x 3 | 125 x 80 | 141.3 | 88.9 | 124 | 111 | 127 |
| 5 x 2 1/2 | 125 x 65 | 141.3 | 73.0 | 124 | 108 | 127 |
| 5 x 2 | 125 x 50 | 141.3 | 60.3 | 124 | 105 | 127 |
| 6 x 5 | 150 x 125 | 168.3 | 141.3 | 143 | 137 | 140 |
| 6 x 4 | 150 x 100 | 168.3 | 114.3 | 143 | 130 | 140 |
| 6 x 3 1/2 | 150 x 90 | 168.3 | 101.6 | 143 | 127 | 140 |
| 6 x 3 | 150 x 80 | 168.3 | 88.9 | 143 | 124 | 140 |
| 6 x 2 1/2 | 150 x 65 | 168.3 | 73.0 | 143 | 121 | 140 |

| Nominal Pipe Size | | Outside Diameter | | Center to End | | Length |
|-------------------|-----------|------------------|-------|---------------|-----|--------|
| Inch. | mm | D | P | C | M | H |
| 8 x 6 | 200 x 150 | 219.1 | 168.3 | 178 | 168 | 152 |
| 8 x 5 | 200 x 125 | 219.1 | 141.3 | 178 | 162 | 152 |
| 8 x 4 | 200 x 100 | 219.1 | 114.3 | 178 | 156 | 152 |
| 8 x 3 1/2 | 200 x 90 | 219.1 | 101.6 | 178 | 152 | 152 |
| 10 x 8 | 250 x 200 | 273.1 | 219.1 | 216 | 203 | 178 |
| 10 x 6 | 250 x 150 | 273.1 | 168.1 | 216 | 194 | 178 |
| 10 x 5 | 250 x 125 | 273.1 | 141.3 | 216 | 191 | 178 |
| 10 x 4 | 250 x 100 | 273.1 | 114.3 | 216 | 184 | 178 |
| 12 x 10 | 300 x 250 | 323.9 | 273.1 | 254 | 241 | 203 |
| 12 x 8 | 300 x 200 | 323.9 | 219.1 | 254 | 229 | 203 |
| 12 x 6 | 300 x 150 | 323.9 | 168.3 | 254 | 219 | 203 |
| 12 x 5 | 300 x 125 | 323.9 | 141.3 | 254 | 216 | 203 |
| 14 x 12 | 350 x 300 | 355.6 | 323.9 | 279 | 270 | 330 |
| 14 x 10 | 350 x 250 | 355.6 | 273.1 | 279 | 257 | 330 |
| 14 x 8 | 350 x 200 | 355.6 | 219.1 | 279 | 248 | 330 |
| 14 x 6 | 350 x 150 | 355.6 | 168.3 | 279 | 238 | 330 |
| 16 x 14 | 400 x 350 | 406.4 | 355.6 | 305 | 305 | 356 |
| 16 x 12 | 400 x 300 | 406.4 | 323.9 | 305 | 295 | 356 |
| 16 x 10 | 400 x 250 | 406.4 | 273.1 | 305 | 283 | 356 |
| 16 x 8 | 400 x 200 | 406.4 | 219.1 | 305 | 273 | 356 |
| 16 x 6 | 400 x 150 | 406.4 | 168.3 | 305 | 264 | 356 |
| 18 x 16 | 450 x 400 | 457.0 | 406.4 | 343 | 330 | 381 |
| 18 x 14 | 450 x 350 | 457.0 | 355.6 | 343 | 330 | 381 |
| 18 x 12 | 450 x 300 | 457.0 | 323.9 | 343 | 321 | 381 |
| 18 x 10 | 450 x 250 | 457.0 | 273.1 | 343 | 308 | 381 |
| 18 x 8 | 450 x 200 | 457.0 | 219.1 | 343 | 298 | 381 |
| 20 x 18 | 500 x 450 | 508.0 | 457.0 | 381 | 368 | 508 |
| 20 x 16 | 500 x 400 | 508.0 | 406.4 | 381 | 356 | 508 |
| 20 x 14 | 500 x 350 | 508.0 | 355.6 | 381 | 356 | 508 |
| 20 x 12 | 500 x 300 | 508.0 | 323.9 | 381 | 346 | 508 |
| 20 x 10 | 500 x 250 | 508.0 | 273.1 | 381 | 333 | 508 |
| 20 x 8 | 500 x 200 | 508.0 | 219.1 | 381 | 324 | 508 |
| 22 x 20 | 550 x 500 | 559.0 | 508.0 | 419 | 406 | 508 |
| 22 x 18 | 550 x 450 | 559.0 | 457.0 | 419 | 394 | 508 |
| 22 x 16 | 550 x 400 | 559.0 | 406.4 | 419 | 381 | 508 |
| 22 x 14 | 550 x 350 | 559.0 | 355.6 | 419 | 381 | 508 |
| 22 x 12 | 550 x 300 | 559.0 | 323.9 | 419 | 371 | 508 |
| 24 x 10 | 550 x 250 | 559.0 | 273.1 | 419 | 359 | 508 |
| 24 x 22 | 600 x 550 | 610.0 | 559.0 | 432 | 432 | 508 |
| 24 x 20 | 600 x 500 | 610.0 | 508.0 | 432 | 432 | 508 |
| 24 x 18 | 600 x 450 | 610.0 | 457.0 | 432 | 419 | 508 |
| 24 x 16 | 600 x 400 | 610.0 | 406.4 | 432 | 406 | 508 |
| 24 x 14 | 600 x 350 | 610.0 | 355.6 | 432 | 406 | 508 |
| 24 x 12 | 600 x 300 | 610.0 | 323.9 | 432 | 397 | 508 |
| 24 x 10 | 600 x 250 | 610.0 | 273.1 | 432 | 384 | 508 |



**BUTT WELDING PIPE FITTING DIMENSIONAL STANDARD
 ANSI B-16.9 /16.28 / MSS SP-43**

| ALL FITTINGS | | | | 90°/60°/45° /30° ELBOWS & TEES | | REDUCERS | | 180° RETURNS | | | CAPS | | ANGULARITY TOLERANCE ± 1/6" (1.6mm) | | | | | |
|-------------------------------|------------------------------|---------------------|-----------------------------|---|---|----------------------------------|--------------|----------------------------------|---------------------------------|-------------------------------|-------------|-----------------------------------|--|----------------|----------------------|----------------------------|--------------|--|
| Nominal Pipe Size Inch/mm | Outside Diameter at Level | Inside Dia meter | Wall Thickness at End | Centre to End | | Overall Length Dimensions | | Centre to End | | Back to Face Dimensions | | Alignment of End Dimensions | | Overall length | Nominal Pipe Size | Off Angle Inch/mm | Off Plane | |
| | D | T | A, B, C, M | | H | | O | | K | | U | | E | | Q | | P | |
| | (1) B16.9 | MSS SP43 | (2) B16.9 | B16.9 | MSS SP43 | B16.9 | MSS SP43 | B16.9 | MSS SP43 | B16.9 | MSS SP43 | B16.9 | MSS SP43 | B16.9 | MSS SP43 | B16.9 | MSS SP43 | B16.9 |
| 1/2" TO 2 1/2" 15 TO 65 | ±1.0 | | ±0.8 | | | FROM 1/2" TO 10" 15 TO 250 | FROM 3/4" | FROM 1/2" TO 10" 15 TO 250 | FROM 1/2" TO 8" 15 TO 200 | | | | | ±4 | ±3.17 | 1/2" TO 4" 15 TO 100 | 1 | 1 |
| 3" TO 3 1/2" 80 TO 90 | | ±0.79 | | | | | | | | | | | | | | 5" TO 8" 125 TO 200 | 2 | 4 |
| 4" 100 | +2 -1 | | ±1.6 | | | ±2 | ±1.59 | ±2 | ±1.59 | ±7 | ±6.35 | ±7 | ±6.35 | ±1.0 | ±0.79 | 10" TO 12" 250 TO 300 | 3 | 5 |
| 5" TO 6" 125 TO 150 | +3 -1 | +1.59 | | | | | | | | | | | | ±7 | ±6.35 | 14" TO 16" 350 TO 400 | 3 | 16" TO 24" 400 TO 600 1.6 |
| 8" 200 | ±2 | -0.79 | | Not Less Than 87.5% Nominal Thk. | Not Less Than 87.5% Nominal Thk. | | | | | | | | | | | 18" TO 24" 450 TO 600 | 4 | 10 |
| 10" TO 18" 250 TO 450 | +4 -3 | +2.38 -0.79 | ±3.2 | | | FROM 12" TO 30" ±3 | ±2.38 | FROM 12" TO 30" ±3 | 10" TO 24" +2.38 | | | | | | | 26" TO 30" 650 TO 750 | 5 | 26" TO 36" 650 TO 900 2.4 |
| 20" TO 24" 500 TO 600 | +6 -5 | 3.17 0.79 | | | | 300 TO 750 | | 300 TO 750 | 250 TO 600 | ±10" | ±9.53 | | | ±2.0" | ±1.59 | 32" TO 42" 800 TO 1050 | 5 | 13 |
| 26" TO 30" 650 TO 750 | +7 -5 | | ±4.8 | | | | | | | | | | | ±10 | | 44" TO 48" 1100 TO 1200 | 5 | 38" TO 48" 950 TO 1200 3.2 |
| 32" TO 48" 800 TO 1200 | +7 -5 | | | | | ±5 | | | | | | | | | | 42" TO 48" 1050 TO 1200 | ±5 | ±20 |



- Out of round is the sum of absolute values of plus and minus tolerance.
- The inside diameter at ends and the nominal wall thickness are to be specified by the purchaser.
- Out of roundness tolerances shall be the difference between the Max. dia measured on any radial cross-section.
- All dimensions are in millimeters except nominal pipe sizes which are in inches.

WELDING BEVEL STANDARDS ANSI B 16.25