



Pipes and Fittings · Semi-Finished Products



**SHIPBUILDING
ENGINEERING
OFFSHORE**

We act with dedication.



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Imprint

Ihr NIE•MET
Service-Partner

Your NIE•MET
Service Partner

Who is NIE•MET?

NIE•MET Worldwide



JEDERZEIT...

Als führender Vollsortimenter für NE-Halbzeug steht NIE•MET für garantierte Markenqualität, Kundennähe und hochspezialisierte Dienstleistungen rund um die Beschaffung und Verarbeitung von NE-Halbzeugen und Rohrleitungskomponenten.

Mehr als 250 qualifizierte Mitarbeiter bei 26 NIE•MET Service Partnern, umfassende Kapazitäten in Lager, Anarbeitung und Logistik sichern die Bereitstellung dieser Leistungen weltweit.

Mehr als 14.000 Tonnen NE-Halbzeug und ein breites Sortiment an seewasserbeständigen Rohrleitungskomponenten stehen in unserem 50.000 m² großen, klimatisierten Lager als Dauerbevorratung zur Verfügung.

ANYTIME...

NIE•MET is a leading full range distributor of non-ferrous semi-finished products with guaranteed brand quality, focused on customer's needs and highly specialized on complete service program for purchase and handling of non-ferrous semi-finished products as well as piping components.

NIE•MET has a qualified staff of more than 250 employees for 26 service partners, extensive capacities for stock, pre-processing and logistics, ensuring the provision of these services worldwide. More than 14,000 tons of non-ferrous semi-finished products and a wide range of seawater resistant piping components are constantly kept available in our 50,000 m² covered and climatized warehouse.



... ANYWHERE

Waves up to ten metres high, engine capacity of up to 10,000 kW and growing worldwide pressure on travel and docking periods set the standards for the quality and service of NIE•MET: marine technology is advanced technology, proven under extreme conditions on the high seas. Faults in machinery, supply lines and cooling systems may have unforeseeable consequences for human beings, environment as well as economy. Repair and waiting-times mount up to considerable five or six-figure amounts. As a supplier and service partner for piping systems in shipbuilding and offshore technology, we provide quality and precision work, tested and certified according to Lloyd's, DNV and GL requirements.

The experts at NIE•MET are well acquainted, not only with the perils of the high seas, but also with the finer aspects of international Codes.

NIE•MET pipes and fittings made from seawater resistant alloys you can rely on!

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 F: +49 - 421 - 5499-620
 E-Mail: nmd@niemet.de

... ÜBERALL

Wellenhöhen von bis zu 10 Metern, Maschinenleistungen von 10.000 kW und der weltweit wachsende Druck auf Fahrt- und Liegezeiten setzen die Maßstäbe für Qualität und Service bei NIE•MET: Schiffstechnologie ist Hochtechnologie, bewährt unter den extremen Bedingungen der Weltmeere. Mängel an Maschinen, Versorgungs- und Kühlsystemen können unabsehbare Folgen für Menschen und Umwelt, sowie wirtschaftliche Konsequenzen haben. Reparatur- und Wartungszeiten belaufen sich schnell auf fünf- oder gar sechsstellige Summen. Als Lieferant und Servicepartner für Rohrleitungssysteme in Seeschiffen und Offshoretechnologie bieten wir daher Qualität und Präzisionsarbeit, geprüft und zertifiziert nach den Anforderungen von Lloyds, DNV und GL.

Nicht nur mit den Tücken der See, sondern auch mit den Feinheiten internationaler Normen sind die NIE•MET Experten bestens vertraut.

Auf NIE•MET Rohre und Fittings aus seewasserbeständigen Legierungen ist Verlass!





WARUM KUPFER-NICKEL-LEGIERUNGEN?

Die attraktive Widerstandsfähigkeit von Kupfer-Nickel-Legierungen gegen Korrosion und Ablagerungen in Seewasser und ähnlichen Umgebungen haben seit vielen Jahren zu einem umfangreichen Einsatz im Schiffbau geführt.

In den 1930er Jahren begann die Entwicklung von CuNi-Legierungen, ursprünglich für Kondensatoren und Rohrleitungssysteme. In den 1950er Jahren setzte sich CuNi90/10 aufgrund seiner exzellenten Korrosionsbeständigkeit im Kondensatorenbau und für Seewasserleitungen durch.

Diese ausgezeichnete Korrosionsbeständigkeit resultiert aus einem dünnen Schutzfilm, der sich schnell und natürlich bildet, nachdem die Oberfläche mit reinem Seewasser in Berührung kommt. Bereits während der ersten Tage bildet sich dieser Film, nach drei Monaten ist er komplett ausgebildet.

WHY COPPER-NICKEL?

The attractive corrosion and biofouling resistance of Cu-Ni alloys in seawater and related environments have led to their substantial use in marine service for many years.

Development of copper-nickel alloys began back in the 1930's, initially for condensers and piping systems. In the 1950's CuNi90/10 started being accepted for condenser service and for seawater pipe work, showing excellent resistance against different types of possible corrosion.

This brilliant corrosion resistance results from a thin protective film which forms naturally and quickly after exposure to clean seawater, changing the alloys' initial exposition to seawater. This first film



develops within the first days already, within three months it reaches its full strength.

Soon it was recognized that this alloy not only shows very good corrosion durability against brackish seawater, but also has inherent resistance to macrofouling, which means reduction of cleaning regimes onboard.

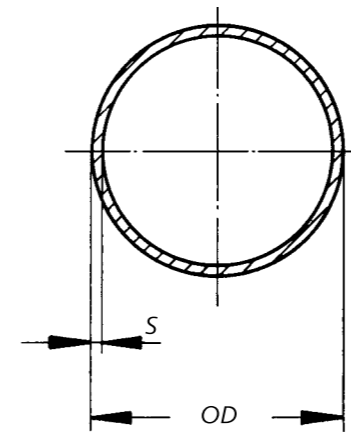
Currently these alloys are used for shipbuilding, offshore, power and desalination industries. Even though being an established alloy, due to new applications arising and better possibilities of monitoring performance and corrosion resistance of pipe works and condensers, knowledge and therewith possible usages of copper-nickel alloys still expands.



SHIPBUILDING

Pipes
Elbows
Concentric Reducers
Saddles
Tees
End Caps
Welding Collars & Flanges
Pipe Connections
Brazing Fittings
Unions
Hermetic®
CUNIPRESS®

PIPES



PIPES

seamless and seam welded

DIN 86019, BS 2871, ASTM B466
 DIN 86018, DIN EN 12449, DIN 1755

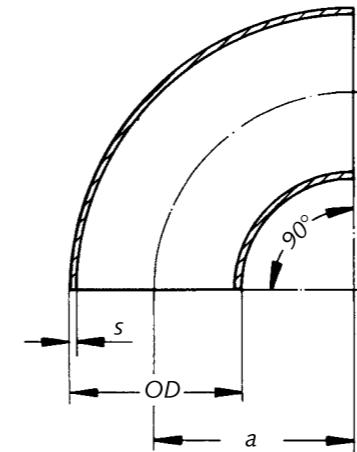
Material:

CuNi90/10
 CuZn20Al2 – aluminium brass



| Size | | Actual OD mm | Standard Wall Thickness | | | | |
|-------------|-------|--------------|-------------------------|-----|-----|-----|---|
| inch | DN mm | | s mm | | | | |
| Seamless | | 8 | 1 | 1.5 | | | |
| | | 10 | 1 | 1.5 | | | |
| | | 12 | 1 | 1.5 | | | |
| | | 14 | 1 | | | | |
| | | 15 | 1 | | | | |
| | | 16 | 1 | 1.5 | | | |
| | | 18 | 1 | 1.5 | | | |
| | | 19 | 1 | 1.5 | | | |
| 1/2 | 16 | 20 | 1 | 1.5 | | | |
| | | 22 | 1 | 1.5 | 2 | | |
| 3/4 | 20 | 25 | 1.5 | 2 | | | |
| | | 28 | 1.5 | 2 | | | |
| 1 | 25 | 30 | 1.5 | 2 | 2.5 | | |
| | | 35 | 1.5 | | | | |
| 1 1/4 | 32 | 38 | 1.5 | 2 | 2.5 | | |
| | | 42 | 1.5 | | | | |
| 1 1/2 | 40 | 44.5 | 1.5 | 2 | 2.5 | | |
| | | 54 | 1.5 | | | | |
| 2 | 50 | 57 | 1.5 | 2 | 2.5 | | |
| 2 1/2 | 65 | 76 | 2 | 2.5 | | | |
| 3 | 80 | 89 | 2 | 2.5 | | | |
| 4 | 100 | 108 | 2.5 | 3 | | | |
| 5 | 125 | 133 | 2.5 | 3 | | | |
| 6 | 150 | 159 | 2.5 | 3 | 3.5 | | |
| 7 | 175 | 194 | 3 | | | | |
| 8 | 200 | 219 | 3 | 3.5 | 4 | 4.5 | |
| 10 | 250 | 267 | 3 | 4 | 4.5 | 5.5 | |
| 12 | 300 | 324 | 4 | 4.5 | 5 | | |
| 14 | 350 | 368 | 4 | 4.5 | 5.5 | | |
| 16 | 400 | 419 | 4 | 5.5 | 6.5 | | |
| Seam welded | | | | | | | |
| | | 18 | 450 | 457 | 4 | 4.5 | 5 |
| | | 20 | 500 | 508 | 5 | | |
| | | 24 | 600 | 610 | 5 | | |

ELBOWS



ELBOWS, LONG RADIUS-90° – FIG. 3.901S

seamless and seam welded

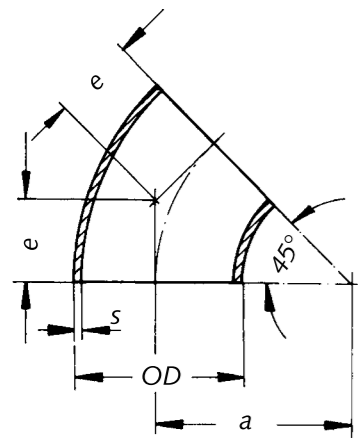
DIN 86090

Material:

CuNi90/10

CuZn20Al2 – aluminium brass

| Size | | Wall Thickness | Radius | Theoretical weight |
|--------------------|----------|----------------|---------|--------------------|
| DN inch | OD mm | s mm | a mm | kg per piece |
| Seamless | | | | |
| 1/2 | 20 | 1 | 25 | 0.025 |
| 3/4 | 25 | 1.5 | 27.5 | 0.058 |
| 1 | 30 | 1.5 | 33.5 | 0.06 |
| 1 1/4 | 38 | 1.5 | 45 | 0.11 |
| 1 1/2 | 44.5 | 1.5 | 51 | 0.14 |
| 2 | 57 | 1.5 | 72 | 0.26 |
| 2 1/2 | 76 | 2 | 95 | 0.62 |
| 3 | 89 | 2 | 114.5 | 0.88 |
| 4 | 108 | 2.5 | 142.5 | 1.65 |
| 5 | 133 | 2.5 | 181 | 2.60 |
| 6 | 159 | 2.5 | 216 | 3.70 |
| 7 | 194 | 3 | 270 | 5.70 |
| 8 | 219 | 3 | 305 | 8.70 |
| 10 | 267 | 3 | 378 | 13.10 |
| 12 | 324 | 4 | 457 | 25.60 |
| 14 | 368 | 4 | 533.5 | 34.00 |
| 16 | 419 | 4 | 609.5 | 49.70 |
| Seam welded | | | | |
| 14 | 368 | 4 | 533.5 | 34.00 |
| 16 | 419 | 4 | 609.5 | 49.70 |
| 18 | 457 | 4.5 | 686 | 61.90 |
| 20 | 508 | 5 | 762 | 83.90 |
| 24 | 610 | 5 | 914 | 135.00 |



ELBOWS, LONG RADIUS-45° – FIG. 3.4515

seamless and seam welded

DIN 86090

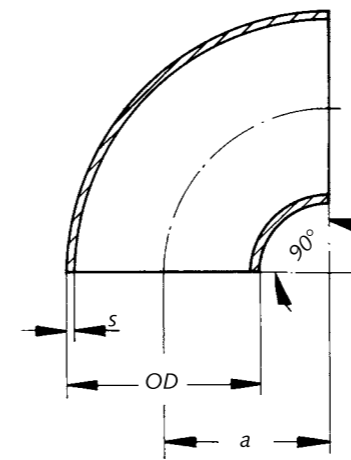
Material:

CuNi90/10

CuZn20Al2 – aluminium brass

| Size | | Wall Thickness | Radius | |
|--------------------|-------|----------------|--------|--------|
| DN inch | OD mm | s mm | a mm | = e mm |
| Seamless | | | | |
| 1/2 | 20 | 1 | 25 | 10.4 |
| 3/4 | 25 | 1.5 | 27.5 | 11.4 |
| 1 | 30 | 1.5 | 33.5 | 14 |
| 1 1/4 | 38 | 1.5 | 45 | 19 |
| 1 1/2 | 44.5 | 1.5 | 51 | 21 |
| 2 | 57 | 1.5 | 72 | 30 |
| 2 1/2 | 76 | 2 | 95 | 39 |
| 3 | 89 | 2 | 114.5 | 47 |
| 4 | 108 | 2.5 | 142.5 | 59 |
| 5 | 133 | 2.5 | 181 | 75 |
| 6 | 159 | 2.5 | 216 | 89 |
| 7 | 194 | 3 | 270 | 112 |
| 8 | 219 | 3 | 305 | 126 |
| 10 | 267 | 3 | 378 | 157 |
| 12 | 324 | 4 | 457 | 189 |
| 14 | 368 | 4 | 533.5 | 221 |
| 16 | 419 | 4 | 609.5 | 252 |
| Seam welded | | | | |
| 14 | 368 | 4 | 533.5 | 221 |
| 16 | 457 | 4 | 609.5 | 252 |
| 18 | 457 | 4.5 | 686 | 284 |
| 20 | 508 | 5 | 762 | 316 |
| 24 | 610 | 5 | 914 | 379 |

Elbows, long radius 30° and 60° upon request



ELBOWS, SHORT RADIUS-90° – FIG. 3.9010

seamless and seam welded

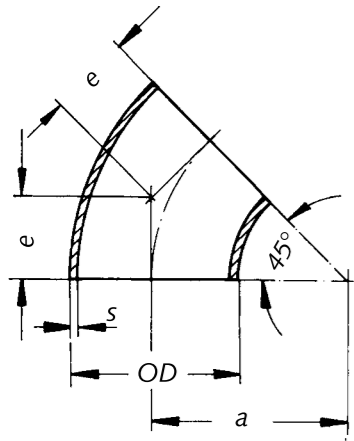
Material:

CuNi90/10

CuZn20Al2 – aluminium brass

| Size | | Wall Thickness | Radius | Theoretical weight |
|--------------------|-------|----------------|--------|--------------------|
| DN inch | OD mm | s mm | a mm | kg per piece |
| Seamless | | | | |
| 1 | 30 | 1.5 | 30 | 0.053 |
| 1 1/4 | 38 | 1.5 | 32.5 | 0.075 |
| 1 1/2 | 44.5 | 1.5 | 40 | 0.114 |
| 2 | 57 | 1.5 | 52.5 | 0.20 |
| 2 1/2 | 76 | 2 | 70 | 0.46 |
| 3 | 89 | 2 | 82.5 | 0.63 |
| 4 | 108 | 2.5 | 100 | 1.16 |
| 5 | 133 | 2.5 | 125 | 1.80 |
| 6 | 159 | 2.5 | 150 | 2.60 |
| 7 | 194 | 3 | 180 | 3.79 |
| 8 | 219 | 3 | 210 | 5.99 |
| 10 | 267 | 3 | 255 | 8.87 |
| 12 | 324 | 4 | 305 | 17.10 |
| 14 | 368 | 4 | 352.5 | 22.60 |
| 16 | 419 | 4 | 400 | 32.80 |
| Seam welded | | | | |
| 14 | 368 | 4 | 352.5 | 22.60 |
| 16 | 419 | 4 | 400 | 32.50 |
| 18 | 457 | 4.5 | 457 | 40.90 |
| 20 | 508 | 5 | 508 | 56.20 |
| 24 | 610 | 5 | 610 | 90.00 |

Elbows

**ELBOWS, SHORT RADIUS-45° – FIG. 34510**

seamless and seam welded

Material:

CuNi90/10

CuZn20Al2 – aluminium brass

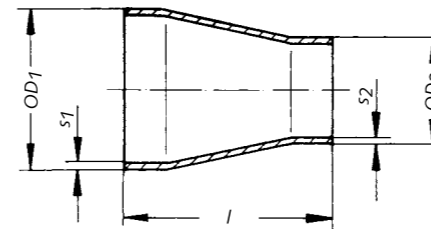
| Size | | Wall Thickness | Radius | = e |
|--------------------|----------|----------------|---------|-----|
| DN inch | OD mm | s mm | a mm | mm |
| Seamless | | | | |
| 1 | 30 | 1.5 | 30 | 12 |
| 1¼ | 38 | 1.5 | 32.5 | 14 |
| 1½ | 44.5 | 1.5 | 40 | 17 |
| 2 | 57 | 1.5 | 52.5 | 22 |
| 2½ | 76 | 2 | 70 | 29 |
| 3 | 89 | 2 | 82.5 | 34 |
| 4 | 108 | 2.5 | 100 | 41 |
| 5 | 133 | 2.5 | 125 | 52 |
| 6 | 159 | 2.5 | 150 | 62 |
| 7 | 194 | 3 | 180 | 75 |
| 8 | 219 | 3 | 210 | 87 |
| 10 | 267 | 3 | 255 | 106 |
| 12 | 324 | 4 | 305 | 126 |
| 14 | 368 | 4 | 352.5 | 146 |
| 16 | 419 | 4 | 400 | 166 |
| Seam welded | | | | |
| 14 | 368 | 4 | 352.5 | 146 |
| 16 | 419 | 4 | 400 | 166 |
| 18 | 457 | 4.5 | 457 | 189 |
| 20 | 508 | 5 | 508 | 210 |
| 24 | 610 | 5 | 610 | 253 |

Elbows, short radius 30° and 60° upon request





CONCENTRIC REDUCERS



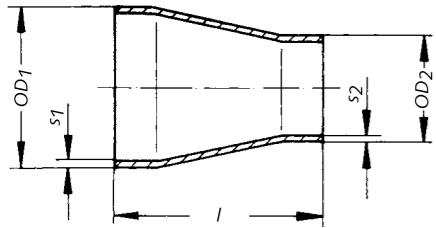
CONCENTRIC REDUCERS
seamless or seam welded

| | | OD 2 | | | | | | | | | | | | | | | | | | | | | |
|------|------|------|----|----|----|----|------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| | | 16 | 20 | 25 | 30 | 38 | 44.5 | 57 | 76 | 89 | 108 | 133 | 159 | 194 | 219 | 267 | 324 | 368 | 419 | 457 | 508 | | |
| OD 1 | 20 | ● | | | | | | | | | | | | | | | | | | | | | |
| | 25 | ● | ● | | | | | | | | | | | | | | | | | | | | |
| | 30 | ● | ● | ● | | | | | | | | | | | | | | | | | | | |
| | 38 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | 44.5 | | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | 57 | | | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | 76 | | | | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | 89 | | | | | ● | ● | ● | ● | | | | | | | | | | | | | | |
| | 108 | | | | | | ● | ● | ● | ● | | | | | | | | | | | | | |
| | 133 | | | | | | | ● | ● | ● | ● | | | | | | | | | | | | |
| | 159 | | | | | | | | ● | ● | ● | ● | | | | | | | | | | | |
| | 194 | | | | | | | | | ● | ● | ● | ● | | | | | | | | | | |
| | 219 | | | | | | | | | | ● | ● | ● | ● | ● | | | | | | | | |
| | 267 | | | | | | | | | | | ● | ● | ● | ● | ● | | | | | | | |
| | 324 | | | | | | | | | | | | ○ | ● | ● | ● | | | | | | | |
| | 368 | | | | | | | | | | | | | ○ | ○ | ○ | ○ | | | | | | |
| | 419 | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | | | | | |
| | 457 | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | | | | |
| | 508 | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | | |
| 610 | | | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | | |

● seamless concentric reducers

○ seam welded concentric reducers

Concentric Reducers



CONCENTRIC REDUCERS – FIG. 3.0001

seamless

DIN 86098

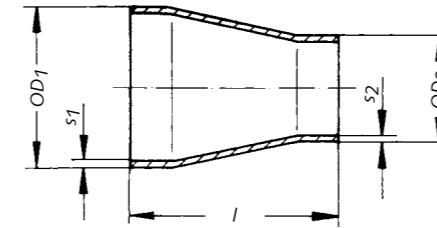
Material:

CuNi90/10

CuZn20Al2 – aluminium brass

| Size | | | Dimension | | | | | Length | Theoretical weight | | |
|---------|---|-------|-----------------|----|----------------|-----------------|----|----------------|--------------------|----|--------------|
| DN inch | | | OD ₁ | mm | s ₁ | OD ₂ | mm | s ₂ | l | mm | kg per piece |
| 1/2 | x | 3/8 | 20 | x | 1 | 16 | x | 1 | 30 | | 0.015 |
| 3/4 | x | 3/8 | 25 | x | 1.5 | 16 | x | 1 | 30 | | 0.020 |
| 3/4 | x | 1/2 | 25 | x | 1.5 | 20 | x | 1 | 30 | | 0.023 |
| 1 | x | 3/8 | 30 | x | 1.5 | 16 | x | 1 | 35 | | 0.030 |
| 1 | x | 1/2 | 30 | x | 1.5 | 20 | x | 1 | 35 | | 0.033 |
| 1 | x | 3/4 | 30 | x | 1.5 | 25 | x | 1.5 | 35 | | 0.035 |
| 1 1/4 | x | 3/8 | 38 | x | 1.5 | 16 | x | 1 | 50 | | 0.038 |
| 1 1/4 | x | 1/2 | 38 | x | 1.5 | 20 | x | 1 | 50 | | 0.040 |
| 1 1/4 | x | 3/4 | 38 | x | 1.5 | 25 | x | 1.5 | 50 | | 0.043 |
| 1 1/4 | x | 1 | 38 | x | 1.5 | 30 | x | 1.5 | 50 | | 0.045 |
| 1 1/2 | x | 1/2 | 44.5 | x | 1.5 | 20 | x | 1 | 80 | | 0.05 |
| 1 1/2 | x | 3/4 | 44.5 | x | 1.5 | 25 | x | 1.5 | 80 | | 0.06 |
| 1 1/2 | x | 1 | 44.5 | x | 1.5 | 30 | x | 1.5 | 80 | | 0.07 |
| 1 1/2 | x | 1 1/4 | 44.5 | x | 1.5 | 38 | x | 1.5 | 80 | | 0.08 |
| 2 | x | 3/4 | 57 | x | 1.5 | 25 | x | 1.5 | 80 | | 0.11 |
| 2 | x | 1 | 57 | x | 1.5 | 30 | x | 1.5 | 80 | | 0.12 |
| 2 | x | 1 1/4 | 57 | x | 1.5 | 38 | x | 1.5 | 80 | | 0.14 |
| 2 | x | 1 1/2 | 57 | x | 1.5 | 44.5 | x | 1.5 | 80 | | 0.16 |
| 2 1/2 | x | 1 | 76 | x | 2 | 30 | x | 1.5 | 90 | | 0.25 |
| 2 1/2 | x | 1 1/4 | 76 | x | 2 | 38 | x | 1.5 | 90 | | 0.27 |
| 2 1/2 | x | 1 1/2 | 76 | x | 2 | 44.5 | x | 1.5 | 90 | | 0.30 |
| 2 1/2 | x | 2 | 76 | x | 2 | 57 | x | 1.5 | 90 | | 0.33 |
| 3 | x | 1 1/4 | 89 | x | 2 | 38 | x | 1.5 | 90 | | 0.46 |
| 3 | x | 1 1/2 | 89 | x | 2 | 44.5 | x | 1.5 | 90 | | 0.48 |
| 3 | x | 2 | 89 | x | 2 | 57 | x | 1.5 | 90 | | 0.49 |
| 3 | x | 2 1/2 | 89 | x | 2 | 76 | x | 2 | 90 | | 0.51 |
| 4 | x | 1 1/2 | 108 | x | 2.5 | 44.5 | x | 1.5 | 100 | | 0.58 |
| 4 | x | 2 | 108 | x | 2.5 | 57 | x | 1.5 | 100 | | 0.60 |
| 4 | x | 2 1/2 | 108 | x | 2.5 | 76 | x | 2 | 100 | | 0.66 |
| 4 | x | 3 | 108 | x | 2.5 | 89 | x | 2 | 100 | | 0.72 |

Concentric Reducers



CONCENTRIC REDUCERS – FIG. 3.0001

seamless

DIN 86098

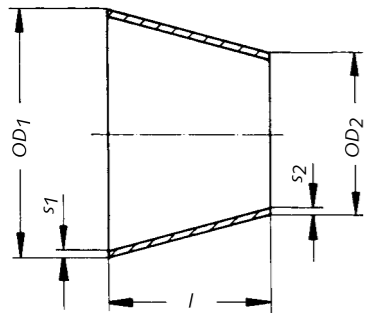
Material:

CuNi90/10

CuZn20Al2 – aluminium brass

| Size | | | Dimension | | | | | Length | Theoretical weight | | |
|---------|---|-------|-----------------|----|----------------|-----------------|----|----------------|--------------------|----|--------------|
| DN inch | | | OD ₁ | mm | s ₁ | OD ₂ | mm | s ₂ | l | mm | kg per piece |
| 5 | x | 2 | 133 | x | 2.5 | 57 | x | 1.5 | 140 | | 0.86 |
| 5 | x | 2 1/2 | 133 | x | 2.5 | 76 | x | 2 | 140 | | 0.90 |
| 5 | x | 3 | 133 | x | 2.5 | 89 | x | 2 | 140 | | 0.94 |
| 5 | x | 4 | 133 | x | 2.5 | 108 | x | 2.5 | 140 | | 0.98 |
| 6 | x | 2 1/2 | 159 | x | 2.5 | 76 | x | 2 | 150 | | 1.16 |
| 6 | x | 3 | 159 | x | 2.5 | 89 | x | 2 | 150 | | 1.25 |
| 6 | x | 4 | 159 | x | 2.5 | 108 | x | 2.5 | 150 | | 1.37 |
| 6 | x | 5 | 159 | x | 2.5 | 133 | x | 2.5 | 150 | | 1.70 |
| 7 | x | 3 | 194 | x | 3 | 89 | x | 2 | 155 | | 1.94 |
| 7 | x | 4 | 194 | x | 3 | 108 | x | 2.5 | 155 | | 1.96 |
| 7 | x | 5 | 194 | x | 3 | 133 | x | 2.5 | 155 | | 2.01 |
| 7 | x | 6 | 194 | x | 3 | 159 | x | 2.5 | 155 | | 2.08 |
| 8 | x | 4 | 219 | x | 3 | 108 | x | 2.5 | 155 | | 2.55 |
| 8 | x | 5 | 219 | x | 3 | 133 | x | 2.5 | 155 | | 2.64 |
| 8 | x | 6 | 219 | x | 3 | 159 | x | 2.5 | 155 | | 2.73 |
| 8 | x | 7 | 219 | x | 3 | 194 | x | 3 | 155 | | 2.82 |
| 10 | x | 5 | 267 | x | 3 | 133 | x | 2.5 | 210 | | 4.42 |
| 10 | x | 6 | 267 | x | 3 | 159 | x | 2.5 | 210 | | 4.53 |
| 10 | x | 7 | 267 | x | 3 | 194 | x | 3 | 210 | | 4.63 |
| 10 | x | 8 | 267 | x | 3 | 219 | x | 3 | 210 | | 4.78 |
| 12 | x | 5 | 324 | x | 4 | 133 | x | 2.5 | 210 | | 7.12 |
| 12 | x | 6 | 324 | x | 4 | 159 | x | 2.5 | 210 | | 7.20 |
| 12 | x | 7 | 324 | x | 4 | 194 | x | 3 | 210 | | 7.28 |
| 12 | x | 8 | 324 | x | 4 | 219 | x | 3 | 210 | | 7.40 |
| 12 | x | 10 | 324 | x | 4 | 267 | x | 3 | 210 | | 7.55 |
| 14 | x | 6 | 368 | x | 4 | 159 | x | 2.5 | 300 | | 10.75 |
| 14 | x | 7 | 368 | x | 4 | 194 | x | 3 | 300 | | 11.05 |
| 14 | x | 8 | 368 | x | 4 | 219 | x | 3 | 300 | | 11.40 |
| 14 | x | 10 | 368 | x | 4 | 267 | x | 3 | 300 | | 11.80 |
| 14 | x | 12 | 368 | x | 4 | 324 | x | 4 | 300 | | 12.20 |

Concentric Reducers

**CONCENTRIC REDUCERS – FIG. 3.0001 W**

seam welded

Material:

CuNi90/10

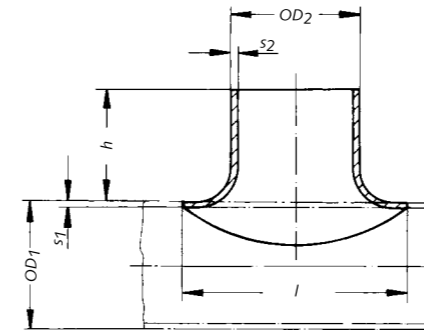
CuZn20Al2 – aluminium brass

| Size | | | Dimension | | | | | | Length | Theoretical weight |
|---------|---|----|-----------|----|-----|-----|----|-----|---------|--------------------|
| DN inch | | | OD1 | mm | s1 | OD2 | mm | s2 | l mm | kg per piece |
| 16 | x | 7 | 419 | x | 4 | 194 | x | 3 | 325 | 12.90 |
| 16 | x | 8 | 419 | x | 4 | 219 | x | 3 | 325 | 13.40 |
| 16 | x | 10 | 419 | x | 4 | 267 | x | 3 | 325 | 13.90 |
| 16 | x | 12 | 419 | x | 4 | 324 | x | 4 | 325 | 14.40 |
| 16 | x | 14 | 419 | x | 4 | 368 | x | 4 | 325 | 15.10 |
| 18 | x | 8 | 457 | x | 4.5 | 219 | x | 3 | 350 | 17.09 |
| 18 | x | 10 | 457 | x | 4.5 | 267 | x | 3 | 350 | 17.60 |
| 18 | x | 12 | 457 | x | 4.5 | 324 | x | 4 | 350 | 18.19 |
| 18 | x | 14 | 457 | x | 4.5 | 368 | x | 4 | 350 | 18.95 |
| 18 | x | 16 | 457 | x | 4.5 | 419 | x | 4 | 350 | 19.90 |
| 20 | x | 10 | 508 | x | 5 | 267 | x | 3 | 375 | 22.00 |
| 20 | x | 12 | 508 | x | 5 | 324 | x | 4 | 375 | 23.10 |
| 20 | x | 14 | 508 | x | 5 | 368 | x | 4 | 375 | 24.30 |
| 20 | x | 16 | 508 | x | 5 | 419 | x | 4 | 375 | 25.20 |
| 20 | x | 18 | 508 | x | 5 | 457 | x | 4.5 | 375 | 26.10 |
| 24 | x | 14 | 610 | x | 5 | 368 | x | 4 | 400 | 29.90 |
| 24 | x | 16 | 610 | x | 5 | 419 | x | 4 | 400 | 30.70 |
| 24 | x | 18 | 610 | x | 5 | 457 | x | 4.5 | 400 | 31.80 |
| 24 | x | 20 | 610 | x | 5 | 508 | x | 5 | 400 | 33.50 |





SADDLES

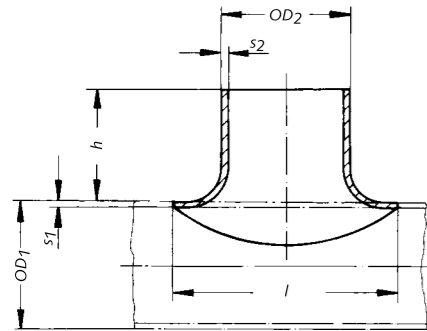


SADDLES

with equal or reduced branch

| | | OD 2 | | | | | | | | | | | | | | | | | | | | |
|------|------|------|----|----|----|------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | | 20 | 25 | 30 | 38 | 44.5 | 57 | 76 | 89 | 108 | 133 | 159 | 194 | 219 | 267 | 324 | 368 | 419 | 457 | 508 | 610 | |
| OD 1 | 20 | ● | | | | | | | | | | | | | | | | | | | | |
| | 25 | ● | ● | | | | | | | | | | | | | | | | | | | |
| | 30 | ● | ● | ● | | | | | | | | | | | | | | | | | | |
| | 38 | ● | ● | ● | ● | | | | | | | | | | | | | | | | | |
| | 44.5 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | |
| | 57 | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | |
| | 76 | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | | |
| | 89 | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | | |
| | 108 | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | | |
| | 133 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | | |
| | 159 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | | |
| | 194 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | | |
| | 219 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | 267 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | 324 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | | | |
| | 368 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | | | | |
| | 419 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | | | |
| | 457 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | | |
| | 508 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 610 | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |

● seamless saddles ○ seam welded saddles



SADDLES, SEAMLESS – FIG. 3.0100

with equal or reduced branch

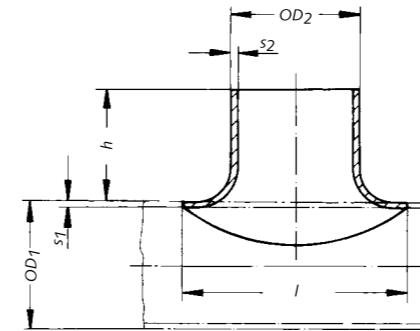
DIN 86087

Material:

CuNi90/10

CuZn20Al2 – aluminium brass

| Size | | | Dimension | | | | | Height | Length | Theoretical weight | |
|---------|---|-------|-----------|----|-----|------|----|--------|--------|--------------------|--------------|
| DN inch | | | OD1 | mm | s1 | OD2 | mm | s2 | h | l | kg per piece |
| | | | | | | | | | mm | mm | |
| 1/2 | x | 1/2 | 20 | x | 1 | 20 | x | 1 | 20 | 32 | 0.03 |
| 3/4 | x | 1/2 | 25 | x | 1.5 | 20 | x | 1 | 20 | 40 | 0.04 |
| 3/4 | x | 3/4 | 25 | x | 1.5 | 25 | x | 1.5 | 22 | 40 | 0.05 |
| 1 | x | 3/4 | 30 | x | 1.5 | 25 | x | 1.5 | 22 | 40 | 0.07 |
| 1 | x | 1 | 30 | x | 1.5 | 30 | x | 1.5 | 30 | 50 | 0.08 |
| 1 1/4 | x | 1 | 38 | x | 1.5 | 30 | x | 1.5 | 30 | 50 | 0.09 |
| 1 1/4 | x | 1 1/4 | 38 | x | 1.5 | 38 | x | 1.5 | 35 | 64 | 0.11 |
| 1 1/2 | x | 1 1/4 | 44.5 | x | 1.5 | 38 | x | 1.5 | 35 | 64 | 0.14 |
| 1 1/2 | x | 1 1/2 | 44.5 | x | 1.5 | 44.5 | x | 1.5 | 35 | 74 | 0.15 |
| 2 | x | 1 1/4 | 57 | x | 1.5 | 38 | x | 1.5 | 35 | 64 | 0.14 |
| 2 | x | 1 1/2 | 57 | x | 1.5 | 44.5 | x | 1.5 | 35 | 74 | 0.15 |
| 2 | x | 2 | 57 | x | 1.5 | 57 | x | 1.5 | 40 | 97 | 0.20 |
| 2 1/2 | x | 1 1/4 | 76 | x | 2 | 38 | x | 1.5 | 35 | 64 | 0.34 |
| 2 1/2 | x | 1 1/2 | 76 | x | 2 | 44.5 | x | 1.5 | 35 | 74 | 0.30 |
| 2 1/2 | x | 2 | 76 | x | 2 | 57 | x | 1.5 | 40 | 97 | 0.52 |
| 2 1/2 | x | 2 1/2 | 76 | x | 2 | 76 | x | 2 | 50 | 126 | 0.40 |
| 3 | x | 1 1/4 | 89 | x | 2 | 38 | x | 1.5 | 35 | 64 | 0.36 |
| 3 | x | 1 1/2 | 89 | x | 2 | 44.5 | x | 1.5 | 35 | 74 | 0.44 |
| 3 | x | 2 | 89 | x | 2 | 57 | x | 1.5 | 40 | 97 | 0.56 |
| 3 | x | 2 1/2 | 89 | x | 2 | 76 | x | 2 | 50 | 126 | 0.55 |
| 3 | x | 3 | 89 | x | 2 | 89 | x | 2 | 55 | 149 | 0.76 |
| 4 | x | 1 1/2 | 108 | x | 2.5 | 44.5 | x | 1.5 | 35 | 74 | 0.30 |
| 4 | x | 2 | 108 | x | 2.5 | 57 | x | 1.5 | 40 | 97 | 0.40 |
| 4 | x | 2 1/2 | 108 | x | 2.5 | 76 | x | 2 | 50 | 126 | 0.40 |
| 4 | x | 3 | 108 | x | 2.5 | 89 | x | 2 | 55 | 149 | 1.02 |
| 4 | x | 4 | 108 | x | 2.5 | 108 | x | 2.5 | 75 | 188 | 0.70 |
| 5 | x | 2 | 133 | x | 2.5 | 57 | x | 1.5 | 40 | 97 | 0.40 |
| 5 | x | 2 1/2 | 133 | x | 2.5 | 76 | x | 2 | 50 | 126 | 0.40 |
| 5 | x | 3 | 133 | x | 2.5 | 89 | x | 2 | 55 | 149 | 1.24 |
| 5 | x | 4 | 133 | x | 2.5 | 108 | x | 2.5 | 75 | 188 | 1.10 |
| 5 | x | 5 | 133 | x | 2.5 | 133 | x | 2.5 | 85 | 233 | 1.10 |

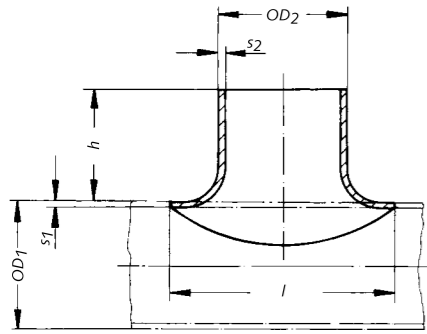


SADDLES, SEAMLESS – FIG. 3.0100

(continuation)

| Size | | | Dimension | | | | | Height | Length | Theoretical weight | |
|---------|---|-------|-----------|----|-----|-----|----|--------|--------|--------------------|--------------|
| DN inch | | | OD1 | mm | s1 | OD2 | mm | s2 | h | l | kg per piece |
| | | | | | | | | | mm | mm | |
| 6 | x | 2 1/2 | 159 | x | 2.5 | 76 | x | 2 | 50 | 126 | 0.40 |
| 6 | x | 3 | 159 | x | 2.5 | 89 | x | 2 | 55 | 149 | 1.18 |
| 6 | x | 4 | 159 | x | 2.5 | 108 | x | 2.5 | 75 | 188 | 1.30 |
| 6 | x | 5 | 159 | x | 2.5 | 133 | x | 2.5 | 85 | 233 | 2.10 |
| 6 | x | 6 | 159 | x | 2.5 | 159 | x | 2.5 | 95 | 279 | 2.25 |
| 7 | x | 2 1/2 | 194 | x | 3 | 76 | x | 2 | 50 | 126 | 1.53 |
| 7 | x | 3 | 194 | x | 3 | 89 | x | 2 | 55 | 149 | 1.35 |
| 7 | x | 4 | 194 | x | 3 | 108 | x | 2.5 | 75 | 188 | 1.42 |
| 7 | x | 5 | 194 | x | 3 | 133 | x | 2.5 | 85 | 233 | 2.38 |
| 7 | x | 6 | 194 | x | 3 | 159 | x | 2.5 | 95 | 279 | 2.86 |
| 7 | x | 7 | 194 | x | 3 | 194 | x | 3 | 110 | 334 | 3.50 |
| 8 | x | 3 | 219 | x | 3 | 89 | x | 2 | 55 | 149 | 0.90 |
| 8 | x | 4 | 219 | x | 3 | 108 | x | 2.5 | 75 | 188 | 1.80 |
| 8 | x | 5 | 219 | x | 3 | 133 | x | 2.5 | 85 | 233 | 2.60 |
| 8 | x | 6 | 219 | x | 3 | 159 | x | 2.5 | 95 | 279 | 3.60 |
| 8 | x | 7 | 219 | x | 3 | 194 | x | 3 | 110 | 334 | 4.90 |
| 8 | x | 8 | 219 | x | 3 | 219 | x | 3 | 125 | 379 | 5.70 |
| 10 | x | 4 | 267 | x | 3 | 108 | x | 2.5 | 75 | 188 | 1.90 |
| 10 | x | 5 | 267 | x | 3 | 133 | x | 2.5 | 85 | 233 | 2.60 |
| 10 | x | 6 | 267 | x | 3 | 159 | x | 2.5 | 95 | 279 | 3.60 |
| 10 | x | 7 | 267 | x | 3 | 194 | x | 3 | 110 | 334 | 4.90 |
| 10 | x | 8 | 267 | x | 3 | 219 | x | 3 | 125 | 379 | 5.70 |
| 10 | x | 10 | 267 | x | 3 | 267 | x | 3 | 155 | 447 | 7.90 |
| 12 | x | 5 | 324 | x | 4 | 133 | x | 2.5 | 85 | 233 | 2.60 |
| 12 | x | 6 | 324 | x | 4 | 159 | x | 2.5 | 95 | 279 | 3.60 |
| 12 | x | 7 | 324 | x | 4 | 194 | x | 3 | 110 | 334 | 4.90 |
| 12 | x | 8 | 324 | x | 4 | 219 | x | 3 | 125 | 379 | 7.70 |
| 12 | x | 10 | 324 | x | 4 | 267 | x | 3 | 155 | 447 | 9.70 |
| 12 | x | 12 | 324 | x | 4 | 324 | x | 4 | 185 | 560 | 12.90 |

Saddles

**SADDLES, SEAMLESS – FIG. 3.0100**

(continuation)

SADDLES, SEAM WELDED – FIG. 3.0100 W

with equal or reduced branch

DIN 86087

Material:

CuNi90/10

CuZn20Al2 – aluminium brass

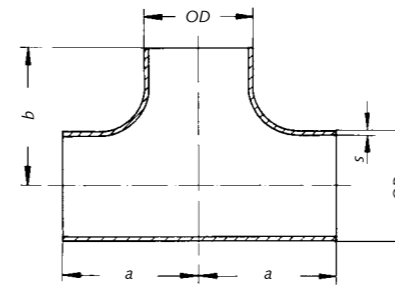
| Size | | | Dimension | | | | | | Height | Length | Theoretical weight |
|------|------|----|-----------------|----|----------------|-----------------|----|----------------|--------|--------|--------------------|
| DN | inch | | OD ₁ | mm | s ₁ | OD ₂ | mm | s ₂ | h | l | kg per piece |
| | | | | | | | | | mm | mm | |
| 14 | x | 6 | 368 | x | 4 | 159 | x | 2.5 | 95 | 279 | 3.60 |
| 14 | x | 7 | 368 | x | 4 | 194 | x | 3 | 110 | 334 | 4.90 |
| 14 | x | 8 | 368 | x | 4 | 219 | x | 3 | 125 | 379 | 7.70 |
| 14 | x | 10 | 368 | x | 4 | 267 | x | 3 | 155 | 447 | 9.90 |
| 14 | x | 12 | 368 | x | 4 | 324 | x | 4 | 185 | 560 | 12.90 |
| 14 | x | 14 | 368 | x | 4 | 368 | x | 4 | 200 | 613 | 14.85 |
| 16 | x | 6 | 419 | x | 4 | 159 | x | 2.5 | 95 | 279 | 3.65 |
| 16 | x | 7 | 419 | x | 4 | 194 | x | 3 | 110 | 334 | 4.90 |
| 16 | x | 8 | 419 | x | 4 | 219 | x | 3 | 125 | 379 | 7.70 |
| 16 | x | 10 | 419 | x | 4 | 267 | x | 3 | 155 | 447 | 9.70 |
| 16 | x | 12 | 419 | x | 4 | 324 | x | 4 | 185 | 560 | 12.90 |
| 16 | x | 14 | 419 | x | 4 | 368 | x | 4 | 200 | 613 | 14.85 |
| 16 | x | 16 | 419 | x | 4 | 419 | x | 4 | 225 | 680 | 18.51 |
| 18 | x | 6 | 457 | x | 4.5 | 159 | x | 2.5 | 95 | 279 | 3.60 |
| 18 | x | 7 | 457 | x | 4.5 | 194 | x | 3 | 110 | 334 | 4.90 |
| 18 | x | 8 | 457 | x | 4.5 | 219 | x | 3 | 125 | 379 | 7.70 |
| 18 | x | 10 | 457 | x | 4.5 | 267 | x | 3 | 155 | 447 | 9.70 |
| 18 | x | 12 | 457 | x | 4.5 | 324 | x | 4 | 185 | 560 | 12.90 |
| 18 | x | 14 | 457 | x | 4.5 | 368 | x | 4 | 200 | 613 | 14.85 |
| 18 | x | 16 | 457 | x | 4.5 | 419 | x | 4 | 225 | 680 | 18.51 |
| 18 | x | 18 | 457 | x | 4.5 | 457 | x | 4.5 | 250 | 800 | 24.80 |
| 20 | x | 6 | 508 | x | 5 | 159 | x | 2.5 | 95 | 279 | 5.40 |
| 20 | x | 7 | 508 | x | 5 | 194 | x | 3 | 110 | 334 | 6.50 |
| 20 | x | 8 | 508 | x | 5 | 219 | x | 3 | 125 | 379 | 7.70 |
| 20 | x | 10 | 508 | x | 5 | 267 | x | 3 | 155 | 447 | 9.70 |
| 20 | x | 12 | 508 | x | 5 | 324 | x | 4 | 185 | 560 | 12.90 |
| 20 | x | 14 | 508 | x | 5 | 368 | x | 4 | 200 | 613 | 14.85 |
| 20 | x | 16 | 508 | x | 5 | 419 | x | 4 | 225 | 680 | 18.51 |
| 20 | x | 18 | 508 | x | 5 | 457 | x | 4.5 | 250 | 800 | 24.80 |
| 20 | x | 20 | 508 | x | 5 | 508 | x | 5 | 275 | 880 | 31.80 |
| 24 | x | 16 | 610 | x | 5 | 419 | x | 4 | 225 | 680 | 18.51 |
| 24 | x | 18 | 610 | x | 5 | 457 | x | 4.5 | 250 | 800 | 24.80 |
| 24 | x | 20 | 610 | x | 5 | 508 | x | 5 | 275 | 880 | 31.80 |
| 24 | x | 24 | 610 | x | 5 | 610 | x | 5 | 300 | 1020 | 41.52 |

Other dimensions upon request





TEES

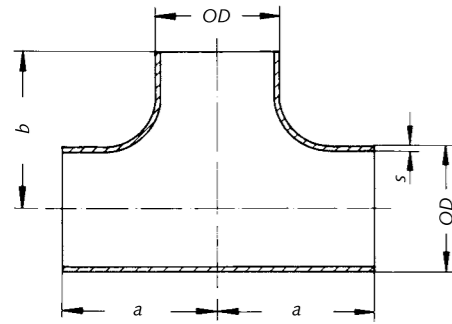


TEES

with equal or reduced branch

| | | OD 2 | | | | | | | | | | | | | | | | | | | |
|------|------|------|----|----|----|------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | | 20 | 25 | 30 | 38 | 44.5 | 57 | 76 | 89 | 108 | 133 | 159 | 194 | 219 | 267 | 324 | 368 | 419 | 457 | 508 | |
| OD 1 | mm | 20 | 25 | 30 | 38 | 44.5 | 57 | 76 | 89 | 108 | 133 | 159 | 194 | 219 | 267 | 324 | 368 | 419 | 457 | 508 | |
| | 20 | | | | | | | | | | | | | | | | | | | | |
| | 25 | • | • | | | | | | | | | | | | | | | | | | |
| | 30 | • | • | • | | | | | | | | | | | | | | | | | |
| | 38 | | • | • | • | | | | | | | | | | | | | | | | |
| | 44.5 | | | • | • | • | | | | | | | | | | | | | | | |
| | 57 | | | • | • | • | • | | | | | | | | | | | | | | |
| | 76 | | | • | • | • | • | • | | | | | | | | | | | | | |
| | 89 | | | | • | • | • | • | • | | | | | | | | | | | | |
| | 108 | | | | | • | • | • | • | • | | | | | | | | | | | |
| | 133 | | | | | | • | • | • | • | • | | | | | | | | | | |
| | 159 | | | | | | | • | • | • | • | • | | | | | | | | | |
| | 194 | | | | | | | | • | • | • | • | • | | | | | | | | |
| | 219 | | | | | | | | | • | • | • | • | • | | | | | | | |
| | 267 | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | | | | | | |
| | 324 | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | | | | | |
| | 368 | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | | | | |
| | 419 | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | | | |
| 457 | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | | | |
| 508 | | | | | | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | |

• seamless tee ○ pulled tee with welded outlet



TEES, EQUAL | FORM A – FIG. 3.0200

seamless

DIN 86088

Material:
CuNi90/10
CuZn20Al2 – aluminium brass

| Size | | Wall Thickness | a | b | Theoretical weight |
|---------|-------|----------------|-----|-----|--------------------|
| DN inch | OD mm | s mm | mm | mm | kg per piece |
| 1/2 | 20 | 1 | 25 | 25 | 0.11 |
| 3/4 | 25 | 1.5 | 29 | 29 | 0.14 |
| 1 | 30 | 1.5 | 38 | 38 | 0.18 |
| 1 1/4 | 38 | 1.5 | 48 | 48 | 0.22 |
| 1 1/2 | 44.5 | 1.5 | 57 | 57 | 0.31 |
| 2 | 57 | 1.5 | 64 | 64 | 0.45 |
| 2 1/2 | 76 | 2 | 76 | 76 | 1.07 |
| 3 | 89 | 2 | 86 | 86 | 2.33 |
| 4 | 108 | 2.5 | 105 | 105 | 2.85 |
| 5 | 133 | 2.5 | 124 | 124 | 3.41 |
| 6 | 159 | 2.5 | 143 | 143 | 4.71 |
| 8 | 219 | 3 | 178 | 178 | 7.25 |

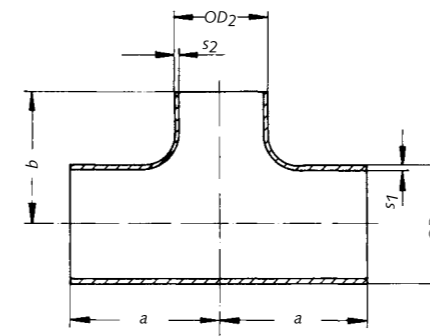
TEES, EQUAL | FORM B – FIG. 3.0200 W

pulled tee with welded outlet

DIN 86088W

Material:
CuNi90/10
CuZn20Al2 – aluminium brass

| Size | | Wall Thickness | a | b | l | Theoretical weight |
|---------|-------|----------------|-----|-----|-----|--------------------|
| DN inch | OD mm | s mm | mm | mm | mm | kg per piece |
| 10 | 267 | 3 | 324 | 289 | 447 | 19.20 |
| 12 | 324 | 4 | 380 | 347 | 560 | 30.48 |
| 14 | 368 | 4 | 407 | 384 | 613 | 38.50 |
| 16 | 419 | 4 | 440 | 435 | 680 | 49.10 |
| 18 | 457 | 4.5 | 500 | 479 | 800 | 56.80 |
| 20 | 508 | 5 | 540 | 529 | 880 | 77.31 |



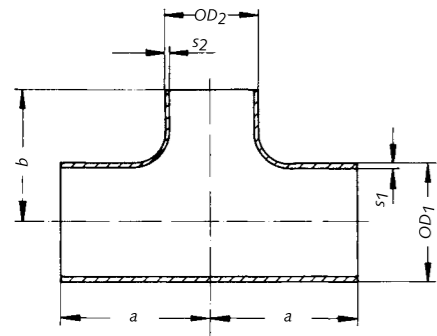
TEES, REDUCING – FIG. 3.0400

seamless

DIN 86088

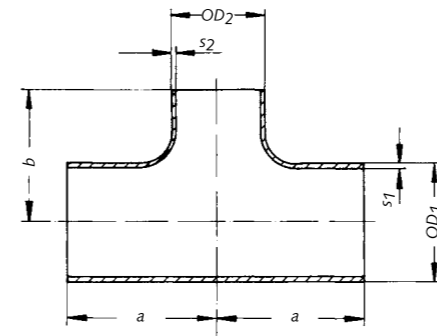
Material:
CuNi90/10
CuZn20Al2 – aluminium brass

| Size | | Dimension | | | a | b | Theoretical weight | | | | |
|---------|---|-----------|-------|--------|-------|------|--------------------|--------------|----|----|-------|
| DN inch | | OD1 mm | s1 mm | OD2 mm | s2 mm | mm | mm | kg per piece | | | |
| 3/4 | x | 1/2 | 25 | x | 1.5 | 20 | x | 1 | 29 | 26 | 0.05 |
| 1 | x | 1/2 | 30 | x | 1.5 | 20 | x | 1 | 38 | 29 | 0.07 |
| 1 | x | 3/4 | 30 | x | 1.5 | 25 | x | 1.5 | 38 | 35 | 0.07 |
| 1 1/4 | x | 1/2 | 38 | x | 1.5 | 20 | x | 1 | 48 | 33 | 0.12 |
| 1 1/4 | x | 3/4 | 38 | x | 1.5 | 25 | x | 1.5 | 48 | 35 | 0.125 |
| 1 1/4 | x | 1 | 38 | x | 1.5 | 30 | x | 1.5 | 48 | 42 | 0.125 |
| 1 1/2 | x | 1/2 | 44.5 | x | 1.5 | 20 | x | 1 | 57 | 36 | 0.185 |
| 1 1/2 | x | 3/4 | 44.5 | x | 1.5 | 25 | x | 1.5 | 57 | 40 | 0.185 |
| 1 1/2 | x | 1 | 44.5 | x | 1.5 | 30 | x | 1.5 | 57 | 45 | 0.185 |
| 1 1/2 | x | 1 1/4 | 44.5 | x | 1.5 | 38 | x | 1.5 | 57 | 51 | 0.185 |
| 2 | x | 3/4 | 57 | x | 1.5 | 25 | x | 1.5 | 64 | 47 | 0.280 |
| 2 | x | 1 | 57 | x | 1.5 | 30 | x | 1.5 | 64 | 51 | 0.285 |
| 2 | x | 1 1/4 | 57 | x | 1.5 | 38 | x | 1.5 | 64 | 57 | 0.285 |
| 2 | x | 1 1/2 | 57 | x | 1.5 | 44.5 | x | 1.5 | 64 | 63 | 0.290 |
| 2 1/2 | x | 1 | 76 | x | 2 | 30 | x | 1.5 | 76 | 56 | 0.650 |
| 2 1/2 | x | 1 1/4 | 76 | x | 2 | 38 | x | 1.5 | 76 | 62 | 0.650 |
| 2 1/2 | x | 1 1/2 | 76 | x | 2 | 44.5 | x | 1.5 | 76 | 71 | 0.650 |
| 2 1/2 | x | 2 | 76 | x | 2 | 57 | x | 1.5 | 76 | 73 | 0.650 |
| 3 | x | 1 1/4 | 89 | x | 2 | 38 | x | 1.5 | 86 | 73 | 0.820 |
| 3 | x | 1 1/2 | 89 | x | 2 | 44.5 | x | 1.5 | 86 | 76 | 0.900 |
| 3 | x | 2 | 89 | x | 2 | 57 | x | 1.5 | 86 | 80 | 1.10 |
| 3 | x | 2 1/2 | 89 | x | 2 | 76 | x | 2 | 86 | 83 | 1.25 |



TEES, REDUCING – FIG. 3.0400
(continuation)

| Size | | | Dimension | | | | | a | b | Theoretical weight | |
|---------|---|----|-----------|----|-----|------|----|-----|-----|--------------------|--------------|
| DN inch | | | OD1 | mm | s1 | OD2 | mm | s2 | mm | mm | kg per piece |
| 4 | x | 1½ | 108 | x | 2.5 | 44.5 | x | 1.5 | 105 | 89 | 2.30 |
| 4 | x | 2 | 108 | x | 2.5 | 57 | x | 1.5 | 105 | 90 | 2.45 |
| 4 | x | 2½ | 108 | x | 2.5 | 76 | x | 2 | 105 | 92 | 2.50 |
| 4 | x | 3 | 108 | x | 2.5 | 89 | x | 2 | 105 | 96 | 2.60 |
| 5 | x | 2 | 133 | x | 2.5 | 57 | x | 1.5 | 124 | 98 | 3.20 |
| 5 | x | 2½ | 133 | x | 2.5 | 76 | x | 2 | 124 | 105 | 3.30 |
| 5 | x | 3 | 133 | x | 2.5 | 89 | x | 2 | 124 | 108 | 3.40 |
| 5 | x | 4 | 133 | x | 2.5 | 108 | x | 2.5 | 124 | 117 | 3.51 |
| 6 | x | 2½ | 159 | x | 2.5 | 76 | x | 2 | 143 | 118 | 4.05 |
| 6 | x | 3 | 159 | x | 2.5 | 89 | x | 2 | 143 | 121 | 4.15 |
| 6 | x | 4 | 159 | x | 2.5 | 108 | x | 2.5 | 143 | 130 | 4.31 |
| 6 | x | 5 | 159 | x | 2.5 | 133 | x | 2.5 | 143 | 136 | 4.51 |
| 8 | x | 4 | 219 | x | 3 | 108 | x | 2.5 | 178 | 156 | 6.15 |
| 8 | x | 5 | 219 | x | 3 | 133 | x | 2.5 | 178 | 162 | 6.30 |
| 8 | x | 6 | 219 | x | 3 | 159 | x | 2.5 | 178 | 168 | 6.50 |



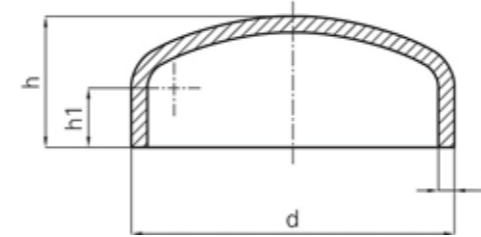
TEES, REDUCING – FIG. 3.0400 W
pulled tee with welded outlet

DIN 86088W

Material:
CuNi90/10
CuZn20Al2 – aluminium brass

| Size | | | Dimension | | | | | a | b | l | Theoretical weight | |
|---------|---|----|-----------|----|-----|-----|----|-----|-----|-----|--------------------|--------------|
| DN inch | | | OD1 | mm | s1 | OD2 | mm | s2 | mm | mm | mm | kg per piece |
| 10 | x | 4 | 267 | x | 3 | 108 | x | 2.5 | 194 | 209 | 188 | 8.58 |
| 10 | x | 5 | 267 | x | 3 | 133 | x | 2.5 | 217 | 219 | 233 | 9.73 |
| 10 | x | 6 | 267 | x | 3 | 159 | x | 2.5 | 240 | 229 | 279 | 10.62 |
| 10 | x | 7 | 267 | x | 3 | 194 | x | 3 | 267 | 243 | 334 | 11.82 |
| 10 | x | 8 | 267 | x | 3 | 219 | x | 3 | 290 | 259 | 379 | 13.28 |
| 12 | x | 5 | 324 | x | 4 | 133 | x | 2.5 | 217 | 247 | 233 | 15.73 |
| 12 | x | 6 | 324 | x | 4 | 159 | x | 2.5 | 240 | 257 | 279 | 17.16 |
| 12 | x | 7 | 324 | x | 4 | 194 | x | 3 | 267 | 272 | 334 | 18.95 |
| 12 | x | 8 | 324 | x | 4 | 219 | x | 3 | 290 | 287 | 379 | 20.74 |
| 12 | x | 10 | 324 | x | 4 | 267 | x | 3 | 324 | 317 | 447 | 23.60 |
| 14 | x | 6 | 368 | x | 4 | 159 | x | 2.5 | 240 | 279 | 279 | 19.53 |
| 14 | x | 7 | 368 | x | 4 | 194 | x | 3 | 267 | 294 | 334 | 21.56 |
| 14 | x | 8 | 368 | x | 4 | 219 | x | 3 | 290 | 309 | 379 | 23.60 |
| 14 | x | 10 | 368 | x | 4 | 267 | x | 3 | 324 | 339 | 447 | 26.44 |
| 14 | x | 12 | 368 | x | 4 | 324 | x | 4 | 380 | 369 | 560 | 30.92 |
| 16 | x | 7 | 419 | x | 4 | 194 | x | 3 | 267 | 319 | 334 | 24.58 |
| 16 | x | 8 | 419 | x | 4 | 219 | x | 3 | 290 | 335 | 379 | 26.90 |
| 16 | x | 10 | 419 | x | 4 | 267 | x | 3 | 324 | 365 | 447 | 30.15 |
| 16 | x | 12 | 419 | x | 4 | 324 | x | 4 | 380 | 395 | 560 | 35.25 |
| 16 | x | 14 | 419 | x | 4 | 368 | x | 4 | 407 | 410 | 613 | 37.76 |
| 18 | x | 8 | 457 | x | 4.5 | 219 | x | 3 | 290 | 354 | 379 | 33.00 |
| 18 | x | 10 | 457 | x | 4.5 | 267 | x | 3 | 324 | 383 | 447 | 36.98 |
| 18 | x | 12 | 457 | x | 4.5 | 324 | x | 4 | 380 | 413 | 560 | 43.16 |
| 18 | x | 14 | 457 | x | 4.5 | 368 | x | 4 | 407 | 428 | 613 | 46.31 |
| 18 | x | 16 | 457 | x | 4.5 | 419 | x | 4 | 440 | 453 | 680 | 50.01 |
| 20 | x | 8 | 508 | x | 5 | 219 | x | 3 | 290 | 379 | 379 | 40.76 |
| 20 | x | 10 | 508 | x | 5 | 267 | x | 3 | 324 | 409 | 447 | 45.68 |
| 20 | x | 12 | 508 | x | 5 | 324 | x | 4 | 380 | 439 | 560 | 53.49 |
| 20 | x | 14 | 508 | x | 5 | 368 | x | 4 | 407 | 454 | 613 | 57.20 |
| 20 | x | 16 | 508 | x | 5 | 419 | x | 4 | 440 | 479 | 680 | 61.84 |
| 20 | x | 18 | 508 | x | 5 | 457 | x | 4.5 | 500 | 504 | 800 | 70.28 |

END CAPS



END CAPS

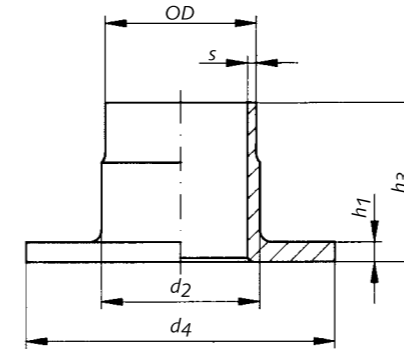
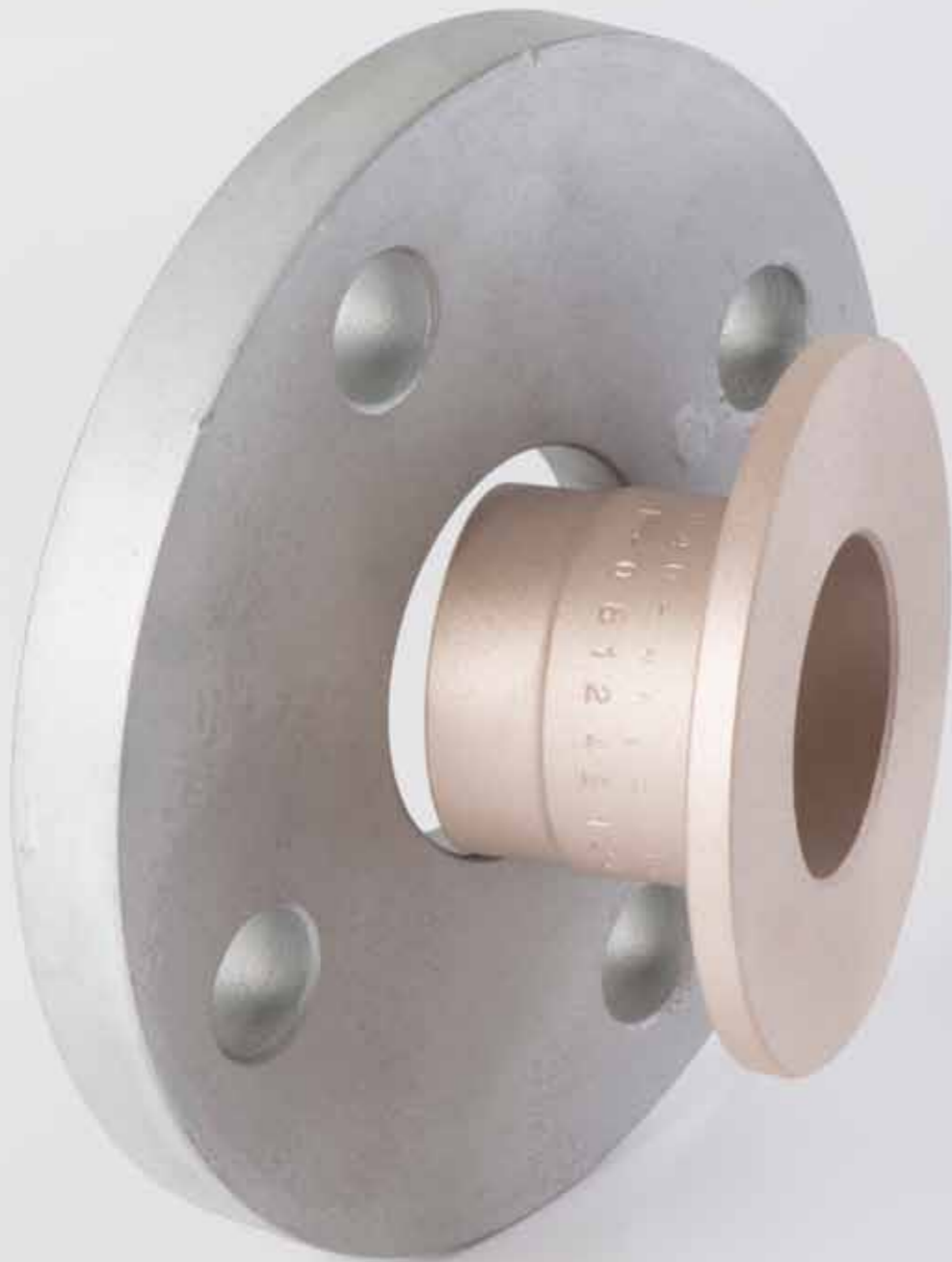
DIN 28011

Material:
CuNi90/10
CuZn20Al2 – aluminium brass

| Size | | Wall Thickness | h | h ₁ | Theoretical weight |
|------------|----------|----------------|-----|----------------|--------------------|
| DN inch | OD mm | S mm | mm | mm | kg per piece |
| 1 | 30 | 1.5 | 19 | 15 | 0.02 |
| 1¼ | 38 | 1.5 | 21 | 15 | 0.06 |
| 1½ | 44.5 | 1.5 | 22 | 15 | 0.10 |
| 2 | 57 | 1.5 | 29 | 20 | 0.19 |
| 2½ | 76 | 2.0 | 33 | 20 | 0.25 |
| 3 | 89 | 2.0 | 35 | 20 | 0.30 |
| 4 | 108 | 2.5 | 39 | 20 | 0.65 |
| 5 | 133 | 2.5 | 44 | 20 | 1.10 |
| 6 | 159 | 2.5 | 49 | 20 | 1.98 |
| 7 | 194 | 3.0 | 56 | 20 | 2.10 |
| 8 | 219 | 3.0 | 58 | 20 | 2.50 |
| 10 | 267 | 3.0 | 70 | 20 | 3.18 |
| 12 | 324 | 4.0 | 81 | 20 | 4.90 |
| 14 | 368 | 4.0 | 89 | 20 | 7.10 |
| 16 | 419 | 4.0 | 99 | 20 | 9.10 |
| 18 | 457 | 4.5 | 107 | 20 | 12.90 |
| 20 | 508 | 5.0 | 116 | 20 | 16.90 |
| 24 | 610 | 5.5 | 139 | 25 | 22.60 |



WELDING COLLARS & FLANGES

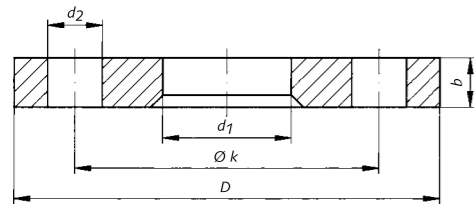


COMPOSITE WELD NECK FLANGES: INNER FLANGE WELDING COLLARS – FIG. 3.100

DIN 86037

Material:
CuNi90/10
CuZn20Al2 – aluminium brass

| Size | | Wall Thickness | d ₂ | d ₄ | h ₁ | h ₃ | Theoretical weight |
|------------|----------|----------------|----------------|----------------|----------------|----------------|--------------------|
| DN inch | OD mm | s mm | mm | mm | mm | mm | kg per piece |
| ¾ | 25 | 1.5 | 27 | 58 | 5 | 40 | 0.15 |
| ¾ | 25 | 2 | 27 | 58 | 5 | 40 | 0.17 |
| 1 | 30 | 1.5 | 32 | 68 | 5 | 40 | 0.20 |
| 1 | 30 | 2 | 32 | 68 | 5 | 40 | 0.22 |
| 1¼ | 38 | 1.5 | 40 | 78 | 5 | 40 | 0.25 |
| 1¼ | 38 | 2 | 40 | 78 | 5 | 40 | 0.30 |
| 1½ | 44.5 | 1.5 | 46.5 | 88 | 6 | 45 | 0.36 |
| 1½ | 44.5 | 2 | 46.5 | 88 | 6 | 45 | 0.40 |
| 2 | 57 | 1.5 | 59 | 102 | 6 | 45 | 0.45 |
| 2 | 57 | 2 | 59 | 102 | 6 | 45 | 0.50 |
| 2½ | 76 | 2 | 78 | 122 | 6 | 45 | 0.62 |
| 3 | 89 | 2 | 91 | 138 | 7 | 50 | 0.86 |
| 4 | 108 | 2.5 | 110 | 158 | 7 | 50 | 1.10 |
| 5 | 133 | 2.5 | 135.5 | 188 | 7 | 50 | 1.50 |
| 6 | 159 | 2.5 | 161.5 | 212 | 9 | 50 | 2.00 |
| 7 | 194 | 3 | 197 | 242 | 9 | 50 | 2.50 |
| 8 | 219 | 3 | 222 | 268 | 9 | 50 | 2.70 |
| 10 | 267 | 3 | 270 | 320 | 9 | 50 | 3.40 |
| 12 | 324 | 4 | 327 | 370 | 11 | 50 | 4.60 |
| 14 | 368 | 4 | 371 | 430 | 11 | 50 | 6.30 |
| 16 | 419 | 4 | 422 | 482 | 12 | 50 | 7.80 |
| 18 | 457 | 4.5 | 460 | 530 | 12 | 50 | 9.50 |
| 20 | 508 | 5 | 511 | 585 | 12 | 50 | 11.70 |
| 24 | 610 | 5 | 613 | 685 | 14 | 60 | 13.40 |



COMPOSITE WELD NECK FLANGES: OUTER FLANGES – FIG. 3.1010

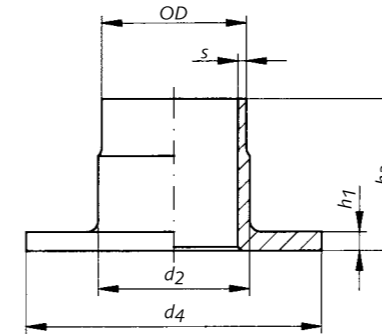
DIN 2642
DIN 86037 PN10/16

Material:
Steel galvanized

| Size | | D | d ₁ | b | k | d ₂ | bolt holes | Theoretical weight |
|---------|-----|-----|----------------|----|-----|----------------|------------|--------------------|
| DN inch | mm | mm | mm | mm | mm | mm | | kg per piece |
| ¾ | 20 | 105 | 28 | 14 | 75 | 14 | 4 | 0.81 |
| 1 | 25 | 115 | 33 | 16 | 85 | 14 | 4 | 1.11 |
| 1¼ | 32 | 140 | 42 | 16 | 100 | 18 | 4 | 1.64 |
| 1½ | 40 | 150 | 50 | 16 | 110 | 18 | 4 | 1.86 |
| 2 | 50 | 165 | 62 | 16 | 125 | 18 | 4 | 2.20 |
| 2½ | 65 | 185 | 81 | 16 | 145 | 18 | 4 | 2.62 |
| 3 | 80 | 200 | 94 | 18 | 160 | 18 | 8 | 3.32 |
| 4 | 100 | 220 | 113 | 18 | 180 | 18 | 8 | 3.67 |
| 5 | 125 | 250 | 138 | 18 | 210 | 18 | 8 | 4.54 |
| 6 | 150 | 285 | 164 | 18 | 240 | 22 | 8 | 5.60 |
| 8 | 200 | 340 | 225 | 20 | 295 | 22 | 8 | 7.46 |
| 10 | 250 | 395 | 273 | 22 | 350 | 22 | 12 | 10.30 |
| 12 | 300 | 445 | 331 | 24 | 400 | 22 | 12 | 12.10 |
| 14 | 350 | 505 | 375 | 24 | 460 | 22 | 16 | 15.70 |
| 16 | 400 | 565 | 426 | 26 | 515 | 26 | 16 | 20.10 |
| 18 | 450 | 615 | 465 | 28 | 565 | 26 | 20 | 25.40 |
| 20 | 500 | 670 | 517 | 30 | 620 | 26 | 20 | 30.80 |
| 24 | 600 | 780 | 618 | 32 | 725 | 30 | 20 | 40.50 |

DIN 86037 PN 16

| Size | | D | d ₁ | b | k | d ₂ | bolt holes | Theoretical weight | |
|---------|----------|----------|-------------------------------|-----|----|----------------|------------|--------------------|------|
| DN inch | mm | mm | mm | mm | mm | mm | | kg per piece | |
| ¾ - 6 | 20 - 150 | 25 - 159 | please refer to DIN 2642 PN10 | | | | | | |
| 7 | 175 | 194 | 315 | 200 | 22 | 270 | 22 | 8 | 7.5 |
| 8 | 200 | 219 | 340 | 225 | 22 | 295 | 22 | 12 | 8.0 |
| 10 | 250 | 267 | 405 | 273 | 24 | 355 | 26 | 12 | 12.0 |
| 12 | 300 | 324 | 460 | 331 | 28 | 410 | 26 | 12 | 16.1 |
| 14 | 350 | 368 | 520 | 375 | 32 | 470 | 26 | 16 | 23.4 |
| 16 | 400 | 419 | 580 | 426 | 36 | 525 | 30 | 16 | 30.9 |



COMPOSITE WELD NECK FLANGES: INNER FLANGE WELDING COLLARS – FIG. 3.2000

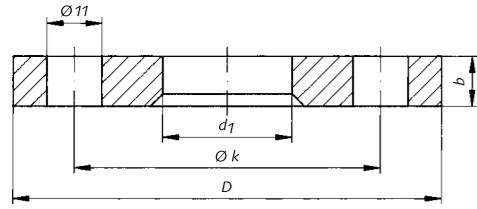
VG 85356

Material:
CuNi90/10
CuZn20Al2 – aluminium brass

DN 20 - DN 32 PN 25
DN 40 - DN 150 PN 16
DN 175 - DN 300 PN 10

| Size | | Wall Thickness | d ₂ | d ₄ | h ₁ | h ₃ | Theoretical weight |
|---------|-------|----------------|----------------|----------------|----------------|----------------|--------------------|
| DN inch | OD mm | s mm | mm | mm | mm | mm | kg per piece |
| ¾ | 25 | 1.5 | 27 | 51 | 5 | 28 | 0.10 |
| ¾ | 25 | 2 | 27 | 51 | 5 | 28 | 0.11 |
| 1 | 30 | 1.5 | 32 | 57 | 5 | 28 | 0.13 |
| 1 | 30 | 2 | 32 | 57 | 5 | 28 | 0.13 |
| 1¼ | 38 | 1.5 | 40 | 65 | 5 | 28 | 0.14 |
| 1¼ | 38 | 2 | 40 | 65 | 5 | 28 | 0.15 |
| 1½ | 44.5 | 1.5 | 46.5 | 73 | 6 | 28 | 0.187 |
| 1½ | 44.5 | 2 | 46.5 | 73 | 6 | 28 | 0.20 |
| 2 | 57 | 1.5 | 59 | 85 | 6 | 30 | 0.243 |
| 2 | 57 | 2 | 59 | 85 | 6 | 30 | 0.260 |
| 2½ | 76 | 2 | 78 | 105 | 6 | 32 | 0.364 |
| 3 | 89 | 2 | 91 | 115 | 7 | 32 | 0.428 |
| 4 | 108 | 2.5 | 110 | 137 | 7 | 32 | 0.600 |
| 5 | 133 | 2.5 | 135.5 | 165 | 7 | 36 | 0.962 |
| 6 | 159 | 2.5 | 161.5 | 191 | 9 | 36 | 1.080 |
| 7 | 194 | 3 | 197 | 229 | 9 | 38 | 1.460 |
| 8 | 219 | 3 | 222 | 253 | 9 | 38 | 1.720 |
| 10 | 267 | 3 | 270 | 305 | 9 | 40 | 2.310 |
| 12 | 324 | 4 | 327 | 357 | 11 | 42 | 3.0 |

Weldings Collars & Flanges

**COMPOSITE WELD NECK FLANGES: OUTER FLANGES – FIG. 3.2010**

VG 85356 PN 10, 16, 25

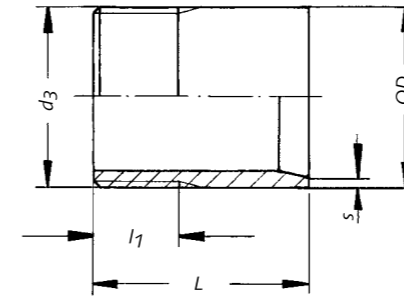
Material:
G-CuSn10Zn
Steel galvanized

DN 20 - DN 32 PN 25
DN 40 - DN 150 PN 16
DN 175 - DN 300 PN 10

| Size | | | D | d ₁ | b | k | | bolt holes | Theoretical weight kg per piece | |
|---------|-------|-------|-----|----------------|----|----|-----|------------|------------------------------------|-----------|
| DN inch | DN mm | OD mm | mm | mm | St | Rg | mm | | steel | red brass |
| 3/4 | 20 | 25 | 86 | 28 | 10 | 10 | 62 | 4 | 0.39 | 0.41 |
| 1 | 25 | 30 | 92 | 33 | 10 | 10 | 68 | 4 | 0.42 | 0.46 |
| 1 1/4 | 32 | 38 | 100 | 42 | 10 | 10 | 76 | 6 | 0.46 | 0.51 |
| 1 1/2 | 40 | 44.5 | 108 | 50 | 10 | 10 | 84 | 6 | 0.532 | 0.583 |
| 2 | 50 | 57 | 120 | 62 | 10 | 12 | 96 | 6 | 0.641 | 0.807 |
| 2 1/2 | 70 | 76 | 140 | 81 | 10 | 14 | 116 | 8 | 0.753 | 1.15 |
| 3 | 80 | 89 | 150 | 94 | 10 | 14 | 126 | 8 | 0.782 | 1.20 |
| 4 | 100 | 108 | 172 | 113 | 12 | 16 | 148 | 10 | 1.16 | 1.68 |
| 5 | 125 | 133 | 200 | 138 | 12 | 18 | 176 | 10 | 1.47 | 2.41 |
| 6 | 150 | 159 | 226 | 164 | 12 | 18 | 202 | 12 | 1.68 | 2.75 |
| 7 | 175 | 194 | 264 | 200 | 12 | 18 | 240 | 14 | 2.09 | 3.43 |
| 8 | 200 | 219 | 288 | 225 | 14 | 20 | 264 | 16 | 2.66 | 4.17 |
| 10 | 250 | 267 | 340 | 273 | 16 | 22 | 316 | 20 | 3.87 | 6.08 |
| 12 | 300 | 324 | 392 | 331 | 16 | 22 | 368 | 24 | 4.20 | 6.60 |



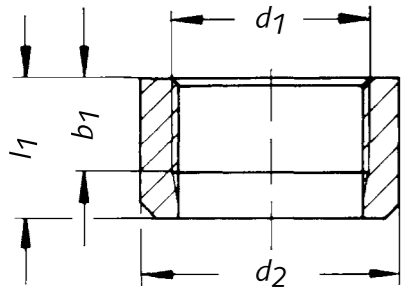
PIPE CONNECTIONS



WELDING ENDS – FIG. 56.0122

Material:
CuNi90/10

| DN | OD | S | d ₃ | L | l ₁ | Theoretical weight |
|-------|------|-----|----------------|----|----------------|--------------------|
| inch | mm | mm | (thread) G | mm | mm | kg per piece |
| | 8 | 1 | G 1/8 | 30 | 10 | 0.011 |
| 1/8 | 10 | 1 | G 1/4 | 30 | 12 | 0.020 |
| 1/4 | 12 | 1 | G 3/8 | 30 | 13 | 0.025 |
| 1/2 | 20 | 1 | G 1/2 | 35 | 15 | 0.062 |
| 3/4 | 25 | 1.5 | G 3/4 | 40 | 15 | 0.093 |
| 1 | 30 | 1.5 | G 1 | 40 | 19 | 0.115 |
| 1 1/4 | 38 | 1.5 | G 1 1/4 | 50 | 20 | 0.190 |
| 1 1/2 | 44.5 | 1.5 | G 1 1/2 | 50 | 20 | 0.275 |
| 2 | 57 | 1.5 | G 2 | 55 | 22 | 0.401 |
| 2 1/2 | 76 | 2 | G 2 1/2 | 60 | 27 | 0.704 |
| 3 | 89 | 2 | G 3 | 65 | 28 | 0.902 |



SOCKETS – FIG. 4.0250

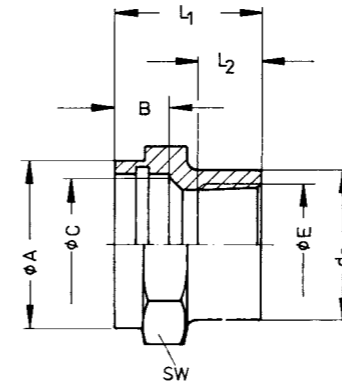
with withworth thread

DIN 86103 Form B

Material:
CuNi90/10
CuZn20Al2 – aluminium brass

| Size | d ₂ | b ₁ | l ₁ | Theoretical weight |
|------------------|----------------|----------------|----------------|--------------------|
| d1 (thread) G | mm | mm | mm | kg per piece |
| G ¼ | 20 | 12 | 20 | 0.030 |
| G ⅜ | 25 | 12 | 20 | 0.050 |
| G ½ | 30 | 14 | 23 | 0.080 |
| G ⅝ | 30 | 14 | 50 | 0.170 |
| G ¾ | 30 | 14 | 75 | 0.255 |
| G ⅞ | 30 | 14 | 100 | 0.380 |
| G 1 | 30 | 14 | 125 | 0.470 |
| G 1 ¼ | 38 | 16 | 25 | 0.140 |
| G 1 ½ | 38 | 16 | 50 | 0.280 |
| G 1 ¾ | 38 | 16 | 75 | 0.445 |
| G 2 | 38 | 16 | 100 | 0.550 |
| G 2 ¼ | 38 | 16 | 125 | 0.700 |
| G 2 ½ | 45 | 18 | 28 | 0.190 |
| G 2 ¾ | 45 | 18 | 50 | 0.350 |
| G 3 | 45 | 18 | 75 | 0.545 |
| G 3 ¼ | 45 | 18 | 100 | 0.700 |
| G 3 ½ | 45 | 18 | 125 | 0.950 |
| G 3 ¾ | 55 | 20 | 30 | 0.290 |
| G 4 | 60 | 22 | 32 | 0.370 |
| G 4 ½ | 75 | 23 | 40 | 0.680 |

Other sizes upon request



STRAIGHT FEMALE CONNECTORS – FIG. 51.0407

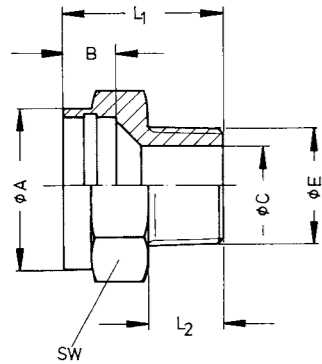
female thread x capillary end

PN up to 63

Material:
CuNi90/10

| Outside diameter of pipe | | E (Thread) | A | B | C | d ₂ | L ₁ | L ₂ | SW |
|--------------------------|-------------------|---------------|----|----|------|----------------|----------------|----------------|----|
| nominal inch | actual mm x G" | "NPT | mm | mm | mm | mm | mm | mm | mm |
| x ⅜ | 8 x ⅜ | ⅜ | 12 | 9 | 6 | 21.5 | 29 | 11 | 22 |
| 1/8 x 1/2 | 10 x 1/2 | 1/2 | 15 | 9 | 8 | 27 | 32 | 14 | 27 |
| 1/8 x 3/4 | 10 x 3/4 | 3/4 | 15 | 9 | 8 | 32 | 34 | 14 | 32 |
| 1/4 x 1/2 | 12 x 1/2 | 1/2 | 17 | 9 | 10 | 27 | 32 | 14 | 27 |
| 1/4 x 3/4 | 12 x 3/4 | 3/4 | 17 | 9 | 10 | 32 | 33 | 14 | 32 |
| 1/4 x 1/2 | 14 x 1/2 | 1/2 | 20 | 10 | 12 | 27 | 32 | 14 | 27 |
| 1/4 x 3/4 | 14 x 3/4 | 3/4 | 20 | 10 | 12 | 32 | 34 | 14 | 32 |
| 1/4 x 1 | 14 x 1 | 1 | 20 | 10 | 12 | 40 | 38 | 17 | 41 |
| 3/8 x 3/8 | 16 x 3/8 | 3/8 | 22 | 10 | 14 | 21.5 | 28 | 11 | 22 |
| 3/8 x 1/2 | 16 x 1/2 | 1/2 | 22 | 10 | 14 | 27 | 31 | 14 | 27 |
| 3/8 x 3/4 | 16 x 3/4 | 3/4 | 22 | 10 | 14 | 32 | 33 | 14 | 32 |
| 3/8 x 1 | 16 x 1 | 1 | 22 | 10 | 14 | 40 | 38 | 17 | 41 |
| 1/2 x 1/2 | 20 x 1/2 | 1/2 | 27 | 10 | 18 | 27 | 28 | 14 | 27 |
| 1/2 x 3/4 | 20 x 3/4 | 3/4 | 27 | 10 | 18 | 32 | 32 | 14 | 32 |
| 1/2 x 1 | 20 x 1 | 1 | 27 | 10 | 18 | 40 | 37 | 17 | 41 |
| 1/2 x 1 ¼ | 20 x 1 ¼ | 1 ¼ | 27 | 10 | 18 | 49 | 40 | 18 | 50 |
| 3/4 x 3/4 | 25 x 3/4 | 3/4 | 32 | 10 | 22 | 32 | 31 | 14 | 32 |
| 3/4 x 1 | 25 x 1 | 1 | 32 | 10 | 22 | 40 | 35 | 17 | 41 |
| 3/4 x 1 ¼ | 25 x 1 ¼ | 1 ¼ | 32 | 10 | 22 | 49 | 39 | 18 | 50 |
| 3/4 x 1 ½ | 25 x 1 ½ | 1 ½ | 32 | 10 | 22 | 55 | 41 | 18 | 55 |
| 1 x 3/4 | 30 x 3/4 | 3/4 | 37 | 11 | 27 | 32 | 31 | 14 | 41 |
| 1 x 1 | 30 x 1 | 1 | 37 | 11 | 27 | 40 | 35 | 17 | 41 |
| 1 x 1 ¼ | 30 x 1 ¼ | 1 ¼ | 37 | 11 | 27 | 49 | 38 | 18 | 50 |
| 1 x 1 ½ | 30 x 1 ½ | 1 ½ | 37 | 11 | 27 | 55 | 40 | 18 | 55 |
| 1 ¼ x 3/4 | 38 x 3/4 | 3/4 | 45 | 15 | 35 | 32 | 39 | 14 | 46 |
| 1 ¼ x 1 | 38 x 1 | 1 | 45 | 15 | 35 | 40 | 39 | 17 | 46 |
| 1 ¼ x 1 ¼ | 38 x 1 ¼ | 1 ¼ | 45 | 15 | 35 | 49 | 40 | 18 | 50 |
| 1 ¼ x 1 ½ | 38 x 1 ½ | 1 ½ | 45 | 15 | 35 | 55 | 42 | 18 | 55 |
| 1 ½ x 1 | 44.5 x 1 | 1 | 52 | 15 | 41.5 | 40 | 43 | 17 | 55 |
| 1 ½ x 1 ¼ | 44.5 x 1 ¼ | 1 ¼ | 52 | 15 | 41.5 | 49 | 39 | 18 | 55 |
| 1 ½ x 1 ½ | 44.5 x 1 ½ | 1 ½ | 52 | 15 | 41.5 | 55 | 40 | 18 | 55 |
| 1 ½ x 2 | 44.5 x 2 | 2 | 52 | 15 | 41.5 | 70 | 43 | 18 | 70 |
| 2 x 1 ¼ | 57 x 1 ¼ | 1 ¼ | 65 | 15 | 54 | 49 | 45 | 18 | 65 |
| 2 x 1 ½ | 57 x 1 ½ | 1 ½ | 65 | 15 | 54 | 55 | 40 | 18 | 65 |
| 2 x 2 | 57 x 2 | 2 | 65 | 15 | 54 | 70 | 40 | 18 | 70 |
| 2 x 2 ½ | 57 x 2 ½ | 2 ½ | 65 | 15 | 54 | 85 | 49 | 24 | 85 |

Pipe Connections



STRAIGHT MALE CONNECTORS – FIG. 51.0408

capillary end x male thread

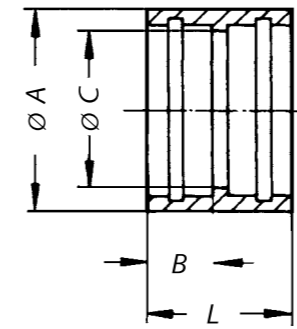
PN up to 63

Material:
CuNi90/10

| Outside diameter of pipe | | E (Thread) | A | B | C | L ₁ | L ₂ | SW |
|--------------------------|-------------------|---------------|----|----|----|----------------|----------------|----|
| nominal inch | actual mm x C" | "NPT | mm | mm | mm | mm | mm | mm |
| x 3/8 | 8 x 3/8 | 3/8 | 12 | 9 | 6 | 26 | 15 | 19 |
| 1/8 x 1/2 | 10 x 1/2 | 1/2 | 15 | 9 | 8 | 30 | 18 | 22 |
| 1/8 x 3/4 | 10 x 3/4 | 3/4 | 15 | 9 | 8 | 33 | 18 | 30 |
| 1/4 x 1/4 | 12 x 1/2 | 1/2 | 17 | 9 | 10 | 30 | 18 | 22 |
| 1/4 x 3/4 | 12 x 3/4 | 3/4 | 17 | 9 | 10 | 33 | 18 | 30 |
| 1/4 x 1/2 | 14 x 1/2 | 1/2 | 20 | 10 | 10 | 30 | 18 | 22 |
| 1/4 x 3/4 | 14 x 3/4 | 3/4 | 20 | 10 | 12 | 33 | 18 | 30 |
| 1/4 x 1 | 14 x 1 | 1 | 20 | 10 | 12 | 38 | 21 | 36 |
| 3/8 x 3/8 | 16 x 3/8 | 3/8 | 22 | 10 | 8 | 29 | 15 | 22 |
| 3/8 x 1/2 | 16 x 1/2 | 1/2 | 22 | 10 | 10 | 30 | 18 | 22 |
| 3/8 x 3/4 | 16 x 3/4 | 3/4 | 22 | 10 | 14 | 33 | 18 | 30 |
| 3/8 x 1 | 16 x 1 | 1 | 22 | 10 | 14 | 38 | 21 | 36 |
| 1/2 x 1/2 | 20 x 1/2 | 1/2 | 27 | 10 | 10 | 33 | 18 | 27 |
| 1/2 x 3/4 | 20 x 3/4 | 3/4 | 27 | 10 | 14 | 34 | 18 | 30 |
| 1/2 x 1 | 20 x 1 | 1 | 27 | 10 | 18 | 39 | 21 | 36 |
| 1/2 x 1 1/4 | 20 x 1 1/4 | 1 1/4 | 27 | 10 | 18 | 43 | 22 | 46 |
| 3/4 x 3/4 | 25 x 3/4 | 3/4 | 32 | 10 | 14 | 35 | 18 | 32 |
| 3/4 x 1 | 25 x 1 | 1 | 32 | 10 | 22 | 39 | 21 | 36 |
| 3/4 x 1 1/4 | 25 x 1 1/4 | 1 1/4 | 32 | 10 | 22 | 43 | 22 | 46 |
| 3/4 x 1 1/2 | 25 x 1 1/2 | 1 1/2 | 32 | 10 | 22 | 44 | 22 | 50 |
| 1 x 3/4 | 30 x 3/4 | 3/4 | 37 | 11 | 14 | 38 | 18 | 41 |
| 1 x 1 | 30 x 1 | 1 | 37 | 11 | 22 | 41 | 21 | 41 |
| 1 x 1 1/4 | 30 x 1 1/4 | 1 1/4 | 37 | 11 | 27 | 44 | 22 | 46 |
| 1 x 1 1/2 | 30 x 1 1/2 | 1 1/2 | 37 | 11 | 27 | 45 | 22 | 50 |
| 1 1/4 x 3/4 | 38 x 3/4 | 3/4 | 45 | 15 | 14 | 44 | 18 | 46 |
| 1 1/4 x 1 | 38 x 1 | 1 | 45 | 15 | 22 | 44 | 21 | 46 |
| 1 1/4 x 1 1/4 | 38 x 1 1/4 | 1 1/4 | 45 | 15 | 27 | 45 | 22 | 46 |
| 1 1/4 x 1 1/2 | 38 x 1 1/2 | 1 1/2 | 45 | 15 | 35 | 46 | 22 | 50 |
| 1 1/2 x 1 | 44.5 x 1 | 1 | 52 | 15 | 22 | 47 | 21 | 55 |
| 1 1/2 x 1 1/4 | 44.5 x 1 1/4 | 1 1/4 | 52 | 15 | 27 | 48 | 22 | 55 |
| 1 1/2 x 1 1/2 | 44.5 x 1 1/2 | 1 1/2 | 52 | 15 | 35 | 48 | 22 | 55 |
| 1 1/2 x 2 | 44.5 x 2 | 2 | 52 | 15 | 41 | 51 | 22 | 65 |
| 2 x 1 1/4 | 57 x 1 1/4 | 1 1/4 | 65 | 15 | 27 | 51 | 22 | 65 |
| 2 x 1 1/2 | 57 x 1 1/2 | 1 1/2 | 65 | 15 | 35 | 51 | 22 | 65 |
| 2 x 2 | 57 x 2 | 2 | 65 | 15 | 48 | 51 | 22 | 65 |
| 2 x 2 1/2 | 57 x 2 1/2 | 2 1/2 | 65 | 15 | 54 | 60 | 28 | 75 |



BRAZING FITTINGS



COUPLINGS, STRAIGHT – FIG. 5.0010

with incorporated silver solder

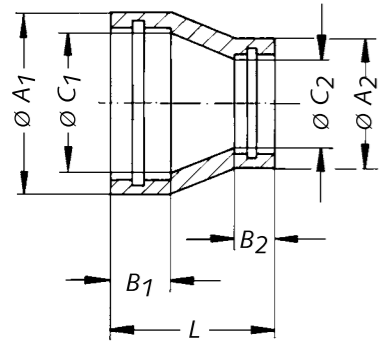
PN up to 63

Material:

CuNi90/10

CuZn20Al2 – aluminium brass

| Size | | A | C | L | B | Theoretical weight |
|------------|----------|----|------|----|----|--------------------|
| DN inch | OD mm | mm | mm | mm | mm | kg per piece |
| | 8 | 12 | 6 | 20 | 9 | 0.010 |
| 1/8 | 10 | 15 | 8 | 20 | 9 | 0.015 |
| 1/4 | 12 | 17 | 10 | 20 | 9 | 0.020 |
| 3/8 | 14 | 20 | 12 | 22 | 10 | 0.025 |
| 1/2 | 16 | 22 | 14 | 22 | 10 | 0.030 |
| 3/4 | 20 | 27 | 18 | 22 | 10 | 0.045 |
| 1 | 25 | 32 | 22 | 22 | 10 | 0.055 |
| 1 1/4 | 30 | 37 | 27 | 24 | 11 | 0.070 |
| 1 1/2 | 38 | 45 | 35 | 32 | 15 | 0.120 |
| 2 | 44.5 | 52 | 41.5 | 33 | 15 | 0.170 |
| | 57 | 65 | 54 | 33 | 15 | 0.220 |



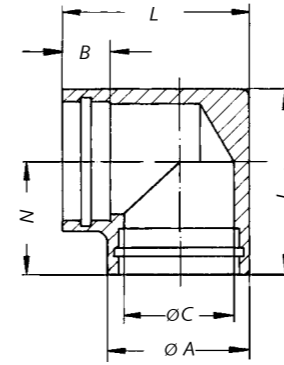
COUPLINGS, REDUCED – FIG. 5.0020

with incorporated silver solder
capillary x capillary end

PN up to 63

Material:
CuNi90/10

| Outside diameter of pipe | | A ₁ | A ₂ | C ₁ | C ₂ | B ₁ | B ₂ | L | Theoretical weight |
|--------------------------|-----------|----------------|----------------|----------------|----------------|----------------|----------------|----|--------------------|
| nominal inch | actual mm | mm | mm | mm | mm | mm | mm | mm | kg per piece |
| | 10 x 8 | 15 | 12 | 8 | 6 | 9 | 9 | 22 | 0.042 |
| | 12 x 8 | 17 | 12 | 10 | 6 | 9 | 9 | 25 | 0.046 |
| 1/4 x 1/8 | 12 x 10 | 17 | 15 | 10 | 8 | 9 | 9 | 21 | 0.048 |
| | 14 x 8 | 20 | 12 | 12 | 6 | 10 | 9 | 30 | 0.056 |
| 1/4 x 1/8 | 14 x 10 | 20 | 15 | 12 | 8 | 10 | 9 | 26 | 0.054 |
| 3/8 x 1/8 | 16 x 10 | 22 | 15 | 14 | 8 | 10 | 9 | 28 | 0.062 |
| 3/8 x 1/4 | 16 x 12 | 22 | 17 | 14 | 10 | 10 | 9 | 27 | 0.058 |
| 1/2 x 1/4 | 20 x 12 | 27 | 17 | 18 | 10 | 10 | 9 | 33 | 0.068 |
| 1/2 x 3/8 | 20 x 16 | 27 | 22 | 18 | 14 | 10 | 10 | 27 | 0.065 |
| 3/4 x 3/8 | 25 x 16 | 32 | 22 | 22 | 14 | 10 | 10 | 33 | 0.069 |
| 3/4 x 1/2 | 25 x 20 | 32 | 27 | 22 | 18 | 10 | 10 | 27 | 0.090 |
| 1 x 3/8 | 30 x 16 | 37 | 22 | 27 | 14 | 11 | 10 | 35 | 0.100 |
| 1 x 1/2 | 30 x 20 | 37 | 27 | 27 | 18 | 11 | 10 | 31 | 0.098 |
| 1 x 3/4 | 30 x 25 | 37 | 32 | 27 | 22 | 11 | 10 | 28 | 0.180 |
| 1 1/4 x 3/8 | 38 x 16 | 45 | 22 | 35 | 14 | 15 | 10 | 45 | 0.162 |
| 1 1/4 x 1/2 | 38 x 20 | 45 | 27 | 35 | 18 | 15 | 10 | 41 | 0.153 |
| 1 1/4 x 3/4 | 38 x 25 | 45 | 32 | 35 | 22 | 15 | 10 | 36 | 0.122 |
| 1 1/4 x 1 | 38 x 30 | 45 | 37 | 35 | 27 | 15 | 11 | 33 | 0.205 |
| 1 1/2 x 3/8 | 44.5 x 16 | 52 | 22 | 41.5 | 14 | 15 | 10 | 51 | 0.204 |
| 1 1/2 x 1/2 | 44.5 x 20 | 52 | 27 | 41.5 | 18 | 15 | 10 | 47 | 0.202 |
| 1 1/2 x 3/4 | 44.5 x 25 | 52 | 32 | 41.5 | 22 | 15 | 10 | 42 | 0.179 |
| 1 1/2 x 1 | 44.5 x 30 | 52 | 37 | 41.5 | 27 | 15 | 11 | 39 | 0.242 |
| 1 1/2 x 1 1/4 | 44.5 x 38 | 52 | 45 | 41.5 | 35 | 15 | 15 | 36 | 0.232 |
| 2 x 3/8 | 57 x 16 | 65 | 22 | 54 | 14 | 15 | 10 | 62 | 0.280 |
| 2 x 1/2 | 57 x 20 | 65 | 27 | 54 | 18 | 15 | 10 | 58 | 0.287 |
| 2 x 3/4 | 57 x 25 | 65 | 32 | 54 | 22 | 15 | 10 | 54 | 0.291 |
| 2 x 1 | 57 x 30 | 65 | 37 | 54 | 27 | 15 | 11 | 50 | 0.310 |
| 2 x 1 1/4 | 57 x 38 | 65 | 45 | 54 | 35 | 15 | 15 | 47 | 0.275 |
| 2 x 1 1/2 | 57 x 44.5 | 65 | 52 | 54 | 41.5 | 15 | 15 | 41 | 0.280 |



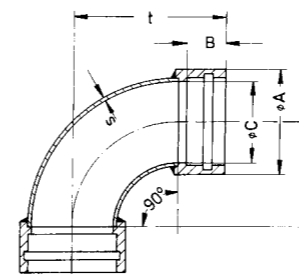
CAPILLARY ELBOWS – FIG. 5.0200

with incorporated silver solder

PN up to 63

Material:
CuNi90/10

| Size | | A | B | C | L | N | Theoretical weight |
|---------|-------|----|----|------|----|------|--------------------|
| DN inch | OD mm | mm | mm | mm | mm | mm | kg per piece |
| | 8 | 15 | 9 | 6 | 24 | 16.5 | 0.035 |
| 1/8 | 10 | 15 | 9 | 8 | 24 | 16.5 | 0.040 |
| 1/4 | 12 | 17 | 9 | 10 | 26 | 17.5 | 0.045 |
| 1/4 | 14 | 22 | 10 | 12 | 32 | 21 | 0.054 |
| 3/8 | 16 | 22 | 10 | 14 | 32 | 21 | 0.090 |
| 1/2 | 20 | 27 | 10 | 18 | 37 | 23.5 | 0.130 |
| 3/4 | 25 | 32 | 10 | 22 | 42 | 26 | 0.185 |
| 1 | 30 | 37 | 11 | 27 | 48 | 29.5 | 0.260 |
| 1 1/4 | 38 | 45 | 15 | 35 | 60 | 36.5 | 0.370 |
| 1 1/2 | 44.5 | 52 | 15 | 41.5 | 67 | 41 | 0.520 |
| 2 | 57 | 65 | 15 | 54 | 80 | 47.5 | 0.870 |



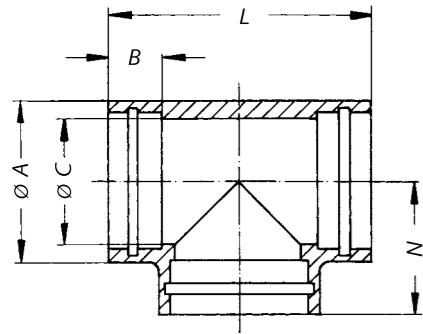
ELBOWS, LONG RADIUS-90° – FIG. 5.0220

Female capillary

Material:
CuNi90/10

| Size | | A | B | C | ≈ | R | t _s |
|---------|-------|----|----|------|------|------|----------------|
| DN inch | OD mm | mm | mm | mm | mm | mm | mm |
| 3/8 | 16 | 22 | 10 | 14 | | | 1 |
| 1/2 | 20 | 27 | 10 | 18 | 22 | 37 | 1 |
| 3/4 | 25 | 32 | 10 | 22 | 27.5 | 39 | 1.5 |
| 1 | 30 | 37 | 11 | 27 | 33.5 | 46.5 | 1.5 |
| 1 1/4 | 38 | 45 | 15 | 35 | 45 | 63 | 1.5 |
| 1 1/2 | 44.5 | 52 | 15 | 41.5 | 51 | 69 | 1.5 |
| 2 | 57 | 65 | 15 | 54 | 72 | 90 | 1.5 |
| 2 1/2 | 76 | 84 | 20 | 72 | 95 | 120 | 2 |

45 deg. Elbow available on request



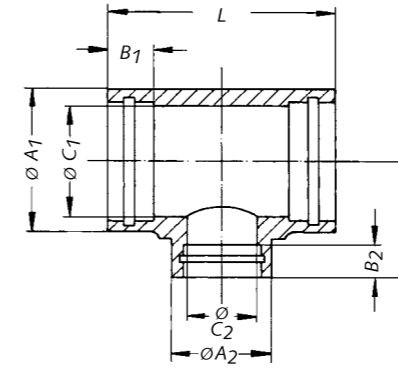
CAPILLARY TEES, EQUAL – FIG. 5.2000

with incorporated silver solder

PN up to 63

Material:
CuNi90/10

| Size | | A | C | B | L | N | Theoretical weight |
|---------|-------|----|------|----|----|------|--------------------|
| DN inch | OD mm | mm | mm | mm | mm | mm | kg per piece |
| | 8 | 15 | 6 | 9 | 33 | 16.5 | 0.020 |
| 1/8 | 10 | 15 | 8 | 9 | 33 | 16.5 | 0.030 |
| 1/4 | 12 | 17 | 10 | 9 | 35 | 17.5 | 0.040 |
| 1/4 | 14 | 22 | 12 | 10 | 42 | 21 | 0.060 |
| 3/8 | 16 | 22 | 14 | 10 | 42 | 21 | 0.080 |
| 1/2 | 20 | 27 | 18 | 10 | 47 | 23.5 | 0.120 |
| 3/4 | 25 | 32 | 22 | 10 | 52 | 26 | 0.190 |
| 1 | 30 | 37 | 27 | 11 | 57 | 28.5 | 0.250 |
| 1 1/4 | 38 | 45 | 35 | 15 | 73 | 36.5 | 0.470 |
| 1 1/2 | 44.5 | 52 | 41.5 | 15 | 82 | 41 | 0.570 |
| 2 | 57 | 65 | 54 | 15 | 95 | 47.5 | 0.860 |



CAPILLARY TEES, REDUCING – FIG. 5.2020

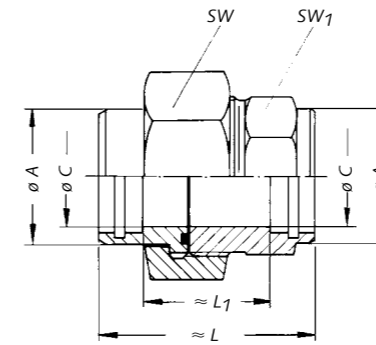
with incorporated silver solder

PN up to 63

Material:
CuNi90/10

| Size | | A ₁ | A ₂ | C ₁ | C ₂ | B ₁ | B ₂ | N | L | Theoretical weight | | |
|---------|-------|--------------------|--------------------|----------------|----------------|----------------|----------------|----|----|--------------------|----|------|
| DN inch | DN mm | OD ₁ mm | OD ₂ mm | mm | mm | mm | mm | mm | mm | kg per piece | | |
| 1/8 | | 10 | 8 | 15 | 15 | 8 | 6 | 9 | 9 | 16.5 | 33 | 0.06 |
| 1/4 | | 12 | 8 | 17 | 12 | 10 | 6 | 9 | 9 | 17.5 | 35 | 0.07 |
| 1/4 | 1/8 | 12 | 10 | 17 | 15 | 10 | 8 | 9 | 9 | 17.5 | 35 | 0.07 |
| 1/4 | | 14 | 8 | 22 | 12 | 12 | 6 | 10 | 9 | 21 | 42 | 0.08 |
| 1/4 | 1/8 | 14 | 10 | 22 | 15 | 12 | 8 | 10 | 9 | 21 | 42 | 0.08 |
| 3/8 | 1/8 | 16 | 10 | 22 | 15 | 14 | 8 | 10 | 9 | 21 | 42 | 0.09 |
| 3/8 | 1/4 | 16 | 12 | 22 | 17 | 14 | 10 | 10 | 9 | 21 | 42 | 0.10 |
| 1/2 | 1/4 | 20 | 12 | 27 | 17 | 18 | 10 | 10 | 9 | 23.5 | 47 | 0.12 |
| 1/2 | 3/8 | 20 | 16 | 27 | 22 | 18 | 14 | 10 | 10 | 23.5 | 47 | 0.12 |
| 3/4 | 3/8 | 25 | 16 | 32 | 22 | 22 | 14 | 10 | 10 | 26 | 52 | 0.15 |
| 3/4 | 1/2 | 25 | 20 | 32 | 27 | 22 | 18 | 10 | 10 | 26 | 52 | 0.16 |
| 1 | 3/8 | 30 | 16 | 37 | 22 | 27 | 14 | 11 | 10 | 28.5 | 57 | 0.20 |
| 1 | 1/2 | 30 | 20 | 37 | 27 | 27 | 18 | 11 | 10 | 28.5 | 57 | 0.25 |
| 1 | 3/4 | 30 | 25 | 37 | 32 | 27 | 22 | 11 | 10 | 28.5 | 57 | 0.30 |
| 1 1/4 | 3/8 | 38 | 16 | 45 | 22 | 35 | 14 | 15 | 10 | 36.5 | 73 | 0.40 |
| 1 1/4 | 1/2 | 38 | 20 | 45 | 27 | 35 | 18 | 15 | 10 | 36.5 | 73 | 0.43 |
| 1 1/4 | 3/4 | 38 | 25 | 45 | 32 | 35 | 22 | 15 | 10 | 36.5 | 73 | 0.43 |
| 1 1/4 | 1 | 38 | 30 | 45 | 37 | 35 | 27 | 15 | 11 | 36.5 | 73 | 0.43 |
| 1 1/2 | 3/8 | 44.5 | 16 | 52 | 22 | 41.5 | 14 | 15 | 10 | 41 | 82 | 0.51 |
| 1 1/2 | 1/2 | 44.5 | 20 | 52 | 27 | 41.5 | 18 | 15 | 10 | 41 | 82 | 0.53 |
| 1 1/2 | 3/4 | 44.5 | 25 | 52 | 32 | 41.5 | 22 | 15 | 10 | 41 | 82 | 0.54 |
| 1 1/2 | 1 | 44.5 | 30 | 52 | 37 | 41.5 | 27 | 15 | 11 | 41 | 82 | 0.57 |
| 1 1/2 | 1 1/4 | 44.5 | 38 | 52 | 45 | 41.5 | 35 | 15 | 15 | 41 | 82 | 0.59 |
| 2 | 1/2 | 57 | 20 | 65 | 27 | 54 | 18 | 15 | 10 | 47.5 | 95 | 0.64 |
| 2 | 3/4 | 57 | 25 | 65 | 32 | 54 | 22 | 15 | 10 | 47.5 | 95 | 0.65 |
| 2 | 1 | 57 | 30 | 65 | 37 | 54 | 27 | 15 | 11 | 47.5 | 95 | 0.68 |
| 2 | 1 1/4 | 57 | 38 | 65 | 45 | 54 | 35 | 15 | 15 | 47.5 | 95 | 0.69 |
| 2 | 1 1/2 | 57 | 44.5 | 65 | 52 | 54 | 41.5 | 15 | 15 | 47.5 | 95 | 0.71 |

UNIONS



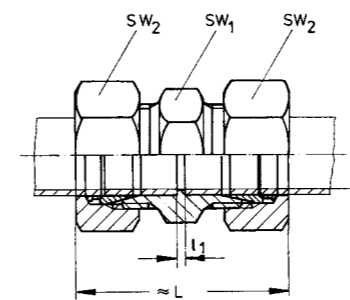
UNIONS – FIG. 50.0403

with incorporated silver solder
capillary x capillary ends

PN up to 63

Material:
CuNi90/10

| Outside diameter of pipe | | A | C | ≈ L ₁ | ≈ L | SW | SW ₁ |
|--------------------------|-----------|----|------|------------------|------|----|-----------------|
| nominal inch | actual mm | mm | mm | mm | mm | mm | mm |
| | 8 | 12 | 6 | 19 | 37 | 22 | 13 |
| 1/8 | 10 | 15 | 8 | 23 | 41 | 27 | 17 |
| 1/4 | 12 | 17 | 10 | 23 | 41 | 27 | 19 |
| 1/4 | 14 | 20 | 12 | 30 | 50 | 32 | 22 |
| 3/8 | 16 | 22 | 14 | 31 | 51 | 36 | 24 |
| 1/2 | 20 | 27 | 18 | 36 | 56 | 41 | 27 |
| 3/4 | 25 | 32 | 22 | 38.5 | 58.5 | 46 | 32 |
| 1 | 30 | 37 | 27 | 39.5 | 61.5 | 50 | 36 |
| 1 1/4 | 38 | 45 | 35 | 42 | 72 | 60 | 46 |
| 1 1/2 | 44.5 | 52 | 41.5 | 46 | 76 | 70 | 55 |
| 2 | 57 | 65 | 54 | 51 | 81 | 85 | 65 |



UNIONS – FIG. 65.0450

with double wedge ring

PN up to 25

Material:
CuNi90/10

| Outside diameter of pipe | | C | ≈ L | ≈ L ₁ | SW ₁ | SW ₂ |
|--------------------------|-----------|----|-----|------------------|-----------------|-----------------|
| nominal inch | actual mm | mm | mm | mm | mm | mm |
| | 8 | 6 | 45 | 4 | 17 | 17 |
| 1/8 | 10 | 8 | 47 | 4 | 17 | 19 |
| 1/4 | 12 | 10 | 47 | 3 | 19 | 22 |
| 3/8 | 16 | 14 | 51 | 3 | 24 | 27 |
| 1/2 | 20 | 18 | 57 | 3 | 27 | 32 |
| 3/4 | 25 | 22 | 64 | 3 | 36 | 41 |
| 1 | 30 | 27 | 71 | 3 | 41 | 46 |

Other dimensions upon request



THE CHIBRO HERMETIC® is a patented system for bulkhead penetrations.

The main advantages of the System are:

Shorter installation time on board.

Installation of a conventional penetration needs the outer sleeve or the intermediate flange to be welded on both sides of the structure and its ends coupled to the pipeline. The ILTA/CHIBRO HERMETIC system of penetration only requires the two discs to be assembled and the screws tightened for the compression of the o-ring.

Elimination of all problems caused by welding on board (deformation of structures, splatters on other fittings already installed, etc.).

Better quality of the final product.

The pipe in the penetration area is not welded and therefore its mechanical characteristics and corrosion resistance remain unchanged. Simplified material management and higher flexibility in the use of product.

Reduction of the overall costs.

The patented ILTA/CHIBRO HERMETIC System allows the penetration of pipes to be made through watertight and fire-resisting compartments on board ships and off-shore units of any type or dimension in a safe, fast and economical way. In fact, the ILTA/CHIBRO HERMETIC system of penetration has successfully passed the **Standard fire Test for class A-60 and A0** stipulated by the IMO 754 (18) Resolution and a hydrostatic pressure test under a head water column head greater than 100 metres.

APPLICATIONS AND APPROVALS

The ILTA/CHIBRO HERMETIC system can be used on pipes passing through watertight decks and bulkheads (below the freeboard deck) as well as A-60 and A0 fire-resistant divisions (A-30 in Aluminium).

The range of outside diameters of pipes for which the ILTA/CHIBRO HERMETIC system penetration are available extends from **Ø 6 mm up to Ø 273 mm**.

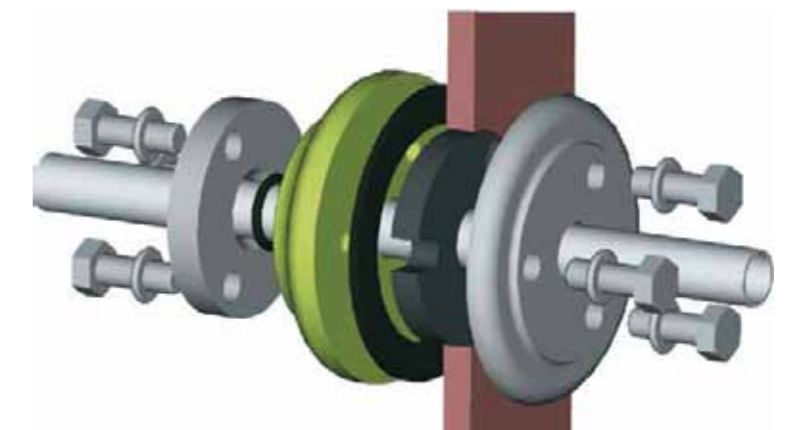
The system has been designed and tested to withstand a pressure of a 100 meter water column. Therefore they can be used on ships and off-shore units of any dimensions.

The ILTA/CHIBRO HERMETIC system of penetration has been approved for all the above mentioned applications by the following Classification Bodies:

- Registro Italiano Navale
- Loyd's Register of Shipping
- American Bureau of Shipping
- Det Norske Veritas
- Bureau Veritas
- Germanischer Lloyd

Certificates are available upon request.

If required, Approval Certificates of other Classification Bodies can be obtained.



CUNIPRESS

THE CHIBRO CUNIPRESS® SYSTEM

is a metric press-fit system specifically developed for seawater and other aggressive media applications.

The CUNIPRESS System has been studied to realize in a reliable and economic way pipeworks for sea-water, brackish water and industrial water in the range of diameters from 15 up to 108 mm.

The CUNIPRESS System consists of the following components:

- Fittings: bends, T pieces, reducers, etc. in 90/10 copper-nickel alloy according to UNS C 70600
- Pipes: precision cold-drawn in 90/10 copper-nickel alloy according to UNS C 70600
- Electromechanical or electrohydraulic pressing tool: for the connection of components by pressing the fittings onto the pipe ends

The range of component is completed with accessories which can be coupled to the pipe with the same technique of CUNIPRESS fittings.

Main advantages of CUNIPRESS System

- Simple and fast assembly
- Reliability of pipework also in severe service conditions
- High corrosion resistance of piping for sea, Brackish and industrial water services
- Elimination of workshop labour normally carried out with conventional systems

APPLICATIONS

The CUNIPRESS System has been specially studied for use in sea, brackish and industrial water plants. Typical applications, for example in shipbuilding, are following services:

- Machinery sea-water cooling
- Bilge and ballast pipe systems
- Fire extinguishing and deck washing
- Sprinkler systems
- Sea-water desalination units

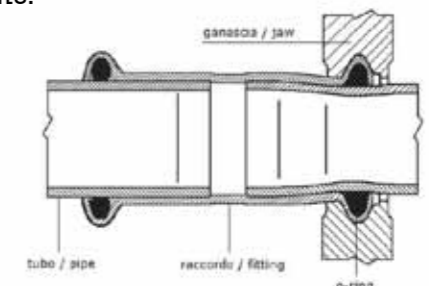
Nevertheless the CUNIPRESS System can be used with benefit also for other fluids such as fresh water for sanitary and cooling services, fuel and lube oils.

The application limits of the System in the range of diameters from 15 up to 108 mm are the following:

- test pressure 64 bar
- working pressure 16 bar
- maximum working temperature 95 °C
- maximum temperature (peaks) 110 °C

The CUNIPRESS System has been approved for applications on board of ships and offshore units by R.I.N.A., A.B.S., D.N.V., L.R., B.V., G.L., Italian Navy, U.S. Coast Guard, U.K. Maritime and Coastguard Agency, U.K. Sea Fish Industry Authority.

Moreover it is approved for applications on board of ships built according to Ice Class requirements.



OFFSHORE

UNS 7060X





UNS 7060X

OFFSHORE - UNS 7060X [CUN190-10] ACCORDING TO EEMUA STANDARD

To follow the requirement of the market and the constantly growing Offshore market, with its special demand in respect of size range and pressure rating, we extended our product range of Copper Nickel 90/10 as follows:

EEMUA - 144: **seamless and welded Tubes** **16/20 bar**

EEMUA - 145: **composite and solid Flanges** **16/20 bar**

Composite Weld Neck Flanges
Solid Weld Neck Flanges
Solid Slip-On Flanges
Composite Blind Flanges

EEMUA - 146: **Fittings** **16/20 bar**

Elbows
Concentric Reducers
Saddles
Tees
Caps
Welding Outlet, butt weld branch connector
Socket Outlet, socket weld branch connector
Threaded Outlet, self reinforced branch connector, threaded type

Range of Sizes:

16 mm / ½" to 914 mm / 36"

Besides the above materials, we are able to offer the whole range of pipe connections and Unions suitable for Offshore application.

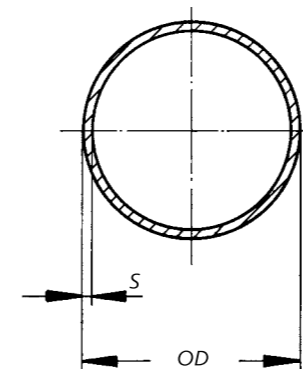
Please do not hesitate to get in contact with us if you need further details!



ENGINEERING

Condenser Tubes
Sheets & Plates,
Circles & Rings
Massive: Round &
Hexagonal Bars

CONDENSER TUBES



CONDENSER TUBES

seamless

ASTM B111
BS 2871 Part 3
EN 12451, DIN 1785

Material:

CuNi90/10
CuNi70/30
CuZn20Al2 – aluminium brass
CuZn28Sn1 – admiralty brass
CuZn38Sn1 – naval brass

| Size | | Standard Wall Thickness | | | | |
|-----------------------------|--------------|-------------------------|---|------|------|------|
| Nominal inch | Actual OD mm | s mm | | | | |
| | 8 | 0.75 | 1 | 1.25 | 1.5 | |
| | 10 | 0.75 | 1 | 1.25 | 1.5 | 2 |
| | 11 | 0.75 | 1 | 1.25 | 1.5 | 2 |
| | 12 | 0.25 | 1 | 1.25 | 1.5 | 2 |
| | 14 | 0.25 | 1 | 1.25 | 1.5 | 2 |
| | 15 | 0.25 | 1 | 1.25 | 1.5 | 2 |
| ⁵ / ₈ | 15.88 | | | 1.25 | 1.65 | 2.11 |
| | 16 | | 1 | 1.25 | 1.5 | 2 |
| | 18 | | 1 | | 1.5 | 2 |
| | 19.05 | | | 1.25 | 1.65 | 2.11 |
| | 20 | | 1 | | 1.5 | 2 |
| | 22 | | | 1.25 | 1.5 | 2 |
| 1 | 25.4 | | | | 1.65 | 2.11 |
| | 28 | | 1 | 1.25 | 1.5 | 2 |
| | 30 | | 1 | 1.25 | 1.5 | 2 |
| | 32 | | 1 | 1.25 | 1.5 | 2 |
| | 35 | | 1 | 1.25 | 1.5 | 2 |

Tube lengths: up to 14,500 mm
Other alloys or sizes on request





SHEETS & PLATES

Material:
CuNi90/10
EN 1652/EN 1653
ASTM B171

Available size range

| | | Hot rolled | Cold rolled |
|-----------|----|------------|-------------|
| Width | mm | up to 3000 | up to 3000 |
| Thickness | mm | 4 - 150 | 2 - 8 |
| Length | mm | up to 8200 | up to 8200 |

CIRCLES & RINGS

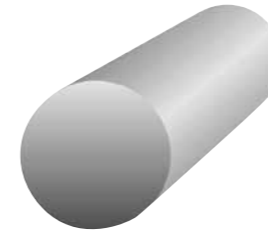
Available size range

| Product form | Thickness mm | Outside diameter mm | Inside diameter mm | Weight kg |
|--------------|--------------|---------------------|--------------------|-----------|
| Circle | 2 - 300 | 100 - 3000 | - | 2 - 20000 |
| Ring | 2 - 300 | 100 - 3000 | 80 - 2800 | 2 - 17000 |

NIE-MET SUPPLIES THE FOLLOWING ALLOYS:

| Alloy | National Standard (DIN)* | British Standard (BS) | American Standard (ASTM) |
|-----------------|---|-----------------------|--------------------------------------|
| CuNi90/10 | (17664 / 1751 / 17675) | CN 102 | B 171 UNS C70600 |
| CuNi70/30 | (17664 / 1751 / 17675) | CN 107 | B 171 UNS C71500 |
| Aluminium brass | Alloy CuZn20Al2 (17660 / 1751 / 17675) | CZ 110 | B 171 UNS C68700 |
| Admiralty brass | Alloy CuZn28Sn1 (17660 / 1751 / 17675) | CZ 111 | B 171 UNS C44300 |
| Naval brass | Alloy CuZn38Sn1 (17660 / 1751 / 17675) | CZ 112 | B 171 UNS C46400 |
| Aluminiumbronze | Alloy CuAl10Ni5Fe4 Alloy CuAl8 (17665 / 1751 / 17675) | CA 105 CA 106 | B 171 UNS C63000 B 171 UNS C61400 |

* replaced by DIN EN 1652 / 1653



ROUND

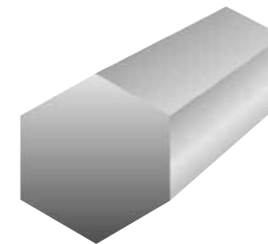
Material
CuNi90/10
CuZn20Al2 – aluminium brass

Applicable production standards:

Cold drawn up to 80 mm (DIN 1756) DIN EN 12163 / 12164 / 12165
Extruded up to 150 mm (DIN 1782) DIN EN 12163 / 12164 / 12165

STOCK LIST

| Dimension mm | Weight kg/mtr. | Dimension mm | Weight kg/mtr. |
|--------------|----------------|--------------|----------------|
| 10 | 0.70 | 50 | 17.47 |
| 12 | 1.01 | 55 | 21.14 |
| 15 | 1.57 | 60 | 25.15 |
| 16 | 1.79 | 65 | 29.52 |
| 18 | 2.26 | 70 | 34.24 |
| 20 | 2.79 | 75 | 39.32 |
| 25 | 4.37 | 80 | 44.72 |
| 30 | 6.29 | 85 | 50.47 |
| 35 | 8.55 | 90 | 56.60 |
| 40 | 11.18 | 100 | 69.90 |
| 45 | 14.15 | | |



HEXAGONAL

Material
CuNi90/10
CuZn20Al2 – aluminium brass

Applicable production standards:

Cold drawn up to 80 mm (DIN 1763) DIN EN 12163 / 12164

STOCK LIST

| Dimension mm | Weight kg/mtr. | Dimension mm | Weight kg/mtr. |
|--------------|----------------|--------------|----------------|
| 17 | 2.23 | 32 | 7.89 |
| 19 | 2.78 | 36 | 9.96 |
| 22 | 3.70 | 41 | 13.00 |
| 24 | 4.44 | 46 | 16.30 |
| 27 | 5.62 | 50 | 19.30 |
| 30 | 6.94 | | |



ALUMINIUM

Sheets & Plates,
Treadplates & Profiles

ALUMINIUM











A) ALUMINIUM SHEETS & PLATES

Please refer to our general catalogue for detailed information about alloys and sizes we are able to supply.

B) TREADPLATES, 5-BAR OR 2-BAR DESIGN

| Size | kg/m ² | Size | kg/m ² |
|--|-------------------|--|-------------------|
| 1.0 / 1.5 x 1250 x 2500 x 1500 x 3000 | 2.84 | 5.0 / 6.5 x 1000 x 2000 x 1250 x 2500 | 14.96 |
| 1.5 / 2.5 x 1250 x 3000 | 4.25 | x 1500 x 3000 | |
| 2.0 / 3.2 x 1250 x 2500 | 5.67 | 6.0 / 7.5 x 1000 x 2000 x 1250 x 2500 | 18.90 |
| 2.5 / 4.0 x 1000 x 2000 x 1250 x 2500 | 7.88 | 6.5 / 8.0 x 1000 x 2000 | 20.48 |
| x 1500 x 3000 | | 8.0 / 9.5 x 1000 x 2000 | 25.20 |
| 3.5 / 5.0 x 1000 x 2000 x 1250 x 2500 | 10.76 | x 1250 x 2500 | |
| x 1500 x 3000 | | x 1500 x 3000 | |

C) PROFILES: ALLOY 6060 T66, 6082 T6, 5083 F/H111/H112, 5754 F/H14/H111/H112

| | | | |
|---|-------------------|---|------------------------|
|  | Round Tubes |  | Flat Bars |
|  | Square Tubes |  | Unequal / Equal Angles |
|  | Rectangular Tubes |  | T-Profiles |
|  | Round Bars |  | I-Beams |
|  | Square Bars |  | Channel-Profiles |

D) WELDING WIRE / ROD

TIG / MIG-WELDING

* Sizes are available in 'mm' or imperial dimensions.

* In our plate-service-center we can cut to any required dimension.

* Test Certificates are available. Third party inspection acc. to Germanischer Lloyd, Lloyds Register of Shipping, Det Norske Veritas or American Bureau of Shipping at request.



ATTACHMENTS

Material Specifications

Comparison Tables

Applicable Production Standards

Tolerance Tables

End Preparation



ATTACHMENTS

NIE•MET CuNi90/10 and CuZn20Al2 meet the requirements regarding chemical analyses of several national and international standards.

NIE•MET CuNi90/10

- 2.0872
- 2.1972
- CN 102
- UNS 7060x
- C 70600
- C 7060T
- CW 352H/355H

CuZn20Al2 (Aluminium Brass)

- 2.0460
- CZ 110
- CW 702R
- C 6870

MECHANICAL PROPERTIES

The mechanical properties of the final products correspond to those specified in the relevant national and international standards.

Please observe that most of DIN standards are replaced by EN-standards, copies are available on request.

CHEMICAL COMPOSITION - NIE-MET STANDARD

| Alloy | CuNi90/10 | CuZn20Al2 |
|--------------|-------------|--------------|
| Cu | rem. | 76.0 - 78.0 |
| Ni | 10.0 - 11.0 | ≤ 0.1 |
| Fe | 1.5 - 1.8 | ≤ 0.06 |
| Mn | 0.6 - 1.0 | ≤ 0.1 |
| Mg | - | ≤ 0.005 |
| Zn | ≤ 0.05 | rem. |
| Pb | ≤ 0.01 | ≤ 0.02 |
| Al | - | 1.8 - 2.3 |
| S | ≤ 0.005 | - |
| P | ≤ 0.02 | ≤ 0.01 |
| As | - | 0.02 - 0.035 |
| C | ≤ 0.05 | - |
| total others | ≤ 0.2 | - |

TYPICAL PHYSICAL PROPERTIES

| Physical properties | CuNi90/10 | CuZn20Al2 |
|---|-------------|------------|
| Density (20°C), kg/m³ | 8900 | 8350 |
| Specific heat (20°C), J/kg K | 377 | 377 |
| Melting range °C | 1100 - 1145 | 935 - 1010 |
| Thermal conductivity (20°C), W/mK | 50 | 100 |
| Coeff. of linear exp. (20-100°C), 10 ⁻⁶ /k | 13 | 18 |
| Electrical resistivity (20°C, annealed), microhm cm | 19 | 7.5 |
| Modulus of elasticity (20°C, annealed), GN/m² | 138 | 112 |

COMPARISON-TABLE STANDARD SPECIFICATIONS FOR CUN90/10

| | Nie-Met Standard | DIN 86019 2.1972 (CW 355 H) | DIN 17664 2.0872 CW 352 H | EEMUA 144 - 1987 UNS 7060x | BS 2871 CN 102 | MIL-T-16420K ASTM B 466 C 70600 | JIS H 3300 C 7060 T |
|------------|------------------|-----------------------------|---------------------------|----------------------------|----------------|---------------------------------|-----------------------|
| Ni % | 10.0 - 11.0 | 9.0 - 11.0 | 9.0 - 11.0 | 10.0 - 11.0 | 10.0 - 11.0 | 9.0 - 11.0 | 9.0 - 11.0 |
| Fe % | 1.5 - 1.8 | 1.5 - 1.8 | 1.0 - 2.0 | 1.5 - 2.0 | 1.0 - 2.0 | 1.0 - 1.8 | 1.0 - 1.8 |
| Mn % | 0.6 - 1.0 | 0.5 - 1.0 | 0.5 - 1.0 | 0.5 - 1.0 | 0.5 - 1.0 | max. 1.0 | 0.2 - 1.0 |
| C % | max. 0.05 | max. 0.05 | max. 0.05 | max. 0.05 | max. 0.05 | max. 0.05 | |
| Pb % | max. 0.01 | max. 0.01 | max. 0.03 | max. 0.01 | max. 0.01 | max. 0.02 | max. 0.05 |
| S % | max. 0.005 | max. 0.005 | max. 0.02 | max. 0.02 | max. 0.05 | max. 0.02 | |
| P % | max. 0.02 | max. 0.02 | max. 0.02 | max. 0.02 | | max. 0.02 | |
| Zn % | max. 0.05 | max. 0.05 | max. 0.05 | max. 0.20 | | max. 0.50 | max. 0.50 |
| other imp. | max. 0.20 | max. 0.20 | max. 0.20 | max. 0.30 | max. 0.30 | | |
| Cu % | rem. | rem. | rem. | rem. | rem. | rem. | +Ni +Fe +Mn min. 99.5 |

PIPES

seamless and seam welded

Material:

CuNi10 – 90/10 copper-nickel-iron

CuZn20 – aluminium brass

SUMMARY-STANDARDS FOR PIPES MADE FROM WROUGHT COPPER ALLOYS CUNI10 AND CUZN20

| Names OD-Sizes | Sizes and tolerances | Alloy Composition | Alloy Characteristics | Technical Delivery | Remarks |
|---|---------------------------------|--|--------------------------------|--------------------------------|--|
| Seamless, drawn CuNi10Fe1.6Mn tube for piping systems 8 OD - 419 OD | DIN 86019 | WL 2.1972 (EN CW 355H) | WL 2.1972 | DIN 85004 T4 | ODs 8 - 57 with OD tolerances to BS 2871 P2/13 for capillary soldered joints |
| Welded copper alloy pipe 457 OD - 1620 OD Alloy CuNi10Fe1.6Mn | DIN 86018 | WL 2.1972 (EN CW 355H) | WL 2.1972 | DIN 85004 T4 | - |
| Seamless, drawn copper alloy pipe and tube, 3 OD - 450 OD Preferred sizes for general purposes Preferred sizes for pipe systems | DIN EN 12449 (DIN 1755 T3) | DIN EN 12449 CuZn20: (DIN 17660) | DIN EN 12449 (DIN 17671 T1) | DIN EN 12449 (DIN 17671 T2) | DIN EN 1652: CuZn20: CW 102R |
| Copper alloy tubes for condensers and heat exchangers, 8 OD - 35 OD | DIN EN 12451 (DIN 1785) | DIN EN 12451 CuNi10: (DIN 17664) CuZn20: (DIN 17660) | DIN EN 12451 (DIN 1785) | - | DIN EN 1652: CuNi10: CW 352H CuZn20: CW 702R |
| Copper and copper alloy seamless condenser tubes up to RA 79 | ASTM B111-87 | CuNi10: C 70600 CuNi20: C 68700 | B111 | B111 | - |
| 90/10 copper nickel alloy piping for offshore applications Tubes seamless and welded RA 16 - RA 914 | EEMUA 144/87 | EEMUA 144/87 UNS 7060x | EEMUA 144/87 | - | ODs 16 - 108 with OD tolerances to BS 2871 P2/13 for capillary soldered joints |
| Copper alloy tubes Tubes for general purposes RA 3 - RA 508 Tubes for heat exchangers | BS 2871 P2/ P3 BS 2871 P3 | BS 2871 P2 BS 2871 P3 | BS 2871 P2 BS 2871 P3 | - | ODs 3 - 108 with OD tolerances to BS 2871 P2/13 for capillary soldered joints |
| Seamless copper nickel pipes and tubes up to RA250 | ASTM B466-86 | CuNi10: B466 CuNi10: B466 | B466 | B466/B251 | OD same as ANSI B 36.10 or B 36.19 (steel/stainless steel) |
| Welded copper nickel pipe RA50.8 - RA 76.1 | ASTM B467-86 | CuNi10: B467 CuNi30: B467 | B467 | B467 | OD same as ANSI B 36.10 or B 36.19 (steel/stainless steel) |

BUTT WELD FITTINGS

Applicable production standards for butt weld fittings

| Country | National Standards Authority | Designation of Material in Standard | National Standards | | | | | |
|--------------------------|------------------------------|--|--------------------|-------|---------|-------|-------|--------|
| | | | Welding Collars | Elbow | Reducer | Tee | Cap | Saddle |
| Germany | DIN | CuNi10Fe1.6Mn Werkstoff Nr. 2.1972 CuZn20Al2 Werkstoff Nr. 2.0460 | 86037 | 86090 | 86089 | 86088 | 28011 | 86087 |
| Great Britain | BS | aluminium brass CZ 100 90/10 copper-nickel-iron CN 102 | | | | | | |
| United States of America | ASTM ASME ANSI | aluminium brass UNS No. C 68700 copper nickel 10% UNS No. C 70600 | | | | | | |

SEAMLESS BUTT WELD FITTINGS

Seamless butt weld fittings are produced from seamless tube and pipe by either hot or cold forming process.

Seamless butt weld fittings are available in standard sizes, as published in the relevant product tables, and in non-standard sizes. Standard-size fittings are generally available ex stock.

WELDING

Welding is carried out by Code-qualified personnel (ASME Boiler and Pressure Vessel Code, Section 9; Lloyds Register of Shipping; TÜV and others) whose qualifications are regularly checked and approved. Established welding methods include automatic plasma arc, automatic TIG, pulsed TIG, MIG and shielded-electrode techniques.

SEAM WELDED BUTT WELD FITTINGS

Seam welded butt weld fittings are produced from hot rolled, annealed and pickled sheet resp. plate, formed into half shells or segments and longitudinally seam welded.

Seam welded butt weld fittings are available in standard sizes, as published in the relevant product tables, and in non-standard sizes. Standard-size fittings are generally available ex stock.

SUPPLY CONDITION

Unless otherwise agreed, seamless butt weld fittings are supplied according to technical delivery condition DIN 86086. Seam welded butt weld fittings are supplied in the as-welded condition.

Tolerance Table: Wall Thickness

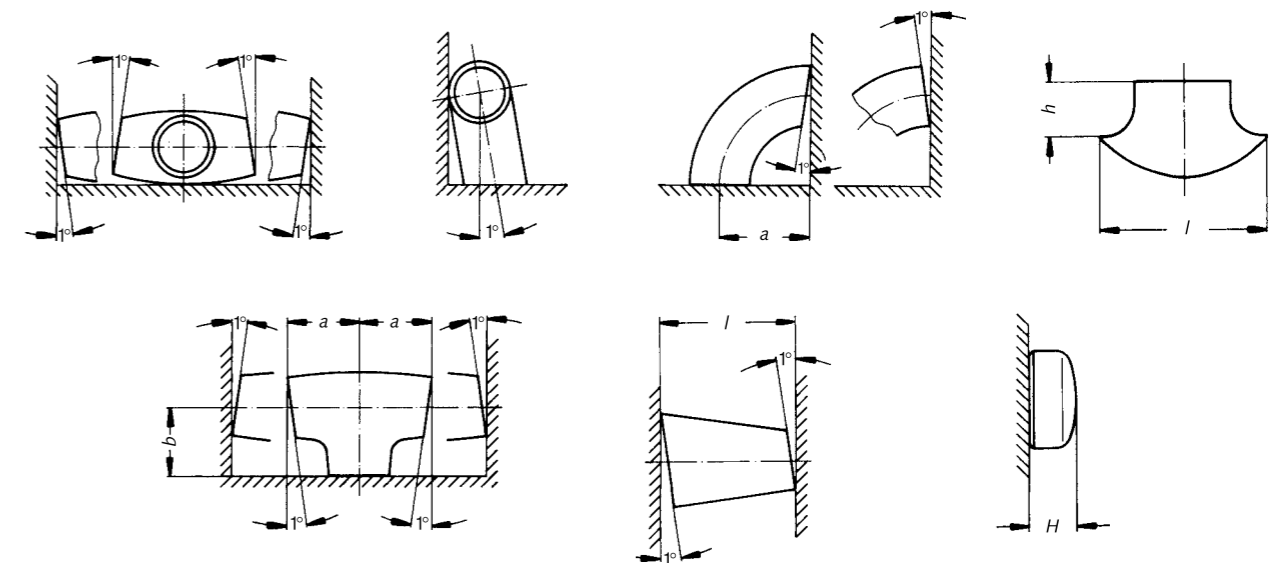
**TOLERANCES ON WALL THICKNESSES OF THE ENDS OF BUTT WELD FITTINGS
[ALL SIZES IN MM]**

| Size OD | Inner Ø | ± | S | ± | Inner Ø | ± | S | ± | Inner Ø | ± | S | ± | Inner Ø | ± | S | ± | Inner Ø | ± | S | ± | Inner Ø | ± | S | ± | |
|------------|------------|-----|-----|--------------|------------|-----|-----|--------------|------------|-----|-----|--------------|------------|-----|-----|--------------|------------|-----|-----|--------------|------------|-----|-----|--------------|--------------|
| 20 | 18 | | 1 | 0.3 0.1 | 17 | | 1.5 | 0.45 0.15 | 16 | 0.3 | 2 | 0.6 0.2 | | | | | | | | | | | | | |
| 25 | 22 | 0.3 | | | 21 | 0.3 | | | | | | | | | | | | | | | | | | | |
| 30 | 27 | | | | 26 | | | | | | | | | | | | | | | | | | | | |
| 38 | 35 | | 1.5 | 0.45 0.15 | 34 | | 2 | 0.6 0.2 | 33 | | 0.4 | | | | | | | | | | | | | | |
| 44.5 | 41.5 | 0.4 | | | 40.5 | 0.4 | | | 39.5 | | 2.5 | 0.75 0.25 | | | | | | | | | | | | | |
| 57 | 54 | 0.5 | | | 53 | 0.5 | | | 52 | 0.5 | | | 51 | 0.5 | 3 | 0.9 0.3 | | | | | | | | | |
| 76 | 72 | | 2 | 0.6 0.2 | 71 | | 2.5 | 0.75 0.25 | 70 | | 0.6 | | 69 | | 3 | 0.9 0.3 | | | | | | | | | |
| 89 | 85 | 0.6 | | | 84 | 0.6 | | | 83 | | 0.6 | | 82 | | 3.5 | 1.05 0.35 | | | | | | | | | |
| 108 | 103 | | | 0.75 0.25 | 102 | | | 0.9 0.3 | 101 | | | 1.05 0.35 | 100 | | | 1.2 0.4 | 99 | | 4.5 | 1.35 0.45 | 98 | 0.6 | 5 | 1.5 0.5 | |
| 133 | 128 | | 2.5 | | 127 | 0.8 | | | 126 | 0.8 | | | 125 | 0.8 | 4 | | 123 | 0.8 | 5 | 1.88 0.63 | 121 | | 0.8 | 6 | 2.25 0.75 |
| 159 | 154 | | | 0.9 0.3 | 153 | | 3 | 1.2 0.4 | 152 | | 3.5 | | 151 | | 4 | 1.5 0.5 | 147 | | | 1.3 0.44 | 143 | | 8 | 3 1 | |
| 194 | 189 | | | | 188 | | | | 187 | | | | 186 | | | | 182 | | | 2.25 0.75 | 178 | | | | |
| 219 | 213 | | 3 | 1.2 0.4 | 212 | 1 | 3.5 | 1.3 0.44 | 211 | 1 | 4 | 1.5 0.5 | 207 | 1 | | | 203 | 1 | 8 | 3 1 | 199 | 1 | 10 | 3.75 1.25 | |
| 267 | 261 | | | | 259 | 1 | 4 | 1.5 0.5 | 257 | 1 | 5 | 1.88 0.63 | 255 | 1 | | | 249 | | 9 | 3.38 1.13 | 243 | | 12 | 4.5 1.5 | |
| 324 | 316 | | | | 315 | | | | 314 | | 6 | 2.25 0.75 | 312 | | | | | | | | | | | | |
| 368 | 360 | | 4 | 2.0 0.5 | 359 | 2 | 4.5 | 1.69 0.56 | 357 | 2 | 5.5 | 2.1 | 356 | 2 | | | | | | 0.69 | 407 | | | | |
| 419 | 411 | | | | 410 | | | | 408 | | | | 407 | | | | 405 | 2 | 7 | 2.62 0.88 | | | | | |
| 457 | 449 | | | 1.5 0.9 | 448 | | | 1.69 0.9 | 443 | | | | 443 | | 7 | 2.62 0.9 | | | | | | | | | |
| 508 | 499 | | 4.5 | 1.69 0.9 | 498 | 3 | 5 | 1.88 0.9 | 493 | 3 | 7.5 | 2.8 0.9 | 493 | 3 | | | | | | | | | | | |
| 610 | 601 | | | | 600 | 3 | | | 599 | | 5.5 | 2.1 0.9 | | | | | | | | | | | | | |
| 711 | 699 | | 6 | 2.25 0.9 | 698 | | | 2.44 0.9 | | | | | | | | | | | | | | | | | |
| 813 | 801 | | | | 799 | | | 2.62 0.9 | | | | | | | | | | | | | | | | | |
| 914 | 898 | | | | | | | | | | | | | | | | | | | | | | | | |
| 1016 | 1000 | | 8 | 3 0.9 | | | | | | | | | | | | | | | | | | | | | |

Tolerance Table: Other Tolerances

TOLERANCES FOR BUTT WELD FITTINGS MENTIONED IN THIS CATALOGUE

| Size | | Elbows | Tees, seamless | | Tees, welded | | End Caps | Red. pieces | Saddles | | |
|------------|----------|----------|----------------|-------|--------------|-----|------------|-------------|---------|-----|-----|
| DN inch | DN mm | OD mm | 30° - 90° a | a | b | a | b | H | l | h | l |
| 3/8 | 12 | 16 | ± 2 | ± 0.5 | ± 0.5 | | | ± 3.2 | ± 1 | ± 3 | ± 3 |
| 1/2 | 16 | 20 | ± 2 | ± 0.5 | ± 0.5 | | | ± 3.2 | ± 1 | ± 3 | ± 3 |
| 3/4 | 20 | 25 | ± 2 | ± 0.5 | ± 0.5 | | | ± 3.2 | ± 1 | ± 3 | ± 3 |
| 1 | 25 | 30 | ± 2 | ± 0.5 | ± 0.5 | | | ± 3.2 | ± 1 | ± 3 | ± 3 |
| 1 1/4 | 32 | 38 | ± 2 | ± 0.5 | ± 0.5 | | | ± 3.2 | ± 1 | ± 3 | ± 3 |
| 1 1/2 | 40 | 44.5 | ± 2 | ± 0.5 | ± 0.5 | | | ± 3.2 | ± 1 | ± 3 | ± 3 |
| 2 | 50 | 57 | ± 2 | ± 0.5 | ± 0.5 | | | ± 3.2 | ± 1 | ± 3 | ± 3 |
| 2 1/2 | 65 | 76 | ± 2 | ± 0.5 | ± 0.5 | | | ± 3.2 | ± 1 | ± 3 | ± 3 |
| 3 | 80 | 89 | ± 2 | ± 0.5 | ± 0.5 | | | ± 3.2 | ± 1 | ± 3 | ± 3 |
| 4 | 100 | 108 | ± 2 | ± 1.0 | ± 1.0 | | | ± 3.2 | ± 1 | ± 3 | ± 4 |
| 5 | 125 | 133 | ± 2 | ± 1.0 | ± 1.0 | | | ± 6.4 | ± 1 | ± 3 | ± 4 |
| 6 | 150 | 159 | ± 2 | ± 1.0 | ± 1.0 | | | ± 6.4 | ± 1 | ± 3 | ± 4 |
| 7 | 175 | 194 | ± 2 | ± 1.0 | ± 1.0 | | | ± 6.4 | ± 1 | ± 3 | ± 4 |
| 8 | 200 | 219 | ± 2 | ± 1.0 | ± 1.0 | | | ± 6.4 | ± 1 | ± 3 | ± 5 |
| 10 | 250 | 267 | ± 3 | ± 2.0 | ± 2.0 | ± 3 | +4.7 -5.4 | ± 6.4 | ± 1 | ± 3 | ± 5 |
| 12 | 300 | 324 | ± 3 | | | ± 3 | +5.0 -5.5 | ± 6.4 | ± 1 | ± 3 | ± 6 |
| 14 | 350 | 368 | ± 3 | | | ± 3 | +7.5 -8.0 | ± 6.4 | ± 3 | ± 5 | ± 6 |
| 16 | 400 | 419 | ± 3 | | | ± 3 | +7.5 -8.0 | ± 6.4 | ± 3 | ± 5 | ± 6 |
| 18 | 450 | 457 | ± 3 | | | ± 3 | +8.0 -8.9 | ± 6.4 | ± 3 | ± 5 | ± 6 |
| 20 | 500 | 508 | ± 3 | | | ± 3 | +8.2 -8.9 | ± 6.4 | ± 3 | ± 5 | ± 7 |
| 24 | 600 | 610 | ± 15 | | | ± 5 | +8.2 -8.9 | ± 6.4 | ± 5 | ± 5 | ± 7 |
| 28 | 700 | 711 | ± 25 | | | ± 5 | +8.75 -8.9 | ± 6.4 | ± 5 | ± 5 | ± 7 |
| 32 | 800 | 813 | ± 35 | | | ± 5 | +8.75 -8.9 | ± 6.4 | ± 5 | ± 5 | ± 7 |
| 36 | 900 | 914 | ± 50 | | | ± 5 | +9.5 -8.9 | ± 6.4 | ± 5 | ± 5 | ± 7 |



End Preparation

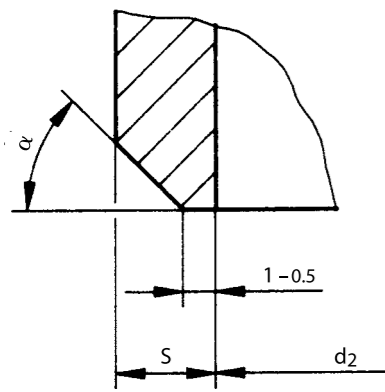
END PREPARATION

Design of edges, bevels for s

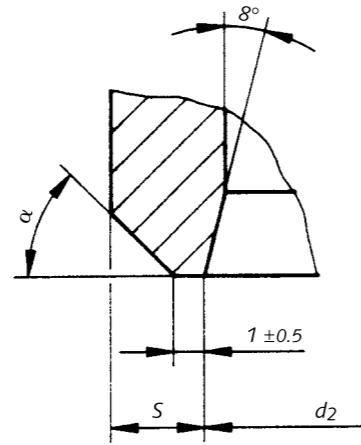
$< 3 \text{ mm}$ no bevel

$\geq 3 \text{ mm} \leq 5 \text{ mm}$ $a = 30^\circ + 5^\circ$

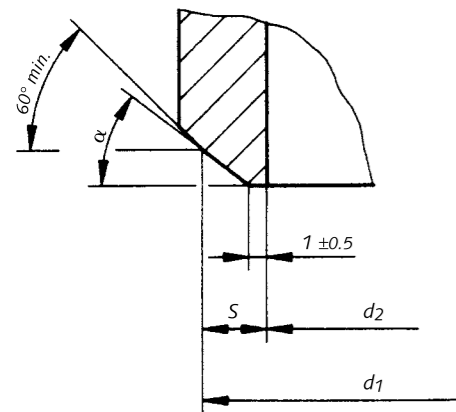
$> 5 \text{ mm}$ $a = 45^\circ \pm 2.5^\circ$



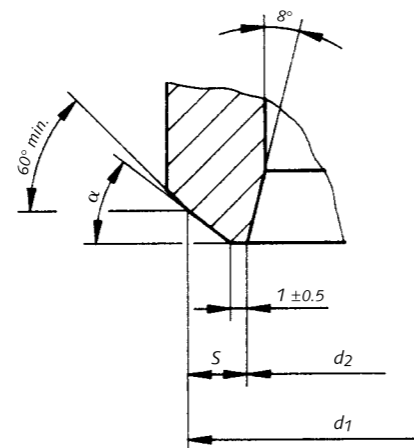
Edge preparation equal to those of the adjoining pipe.



Edge preparation for pipe end with internal diameter smaller than the bore of the adjoining pipe (d_2). Use an 8° bevel at transition to d_2 .



Edge preparation for pipe end with outside diameter larger than that of the adjoining pipe (d_1). Use a bevel of 60° min. at transition to d_1 .



Edge preparation for pipe end with an internal diameter smaller than the bore of the adjoining pipe (d_2), and with an outside diameter larger than that of the adjoining pipe (d_1). Use an 8° bevel at transition to d_2 . Use a bevel of 60° min. at transition to d_1 .





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