



COPPER & CUNI 90/10 PIPES, FITTINGS, FLANGES FOR OFFSHORE



Company Overview

Established in 1974, TTS Ind. Co., Ltd is one of the leading manufacturer of Copper and Copper Alloy materials used in Onshore & Offshore Oil Industries, Shipbuilding and allied Industries. TTS Ind. Co., Ltd is proud of it's qualified technical team to assist it's valued customers and project partners in selection and providing technical assistance, whenever required. Our extensive experience and flexibility allows us to cater for single piece replacement requirement or complete project requirement of Pipes, Fittings and Flanges of Copper & Copper Alloys and ensuring execution to an agreed time frame. TTS Ind. Co., Ltd's mission is to remain a leading manufacturer & supplier, utilizing technical innovation, and a positive contributor to the community, we serve.



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Certificate



ABS



BV



DNV



LR



RMRS



CCS



RINA



ISO 9001



ISO 14001



CE-PED

Customer Approval



LARSEN & TURBO



CRCC



ONGC



MDL



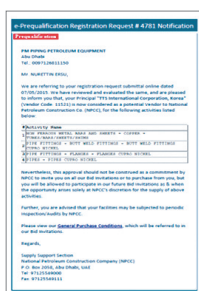
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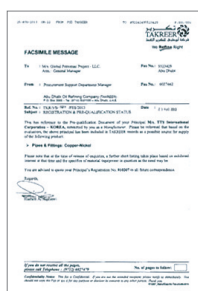
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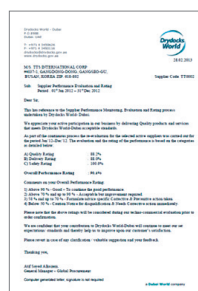
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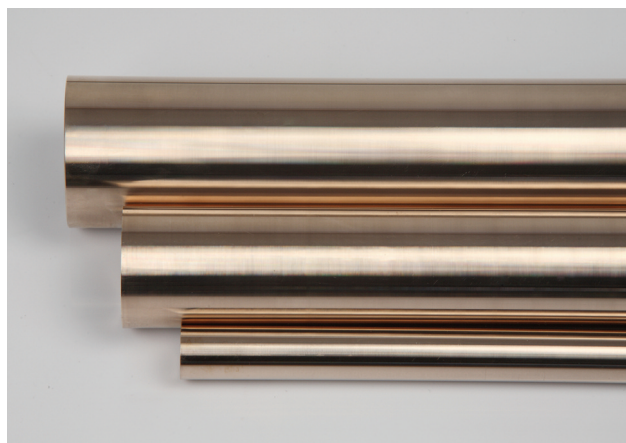
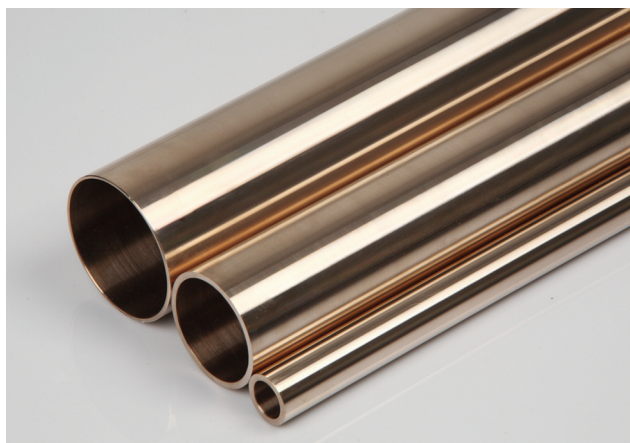
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DRYDOCKS WORLD DUBAI

Pipe European Standards

| Outside Diameter of pipe OD | | | 10 bar | | 14 bar | | 16 bar | | 20 bar | |
|--------------------------------|-----|--------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | | | Wall Thickness | Approx. Weight | Wall Thickness | Approx. Weight | Wall Thickness | Approx. Weight | Wall Thickness | Approx. Weight |
| Nominal | | Actual mm | Actual mm | kg/m | Actual mm | kg/m | Actual mm | kg/m | Actual mm | kg/m |
| inch | ND | | | | | | | | | |
| SEAMLESS | | | | | | | | | | |
| 1/8 | | 10 | 1.0 | 0.26 | 1.0 | 0.26 | 1.0 | 0.26 | 1.0 | 0.26 |
| 1/4 | | 12 | 1.0 | 0.31 | 1.0 | 0.31 | 1.0 | 0.31 | 1.0 | 0.31 |
| 3/8 | 10 | 16 | 1.0 | 0.42 | 1.0 | 0.42 | 2.0 | 0.79 | 2.0 | 0.79 |
| 1/2 | 15 | 20 | 1.0 | 0.53 | 1.5 | 0.53 | 2.0 | 1.01 | 2.0 | 1.01 |
| 3/4 | 20 | 25 | 1.5 | 0.99 | 1.5 | 0.99 | 2.0 | 1.30 | 2.0 | 1.30 |
| 1 | 25 | 30 | 1.5 | 1.20 | 1.5 | 1.20 | 2.5 | 1.93 | 2.5 | 1.93 |
| 1 1/4 | 32 | 38 | 1.5 | 1.54 | 1.5 | 1.54 | 2.5 | 2.50 | 2.5 | 2.50 |
| 1 1/2 | 40 | 44.5 | 1.5 | 1.81 | 1.5 | 1.81 | 2.5 | 2.95 | 2.5 | 2.95 |
| 2 | 50 | 57 | 1.5 | 2.34 | 1.5 | 2.34 | 2.5 | 3.83 | 2.5 | 3.83 |
| 2 1/2 | 65 | 76.1 | 2.0 | 4.16 | 2.0 | 4.16 | 2.5 | 5.17 | 2.5 | 5.17 |
| 3 | 80 | 88.9 | 2.0 | 4.88 | 2.5 | 6.07 | 2.5 | 6.07 | 2.5 | 6.07 |
| 4 | 100 | 108 | 2.5 | 7.41 | 2.5 | 7.41 | 3.0 | 8.85 | 3.0 | 8.85 |
| 5 | 125 | 133 | 2.5 | 9.16 | 2.5 | 9.16 | 3.0 | 10.95 | 3.0 | 10.95 |
| 6 | 150 | 159 | 2.5 | 10.99 | 2.5 | 10.99 | 3.0 | 13.14 | 3.5 | 15.29 |
| 7 | 175 | 193.7 | 3.0 | 16.07 | 3.5 | 18.70 | 3.5 | 18.70 | 3.5 | 18.70 |
| 8 | 200 | 219.1 | 3.0 | 18.21 | 3.5 | 21.19 | 4.0 | 24.17 | 4.5 | 27.12 |
| 10 | 250 | 267 | 3.0 | 22.24 | 4.0 | 29.55 | 4.5 | 33.18 | 5.5 | 40.39 |
| 12 | 300 | 323.9 | 4.0 | 35.94 | 5.0 | 44.78 | 5.5 | 49.18 | 7.0 | 62.30 |
| 14 | 350 | 368 | 4.0 | 40.89 | 5.5 | 56.00 | 6.5 | 65.99 | 8.0 | 80.89 |
| | | | | | | | | | | |
| SEAM WELDED | | | | | | | | | | |
| 16 | 400 | 419 | 4.0 | 46.62 | 6.0 | 69.60 | 7.0 | 81.00 | 9.0 | 103.64 |
| 18 | 450 | 457.2 | 4.0 | 50.91 | 7.0 | 88.20 | 8.0 | 100.93 | 9.5 | 119.45 |
| 20 | 500 | 508 | 4.5 | 63.63 | 7.5 | 105.10 | 8.5 | 119.24 | 11.0 | 153.54 |
| 24 | 600 | 610 | 5.0 | 84.96 | 9.0 | 151.40 | 10.5 | 176.79 | 13.0 | 217.97 |
| 28 | 700 | 711 | 6.0 | 118.80 | 10.5 | 205.90 | 12.0 | 235.58 | 15.0 | 293.22 |
| 32 | 800 | 813 | 6.0 | 135.99 | 12.0 | 269.10 | 13.5 | 303.14 | 17.0 | 380.06 |
| 36 | 900 | 914 | 8.0 | 203.57 | 13.5 | 340.40 | 15.5 | 391.14 | 19.0 | 477.60 |



Pipe U.S Standards

| Outside Diameter of pipe OD | | | Schedule 5S | | | | Schedule 10S | | | |
|--------------------------------|----------------|--------------|----------------|------|----------------|-------|----------------|------|----------------|-------|
| | | | Wall Thickness | | Approx. Weight | | Wall Thickness | | Approx. Weight | |
| Nominal inch | Actual inch | Actual mm | Actual | | Lb/Ft | kg/m | Actual | | Lb/Ft | kg/m |
| | | | inch | mm | | | inch | mm | | |
| SEAMLESS | | | | | | | | | | |
| 1⁄8 | 0.405 | 10.29 | | | | | 0.049 | 1.24 | 0.19 | 0.28 |
| 1⁄4 | 0.540 | 13.72 | | | | | 0.065 | 1.65 | 0.33 | 0.49 |
| 3⁄8 | 0.675 | 17.15 | | | | | 0.065 | 1.65 | 0.42 | 0.63 |
| 1⁄2 | 0.840 | 21.34 | 0.065 | 1.65 | 0.54 | 0.80 | 0.083 | 2.11 | 0.67 | 1.00 |
| 3⁄4 | 1.050 | 26.67 | 0.065 | 1.65 | 0.69 | 1.03 | 0.083 | 2.11 | 0.86 | 1.28 |
| 1 | 1.315 | 33.40 | 0.065 | 1.65 | 0.87 | 1.30 | 0.109 | 2.77 | 1.40 | 2.09 |
| 1 1⁄4 | 1.660 | 42.16 | 0.065 | 1.65 | 1.11 | 1.65 | 0.109 | 2.77 | 1.81 | 2.70 |
| 1 1⁄2 | 1.900 | 48.26 | 0.065 | 1.65 | 1.28 | 1.91 | 0.109 | 2.77 | 2.09 | 3.11 |
| 2 | 2.375 | 60.32 | 0.065 | 1.65 | 1.61 | 2.40 | 0.109 | 2.77 | 2.64 | 3.93 |
| 2 1⁄2 | 2.875 | 73.03 | 0.083 | 2.11 | 2.48 | 3.69 | 0.120 | 3.05 | 3.53 | 5.26 |
| 3 | 3.500 | 88.90 | 0.083 | 2.11 | 3.03 | 4.51 | 0.120 | 3.05 | 4.33 | 6.45 |
| 3 1⁄2 | 4.000 | 101.60 | 0.083 | 2.11 | 3.48 | 5.18 | 0.120 | 3.05 | 4.97 | 7.40 |
| 4 | 4.500 | 114.30 | 0.083 | 2.11 | 3.92 | 5.84 | 0.120 | 3.05 | 5.61 | 8.36 |
| 5 | 5.563 | 141.30 | 0.109 | 2.77 | 6.36 | 9.47 | 0.134 | 3.40 | 7.77 | 11.57 |
| 6 | 6.625 | 168.30 | 0.109 | 2.77 | 7.60 | 11.32 | 0.134 | 3.40 | 9.29 | 13.84 |
| 8 | 8.625 | 219.10 | 0.109 | 2.77 | 9.93 | 14.79 | 0.148 | 3.76 | 13.40 | 19.96 |
| 10 | 10.750 | 273.05 | 0.134 | 3.40 | 15.19 | 22.63 | 0.165 | 4.19 | 18.65 | 27.78 |
| 12 | 12.750 | 323.90 | 0.156 | 3.96 | 20.98 | 31.25 | 0.180 | 4.57 | 24.17 | 36.00 |

| Outside Diameter of pipe OD | | | Schedule 40S | | | | Schedule 80S | | | |
|--------------------------------|----------------|--------------|----------------|------|----------------|-------|----------------|-------|----------------|--------|
| | | | Wall Thickness | | Approx. Weight | | Wall Thickness | | Approx. Weight | |
| Nominal inch | Actual inch | Actual mm | Actual | | Lb/Ft | kg/m | Actual | | Lb/Ft | kg/m |
| | | | inch | mm | | | inch | mm | | |
| SEAMLESS | | | | | | | | | | |
| 1⁄8 | 0.405 | 10.29 | 0.068 | 1.73 | 0.24 | 0.37 | 0.095 | 2.41 | 0.31 | 0.47 |
| 1⁄4 | 0.540 | 13.72 | 0.088 | 2.24 | 0.42 | 0.63 | 0.119 | 3.02 | 0.54 | 0.80 |
| 3⁄8 | 0.675 | 17.15 | 0.091 | 2.31 | 0.57 | 0.84 | 0.126 | 3.20 | 0.74 | 1.10 |
| 1⁄2 | 0.840 | 21.34 | 0.109 | 2.77 | 0.85 | 1.27 | 0.147 | 3.73 | 1.09 | 1.62 |
| 3⁄4 | 1.050 | 26.67 | 0.113 | 2.87 | 1.13 | 1.69 | 0.154 | 3.91 | 1.47 | 2.20 |
| 1 | 1.315 | 33.40 | 0.133 | 3.38 | 1.68 | 2.50 | 0.179 | 4.55 | 2.17 | 3.24 |
| 1 1⁄4 | 1.660 | 42.16 | 0.140 | 3.56 | 2.27 | 3.39 | 0.191 | 4.85 | 3.00 | 4.47 |
| 1 1⁄2 | 1.900 | 48.26 | 0.145 | 3.68 | 2.72 | 4.05 | 0.200 | 5.08 | 3.63 | 5.41 |
| 2 | 2.375 | 60.32 | 0.154 | 3.91 | 3.65 | 5.44 | 0.218 | 5.54 | 5.02 | 7.48 |
| 2 1⁄2 | 2.875 | 73.03 | 0.203 | 5.16 | 5.79 | 8.63 | 0.276 | 7.01 | 7.66 | 11.41 |
| 3 | 3.500 | 88.90 | 0.216 | 5.49 | 7.58 | 11.29 | 0.300 | 7.62 | 10.25 | 15.27 |
| 3 1⁄2 | 4.000 | 101.60 | 0.226 | 5.74 | 9.11 | 13.57 | 0.318 | 8.08 | 12.51 | 18.63 |
| 4 | 4.500 | 114.30 | 0.237 | 6.02 | 10.79 | 16.07 | 0.337 | 8.56 | 14.98 | 22.32 |
| 5 | 5.563 | 141.30 | 0.258 | 6.55 | 14.62 | 21.77 | 0.375 | 9.53 | 20.78 | 30.97 |
| 6 | 6.625 | 168.30 | 0.280 | 7.11 | 18.97 | 28.26 | 0.432 | 10.97 | 28.57 | 42.56 |
| 8 | 8.625 | 219.10 | 0.322 | 8.18 | 28.55 | 42.55 | 0.500 | 12.70 | 43.39 | 64.64 |
| 10 | 10.750 | 273.05 | 0.365 | 9.27 | 40.48 | 60.31 | 0.500 | 12.70 | 54.74 | 96.01 |
| 12 | 12.750 | 323.90 | 0.375 | 9.53 | 49.56 | 73.88 | 0.500 | 12.70 | 65.42 | 132.08 |

Elbows

Type and Construction

Seamless : up to 14inch / 368.0mmOD

Seam Welded : from 16inch / 419.1mmOD

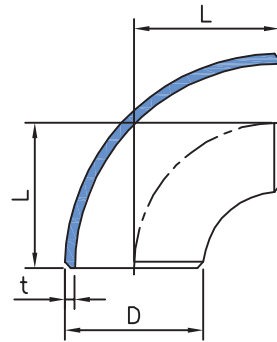
Dimensions

EEMUA 146 Section 1, Long Radius

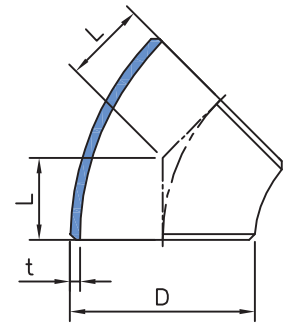
Other dimensions are available on request

Weld Preparation

For wall thickness less than 3 mm,
the elbows are supplied with plain weld
ends. Larger thicknesses are supplied with
the weld bevel of $37\frac{1}{2}^{\circ} \pm 2\frac{1}{2}^{\circ}$



90° ELBOW



45° ELBOW

| Nominal Size | Specified Size OD(D) | Wall Thickness(t) | | Center to Face(L) | | Approx. Weight (kg) | | | |
|-------------------------------|----------------------|-------------------|--------|-------------------|------|---------------------|--------|--------|---------|
| | | 16 bar | 20 bar | 45° | 90° | 45° | 45° | 90° | 90° |
| inch | mm | mm | mm | | | 16 bar | 20 bar | 16 bar | 20 bar |
| 1 | 30 | 2.5 | 2.5 | 22 | 38 | 0.06 | 0.06 | 0.12 | 0.12 |
| 1 ¹ / ₄ | 38 | 2.5 | 2.5 | 25 | 48 | 0.09 | 0.09 | 0.13 | 0.13 |
| 1 ¹ / ₂ | 44.5 | 2.5 | 2.5 | 29 | 57 | 0.15 | 0.15 | 0.30 | 0.30 |
| 2 | 57 | 2.5 | 2.5 | 35 | 76 | 0.25 | 0.25 | 0.52 | 0.52 |
| 2 ¹ / ₂ | 76.1 | 2.5 | 2.5 | 44 | 95 | 0.45 | 0.45 | 0.90 | 0.90 |
| 3 | 88.9 | 2.5 | 2.5 | 51 | 114 | 0.65 | 0.65 | 1.25 | 1.25 |
| 4 | 108 | 3.0 | 3.0 | 64 | 152 | 1.00 | 1.00 | 2.10 | 2.10 |
| 6 | 159 | 3.0 | 3.5 | 95 | 229 | 2.30 | 2.70 | 4.70 | 5.50 |
| 8 | 219.1 | 4.0 | 4.5 | 127 | 305 | 6.00 | 6.50 | 12.00 | 13.00 |
| 10 | 267 | 4.5 | 5.5 | 159 | 381 | 10.00 | 12.00 | 20.00 | 24.00 |
| 12 | 323.9 | 5.5 | 7.0 | 190 | 457 | 17.00 | 23.00 | 35.00 | 45.00 |
| 14 | 368 | 6.5 | 8.0 | 222 | 533 | 27.00 | 34.00 | 55.00 | 67.00 |
| 16 | 419 | 7.0 | 9.0 | 254 | 610 | 38.00 | 50.00 | 77.00 | 99.00 |
| 18 | 457.2 | 8.0 | 9.5 | 286 | 686 | 54.00 | 64.00 | 109.00 | 128.00 |
| 20 | 508 | 8.5 | 11.0 | 318 | 762 | 71.00 | 92.00 | 142.00 | 184.00 |
| 24 | 610 | 10.5 | 13.0 | 381 | 914 | 126.00 | 156.00 | 252.00 | 312.00 |
| 28 | 711 | 12.0 | 15.0 | 438 | 1067 | 197.00 | 245.00 | 394.00 | 490.00 |
| 32 | 813 | 13.5 | 17.0 | 502 | 1219 | 289.00 | 362.00 | 579.00 | 725.00 |
| 36 | 914 | 15.5 | 19.0 | 565 | 1372 | 420.00 | 513.00 | 841.00 | 1026.00 |

Equal Tees

Type and Construction

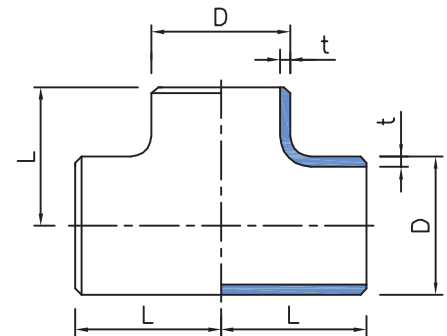
Seamless : up to 14inch / 368.0mmOD

Seam Welded : from 16inch / 419.1mmOD

Dimensions

EEMUA 146 Section 1

Other dimensions are available on request



Weld Preparation

For wall thickness less than 3mm, the tees are supplied with plain weld ends. Larger thicknesses are supplied with the weld bevel of $37\frac{1}{2}^{\circ} \pm 2\frac{1}{2}^{\circ}$

| Nominal Size | Specified Size OD(D) | Wall Thickness (t) | | Center to Face(L) | Approx. Weight | |
|-------------------------------|----------------------|--------------------|--------|-------------------|----------------|--------|
| | | 16 bar | 20 bar | | 16 bar | 20 bar |
| in | mm | mm | mm | | kg | kg |
| 1 | 30 | 2.5 | 2.5 | 38 | 0.30 | 0.30 |
| 1 ¹ / ₄ | 38 | 2.5 | 2.5 | 48 | 0.50 | 0.50 |
| 1 ¹ / ₂ | 44.5 | 2.5 | 2.5 | 57 | 0.75 | 0.75 |
| 2 | 57 | 2.5 | 2.5 | 64 | 1.00 | 1.00 |
| 2 ¹ / ₂ | 76.1 | 2.5 | 2.5 | 76 | 1.60 | 1.60 |
| 3 | 88.9 | 2.5 | 2.5 | 86 | 2.00 | 2.00 |
| 4 | 108 | 3.0 | 3.0 | 105 | 3.25 | 3.25 |
| 6 | 159 | 3.0 | 3.5 | 143 | 6.00 | 7.20 |
| 8 | 219.1 | 4.0 | 4.5 | 178 | 11.25 | 12.70 |
| 10 | 267 | 4.5 | 5.5 | 216 | 22.50 | 27.50 |
| 12 | 323.9 | 5.5 | 7.0 | 254 | 39.50 | 50.30 |
| 14 | 368 | 6.5 | 8.0 | 279 | 62.00 | 76.00 |
| 16 | 419 | 7.0 | 9.0 | 305 | 88.00 | 119.00 |
| 18 | 457.2 | 8.0 | 9.5 | 343 | 128.00 | 152.00 |
| 20 | 508 | 8.5 | 11.0 | 381 | 165.00 | 214.00 |
| 24 | 610 | 10.5 | 13.0 | 432 | 266.00 | 330.00 |
| 28 | 711 | 12.0 | 15.0 | 521 | 388.00 | 458.00 |
| 32 | 813 | 13.5 | 17.0 | 597 | 508.00 | 606.00 |
| 36 | 914 | 15.5 | 19.0 | 673 | 650.00 | 794.00 |

Reducing Tees

Type and Construction

Seamless : up to 14inch / 368.0mmOD

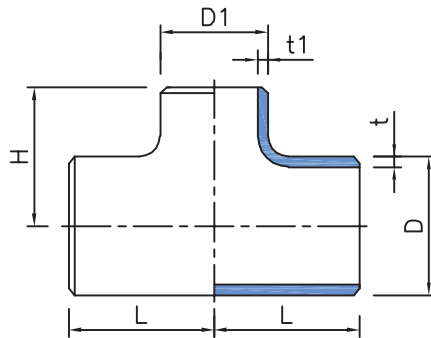
Seam Welded : from 16inch / 419.1mmOD

Dimensions

EEMUA 146 Section 1

Other dimensions are available on request

| Specified Size OD(D x D ₁) | Wall Thickness(t x t ₁) | | Center to Face | | Approx. Weight | |
|--|-------------------------------------|---------|----------------|-----|----------------|--------|
| | 16 bar | 20 bar | L | H | 16 bar | 20 bar |
| mm | mm | mm | mm | mm | kg | kg |
| 30×25 | 2.5×2.0 | 2.5×2.0 | 38 | 38 | 0.18 | 0.18 |
| 38×30 | 2.5×2.5 | 2.5×2.5 | 48 | 48 | 0.29 | 0.29 |
| 38×25 | 2.5×2.0 | 2.5×2.0 | 48 | 48 | 0.28 | 0.28 |
| 44.5×38 | 2.5×2.5 | 2.5×2.5 | 57 | 57 | 0.42 | 0.42 |
| 44.5×30 | 2.5×2.5 | 2.5×2.5 | 57 | 57 | 0.40 | 0.40 |
| 44.5×25 | 2.5×2.5 | 2.5×2.5 | 57 | 57 | 0.38 | 0.38 |
| 57×44.5 | 2.5×2.5 | 2.5×2.5 | 64 | 60 | 0.58 | 0.58 |
| 57×38 | 2.5×2.5 | 2.5×2.5 | 64 | 57 | 0.56 | 0.56 |
| 57×30 | 2.5×2.5 | 2.5×2.5 | 64 | 51 | 0.53 | 0.53 |
| 76.1×57 | 2.5×2.5 | 2.5×2.5 | 76 | 70 | 0.90 | 0.90 |
| 76.1×44.5 | 2.5×2.5 | 2.5×2.5 | 76 | 67 | 0.87 | 0.87 |
| 76.1×38 | 2.5×2.5 | 2.5×2.5 | 76 | 64 | 0.85 | 0.85 |
| 88.9×76.1 | 2.5×2.5 | 2.5×2.5 | 86 | 83 | 1.24 | 1.24 |
| 88.9×57 | 2.5×2.5 | 2.5×2.5 | 86 | 76 | 1.16 | 1.16 |
| 88.9×44.5 | 2.5×2.5 | 2.5×2.5 | 86 | 73 | 1.12 | 1.12 |
| 108×88.9 | 3.0×2.5 | 3.0×2.5 | 105 | 98 | 2.12 | 2.12 |
| 108×76.1 | 3.0×2.5 | 3.0×2.5 | 105 | 95 | 2.06 | 2.06 |
| 108×57 | 3.0×2.5 | 3.0×2.5 | 105 | 89 | 1.98 | 1.98 |
| 159×108 | 3.0×3.0 | 3.5×3.0 | 143 | 130 | 4.19 | 4.80 |
| 159×88.9 | 3.0×2.5 | 3.5×2.5 | 143 | 124 | 4.01 | 4.62 |
| 159×76.1 | 3.0×2.5 | 3.5×2.5 | 143 | 121 | 3.96 | 4.57 |
| 219.1×159 | 4.0×3.0 | 4.5×3.5 | 178 | 168 | 9.33 | 10.50 |
| 219.1×108 | 4.0×3.0 | 4.5×3.0 | 178 | 156 | 8.97 | 10.02 |
| 219.1×88.9 | 4.0×2.5 | 4.5×2.5 | 178 | 152 | 8.82 | 9.87 |
| 267×219.1 | 4.5×4.0 | 5.5×4.5 | 216 | 203 | 15.94 | 19.25 |
| 267×159 | 4.5×3.0 | 5.5×3.5 | 216 | 194 | 15.06 | 18.29 |
| 267×108 | 4.5×2.5 | 5.5×3.0 | 216 | 184 | 14.71 | 17.82 |
| 323.9×267 | 5.5×4.5 | 7.0×5.5 | 254 | 241 | 27.48 | 34.69 |
| 323.9×219.1 | 5.5×4.0 | 7.0×4.5 | 254 | 229 | 26.49 | 33.32 |
| 323.9×159 | 5.5×3.0 | 7.0×3.5 | 254 | 219 | 25.62 | 32.38 |



| Specified Size OD(D x D1) | Wall Thickness(t x t1) | | Center to Face | | Approx. Weight | |
|---------------------------|------------------------|-----------|----------------|-----|----------------|--------|
| | 16 bar | 20 bar | L | H | 16 bar | 20 bar |
| mm | mm | mm | mm | mm | kg | kg |
| 368×323.9 | 6.5×5.5 | 8.0×7.0 | 279 | 270 | 40.87 | 50.27 |
| 368×267 | 6.5×4.5 | 8.0×5.5 | 279 | 257 | 39.07 | 47.87 |
| 368×219.1 | 6.5×4.0 | 8.0×4.5 | 279 | 248 | 38.02 | 46.66 |
| 419×368 | 7.0×6.5 | 9.0×8.0 | 305 | 305 | 55.46 | 70.63 |
| 419×323.9 | 7.0×5.5 | 9.0×7.0 | 305 | 295 | 53.38 | 68.24 |
| 419×267 | 7.0×4.5 | 9.0×5.5 | 305 | 283 | 51.62 | 65.89 |
| 457.2×419 | 8.0×7.0 | 9.5×9.0 | 343 | 330 | 77.10 | 92.04 |
| 457.2×368 | 8.0×6.5 | 9.5×8.0 | 343 | 330 | 75.59 | 89.72 |
| 457.2×323.9 | 8.0×5.5 | 9.5×7.0 | 343 | 321 | 73.45 | 87.31 |
| 508×457.2 | 8.5×8.0 | 11.0×9.5 | 381 | 368 | 101.91 | 130.03 |
| 508×419 | 8.5×7.0 | 11.0×9.0 | 381 | 356 | 98.68 | 127.00 |
| 508×368 | 8.5×6.5 | 11.0×8.0 | 381 | 356 | 97.16 | 124.69 |
| 610×508 | 10.5×8.5 | 13.0×11.0 | 432 | 432 | 167.14 | 206.90 |
| 610×457.2 | 10.5×8.0 | 13.0×9.5 | 432 | 419 | 163.52 | 201.40 |
| 610×419 | 10.5×7.0 | 13.0×9.0 | 432 | 406 | 160.21 | 197.91 |
| 711×610 | 12.0×10.5 | 15.0×13.0 | 521 | 508 | 271.22 | 337.26 |
| 711×508 | 12.0×8.5 | 15.0×11.0 | 521 | 483 | 259.52 | 323.69 |
| 711×457.2 | 12.0×8.0 | 15.0×9.5 | 521 | 470 | 255.88 | 317.78 |
| 813×711 | 13.5×12.0 | 17.0×15.0 | 597 | 572 | 399.14 | 500.07 |
| 813×610 | 13.5×10.5 | 17.0×13.0 | 597 | 559 | 387.17 | 484.85 |
| 813×508 | 13.5×8.5 | 17.0×11.0 | 597 | 533 | 357.34 | 471.09 |
| 914×813 | 15.5×13.5 | 19.0×17.0 | 673 | 648 | 581.77 | 712.24 |
| 914×711 | 15.5×12.0 | 19.0×15.0 | 673 | 622 | 562.82 | 688.14 |
| 914×610 | 15.5×10.5 | 19.0×13.0 | 673 | 610 | 551.05 | 673.17 |

Concentric & Eccentric Reducers

Type and Construction

Seamless : up to 12inch / 323.9mmOD

Seam Welded : from 14inch / 368.0mmOD

Dimensions

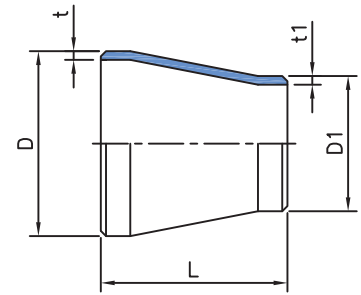
EEMUA 146 Section 1

Other dimensions are available on request

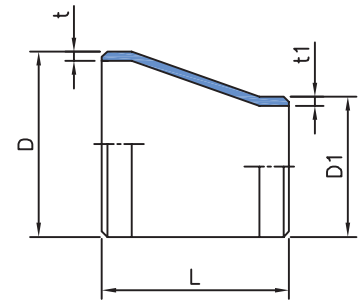
Weld Preparation

For wall thickness less than 3 mm, the reducers are supplied with plain weld ends. Larger thicknesses are supplied with the weld bevel of $37\frac{1}{2}^{\circ} \pm 2\frac{1}{2}^{\circ}$

Concentric Reducers



Eccentric Reducers



| Specified Size OD (D x D1) | Length (L) | Wall Thickness (t x t1) | | Approx. Weight | |
|-------------------------------|---------------|-------------------------|---------|----------------|--------|
| | | 16 bar | 20 bar | 16 bar | 20 bar |
| mm | mm | mm | mm | kg | kg |
| 57×30 | 76 | 2.5×2.5 | 2.5×2.5 | 0.29 | 0.29 |
| 57×38 | 76 | 2.5×2.5 | 2.5×2.5 | 0.29 | 0.29 |
| 57×44.5 | 76 | 2.5×2.5 | 2.5×2.5 | 0.29 | 0.29 |
| 76.1×57 | 89 | 2.5×2.5 | 2.5×2.5 | 0.40 | 0.40 |
| 88.9×57 | 89 | 2.5×2.5 | 2.5×2.5 | 0.44 | 0.44 |
| 88.9×76.1 | 89 | 2.5×2.5 | 2.5×2.5 | 0.50 | 0.50 |
| 108×57 | 102 | 3.0×2.5 | 3.0×2.5 | 0.67 | 0.67 |
| 108×76.1 | 102 | 3.0×2.5 | 3.0×2.5 | 0.75 | 0.75 |
| 108×88.9 | 102 | 3.0×2.5 | 3.0×2.5 | 0.80 | 0.80 |
| 159×57 | 140 | 3.0×2.5 | 3.5×2.5 | 0.32 | 1.54 |
| 159×76.1 | 140 | 3.0×2.5 | 3.5×2.5 | 1.44 | 1.68 |
| 159×88.9 | 140 | 3.0×2.5 | 3.5×2.5 | 1.52 | 1.77 |
| 159×108 | 140 | 3.0×3.0 | 3.5×3.0 | 1.64 | 1.91 |
| 219.1×76.1 | 152 | 4.0×2.5 | 4.5×2.5 | 2.49 | 2.79 |
| 219.1×88.9 | 152 | 4.0×2.5 | 4.5×2.5 | 2.60 | 2.92 |
| 219.1×108 | 152 | 4.0×3.0 | 4.5×3.0 | 2.77 | 3.11 |
| 219.1×159 | 152 | 4.0×3.0 | 4.5×3.5 | 3.21 | 3.60 |
| 267×108 | 178 | 4.5×3.0 | 5.5×3.0 | 4.84 | 5.89 |
| 267×159 | 178 | 4.5×3.0 | 5.5×3.5 | 5.52 | 6.71 |
| 267×219.1 | 178 | 4.5×4.0 | 5.5×4.5 | 6.31 | 7.68 |
| 323.9×159 | 203 | 5.5×3.0 | 7.0×3.5 | 7.63 | 9.65 |
| 323.9×219.1 | 203 | 5.5×4.0 | 7.0×4.5 | 8.60 | 10.89 |
| 323.9×267 | 203 | 5.5×4.5 | 7.0×5.5 | 9.38 | 11.87 |
| 368×219.1 | 330 | 6.5×4.0 | 8.0×4.5 | 17.24 | 21.50 |
| 368×267 | 330 | 6.5×4.5 | 8.0×5.5 | 18.68 | 23.00 |
| 368×323.9 | 330 | 6.5×5.5 | 8.0×7.0 | 20.39 | 25.00 |

| Specified Size OD (D x D1) | Length (L) | Wall Thickness (t x t1) | | Approx. Weight | |
|-------------------------------|---------------|-------------------------|-----------|----------------|--------|
| | | 16 bar | 20 bar | 16 bar | 20 bar |
| mm | mm | mm | mm | kg | kg |
| 419×267 | 356 | 7.0×4.5 | 9.0×5.5 | 23.44 | 30.00 |
| 419×323.9 | 356 | 7.0×5.5 | 9.0×7.0 | 25.43 | 32.50 |
| 419×368 | 356 | 7.0×6.5 | 9.0×8.0 | 26.97 | 34.50 |
| 457.2×323.9 | 381 | 8.0×5.5 | 9.5×7.0 | 30.70 | 37.03 |
| 457.2×368 | 381 | 8.0×6.5 | 9.5×8.0 | 34.06 | 41.50 |
| 457.2×419 | 381 | 8.0×7.0 | 9.5×9.0 | 37.90 | 46.50 |
| 508×368 | 508 | 8.5×6.5 | 11.0×8.0 | 50.80 | 64.10 |
| 508×419 | 508 | 8.5×7.0 | 11.0×9.0 | 55.40 | 71.10 |
| 508×457.2 | 508 | 8.5×8.0 | 11.0×9.5 | 61.20 | 75.70 |
| 610×419 | 508 | 10.5×7.0 | 13.0×9.0 | 70.00 | 87.50 |
| 610×457.2 | 508 | 10.5×8.0 | 13.0×9.5 | 76.30 | 92.50 |
| 610×508 | 508 | 10.5×8.5 | 13.0×11.0 | 81.80 | 102.80 |
| 711×457.2 | 610 | 12.0×8.0 | 15×9.5 | 109.30 | 133.60 |
| 711×508 | 610 | 12.0×8.5 | 15×11.0 | 116.30 | 146.70 |
| 711×610 | 610 | 12.0×10.5 | 15×13.0 | 137.30 | 170.10 |
| 813×508 | 610 | 13.5×8.5 | 17.0×11.0 | 136.40 | 172.60 |
| 813×610 | 610 | 13.5×10.5 | 17.0×13.0 | 158.40 | 197.30 |
| 813×711 | 610 | 13.5×12.0 | 17.0×15.0 | 179.50 | 224.20 |
| 914×610 | 610 | 15.5×10.5 | 19.0×13.0 | 185.00 | 226.70 |
| 914×711 | 610 | 15.5×12 | 19.0×15.0 | 207.10 | 255.00 |
| 914×813 | 610 | 15.5×13.5 | 19.0×17.0 | 231.30 | 285.80 |

Caps

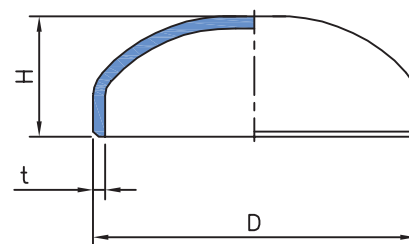
Type and Construction

Seamless

Dimensions

EEMUA 146 Section 1

Other dimensions are available on request



Weld Preparation

For wall thickness less than 3mm, the caps are supplied with plain weld ends. Larger thicknesses are supplied with the weld bevel of $37\frac{1}{2}^{\circ} \pm 2\frac{1}{2}^{\circ}$

| Specified Size OD(D) | Wall Thickness (t) | | H | | Approx. Weight | |
|-------------------------|--------------------|-------|-------|-------|----------------|--------|
| | 16bar | 20bar | 16bar | 20bar | 16 bar | 20 bar |
| | mm | mm | mm | mm | kg | kg |
| 44.5 | 2.5 | 2.5 | 19.6 | 19.6 | 0.08 | 0.08 |
| 57 | 2.5 | 2.5 | 22.0 | 22.0 | 0.11 | 0.11 |
| 76.1 | 2.5 | 2.5 | 25.7 | 25.7 | 0.18 | 0.18 |
| 88.9 | 2.5 | 2.5 | 28.2 | 28.2 | 0.24 | 0.24 |
| 108 | 3.0 | 3.0 | 31.7 | 31.7 | 0.40 | 0.40 |
| 159 | 3.0 | 3.5 | 41 | 44 | 0.8 | 0.97 |
| 219.1 | 4.0 | 4.5 | 55 | 60 | 2.0 | 2.40 |
| 267 | 4.5 | 5.5 | 69 | 69 | 3.4 | 4.10 |
| 323.9 | 5.5 | 7.0 | 80 | 85 | 5.9 | 7.70 |
| 368 | 6.5 | 8.0 | 93 | 103 | 9.1 | 11.90 |
| 419 | 7.0 | 9.0 | 102 | 112 | 12.4 | 16.90 |
| 457.2 | 8.0 | 9.5 | 119 | 119 | 17.6 | 20.90 |
| 508 | 8.5 | 11.0 | 129 | 139 | 22.7 | 30.80 |
| 610 | 10.5 | 13.0 | 148 | 163 | 39.2 | 51.60 |
| 711 | 12.0 | 15.0 | 176 | 191 | 61.8 | 81.40 |
| 813 | 13.5 | 17.0 | 200 | 210 | 90.5 | 117.40 |
| 914 | 15.5 | 19.0 | 221 | 231 | 132.2 | 166.20 |

Saddles

Saddles

Seamless : up to 12inch / 323.9mmOD

Seam Welded : from 14inch / 368.0mmOD

Dimensions

EEMUA 146 Section 7

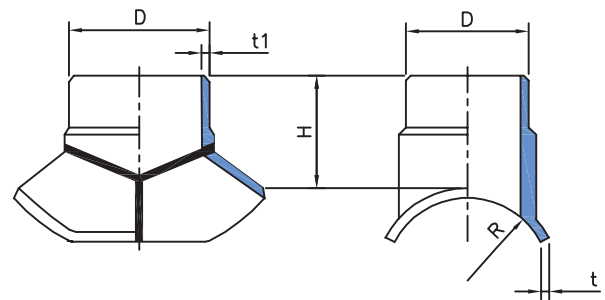
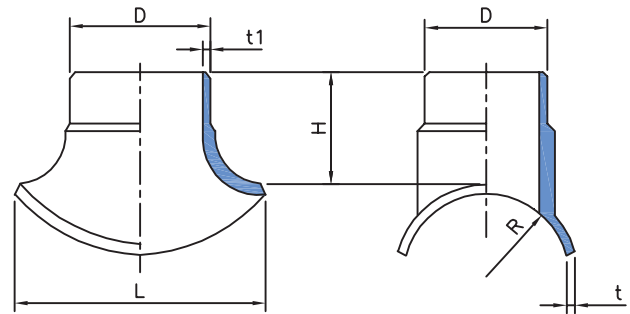
Other dimensions are available on request

Weld Preparation

Wall thicknesses of 3 mm and greater are chamfered to $37\frac{1}{2}^\circ \pm 2\frac{1}{2}^\circ$ with a root face of $1.6\text{ mm} \pm 0.8\text{ mm}$.

Inspection of Welds

100% radiographic inspection to ASME Code, Section VIII, UW51.



R = Radius of Header Pipe

| Specified Size OD (D x D1) | Wall Thickness (t x t1) | | Center to Face | | Approx. Weight | |
|-------------------------------|-------------------------|---------|----------------|-----|----------------|--------|
| | 16 bar | 20 bar | L | H | 16 bar | 20 bar |
| mm | mm | mm | mm | mm | kg | kg |
| 38×38 | 2.5×2.5 | 2.5×2.5 | 64 | 35 | 0.18 | 0.18 |
| 44.5×38 | 2.5×2.5 | 2.5×2.5 | 64 | 35 | 0.23 | 0.23 |
| 44.5×44.5 | 2.5×2.5 | 2.5×2.5 | 74 | 35 | 0.25 | 0.25 |
| 57×38 | 2.5×2.5 | 2.5×2.5 | 64 | 35 | 0.25 | 0.25 |
| 57×44.5 | 2.5×2.5 | 2.5×2.5 | 74 | 35 | 0.28 | 0.28 |
| 57×57 | 2.5×2.5 | 2.5×2.5 | 97 | 40 | 0.40 | 0.40 |
| 76.1×38 | 2.5×2.5 | 2.5×2.5 | 64 | 35 | 0.37 | 0.37 |
| 76.1×44.5 | 2.5×2.5 | 2.5×2.5 | 74 | 35 | 0.42 | 0.42 |
| 76.1×57 | 2.5×2.5 | 2.5×2.5 | 97 | 40 | 0.60 | 0.60 |
| 76.1×76.1 | 2.5×2.5 | 2.5×2.5 | 126 | 50 | 0.65 | 0.65 |
| 88.9×38 | 2.5×2.5 | 2.5×2.5 | 64 | 35 | 0.45 | 0.45 |
| 88.9×44.5 | 2.5×2.5 | 2.5×2.5 | 74 | 35 | 0.55 | 0.55 |
| 88.9×57 | 2.5×2.5 | 2.5×2.5 | 97 | 40 | 0.62 | 0.62 |
| 88.9×76.1 | 2.5×2.5 | 2.5×2.5 | 126 | 50 | 0.70 | 0.70 |
| 88.9×88.9 | 2.5×2.5 | 2.5×2.5 | 149 | 55 | 0.95 | 0.95 |
| 108×44.5 | 3.0×2.5 | 3.0×2.5 | 74 | 35 | 0.38 | 0.38 |
| 108×57 | 3.0×2.5 | 3.0×2.5 | 97 | 40 | 0.48 | 0.48 |
| 108×76.1 | 3.0×2.5 | 3.0×2.5 | 126 | 50 | 0.78 | 0.78 |
| 108×88.9 | 3.0×2.5 | 3.0×2.5 | 149 | 55 | 0.94 | 0.94 |
| 108×108 | 3.0×3.0 | 3.0×3.0 | 188 | 75 | 1.56 | 1.56 |
| 159×76.1 | 3.0×2.5 | 3.5×2.5 | 126 | 50 | 0.78 | 0.91 |
| 159×88.9 | 3.0×2.5 | 3.5×3.0 | 149 | 55 | 1.20 | 1.40 |
| 159×108 | 3.0×3.0 | 3.5×3.0 | 188 | 75 | 1.44 | 1.68 |
| 159×159 | 3.0×3.0 | 3.5×3.5 | 279 | 95 | 3.12 | 3.64 |
| 219.1×88.9 | 4.0×2.5 | 4.5×2.5 | 149 | 55 | 1.73 | 1.94 |
| 219.1×108 | 4.0×3.0 | 4.5×3.0 | 188 | 75 | 2.40 | 2.70 |
| 219.1×159 | 4.0×3.0 | 4.5×3.5 | 279 | 95 | 5.06 | 5.69 |
| 219.1×219.1 | 4.0×4.0 | 4.5×4.5 | 379 | 125 | 7.60 | 8.55 |

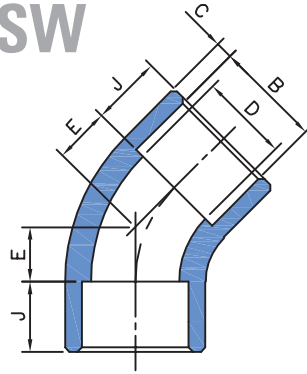
| Specified Size OD (D x D1) | Wall Thickness (t x t1) | | Center to Face | | Approx. Weight | |
|-------------------------------|-------------------------|-----------|----------------|-----|----------------|--------|
| | 16 bar | 20 bar | L | H | 16 bar | 20 bar |
| mm | mm | mm | mm | mm | kg | kg |
| 267×108 | 4.5×3.0 | 5.5×3.0 | 188 | 75 | 2.70 | 3.30 |
| 267×159 | 4.5×3.0 | 5.5×3.5 | 279 | 95 | 5.54 | 6.77 |
| 267×219.1 | 4.5×4.0 | 5.5×4.5 | 379 | 125 | 9.14 | 11.17 |
| 267×267 | 4.5×4.5 | 5.5×5.5 | 447 | 155 | 13.05 | 15.95 |
| 323.9×159 | 5.5×3.0 | 7.0×3.5 | 279 | 95 | 5.22 | 6.64 |
| 323.9×219.1 | 5.5×4.0 | 7.0×4.5 | 379 | 125 | 10.58 | 13.46 |
| 323.9×267 | 5.5×4.5 | 7.0×5.5 | 447 | 155 | 13.75 | 17.50 |
| 323.9×323.9 | 5.5×5.5 | 7.0×7.0 | 560 | 185 | 17.87 | 22.74 |
| 368×219.1 | 6.5×4.0 | 8.0×4.5 | 379 | 125 | 7.10 | 8.75 |
| 368×267 | 6.5×4.5 | 8.0×5.5 | 447 | 155 | 11.80 | 14.55 |
| 368×323.9 | 6.5×5.5 | 8.0×7.0 | 560 | 185 | 15.40 | 18.95 |
| 368×368 | 6.5×6.5 | 8.0×8.0 | 613 | 200 | 20.10 | 24.75 |
| 419×267 | 7.0×4.5 | 9.0×5.5 | 447 | 155 | 11.65 | 15.00 |
| 419×323.9 | 7.0×5.5 | 9.0×7.0 | 560 | 185 | 16.35 | 21.00 |
| 419×368 | 7.0×6.5 | 9.0×8.0 | 613 | 200 | 19.50 | 25.10 |
| 419×419 | 7.0×7.0 | 9.0×9.0 | 680 | 225 | 28.20 | 36.25 |
| 457.2×323.9 | 8.0×5.5 | 9.5×7.0 | 560 | 185 | 16.00 | 19.00 |
| 457.2×368 | 8.0×6.5 | 9.5×8.0 | 613 | 200 | 19.45 | 23.10 |
| 457.2×419 | 8.0×7.0 | 9.5×9.0 | 680 | 225 | 29.70 | 35.25 |
| 457.2×457 | 8.0×8.0 | 9.5×9.5 | 800 | 250 | 43.40 | 51.55 |
| 508×368 | 8.5×6.5 | 11.0×8.0 | 613 | 200 | 20.40 | 26.40 |
| 508×419 | 8.5×7.0 | 11.0×9.0 | 680 | 225 | 31.75 | 41.10 |
| 508×457.2 | 8.5×8.0 | 11.0×9.5 | 800 | 250 | 43.10 | 55.80 |
| 508×508 | 8.5×8.5 | 11.0×11.0 | 880 | 275 | 54.40 | 70.40 |
| 610×419 | 10.5×7.0 | 13.0×9.0 | 680 | 225 | 36.15 | 44.75 |
| 610×457.2 | 10.5×8.0 | 13.0×9.5 | 800 | 250 | 47.85 | 59.25 |
| 610×508 | 10.5×8.5 | 13.0×11.0 | 880 | 275 | 56.00 | 69.30 |
| 610×610 | 10.5×10.5 | 13.0×13.0 | 1020 | 300 | 99.20 | 122.80 |

Socket Welding Elbow 45°/ 90° Capillary Brazing Elbow 45°/ 90°

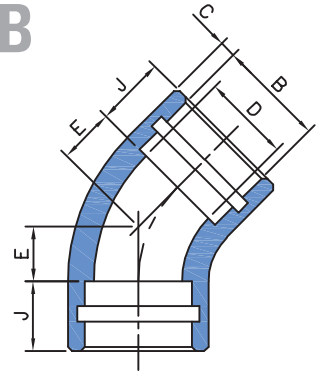
Elbow 45°

16 mm - 57 mm

SW



CB

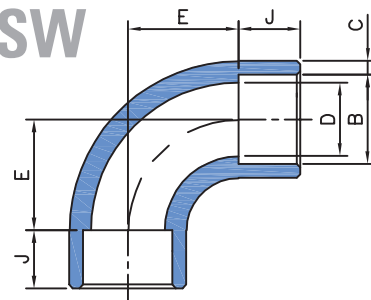


| Nominal Size | Specified Size OD | B | | C | D | E | | J | Approx. Weight | |
|--------------|-------------------|--------|--------|------|------|------|------|------|----------------|------|
| | | max. | min. | min. | min. | SR | LR | min. | SR | LR |
| inch | mm | mm | mm | mm | mm | mm | mm | mm | kg | kg |
| 1/2 | 16 | 16.121 | 16.070 | 3.2 | 12.0 | 5.0 | 12.0 | 10.0 | 0.17 | 0.20 |
| 3/4 | 25 | 25.131 | 25.080 | 3.2 | 21.0 | 8.0 | 15.5 | 13.0 | 0.28 | 0.33 |
| 1 | 30 | 30.131 | 30.080 | 3.2 | 25.0 | 12.0 | 18.6 | 13.0 | 0.38 | 0.44 |
| 1 1/4 | 38 | 38.146 | 38.095 | 3.2 | 33.0 | 15.0 | 23.6 | 13.0 | 0.70 | 0.80 |
| 1 1/2 | 44.5 | 44.646 | 44.595 | 3.2 | 39.5 | 18.0 | 27.6 | 13.0 | 0.90 | 1.10 |
| 2 | 57 | 57.276 | 57.225 | 3.2 | 52.0 | 21.0 | 35.3 | 16.0 | 1.30 | 1.88 |

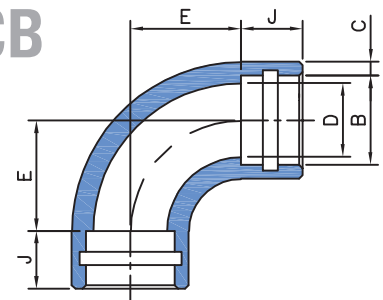
Elbow 90°

16 mm - 57 mm

SW



CB



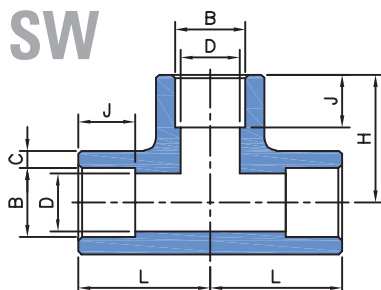
| Nominal Size | Specified Size OD | B | | C | D | E | | J | Approx. Weight | |
|--------------|-------------------|--------|--------|------|------|------|------|------|----------------|------|
| | | max. | min. | min. | min. | SR | LR | min. | SR | LR |
| inch | mm | mm | mm | mm | mm | mm | mm | mm | kg | kg |
| 1/2 | 16 | 16.121 | 16.070 | 3.2 | 12.0 | 17.0 | 30.0 | 10.0 | 0.25 | 0.30 |
| 3/4 | 25 | 25.131 | 25.080 | 3.2 | 21.0 | 24.0 | 37.5 | 13.0 | 0.34 | 0.44 |
| 1 | 30 | 30.131 | 30.080 | 3.2 | 25.0 | 25.0 | 45.0 | 13.0 | 0.50 | 0.64 |
| 1 1/4 | 38 | 38.146 | 38.095 | 3.2 | 33.0 | 30.0 | 57.0 | 13.0 | 0.76 | 0.85 |
| 1 1/2 | 44.5 | 44.646 | 44.595 | 3.2 | 39.5 | 39.0 | 66.8 | 13.0 | 0.93 | 1.17 |
| 2 | 57 | 57.276 | 57.225 | 3.2 | 52.0 | 49.0 | 85.5 | 16.0 | 1.44 | 2.09 |

Socket Welding Tees Capillary Brazing Tees

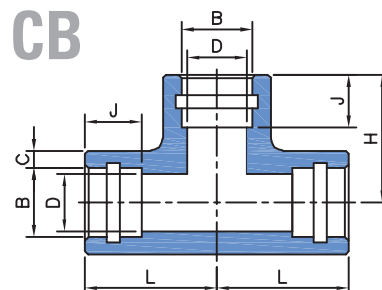
Equal Tees

16 mm - 57 mm

SW



CB



| Nominal Size | Specified Size OD | B | | C | D | J | L | H | Approx. Weight |
|--------------|-------------------|--------|--------|------|------|------|----|----|----------------|
| | | max. | min. | min. | min. | min. | | | |
| inch | mm | mm | mm | mm | mm | mm | mm | mm | kg |
| 1/2 | 16 | 16.121 | 16.070 | 3.2 | 12.0 | 10.0 | 23 | 23 | 0.170 |
| 3/4 | 25 | 25.131 | 25.080 | 3.2 | 21.0 | 13.0 | 26 | 26 | 0.193 |
| 1 | 30 | 30.131 | 30.080 | 3.2 | 25.0 | 13.0 | 30 | 30 | 0.261 |
| 1 1/4 | 38 | 38.146 | 38.095 | 3.2 | 33.0 | 13.0 | 38 | 38 | 0.428 |
| 1 1/2 | 44.5 | 44.646 | 44.595 | 3.2 | 39.5 | 13.0 | 40 | 40 | 0.567 |
| 2 | 57 | 57.276 | 57.225 | 3.2 | 52.0 | 16.0 | 50 | 50 | 0.804 |



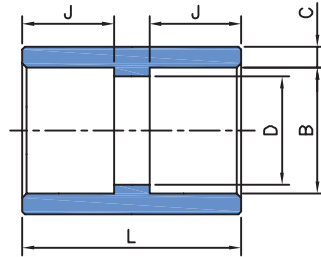
Socket Welding Couplings

Capillary Brazing Couplings

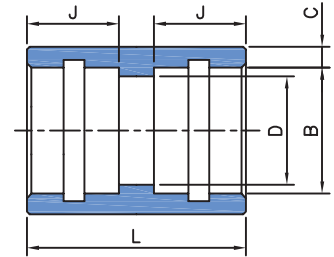
Couplings

29 mm - 76 mm

SW



CB

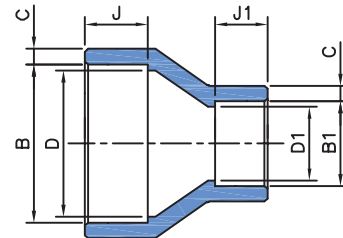


| Nominal Size | Specified Size OD | B | | C | D | J | L | Approx. Weight |
|--------------|-------------------|--------|--------|------|------|------|----|----------------|
| | | max. | min. | min. | min. | min. | | |
| inch | mm | mm | mm | mm | mm | mm | mm | kg |
| 1/2 | 16 | 16.121 | 16.070 | 3.2 | 12.0 | 10.0 | 22 | 0.039 |
| 3/4 | 25 | 25.131 | 25.080 | 3.2 | 21.0 | 13.0 | 28 | 0.073 |
| 1 | 30 | 30.131 | 30.080 | 3.2 | 25.0 | 13.0 | 30 | 0.087 |
| 1 1/4 | 38 | 38.146 | 38.095 | 3.2 | 33.0 | 13.0 | 30 | 0.108 |
| 1 1/2 | 44.5 | 44.646 | 44.595 | 3.2 | 39.5 | 13.0 | 30 | 0.132 |
| 2 | 57 | 57.276 | 57.225 | 3.2 | 52.0 | 16.0 | 36 | 0.201 |

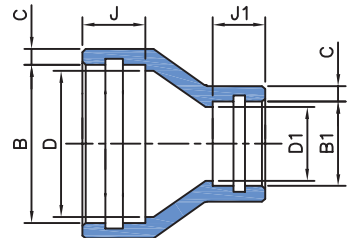
Reducing Couplings

25 mm - 57 mm

SW



CB



| Nominal Size | Specified Size OD | B | | B ₁ | | C | D | D ₁ | J | J ₁ | Approx. Weight |
|---------------|-------------------|--------|--------|----------------|--------|------|------|----------------|------|----------------|----------------|
| | | max. | min. | max. | min. | min. | min. | min. | min. | min. | |
| inch | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | kg |
| 3/4 × 1/2 | 25 × 16 | 25.131 | 25.080 | 16.121 | 16.070 | 3.2 | 21.0 | 12.0 | 13.0 | 10.0 | 0.092 |
| 1 × 1/2 | 30 × 16 | 30.131 | 30.080 | 16.121 | 16.070 | 3.2 | 25.0 | 12.0 | 13.0 | 10.0 | 0.018 |
| 1 × 3/4 | 30 × 25 | 30.131 | 30.080 | 25.131 | 25.080 | 3.2 | 25.0 | 21.0 | 13.0 | 13.0 | 0.012 |
| 1 1/4 × 1/2 | 38 × 16 | 38.146 | 38.095 | 16.121 | 16.070 | 3.2 | 33.0 | 12.0 | 13.0 | 10.0 | 0.152 |
| 1 1/4 × 3/4 | 38 × 25 | 38.146 | 38.095 | 25.131 | 25.080 | 3.2 | 33.0 | 21.0 | 13.0 | 13.0 | 0.136 |
| 1 1/4 × 1 | 38 × 30 | 38.146 | 38.095 | 30.131 | 30.080 | 3.2 | 33.0 | 25.0 | 13.0 | 13.0 | 0.126 |
| 1 1/2 × 1/2 | 44.5 × 16 | 44.646 | 44.595 | 16.121 | 16.070 | 3.2 | 39.5 | 12.0 | 13.0 | 10.0 | 0.199 |
| 1 1/2 × 3/4 | 44.5 × 25 | 44.646 | 44.595 | 25.131 | 25.080 | 3.2 | 39.5 | 21.0 | 13.0 | 13.0 | 0.182 |
| 1 1/2 × 1 | 44.5 × 30 | 44.646 | 44.595 | 30.131 | 30.080 | 3.2 | 39.5 | 25.0 | 13.0 | 13.0 | 0.174 |
| 1 1/2 × 1 1/4 | 44.5 × 38 | 44.646 | 44.595 | 38.146 | 38.095 | 3.2 | 39.5 | 33.0 | 13.0 | 13.0 | 0.144 |
| 2 × 1/2 | 57 × 16 | 57.276 | 57.225 | 16.121 | 16.070 | 3.2 | 52.0 | 12.0 | 16.0 | 10.0 | 0.322 |
| 2 × 3/4 | 57 × 25 | 57.276 | 57.225 | 25.131 | 25.080 | 3.2 | 52.0 | 21.0 | 16.0 | 13.0 | 0.310 |
| 2 × 1 | 57 × 30 | 57.276 | 57.225 | 30.131 | 30.080 | 3.2 | 52.0 | 25.0 | 16.0 | 13.0 | 0.298 |
| 2 × 1 1/4 | 57 × 38 | 57.276 | 57.225 | 38.146 | 38.095 | 3.2 | 52.0 | 33.0 | 16.0 | 13.0 | 0.268 |
| 2 × 1 1/2 | 57 × 44.5 | 57.276 | 57.225 | 44.646 | 44.595 | 3.2 | 52.0 | 39.5 | 16.0 | 13.0 | 0.234 |

Socket Welding End Caps

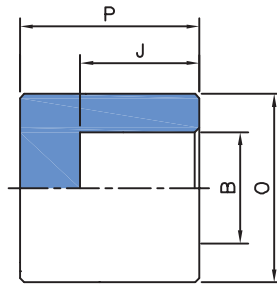
Capillary Brazing End Caps

NPT End Caps

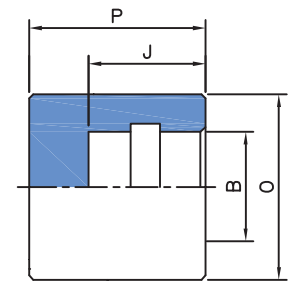
End Caps

16 mm - 57 mm

SW



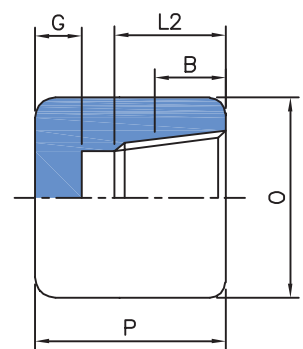
CB



| Nominal Size | Specified Size OD (B) | B | | O | J | P | Approx. Weight |
|--------------|--------------------------|--------|--------|------|------|------|-------------------|
| | | max. | min. | min. | min. | | |
| inch | mm | mm | mm | mm | mm | mm | kg |
| 1/2 | 16 | 16.121 | 16.070 | 23.0 | 10.0 | 14.5 | 0.050 |
| 3/4 | 25 | 25.131 | 25.080 | 32.0 | 13.0 | 15.0 | 0.070 |
| 1 | 30 | 30.131 | 30.080 | 37.0 | 13.0 | 16.0 | 0.080 |
| 1 1/4 | 38 | 38.146 | 38.095 | 45.0 | 13.0 | 20.0 | 0.130 |
| 1 1/2 | 44.5 | 44.646 | 44.595 | 52.0 | 13.0 | 20.5 | 0.190 |
| 2 | 57 | 57.276 | 57.225 | 64.0 | 16.0 | 20.5 | 0.220 |

NPT End Caps

1/2" - 2"



| Nominal Size | | O | P | G | B | L2 | Weight |
|--------------|------|----|----|-----|------|------|--------|
| | | | | min | | min | |
| inch | mm | mm | mm | mm | mm | mm | kg |
| 1/2 | 16 | 29 | 32 | 6.5 | 11.0 | 13.5 | 0.149 |
| 3/4 | 25 | 35 | 37 | 6.5 | 12.5 | 14.0 | 0.216 |
| 1 | 30 | 44 | 38 | 6.5 | 14.5 | 17.5 | 0.363 |
| 1 1/4 | 38 | 57 | 41 | 6.5 | 17.0 | 18.0 | 0.665 |
| 1 1/2 | 44.5 | 64 | 41 | 6.5 | 18.0 | 18.5 | 0.814 |
| 2 | 57 | 76 | 42 | 6.5 | 17.0 | 19.0 | 1.098 |

Weldolets

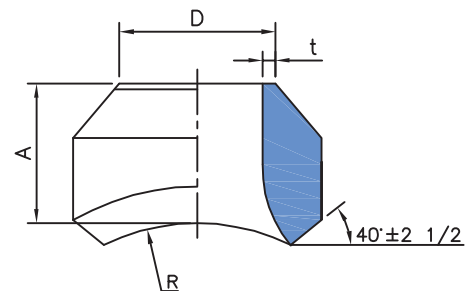
Type and Construction

By hot forging and machining from extruded bars

Dimensions

EEMUA 146 Section 6

Other dimensions are available on request



Weld Preparation

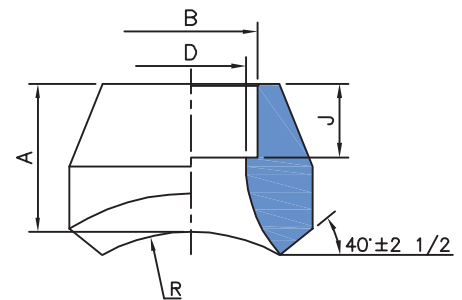
For wall thickness less than 3mm, the elbows are supplied with plain weld ends. Larger thicknesses are supplied with the weld bevel of $37\frac{1}{2}^{\circ} \pm 2\frac{1}{2}^{\circ}$

| Branch Pipe OD (D) | Header Size Range(R) | A | t | | Approx. Weight |
|-----------------------|-------------------------|-------|---------|---------|-------------------|
| | | | 16 bar | 20 bar | |
| mm | mm | mm | min. mm | min. mm | kg |
| 16 | 16 to 44.5 | 19.05 | 2.0 | 2.0 | 0.07 |
| 16 | 57 to 610 | 17.50 | 2.0 | 2.0 | 0.11 |
| 25 | 25 to 44.5 | 22.20 | 2.0 | 2.0 | 0.11 |
| 25 | 57 to 610 | 20.60 | 2.0 | 2.0 | 0.21 |
| 30 | 30 to 44.5 | 27.00 | 2.5 | 2.5 | 0.16 |
| 30 | 57 to 610 | 22.20 | 2.5 | 2.5 | 0.26 |
| 38 | 38 to 44.5 | 30.20 | 2.5 | 2.5 | 0.24 |
| 38 | 57 to 610 | 25.40 | 2.5 | 2.5 | 0.39 |
| 44.5 | 44.5 | 33.30 | 2.5 | 2.5 | 0.45 |
| 44.5 | 57 to 610 | 28.60 | 2.5 | 2.5 | 0.45 |
| 57 | 57 to 76.1 | 38.10 | 2.5 | 2.5 | 0.48 |
| 57 | 88.9 to 610 | 33.30 | 2.5 | 2.5 | 0.88 |
| 76.1 | 76.1 to 108 | 47.60 | 2.5 | 2.5 | 1.85 |
| 76.1 | 159 to 610 | 44.50 | 2.5 | 2.5 | 1.60 |
| 88.9 | 88.9 to 108 | 47.60 | 2.5 | 2.5 | 2.39 |
| 88.9 | 159 to 610 | 44.50 | 2.5 | 2.5 | 2.05 |
| 108 | 108 | 46.80 | 3.0 | 3.0 | 2.82 |
| 108 | 159 | 52.40 | 3.0 | 3.0 | 3.57 |
| 108 | 219.1 to 610 | 49.20 | 3.0 | 3.0 | 2.71 |
| 159 | 159 to 610 | 60.30 | 3.0 | 3.5 | 6.25 |
| 219.1 | 219.1 to 610 | 69.90 | 4.0 | 4.5 | 12.00 |
| 267 | 267 to 610 | 77.80 | 4.5 | 5.5 | 20.00 |
| 323.9 | 323.9 to 610 | 85.70 | 5.5 | 7.0 | 26.10 |
| 368 | 368 to 610 | 88.90 | 6.5 | 8.0 | 39.40 |
| 419 | 419 to 610 | 93.70 | 7.0 | 9.0 | 60.50 |

Sockolets

Sockolets

16 mm - 57 mm

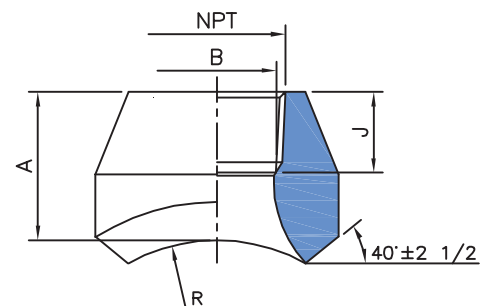


| Branch Pipe OD (B) | Header Size Range (R) | A | D | J | Approx. Weight |
|--------------------|-----------------------|-------|------|------|----------------|
| mm | mm | mm | mm | mm | kg |
| 16 | 25 to 44.5 | 25.40 | 12.0 | 10.0 | 0.10 |
| 16 | 57 to 914 | 23.80 | 12.0 | 10.0 | 0.10 |
| 25 | 30 to 44.5 | 26.90 | 21.0 | 13.0 | 0.13 |
| 25 | 57 to 914 | 25.40 | 21.0 | 13.0 | 0.13 |
| 30 | 38 to 44.5 | 33.30 | 25.0 | 13.0 | 0.22 |
| 30 | 57 to 914 | 28.60 | 25.0 | 13.0 | 0.22 |
| 38 | 57 to 914 | 33.30 | 33.0 | 13.0 | 0.35 |
| 44.5 | 57 to 914 | 30.20 | 39.5 | 13.0 | 0.50 |
| 57 | 76.1 to 914 | 38.10 | 52.0 | 16.0 | 0.90 |

Threadolets

Threadolets

1/2" - 2"



| Branch Pipe OD (D) | | Header Size Range (R) | A | B | J | Approx. Weight |
|--------------------|--------|-----------------------|-------|-------|------|----------------|
| mm | NPT | mm | mm | mm | mm | kg |
| 16 | 1/2" | 25 to 44.5 | 25.40 | 11.74 | 13.5 | 0.10 |
| 16 | 1/2" | 57 to 914 | 23.80 | 11.74 | 13.5 | 0.10 |
| 25 | 3/4" | 30 to 44.5 | 26.90 | 15.58 | 14.0 | 0.13 |
| 25 | 3/4" | 57 to 914 | 25.40 | 15.58 | 14.0 | 0.13 |
| 30 | 1" | 38 to 44.5 | 33.30 | 20.70 | 17.5 | 0.22 |
| 30 | 2" | 57 to 914 | 28.60 | 20.70 | 17.5 | 0.22 |
| 38 | 1 1/4" | 57 to 914 | 33.30 | 29.50 | 18.0 | 0.35 |
| 44.5 | 1 1/2" | 57 to 914 | 30.20 | 34.02 | 18.5 | 0.50 |
| 57 | 2" | 76.1 to 914 | 38.10 | 42.82 | 19.0 | 0.90 |



Composite Weld Neck Flanges: Weld Neck Stub Ends

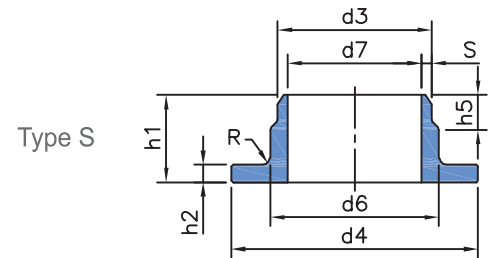
Type and Construction

Short Type(Type S)

Based on DIN 86037 but modified to suit the appropriate tube wall dimensions

Long Type(Type L)

Based on MSS SP-43 to suit the appropriate tube wall dimensions



Dimensions

EEMUA 145 section 1

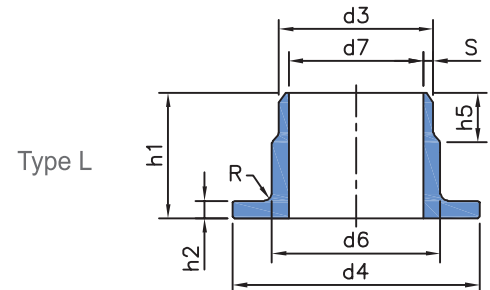
Other dimensions are available on request

Tolerances

EEMUA 145 section 1

Weld Preparation

The stub ends with $S1 < 3\text{mm}$ are supplied with plain weld ends. Larger dimension are supplied with the weld bevel of $37 \frac{1}{2}^\circ \pm 2 \frac{1}{2}^\circ$



| Nominal Size | | d3 | d4 | d6 | d7 | | h1 | | h2 | h5 | S | | Approx. Weight | | | |
|--------------|-------|-------|--------|-------|--------|--------|--------|--------|------|------|---------|---------|----------------|--------|--------|--------|
| | | | | | | | | | | | | | 16 bar | | 20 bar | |
| inch | mm | mm | mm | mm | mm | mm | Type S | Type L | mm | mm | min. mm | min. mm | Type S | Type L | Type S | Type L |
| 1/2 | 16 | 16.0 | 40.0 | 18.0 | 12.00 | 12.00 | 35.0 | 51.0 | 4.0 | 15.0 | 2.0 | 2.0 | 0.07 | 0.09 | 0.07 | 0.09 |
| 3/4 | 25 | 25.0 | 50.0 | 27.0 | 21.00 | 21.00 | 40.0 | 51.0 | 5.0 | 15.0 | 2.0 | 2.0 | 0.16 | 0.19 | 0.16 | 0.19 |
| 1 | 30 | 30.0 | 60.0 | 32.0 | 25.00 | 25.00 | 40.0 | 51.0 | 5.0 | 15.0 | 2.5 | 2.5 | 0.20 | 0.23 | 0.20 | 0.23 |
| 1 1/4 | 38 | 38.0 | 70.0 | 40.0 | 33.03 | 33.03 | 40.0 | 51.0 | 5.0 | 15.0 | 2.5 | 2.5 | 0.25 | 0.29 | 0.25 | 0.29 |
| 1 1/2 | 44.5 | 44.5 | 80.0 | 46.5 | 39.53 | 39.53 | 45.0 | 51.0 | 6.0 | 15.0 | 2.5 | 2.5 | 0.42 | 0.44 | 0.42 | 0.44 |
| 2 | 57 | 57.0 | 99.0 | 59.0 | 52.16 | 52.16 | 45.0 | 64.0 | 6.0 | 15.0 | 2.5 | 2.5 | 0.50 | 0.61 | 0.50 | 0.61 |
| 2 1/2 | 76.1 | 76.1 | 120.0 | 78.0 | 71.23 | 71.23 | 45.0 | 64.0 | 6.0 | 15.0 | 2.5 | 2.5 | 0.67 | 0.80 | 0.67 | 0.80 |
| 3 | 88.9 | 88.9 | 130.0 | 91.0 | 84.08 | 84.08 | 50.0 | 64.0 | 7.0 | 15.0 | 2.5 | 2.5 | 0.86 | 0.97 | 0.86 | 0.97 |
| 4 | 108 | 108.0 | 158.0 | 110.0 | 102.13 | 102.13 | 50.0 | 76.0 | 7.0 | 15.0 | 3.0 | 3.0 | 1.18 | 1.50 | 1.20 | 1.50 |
| 6 | 159 | 159.0 | 212.0 | 161.5 | 153.75 | 152.38 | 50.0 | 89.0 | 9.0 | 15.0 | 3.0 | 3.5 | 2.20 | 2.90 | 2.20 | 2.90 |
| 8 | 219.1 | 219.1 | 270.0 | 222.0 | 211.10 | 210.10 | 50.0 | 102.0 | 9.0 | 15.0 | 4.0 | 4.5 | 3.20 | 5.10 | 3.30 | 5.20 |
| 10 | 267 | 267.0 | 320.0 | 270.0 | 257.97 | 255.93 | 50.0 | 127.0 | 9.0 | 15.0 | 4.5 | 5.5 | 3.90 | 8.90 | 4.20 | 9.80 |
| 12 | 323.9 | 323.9 | 370.0 | 327.0 | 312.83 | 309.74 | 50.0 | 152.0 | 11.0 | 16.0 | 5.5 | 7.0 | 6.50 | 13.80 | 6.80 | 15.40 |
| 14 | 368 | 368.0 | 430.0 | 371.0 | 354.22 | 351.00 | 50.0 | 152.0 | 11.0 | 16.0 | 6.5 | 8.0 | 7.45 | 16.60 | 8.20 | 19.00 |
| 16 | 419 | 419.0 | 482.0 | 422.0 | 404.17 | 399.84 | 50.0 | 152.0 | 12.0 | 16.0 | 7.0 | 9.0 | 9.20 | 20.25 | 10.35 | 23.95 |
| 18 | 457.2 | 457.2 | 530.0 | 460.0 | 441.50 | 438.50 | 50.0 | 152.0 | 12.0 | 16.0 | 8.0 | 9.5 | 11.45 | 23.60 | 12.40 | 26.40 |
| 20 | 508 | 508.0 | 585.0 | 511.0 | 490.50 | 486.50 | 50.0 | 152.0 | 12.0 | 20.0 | 8.5 | 11.0 | 13.40 | 28.65 | 15.10 | 33.85 |
| 24 | 610 | 610.0 | 685.0 | 613.0 | 589.50 | 584.50 | 60.0 | 152.0 | 14.0 | 20.0 | 10.5 | 13.0 | 20.75 | 39.25 | 23.25 | 45.50 |
| 28 | 711 | 711.0 | 800.0 | 719.0 | 687.50 | 681.50 | 60.0 | 190.0 | 19.0 | 24.0 | 12.0 | 15.0 | 33.35 | 75.30 | 36.80 | 86.20 |
| 32 | 813 | 813.0 | 905.0 | 821.0 | 786.50 | 779.50 | 60.0 | 190.0 | 20.5 | 24.0 | 13.5 | 17.0 | 42.25 | 94.60 | 46.85 | 100.15 |
| 36 | 914 | 914.0 | 1000.0 | 922.0 | 883.50 | 876.50 | 60.0 | 190.0 | 22.0 | 32.0 | 15.5 | 19.0 | 49.35 | 115.55 | 54.55 | 131.95 |

Composite Slip-On Flanges: Slip-On Stub Ends

Type and Construction

Suitable for both 16 and 20 bar

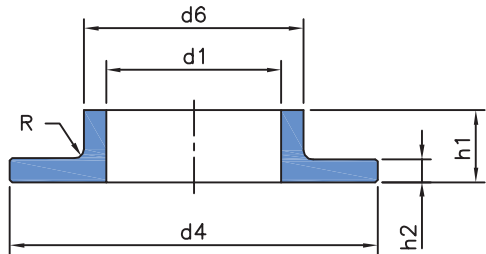
Dimensions

EEMUA 145 section 2

Other dimensions are available on request

Tolerances

EEMUA 145 section 2



| Nominal Size | | d ₁ | d ₆ | d ₄ | h ₁ | h ₂ | Approx. Weight |
|--------------|------|----------------|----------------|----------------|----------------|----------------|----------------|
| inch | mm | mm | mm | mm | mm | mm | kg |
| 1/2 | 16 | 16.07 | 21.0 | 40.0 | 16.0 | 5.0 | 0.10 |
| 3/4 | 25 | 25.08 | 31.0 | 53.0 | 16.0 | 5.0 | 0.10 |
| 1 | 30 | 30.08 | 36.0 | 60.0 | 18.0 | 5.0 | 0.13 |
| 1 1/4 | 38 | 38.10 | 45.0 | 70.0 | 18.0 | 5.0 | 0.13 |
| 1 1/2 | 44.5 | 44.60 | 51.0 | 80.0 | 19.0 | 5.0 | 0.22 |
| 2 | 57 | 57.23 | 67.0 | 99.0 | 19.0 | 6.0 | 0.22 |
| 2 1/2 | 76.1 | 76.33 | 87.0 | 120.0 | 19.0 | 6.0 | 0.35 |
| 3 | 88.9 | 89.18 | 100.0 | 130.0 | 21.0 | 7.0 | 0.50 |
| 4 | 108 | 108.38 | 120.0 | 158.0 | 23.0 | 7.0 | 0.90 |

Backing Flanges

Type and Construction

Manufactured from forged carbon steel to ASTM A105.

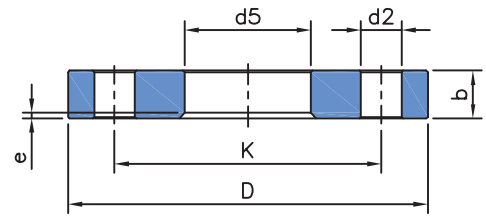
Generally the flanges are protected by galvanising.

Polyamid epoxy coatings are available on request.

Drilling and outside diameter dimensions of flange

- 1/2" ~ 24" are in accordance with ASME B16.5

- 28" ~ 36" are in accordance with MSS SP 44



Dimensions

EEMUA 145 section 1

Other dimensions are available on request

Tolerances

EEMUA 145 section 1

Class 150

| Nominal Size | | D | b | d2 | d5 | | K | e | No. of Holes | Approx. Weight |
|--------------|-------|--------|---------|------|-----------|---------|--------|-----|--------------|----------------|
| | | | | | Weld Neck | Slip On | | | | |
| inch | mm | mm | min. mm | mm | mm | mm | mm | mm | | kg |
| 1/2 | 16 | 89.0 | 14.0 | 15.9 | 19.0 | 23.0 | 60.3 | 2.0 | 4 | 0.60 |
| 3/4 | 25 | 98.0 | 14.0 | 15.9 | 28.0 | 33.0 | 69.8 | 3.0 | 4 | 0.80 |
| 1 | 30 | 108.0 | 14.0 | 15.9 | 33.0 | 38.0 | 79.4 | 3.0 | 4 | 0.90 |
| 1 1/4 | 38 | 117.0 | 14.0 | 15.9 | 41.0 | 47.0 | 88.9 | 3.0 | 4 | 1.10 |
| 1 1/2 | 44.5 | 127.0 | 14.0 | 15.9 | 48.0 | 53.0 | 98.4 | 3.0 | 4 | 1.20 |
| 2 | 57 | 152.0 | 18.0 | 19.0 | 62.0 | 69.0 | 120.6 | 3.0 | 4 | 2.10 |
| 2 1/2 | 76.1 | 178.0 | 18.0 | 19.0 | 81.0 | 89.0 | 139.7 | 3.0 | 4 | 2.60 |
| 3 | 88.9 | 190.0 | 19.0 | 19.0 | 94.0 | 103.0 | 152.4 | 3.0 | 4 | 2.90 |
| 4 | 108 | 229.0 | 24.0 | 19.0 | 113.0 | 123.0 | 190.5 | 3.0 | 8 | 5.90 |
| 6 | 159 | 279.0 | 27.0 | 22.2 | 164.0 | | 241.3 | 4.0 | 8 | 8.40 |
| 8 | 219.1 | 343.0 | 31.0 | 22.2 | 225.0 | | 298.4 | 5.0 | 8 | 12.35 |
| 10 | 267 | 406.0 | 38.0 | 25.4 | 273.0 | | 362.0 | 5.0 | 12 | 19.70 |
| 12 | 323.9 | 483.0 | 41.0 | 25.4 | 330.0 | | 431.8 | 7.0 | 12 | 32.20 |
| 14 | 368 | 533.0 | 45.0 | 28.6 | 374.0 | | 476.2 | 7.0 | 12 | 38.20 |
| 16 | 419 | 597.0 | 51.0 | 28.6 | 426.0 | | 539.8 | 7.0 | 16 | 52.15 |
| 18 | 457.2 | 635.0 | 52.0 | 31.8 | 465.0 | | 577.8 | 7.0 | 16 | 54.05 |
| 20 | 508 | 698.0 | 58.0 | 31.8 | 517.0 | | 635.0 | 7.0 | 20 | 73.20 |
| 24 | 610 | 813.0 | 71.0 | 34.9 | 618.0 | | 749.0 | 9.0 | 20 | 114.25 |
| 28 | 711 | 927.0 | 81.0 | 34.9 | 727.0 | | 864.0 | 9.0 | 28 | 151.80 |
| 32 | 813 | 1060.0 | 95.0 | 41.1 | 829.0 | | 978.0 | 9.0 | 28 | 233.50 |
| 36 | 914 | 1168.0 | 105.0 | 41.1 | 931.0 | | 1086.0 | 9.0 | 32 | 294.10 |

Composite Blind Flanges

Type and Construction

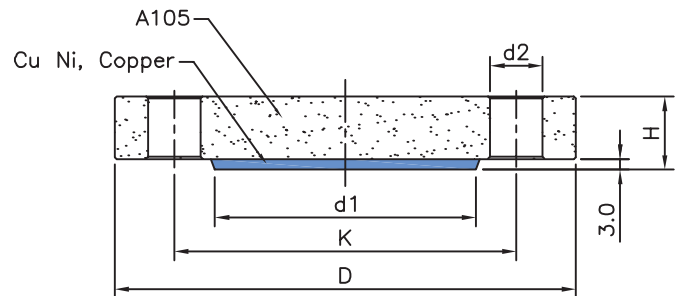
Manufactured from forged carbon steel to ASTM A105 overlaid with CuNi disk plate. Generally the flanges are protected by galvanising. Polyamid epoxy coatings are available on request.

Dimensions

ASME B16.5

Tolerances

ASME B16.5



Class 150

| Nominal Size | | D | K | d ₂ | H | d ₁ | No. of Holes | Approx. Weight |
|--------------|-------|-----|-------|----------------|---------|----------------|--------------|----------------|
| inch | mm | mm | mm | mm | min. mm | mm | | kg |
| 1/2 | 16 | 90 | 60.3 | 15.9 | 12.5 | 34.9 | 4 | 0.82 |
| 3/4 | 25 | 100 | 69.9 | 15.9 | 14.1 | 42.9 | 4 | 1.04 |
| 1 | 30 | 110 | 79.4 | 15.9 | 15.7 | 5.8 | 4 | 1.31 |
| 1 1/4 | 38 | 115 | 88.9 | 15.9 | 17.3 | 63.5 | 4 | 1.58 |
| 1 1/2 | 44.5 | 125 | 98.4 | 15.9 | 18.9 | 73 | 4 | 1.90 |
| 2 | 57 | 150 | 120.7 | 19.0 | 20.5 | 92.1 | 4 | 3.01 |
| 2 1/2 | 76.1 | 180 | 139.7 | 19.0 | 23.7 | 104.8 | 4 | 4.68 |
| 3 | 88.9 | 190 | 152.4 | 19.0 | 25.3 | 127 | 4 | 5.70 |
| 4 | 108 | 230 | 190.5 | 19.0 | 25.3 | 157.2 | 8 | 8.67 |
| 6 | 159 | 280 | 241.3 | 22.2 | 26.9 | 215.9 | 8 | 15.46 |
| 8 | 219.1 | 345 | 298.5 | 22.2 | 30 | 268.9 | 8 | 24.90 |
| 10 | 267 | 405 | 362.0 | 25.4 | 31.6 | 323.8 | 12 | 41.23 |
| 12 | 323.9 | 485 | 431.8 | 25.4 | 33.2 | 381 | 12 | 70.55 |
| 14 | 368 | 535 | 476.3 | 28.6 | 36.4 | 412.8 | 12 | 93.16 |
| 16 | 419 | 595 | 539.8 | 28.6 | 38 | 469.9 | 16 | 123.99 |
| 18 | 457.2 | 635 | 577.9 | 31.8 | 41.1 | 533.4 | 16 | 147.55 |
| 20 | 508 | 700 | 635.0 | 31.8 | 44.3 | 584.2 | 20 | 191.00 |
| 24 | 610 | 815 | 749.3 | 34.9 | 49.1 | 692.2 | 20 | 285.74 |

Solid Weld Neck Flanges

Type and Construction

Drilling and outside diameter dimensions of flange

- 1/2" ~ 24" are in accordance with ASME B16.5

- 28" ~ 36" are in accordance with MSS SP 44

The recommended bolting is in accordance with

ASTM B150 UNS C63000

Dimensions

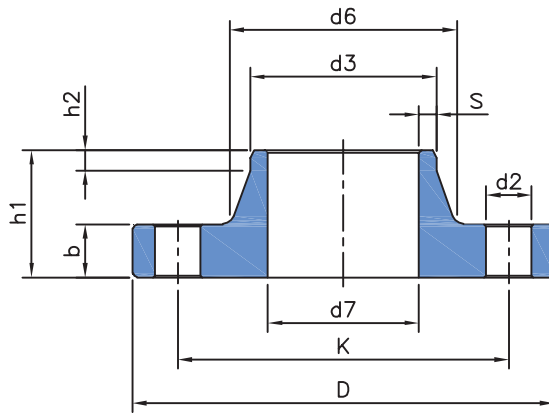
EEMUA 145 section 3

Other dimensions are available on request

Tolerances

EEMUA 145 section 3

| Nominal Size | | D | b | d ₆ | d ₃ | h ₁ | d ₇ | |
|--------------|-------|--------|------|----------------|----------------|----------------|----------------|--------|
| | | | | | | | 16 bar | 20 bar |
| inch | mm | mm | mm | mm | mm | mm | mm | mm |
| 1/2 | 16 | 89.0 | 14.0 | 23.0 | 16.0 | 48.0 | 12.00 | 12.00 |
| 3/4 | 25 | 98.0 | 16.0 | 32.0 | 25.0 | 52.0 | 21.00 | 21.00 |
| 1 | 30 | 108.0 | 16.0 | 42.0 | 30.0 | 56.0 | 25.00 | 25.00 |
| 1 1/4 | 38 | 117.0 | 17.0 | 51.0 | 38.0 | 57.0 | 33.03 | 33.03 |
| 1 1/2 | 44.5 | 127.0 | 20.0 | 61.0 | 44.5 | 62.0 | 39.53 | 39.53 |
| 2 | 57 | 152.0 | 25.0 | 73.0 | 57.0 | 64.0 | 52.16 | 52.16 |
| 2 1/2 | 76.1 | 178.0 | 27.0 | 91.0 | 76.1 | 70.0 | 71.23 | 71.23 |
| 3 | 88.9 | 190.0 | 27.0 | 105.0 | 88.9 | 70.0 | 84.08 | 84.08 |
| 4 | 108 | 229.0 | 27.0 | 135.0 | 108.0 | 76.0 | 102.13 | 102.13 |
| 6 | 159 | 279.0 | 27.0 | 192.0 | 159.0 | 89.0 | 153.75 | 152.38 |
| 8 | 219.1 | 343.0 | 31.0 | 246.0 | 219.1 | 98.0 | 211.10 | 210.10 |
| 10 | 267 | 406.0 | 31.0 | 305.0 | 267.0 | 98.0 | 257.97 | 255.93 |
| 12 | 323.9 | 483.0 | 35.0 | 365.0 | 323.9 | 98.0 | 312.83 | 309.74 |
| 14 | 368 | 533.0 | 41.0 | 400.0 | 368.0 | 99.0 | 354.22 | 351.00 |
| 16 | 419 | 597.0 | 43.0 | 457.0 | 419.0 | 106.0 | 404.17 | 399.84 |
| 18 | 457.2 | 635.0 | 45.0 | 505.0 | 457.2 | 113.0 | 441.50 | 438.50 |
| 20 | 508 | 698.0 | 45.0 | 559.0 | 508.0 | 118.0 | 490.50 | 486.50 |
| 24 | 610 | 813.0 | 49.0 | 664.0 | 610.0 | 137.0 | 589.50 | 584.50 |
| 28 | 711 | 927.0 | 72.0 | 748.0 | 711.0 | 145.0 | 687.50 | 681.40 |
| 32 | 813 | 1060.0 | 72.0 | 876.0 | 813.0 | 160.0 | 786.50 | 779.50 |
| 36 | 914 | 1168.0 | 72.0 | 984.0 | 914.0 | 175.0 | 883.50 | 876.50 |



Class 150

| S | | h ₂ | K | d ₂ | No. of Holes | Approx. Weight | |
|---------|---------|----------------|---------|----------------|--------------|----------------|--------|
| 16 bar | 20 bar | | | | | 16 bar | 20 bar |
| min. mm | min. mm | min. mm | min. mm | kg | kg | kg | kg |
| 2.0 | 2.0 | 8.0 | 60.3 | 15.9 | 4 | 0.72 | 0.72 |
| 2.0 | 2.0 | 7.0 | 69.8 | 15.9 | 4 | 1.04 | 1.04 |
| 2.5 | 2.5 | 8.0 | 79.4 | 15.9 | 4 | 1.30 | 1.30 |
| 2.5 | 2.5 | 8.0 | 88.9 | 15.9 | 4 | 1.70 | 1.70 |
| 2.5 | 2.5 | 7.0 | 98.4 | 15.9 | 4 | 2.30 | 2.30 |
| 2.5 | 2.5 | 9.0 | 120.6 | 19.0 | 4 | 4.10 | 4.10 |
| 2.5 | 2.5 | 8.0 | 139.7 | 19.0 | 4 | 6.10 | 6.10 |
| 2.5 | 2.5 | 8.0 | 152.4 | 19.0 | 4 | 7.10 | 7.10 |
| 3.0 | 3.0 | 8.0 | 190.5 | 19.0 | 8 | 10.20 | 10.20 |
| 3.0 | 3.5 | 8.0 | 241.3 | 22.2 | 8 | 15.50 | 15.80 |
| 4.0 | 4.5 | 8.0 | 298.4 | 22.2 | 8 | 27.70 | 28.00 |
| 4.5 | 5.5 | 8.0 | 362.0 | 25.4 | 12 | 38.50 | 39.30 |
| 5.5 | 7.0 | 8.0 | 431.8 | 25.4 | 12 | 61.60 | 62.90 |
| 6.5 | 8.0 | 8.0 | 476.2 | 28.6 | 12 | 86.80 | 88.40 |
| 7.0 | 9.0 | 8.0 | 539.8 | 28.6 | 16 | 114.20 | 115.60 |
| 8.0 | 9.5 | 8.0 | 577.8 | 31.8 | 16 | 136.00 | 140.70 |
| 8.5 | 11.0 | 8.0 | 635.0 | 31.8 | 20 | 164.60 | 168.40 |
| 10.5 | 13.0 | 8.0 | 749.3 | 34.9 | 20 | 247.70 | 253.70 |
| 12.0 | 15.0 | 8.0 | 864.0 | 34.9 | 28 | 453.00 | 461.10 |
| 13.5 | 17.0 | 8.0 | 978.0 | 41.1 | 28 | 599.00 | 611.10 |
| 15.5 | 19.0 | 8.0 | 1086.0 | 41.1 | 32 | 741.00 | 755.70 |

Solid Slip-On Flanges

Type and Construction

Suitable for both 16 and 20bar.

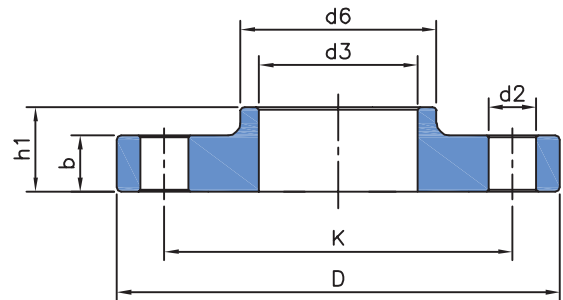
Drilling and outside diameter dimensions are in accordance with ASME B16.5.

The recommended bolting is in accordance with ASTM B150 UNS C63000.

Dimensions

EEMUA 145 section 4

Other dimensions are available on request



Tolerances

EEMUA 145 section 4

Class 150

| Nominal Size | | D | d ₃ | b | h ₁ | d ₆ | No. of Holes | d ₂ | K | Approx. Weight |
|--------------|------|-----|----------------|----|----------------|----------------|--------------|----------------|-------|----------------|
| inch | mm | mm | mm | mm | mm | mm | | mm | mm | kg |
| 1/2 | 16 | 89 | 16.07 | 14 | 20 | 23 | 4 | 15.9 | 60.3 | 0.66 |
| 3/4 | 25 | 98 | 25.08 | 16 | 24 | 32 | 4 | 15.9 | 69.8 | 0.91 |
| 1 | 30 | 108 | 30.08 | 16 | 24 | 47 | 4 | 15.9 | 79.4 | 1.16 |
| 1 1/4 | 38 | 117 | 38.10 | 17 | 26 | 51 | 4 | 15.9 | 88.9 | 1.4 |
| 1 1/2 | 44.5 | 127 | 44.60 | 20 | 26 | 61 | 4 | 15.9 | 98.4 | 1.9 |
| 2 | 57 | 152 | 57.23 | 25 | 28 | 73 | 4 | 19.0 | 120.6 | 3.3 |
| 2 1/2 | 76.1 | 178 | 76.33 | 27 | 32 | 91 | 4 | 19.0 | 139.7 | 4.7 |
| 3 | 88.9 | 190 | 89.18 | 27 | 34 | 105 | 4 | 19.0 | 152.4 | 5.2 |
| 4 | 108 | 229 | 108.38 | 27 | 40 | 135 | 8 | 19.0 | 190.5 | 7.7 |

Solid Blind Flanges

Type and Construction

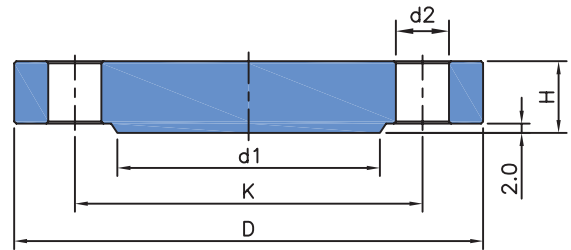
Manufactured from forged Round Bar or Plate.

Dimensions

ASME B16.5

Tolerances

ASME B16.5



Class 150

| Nominal Size | | D | K | d ₂ | H | d ₁ | No. of Holes | Approx. Weight |
|--------------|-------|-----|-------|----------------|---------|----------------|--------------|----------------|
| inch | mm | mm | mm | mm | min. mm | mm | | kg |
| 1/2 | 16 | 90 | 60.3 | 15.9 | 11.6 | 34.9 | 4 | 0.82 |
| 3/4 | 25 | 100 | 69.9 | 15.9 | 13.2 | 42.9 | 4 | 1.04 |
| 1 | 30 | 110 | 79.4 | 15.9 | 14.7 | 5.8 | 4 | 1.31 |
| 1 1/4 | 38 | 115 | 88.9 | 15.9 | 16.3 | 63.5 | 4 | 1.58 |
| 1 1/2 | 44.5 | 125 | 98.4 | 15.9 | 17.9 | 73 | 4 | 1.90 |
| 2 | 57 | 150 | 120.7 | 19.0 | 19.5 | 92.1 | 4 | 3.01 |
| 2 1/2 | 76.1 | 180 | 139.7 | 19.0 | 22.7 | 104.8 | 4 | 4.68 |
| 3 | 88.9 | 190 | 152.4 | 19.0 | 24.3 | 127 | 4 | 5.70 |
| 4 | 108 | 230 | 190.5 | 19.0 | 24.3 | 157.2 | 8 | 8.67 |
| 6 | 159 | 280 | 241.3 | 22.2 | 25.9 | 215.9 | 8 | 15.46 |
| 8 | 219.1 | 345 | 298.5 | 22.2 | 29 | 268.9 | 8 | 24.90 |
| 10 | 267 | 405 | 362.0 | 25.4 | 30.6 | 323.8 | 12 | 41.23 |
| 12 | 323.9 | 485 | 431.8 | 25.4 | 32.2 | 381 | 12 | 70.55 |
| 14 | 368 | 535 | 476.3 | 28.6 | 35.4 | 412.8 | 12 | 93.16 |
| 16 | 419 | 595 | 539.8 | 28.6 | 37 | 469.9 | 16 | 123.99 |
| 18 | 457.2 | 635 | 577.9 | 31.8 | 40.1 | 533.4 | 16 | 147.55 |
| 20 | 508 | 700 | 635.0 | 31.8 | 43.3 | 584.2 | 20 | 191.00 |
| 24 | 610 | 815 | 749.3 | 34.9 | 48.1 | 692.2 | 20 | 285.74 |

Seamless Copper Pipes(A13 / ASME B31.3)

Copper Pipes - SPS(Standard Pipe Sizes)

Preferred Wall Thickness for Drawn Seamless Pipes Based on SPS Diameter

Preferred Sizes according to ASTM B 466 / B 466M - 03

APPENDIX (nonmandatory Information)

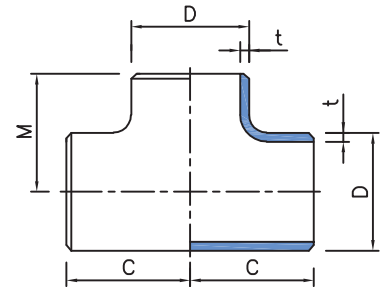
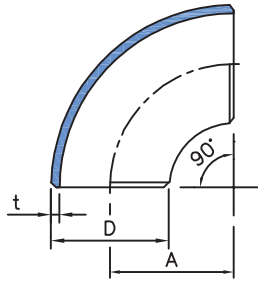
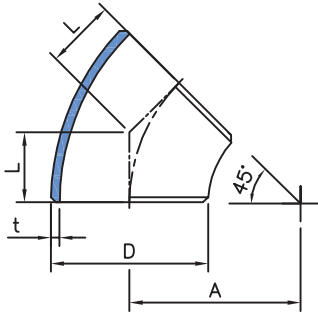
Ref : Material Standard : A13(EIL)/Code : ASME B31.3

| Nominal Size | Outside Diameter | | Wall Thickness | | Material |
|--------------|------------------|-------|----------------|------|--|
| inch | inch | mm | inch | mm | mm |
| 1/8 | 0.405 | 10.3 | 0.062 | 1.57 | Seamless Hard Drawn(H80) Regular Copper to ASTM B42 UNS No.C12200 |
| 1/4 | 0.540 | 13.7 | 0.082 | 2.08 | |
| 3/8 | 0.675 | 17.1 | 0.090 | 2.29 | |
| 1/2 | 0.840 | 21.3 | 0.107 | 2.72 | |
| 3/4 | 1.050 | 26.7 | 0.114 | 2.90 | |
| 1 | 1.315 | 33.4 | 0.126 | 3.20 | |
| 1 1/4 | 1.660 | 42.2 | 0.146 | 3.71 | |
| 1 1/2 | 1.900 | 48.3 | 0.150 | 3.81 | |
| 2 | 2.375 | 60.3 | 0.156 | 3.96 | Seamless Light Drawn(H55) Regular Copper to ASTM B42 UNS No.C12200 |
| 2 1/2 | 2.875 | 73.0 | 0.187 | 4.75 | |
| 3 | 3.500 | 88.9 | 0.219 | 5.56 | |
| 3 1/2 | 4.000 | 101.6 | 0.250 | 6.35 | |
| 4 | 4.500 | 114.3 | 0.250 | 6.35 | |
| 5 | 5.563 | 141.3 | 0.250 | 6.35 | |
| 6 | 6.625 | 168.3 | 0.250 | 6.35 | |

- It is recommended that wherever possible, product purchased to this specification be ordered to the Diameters and Wall Thickness indicated in the above Table.
- Service for Potable Water(Hot, Cold)
- CDA 102 / 110 for Electrical Applications ASTM B188 and B42
- Brazed upto 2" / Forged to ASTM B124 UNS No.C11000 / Butt Welded to ASTM B42 UNS No.C12200

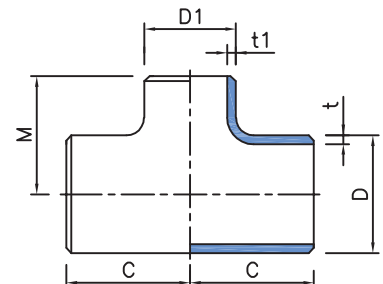
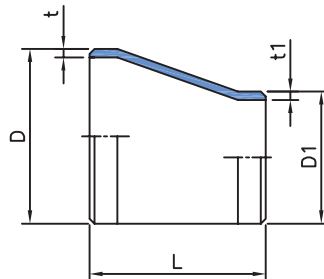
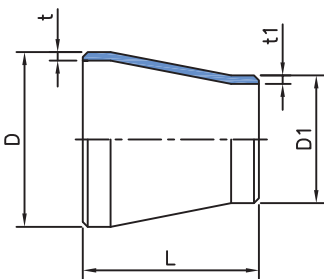


Butt Welding Copper Fittings(ASME B16.9)



| Outside Diameter of pipe D | | Wall Thickness | 45°, 90° Elbow | | Equal Tee | |
|----------------------------------|-----------|-------------------|----------------|--------|---------------|-------------|
| | | | Radius | Length | Center-to-End | |
| Nominal inch | Actual mm | t | A | L | Run C | Outlet M |
| 3" | 88.9 | 5.56 | 114 | 51 | 86 | 86 |
| 4" | 114.3 | 6.35 | 152 | 64 | 105 | 105 |

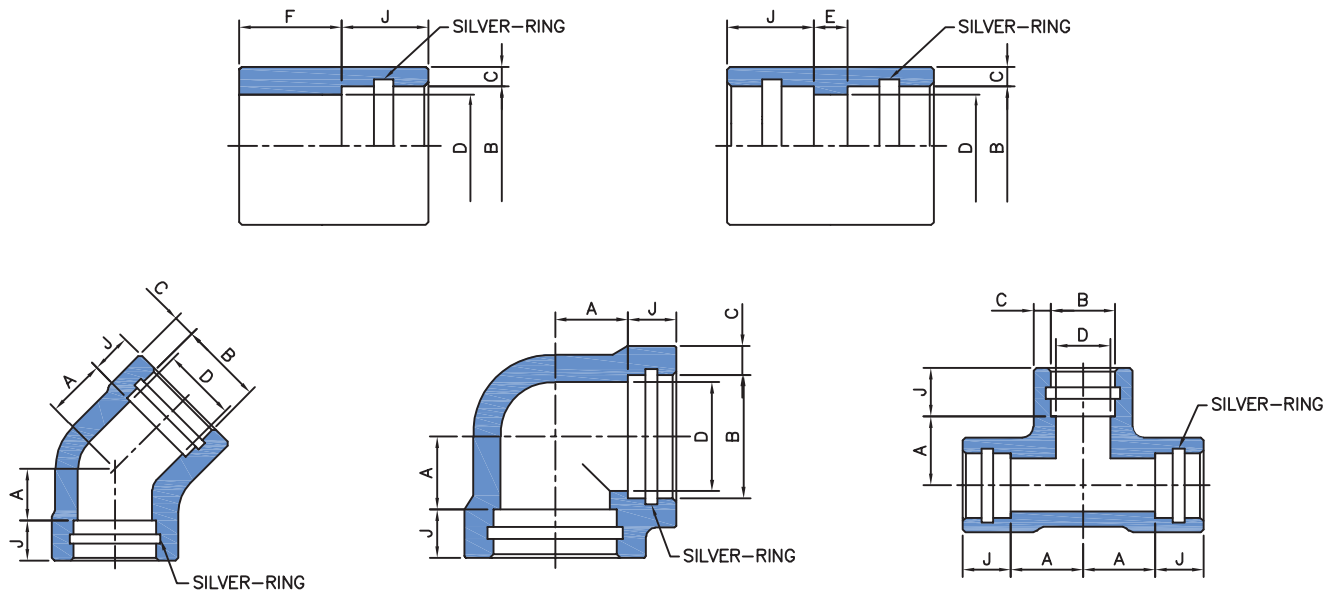
* Dimensions are in millimeters



| Outside Diameter of pipe DxD ₁ | | | | | Wall Thickness | | Con, Ecc Reducer | UnEqual Tee | | |
|---|---|-----|-----------|---|-------------------|------|------------------|---------------|-----|----|
| | | | | | | | Length | Center-to-End | | |
| | | | | | | Run | | Outlet | | |
| Nominal inch | | | Actual mm | | | t | t ₁ | L | C | M |
| 3" | x | 1½" | 88.9 | x | 48.3 | 5.56 | 3.81 | 89 | 86 | 73 |
| | x | 2" | | x | 60.3 | 5.56 | 3.96 | 89 | 86 | 76 |
| 4" | x | 1½" | 114.3 | x | 48.3 | 6.35 | 3.81 | 102 | 105 | 86 |
| | x | 2" | | x | 60.3 | 6.35 | 3.96 | 102 | 105 | 89 |
| | x | 3" | | x | 88.9 | 6.35 | 5.56 | 102 | 105 | 98 |

* Dimensions are in millimeters

#3000 Forged Silver-Brazed Copper Fittings(ASME B16.11)



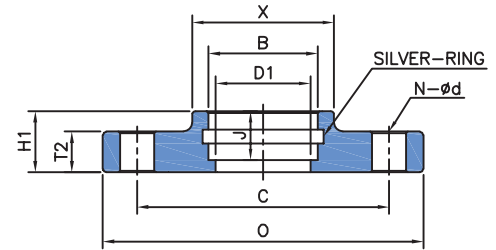
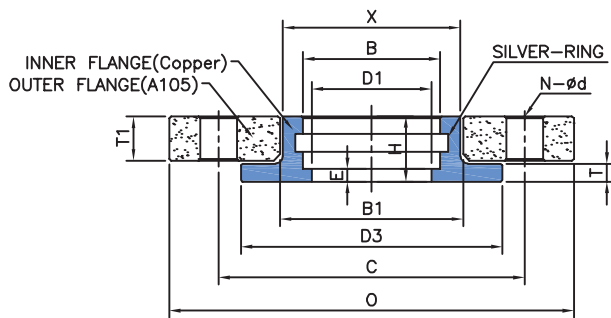
#3000

| Outside Diameter of pipe | | Depth of Socket (min.) | Depth of Socket (min.) | Depth of Socket (min.) | Depth of Socket (min.) | Center To Bottom of Socket | | Center To Bottom of Socket | |
|--------------------------|-----------|------------------------|------------------------|------------------------|------------------------|----------------------------|---------------|----------------------------|-----------|
| Nominal inch | Actual mm | | | | | Full Coupling | Half Coupling | 90° Elbow, Tee | 45° Elbow |
| | | B | D | C | J | E | F | A | |
| 1/2" | 21.3 | 21.4 | 15.9 | 4.09 | 10 | 9.5 | 22.5 | 15.5 | 11 |
| 3/4" | 26.7 | 26.8 | 20.9 | 4.27 | 13 | 9.5 | 24 | 19 | 13 |
| 1" | 33.4 | 33.5 | 27 | 4.98 | 13 | 12.5 | 28.5 | 22.5 | 14 |
| 1 1/2" | 48.3 | 48.4 | 40.7 | 5.54 | 13 | 12.5 | 32 | 32 | 20.5 |
| 2" | 60.3 | 60.5 | 52.4 | 6.04 | 16 | 19 | 41 | 38 | 25.5 |

* Dimensions are in millimeters



Silver-Brazed Copper Flanges(BS EN 1759-3)

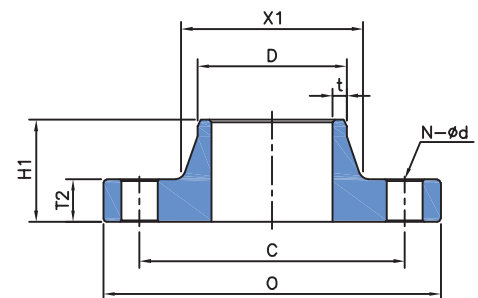
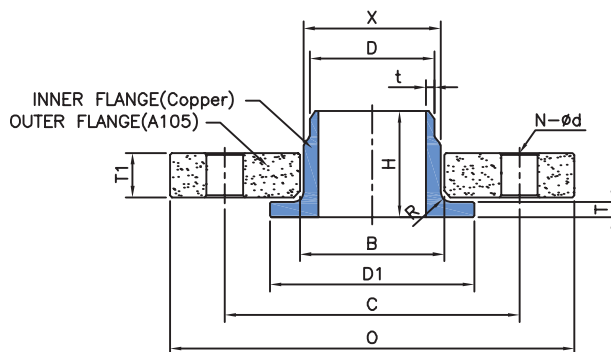


Class 150

| Outside Diameter of pipe | | Socket Bore Dia. | Bore Dia. of Flange | Dia. of Hub | Outside Dia. of Flange | Dia. of Bolt Circle | Num. of Bolts | Dia. of Bolt Holes | Composite S/B Flange | | | | | | Solid S/B Flange | | |
|--------------------------|-----------|------------------|---------------------|-------------|------------------------|---------------------|---------------|--------------------|----------------------|---|---|----------------|----------------|----------------|------------------|----------------|----|
| Nominal inch | Actual mm | B | D ₁ | X | O | C | N | Ød | H | E | T | D ₃ | T ₁ | B ₁ | H ₁ | T ₂ | J |
| 1/2" | 21.3 | 21.4 | 15.9 | 28 | 89 | 60.3 | 4 | 15.9 | 16 | 3 | 5 | 40 | 11.1 | 30 | 21 | 10 | 10 |
| 3/4" | 26.7 | 26.8 | 20.9 | 33 | 98 | 69.8 | 4 | 15.9 | 16 | 3 | 5 | 53 | 12.7 | 35 | 24 | 10 | 11 |
| 1" | 33.4 | 33.5 | 27 | 40 | 108 | 79.4 | 4 | 15.9 | 18 | 3 | 5 | 60 | 14.3 | 42 | 24 | 11 | 13 |
| 1 1/2" | 48.3 | 48.4 | 40.7 | 55 | 127 | 98.4 | 4 | 15.9 | 19 | 3 | 5 | 80 | 17.5 | 57 | 26 | 13 | 16 |
| 2" | 60.3 | 60.5 | 52.4 | 70 | 152 | 120.6 | 4 | 19 | 19 | 3 | 6 | 99 | 19 | 72 | 28 | 15 | 17 |

* Dimensions are in millimeters

Weld-Neck Copper Flanges(BS EN 1759-3)



Class 150

| Outside Diameter of pipe D | | Socket Bore Dia. | Bore Dia.of Flange | Dia. of Hub | Outside Dia.of Flange | Dia.of Bolt Circle | Compsite W/N Flange | | | | | | | Solid W/N Flange | | |
|----------------------------|-----------|------------------|--------------------|-------------|-----------------------|--------------------|---------------------|----|---|---|----------------|----------------|-----|------------------|----------------|----------------|
| Nominal inch | Actual mm | t | O | C | N | Ød | X | H | R | T | D ₁ | T ₁ | B | H ₁ | T ₂ | X ₁ |
| 3" | 88.9 | 5.56 | 190 | 152.4 | 4 | 19 | 91 | 50 | 5 | 7 | 130 | 24 | 94 | 70 | 22 | 103 |
| 4" | 114.3 | 6.35 | 229 | 190.5 | 8 | 19 | 116 | 50 | 5 | 7 | 158 | 24 | 119 | 76 | 22 | 134 |

* Dimensions are in millimeters



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