

Shipbuilding

OSNA[®]-10 and OSNA[®]-30



Copper-Nickel Alloys for Seawater Piping Systems
(*CuNi 90/10 and CuNi 70/30*)

KME Germany GmbH & Co. KG
Shipbuilding - OSNA[®]-10 and OSNA[®]-30
[EN]



Content

KME - The Company	1
The Material	2
Shipbuilding - Product Range	3
Pipes	4
Butt Welding Fittings	
• Elbows	5
• Tee Pieces (<i>equal and reduced</i>)	7
• End Caps	10
• Saddle Type Connections	11
• Reducers (<i>concentric and eccentric</i>)	14
Flanges	
• Welding Necks (<i>equal and reduced</i>)	17
• Outer Flanges	18
• Blind Flanges	19
Brazing Fittings	
• Couplings (<i>straight and reduced</i>)	20
• Elbows	22
• Tee Pieces (<i>equal and reduced</i>)	23
• End Caps	25
• Male Connectors (<i>straight</i>)	26
• Female Connectors (<i>straight</i>)	27
Miscellaneous	
• Hexagon Head Screw Plugs	28
• Welding Ends	29
• Sockets	30
• Unions	31
• Male Unions (<i>reduced</i>)	32
KME Quality Management	36





KME - The Company

KME as one of the largest manufacturers of copper and copper alloy products offers best possible product and engineering solutions in the various fields of industrial applications. As a leading supplier in the most diverse industries, KME serves the worlds market with a broad spectrum of technologically leading copper and copper-alloy tubes, strips and sheets of outstanding production quality.

Marine Applications

KME's business unit Marine Applications is specialized in the production of copper-nickel alloys for piping systems in shipbuilding, offshore installations and other marine applications. The sea and its atmosphere is one of the most corrosive environments on the earth. Seagoing vessels need large amounts of seawater daily for

- fire water systems
- sprinkler systems
- cooling systems
- ballast systems

The materials used for seawater piping systems therefore must be highly resistant to pitting, crevice and erosion corrosion as well as stress corrosion cracking and macrofouling. Moreover such materials must satisfy high standards in terms of hot and cold working properties and weldability.

The Material

KME Alloys OSNA[®]-10 and OSNA[®]-30

For decades, seawater pipe systems made of copper-nickel alloys have been put to successful use on seagoing vessels and offshore production units like platforms, drilling rigs, semi-submersibles FPSOs etc.

The chemical composition of OSNA[®]-10 (CuNi 90/10) and OSNA[®]-30 (CuNi 70/30) copper-nickel alloys have been modified so that they meet the requirements of all the main international standards (see tables below). Reduced tolerance limits for certain impurities moreover provide for an enhanced cold workability and weldability of KME's alloy.

Main Advantages of OSNA[®]-10 and OSNA[®]-30

Despite the rough conditions in marine service and the highly corrosive nature of seawater, the products provide well balanced combination of technical and economical advantages:

- Simple alloying system with good weldability
- Excellent ductility and toughness
- Good erosion corrosion resistance
- Resistant to uniform and localised corrosion
- No effect of ambient seawater temperatures
- No effect of seawater chlorination
- Resistant to biofouling
- Resistant to stress-corrosion cracking
- Low maintenance costs
- A lot of design experience

Comparison of Standard Specifications for OSNA[®]-10 (CuNi 90/10)

	KME Alloy OSNA [®] -10 (CuNi 90/10)	EN 1652/ 12420/12449 ¹⁾ CW352H	DIN 86019 WL 2.1972	EEMUA 2016, 234/1-2 UNS C 7060 x	MIL-T-16420K ASTM B 466 ²⁾ /467 C 70620	JIS H 3300 C 7060 T
Ni %	10.0 – 11.0	9.0 – 11.0	9.0 – 11.0	10.0 – 11.0	9.0 – 11.0	9.0 – 11.0
Fe %	1.5 – 1.8	1.0 – 2.0	1.5 – 1.8	1.5 – 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	max. 1.0	0.2 – 1.0
C %	max. 0.02	max. 0.05	max. 0.05	max. 0.05	max. 0.05	–
Pb %	max. 0.01	max. 0.02	max. 0.01	max. 0.01	max. 0.02	max. 0.05
S %	max. 0.005	max. 0.05	max. 0.005	max. 0.02	max. 0.02	–
P %	max. 0.02	max. 0.02	max. 0.02	max. 0.02	max. 0.02	–
Zn %	max. 0.05	max. 0.50	max. 0.05	max. 0.20	max. 0.50	max. 0.50
Sn %		max. 0.03	–	–	–	–
other imp.	max. 0.20	max. 0.20	max. 0.20	max. 0.30	–	–
Cu %	rem.	rem.	rem.	rem.	min. 86.5	+Ni+Fe+Mn min. 99.5

¹⁾ formerly BS 2871 Part 2

²⁾ equal to C 70600 for subsequent welding

* The iron content has been specified to improve corrosion resistance

Comparison of Standard Specifications for OSNA[®]-30 (CuNi 70/30)

	KME Alloy OSNA [®] -30 (CuNi 70/30)	EN 1652/ 12420/12449 ¹⁾ CW354H	MIL-T-16420K ASTM B 466/467 ²⁾ C 71520	JIS H 3300 C 7150 T
Ni %	30.0 – 32.0	30.0 – 32.0	29.0 – 33.0	29.0 – 33.0
Fe %	0.6 – 1.0	0.4 – 1.0	0.4 – 1.0	0.4 – 1.0
Mn %	0.5 – 1.0	0.5 – 1.5	max. 1.0	0.2 – 1.0
C %	max. 0.04	max. 0.05	max. 0.05	
Pb %	max. 0.01	max. 0.02	max. 0.02	max. 0.05
S %	max. 0.02	max. 0.05	max. 0.02	
P %	max. 0.01	max. 0.02	max. 0.02	
Zn %	max. 0.20	max. 0.50	max. 0.50	max. 0.50
Sn %		max. 0.05		
other imp.	max. 0.30	max. 0.20		
Cu %	rem.	rem.	min. 65	+Ni+Fe+Mn min. 99.5

¹⁾ formerly BS 2871 Part 2

²⁾ equal to C 71500 for subsequent welding

Shipbuilding - Product Range

OSNA®-10 and OSNA®-30 seawater pipes

- are manufactured in two configurations:
 - seamless
 - seamwelded

OSNA®-10 (CuNi 90/10)

6-457 mm O.D.
seamless,
up to 1200 mm O.D.
seam-welded

International Standards

- EN 1652/12420/12449
- DIN 86019
- EEMUA 234/1-2
- ASTM-B-466/467
- MIL-T-16420 K
- DEF STAN 02-779 (NES 779)

OSNA®-30 (CuNi 70/30)

6-323.9 mm O.D.
seamless,
up to 1200 mm O.D.
seam-welded

International Standards

- EN 1652/12420/12449 (CW354H)
- ASTM-B-466/467
- MIL-T-16420 K
- DEF STAN 02-780 (NES 780)

KME offers a comprehensive range of pipes and fittings in different sizes and dimensions for seawater piping systems in different applications.

Furthermore, we are also offering sheets and plates in different sizes.



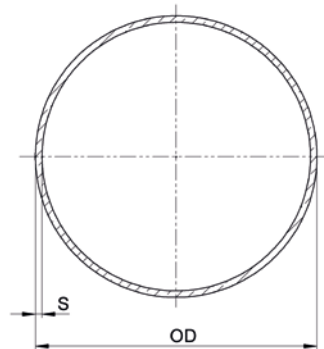
Specifications:

DIN 86019, DIN EN 12449 and similar*.

Material:

OSNA®-10 (CuNi 90/10) and

OSNA®-30 (CuNi 70/30)



Seamless Pipe

Size			Wall Thickness			
DN		OD	Standard		Special*	
in	mm	mm	S	kg/m	S	kg/m
	4	8	1	0.20		
1/8	6	10	1	0.25		
1/4	8	12	1	0.31		
3/8	12	16	1	0.42	1.5	0.61
1/2	16	20	1	0.53	1.5	0.78
3/4	20	25	1.5	0.99	2	1.29
1	25	30	1.5	1.20	2	1.57
1 1/4	32	38	1.5	1.53	2	2.01
1 1/2	40	44.5	1.5	1.80	2	2.38
2	50	57	1.5	2.33	2	3.08
2 1/2	65	76	2	4.14	2.5	5.18
3	80	88.9 (89.0)	2	4.87	2.5	6.09
4	100	108	2.5	7.37	3	8.84
5	125	133	2.5	9.12	3	10.94
6	150	159	2.5	10.93	3	13.08
7	175	194	3	16.01		
8	200	219.1 (219)	3	18.12	3.5	21.12
10	250	267	3	22.13	4	29.47
12	300	323.9 (324)	4	35.80	5	44.75
14	350	368	4	40.70	5.5	55.96
16	400	419	4	46.40	6	69.60
18	450	457	4.5	57.48		

For offshore wall thickness see separate catalogue.

Seam welded Pipe

20	500	508*	5	70.32
24	600	610*	5	84.56
28	700	711*	6	118.28
32	800	813*	6	135.38
36	900	914*	8	202.66

Other dimensions on request.

*) similar to

Elbows

Long radius 1.5 D

Specification:

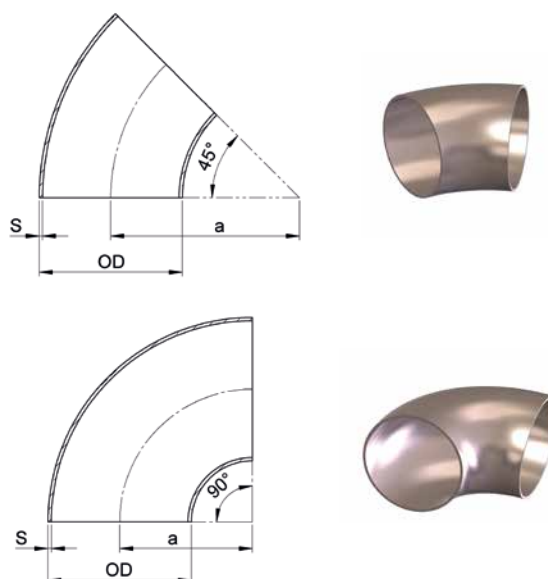
DIN 86090 and similar*.

Material:

OSNA[®]-10 - copper-nickel

Type and Construction:

Elbows for pipes up to and including 14"/ 368 mm in size are normally supplied seamless. Elbows for larger diameter pipes are made from half shells, longitudinally welded. 45° and 90° elbows are available in all sizes.



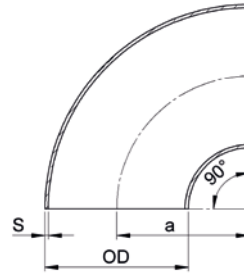
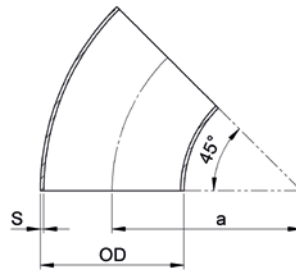
Size			Wall Thickness S mm	Radius a mm	~ e mm	Approx. Weight (~ kg)	
in	DN mm	OD mm				45°	90°
Seamless							
1/2	16	20*	1	25	10.4	0.013	0.026
3/4	20	25*	1.5	27.5	11.4	0.029	0.058
1	25	30	1.5	33.5	14	0.035	0.07
1 1/4	32	38	1.5	45	19	0.06	0.12
1 1/2	40	44.5	1.5	51	21	0.07	0.15
2	50	57	1.5	72	30	0.14	0.29
2 1/2	65	76	2	95	39	0.34	0.69
3	80	89	2	114.5	47	0.47	0.95
4	100	108	2.5	142.5	59	0.90	1.80
5	125	133	2.5	181	75	1.45	2.90
6	150	159	2.5	216	89	2.30	4.60
7	175	194	3	270	112	4.05	8.10
8	200	219	3	305	126	4.55	9.10
10	250	267	3	378	157	7.70	15.40
12	300	324	4	457	189	13.00	26.00
14	350	368	4	533.5	221	21.00	42.00
16	400	419	4	609.5	252	29.50	59.00
18	450	457	4.5	686	284	36.00	72.00
20	500	508	5	762	316	45.00	90.00
24	600	610	5	914	379	60.00	120.00
28	700	711*	6	1067	442	99.00	198.00
32	800	813*	6	1219	505	129.50	259.00
36	900	914*	8	1372	568	218.50	437.00

Other dimensions on request.

*) similar to

Elbows

Short radius 1.0 D



Size			Wall Thickness S mm	Radius a mm	e mm	Approx. Weight (~kg)	
in	DN mm	OD mm				45°	90°
Seamless							
1	25	30	1.5	30	12	0.029	0.058
1¼	32	38	1.5	32.5	14	0.039	0.078
1½	40	44.5	1.5	40	17	0.057	0.144
2	50	57	1.5	52.5	22	0.96	0.192
2½	65	76	2	70	29	0.23	0.46
3	80	89	2	82.5	34	0.32	0.64
4	100	108	2.5	100	41	0.58	1.16
5	125	133	2.5	125	52	0.90	1.80
6	150	159	2.5	150	62	1.30	2.60
7	175	194	3	180	75	2.27	4.54
8	200	219	3	210	87	2.99	5.98
10	250	267	3	255	106	4.44	8.88
12	300	324	4	305	126	8.57	17.14
14	350	368	4	352.5	146	11.30	22.60
16	400	419	4	400	166	14.58	29.16
18	450	457	4.5	457	189	20.45	40.90
20	500	508	5	508	210	28.06	56.12
24	600	610	5	610	253	40.50	81.00
28	700	711	6	711	295	66.00	132.00
32	800	813	6	813	337	86.50	173.00
36	900	914	8	914	379	145.50	291.00

Other dimensions on request.

Tee Pieces, equal

Specification

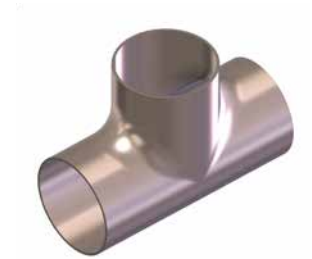
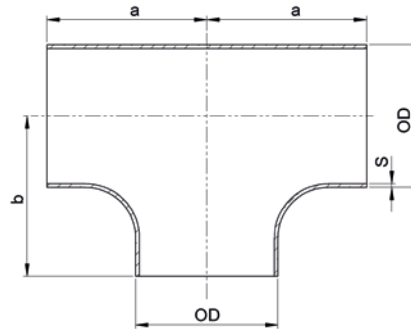
DIN 86088 and similar*

Material:

OSNA®-10 – copper-nickel

Type and Construction:

Tees for pipes up to and including 8"/ 219 mm are normally supplied as one-piece and seamless.



Size			Wall Thickness S	a	b	Approx. Weight kg /piece
in	DN	OD				
1/2	16	20*	1	25	25	0.11
3/4	20	25*	1.5	29	29	0.14
1	25	30	1.5	38	38	0.19
1 1/4	32	38	1.5	48	48	0.37
1 1/2	40	44.5	1.5	57	57	0.56
2	50	57	1.5	64	64	0.72
2 1/2	65	76	2	76	76	1.25
3	80	89	2	86	86	1.74
4	100	108	2.5	105	105	2.94
5	125	133	2.5	124	124	4.01
6	150	159	2.5	143	143	5.25
8	200	219	3	178	178	11.60
10	250	267	3	216	216	14.90
12	300	324	4	254	254	21.30
14	350	368	4	279	279	25.90
16	400	419	4	305	305	33.40
18	450	457	4.5	343	343	48.60
20	500	508	5	381	381	63.20
24	600	610	5.5	432	432	93.80

Other dimensions on request.

*) similar to

Tee Pieces, reduced ¹⁾

Specification

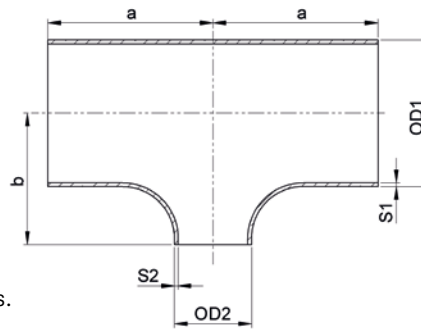
DIN 86088 and similar*

Material:

OSNA[®]-10 – copper-nickel

Type and Construction:

Tees for pipes up to and including 8"/ 219 mm are normally supplied as one-piece and seamless.



¹⁾ final dimensions can be slightly different and can be provided on request.

Size			Wall Thickness		a	b	Approx. Weight kg /piece
DN	OD ₁	OD ₂	S ₁	S ₂			
in	mm	mm	mm		mm	mm	
3/4 x 1/2	20 x 16	25 x 20*	1.5 x 1.0		23	23	0.08
1 x 1/2	25 x 16	30 x 20*	1.5 x 1.0		38	29	0.15
1 x 3/4	25 x 20	30 x 25*	1.5 x 1.5		38	35	0.20
1 1/4 x 1/2	32 x 16	38 x 20*	1.5 x 1.0		36	36	0.32
1 1/4 x 3/4	32 x 20	38 x 25*	1.5 x 1.5		48	35	0.36
1 1/4 x 1	32 x 25	38 x 30	1.5 x 1.5		48	42	0.38
1 1/2 x 1/2	40 x 16	44.5 x 20*	1.5 x 1.0		36	36	0.42
1 1/2 x 3/4	40 x 20	44.5 x 25*	1.5 x 1.5		57	40	0.48
1 1/2 x 1	40 x 25	44.5 x 30	1.5 x 1.5		57	45	0.53
1 1/2 x 1 1/4	40 x 32	44.5 x 38	1.5 x 1.5		57	51	0.59
2 x 3/4	50 x 20	57 x 25*	1.5 x 1.5		64	47	0.60
2 x 1	50 x 25	57 x 30	1.5 x 1.5		64	51	0.66
2 x 1 1/4	50 x 32	57 x 38	1.5 x 1.5		64	57	0.74
2 x 1 1/2	50 x 40	57 x 44.5	1.5 x 1.5		64	63	0.76
2 1/2 x 1	65 x 25	76 x 30	2.0 x 1.5		76	56	1.01
2 1/2 x 1 1/4	65 x 32	76 x 38	2.0 x 1.5		76	62	1.08
2 1/2 x 1 1/2	65 x 40	76 x 44.5	2.0 x 1.5		76	71	1.12
2 1/2 x 2	65 x 50	76 x 57	2.0 x 1.5		76	73	1.18
3 x 1 1/4	80 x 32	89 x 38	2.0 x 1.5		86	73	1.32
3 x 1 1/2	80 x 40	89 x 44.5	2.0 x 1.5		86	76	1.40
3 x 2	80 x 50	89 x 57	2.0 x 1.5		86	80	1.44
3 x 2 1/2	80 x 65	89 x 76	2.0 x 2.0		86	83	1.65
4 x 1 1/2	100 x 40	108 x 44.5	2.5 x 1.5		105	89	2.40
4 x 2	100 x 50	108 x 57	2.5 x 1.5		105	90	2.49
4 x 2 1/2	100 x 65	108 x 76	2.5 x 2.0		105	92	2.43
4 x 3	100 x 80	108 x 89	2.5 x 2.0		105	96	2.39
5 x 2	125 x 50	133 x 57	2.5 x 1.5		124	98	3.66
5 x 2 1/2	125 x 65	133 x 76	2.5 x 2.0		124	105	3.35
5 x 3	125 x 80	133 x 89	2.5 x 2.0		124	108	3.36
5 x 4	125 x 100	133 x 108	2.5 x 2.5		124	117	3.43
6 x 2 1/2	150 x 65	159 x 76	2.5 x 2.0		143	118	4.51
6 x 3	150 x 80	159 x 89	2.5 x 2.0		143	121	4.72
6 x 4	150 x 100	159 x 108	2.5 x 2.5		143	130	4.92
6 x 5	150 x 125	159 x 133	2.5 x 2.5		143	136	5.12
8 x 4	200 x 100	219 x 108	3.0 x 2.5		178	156	8.97
8 x 5	200 x 125	219 x 133	3.0 x 2.5		178	162	9.03
8 x 6	200 x 150	219 x 159	3.0 x 2.5		178	168	9.03

Tee Pieces, reduced ¹⁾

Size			Wall Thickness		a	b	Approx. Weight kg /piece
DN	OD ₁	OD ₂	S ₁	S ₂			
in	mm	mm	mm	mm	mm	mm	
10 x 5	250 x 125	267 x 133	3 x 2.5	216	189	9.88	
10 x 6	250 x 150	267 x 159	3 x 2.5	216	194	10.40	
10 x 7	250 x 175	267 x 194	3 x 3	216	198	11.82	
10 x 8	250 x 200	267 x 219	3 x 3	216	203	13.85	
12 x 6	300 x 150	324 x 159	4 x 2.5	254	219	18.27	
12 x 7	300 x 175	324 x 194	4 x 3	254	222	19.0	
12 x 8	300 x 200	324 x 219	4 x 3	254	229	19.92	
12 x 10	300 x 250	324 x 267	4 x 3	254	241	20.31	
14 x 7	350 x 175	368 x 194	4 x 3	279	242	23.50	
14 x 8	350 x 200	368 x 219	4 x 3	279	248	24.10	
14 x 10	350 x 250	368 x 267	4 x 3	279	257	24.80	
14 x 12	350 x 300	368 x 324	4 x 4	279	270	25.40	
16 x 8	400 x 200	419 x 219	4 x 3	305	276	30.10	
16 x 10	400 x 250	419 x 267	4 x 3	305	283	30.50	
16 x 12	400 x 300	419 x 324	4 x 4	305	295	31.80	
16 x 14	400 x 350	419 x 368	4 x 4	305	305	32.50	
18 x 10	450 x 250	457 x 267	4.5 x 3	343	310	41.70	
18 x 12	450 x 300	457 x 324	4.5 x 4	343	321	43.20	
18 x 14	450 x 350	457 x 368	4.5 x 4	343	330	43.70	
18 x 16	450 x 400	457 x 419	4.5 x 4	343	330	46.20	
20 x 12	500 x 300	508 x 324	5 x 4	381	347	57.70	
20 x 14	500 x 350	508 x 368	5 x 4	381	356	58.40	
20 x 16	500 x 400	508 x 419	5 x 4	381	356	59.20	
20 x 18	500 x 450	508 x 457	5 x 4.5	381	368	60.70	
24 x 14	600 x 350	610 x 368	5 x 4	432	393	84.50	
24 x 16	600 x 400	610 x 419	5 x 4	432	406	85.50	
24 x 18	600 x 450	610 x 457	5 x 4.5	432	419	86.90	
24 x 20	600 x 500	610 x 508	5.5 x 5	432	432	89.40	

Other dimensions on request.

*) similar to

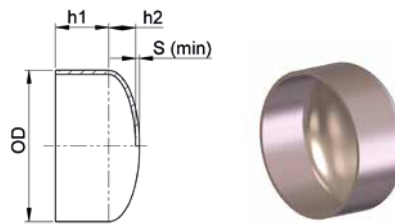
End Caps

Specification

DIN 28011

Material:

OSNA®-10 - copper-nickel



Size			S	h ₁	h ₂	Approx. Weight
in	DN	OD				
1	25	30	1.5	15	5	0.03
1¼	32	38	1.5	15	7	0.05
1½	40	44.5	1.5	15	8	0.06
2	50	57	1.5	20	10	0.10
2½	65	76	2	20	14	0.20
3	80	89	2	20	16	0.26
4	100	108	2.5	20	20	0.45
5	125	133	2.5	20	25	0.63
6	150	159	2.5	20	29	0.85
7	175	194	3	20	36	1.45
8	200	219	3	20	41	1.79
10	250	267	3	20	50	2.56
12	300	324	4	20	61	4.82
14	350	368	4	20	69	6.15
16	400	419	4	20	79	7.83
18	450	457	4.5	20	86	10.36
20	500	508	5	20	96	14.05
24	600	610	5	20	116	19.89
28	700	711	6	25	135	32.65
32	800	813	6	25	155	42.16
36½	900	914.5	8	35	173	72.65

Other dimensions on request.

Saddle Type Connections

Specification:

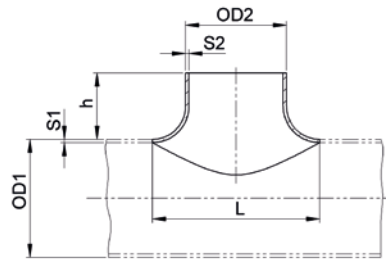
DIN 86087 and similar*

Material:

OSNA®-10 – copper-nickel

Dimensions:

To suit appropriate header and branch pipe diameters and thicknesses.



Type and Construction:

Saddles for pipes up to and including 14"/ 368 mm are normally supplied as one-piece and seamless.

Size			Wall Thickness		Height	Length	Approx. Weight
DN	OD ₁	OD ₂	S ₁	S ₂	h	L	
in	mm	mm	mm		mm	mm	kg /piece
1/2 x 1/2	16 x 16	20 x 20*	1 x 1		20	32	0.05
3/4 x 1/2	20 x 16	25 x 20*	1.5 x 1		20	40	0.06
3/4 x 3/4	20 x 20	25 x 25*	1.5 x 1.5		22	40	0.07
1 x 3/4	25 x 20	30 x 25*	1.5 x 1.5		22	40	0.08
1 x 1	25 x 25	30 x 30*	1.5 x 1.5		30	50	0.09
1 1/4 x 1	32 x 25	38 x 30*	1.5 x 1.5		30	50	0.10
1 1/4 x 1 1/4	32 x 32	38 x 38	1.5 x 1.5		35	64	0.11
1 1/2 x 1 1/4	40 x 32	44.5 x 38	1.5 x 1.5		35	64	0.14
1 1/2 x 1 1/2	40 x 40	44.5 x 44.5	1.5 x 1.5		35	74	0.15
2 x 1 1/4	50 x 32	57 x 38	1.5 x 1.5		35	64	0.15
2 x 1 1/2	50 x 40	57 x 44.5	1.5 x 1.5		35	74	0.17
2 x 2	50 x 50	57 x 57	1.5 x 1.5		40	97	0.25
2 1/2 x 1 1/4	65 x 32	76 x 38	2 x 1.5		35	64	0.34
2 1/2 x 1 1/2	65 x 40	76 x 44.5	2 x 1.5		35	74	0.30
2 1/2 x 2	65 x 50	76 x 57	2 x 1.5		40	97	0.52
2 1/2 x 2 1/2	65 x 65	76 x 76	2 x 2		50	126	0.48
3 x 1 1/4	80 x 32	89 x 38	2 x 1.5		35	64	0.36
3 x 1 1/2	80 x 40	89 x 44.5	2 x 1.5		35	74	0.44
3 x 2	80 x 50	89 x 57	2 x 1.5		40	97	0.56
3 x 2 1/2	80 x 65	89 x 76	2 x 2		50	126	0.55
3 x 3	80 x 80	89 x 89	2 x 2		55	149	0.76
4 x 1 1/2	100 x 40	108 x 44.5	2.5 x 1.5		35	74	0.32
4 x 2	100 x 50	108 x 57	2.5 x 1.5		40	97	0.40
4 x 2 1/2	100 x 65	108 x 76	2.5 x 2		50	126	0.65
4 x 3	100 x 80	108 x 89	2.5 x 2		55	149	0.79
4 x 4	100 x 100	108 x 108	2.5 x 2.5		75	188	1.30

*) similar to

Saddle Type Connections *(continued)*

Specification:

DIN 86087 and similar*

Material:

OSNA®-10 - copper-nickel

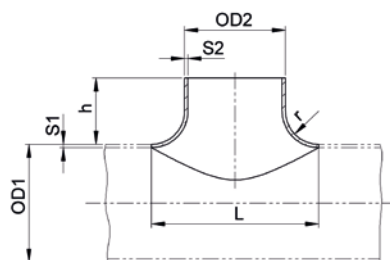
Dimensions:

To suit appropriate header and branch pipe diameters and thicknesses.

Type and Construction:

Saddles for pipes up to and including 14"/ 368 mm are normally supplied as one-piece and seamless.

Size			Wall Thickness		Height	Length	Approx. Weight
in	DN	OD ₁ OD ₂ mm	S ₁	S ₂	h	L	kg /piece
	mm		mm		mm	mm	
5 x 2	125 x 50	133 x 57	2.5 x 1.5		40	97	0.40
5 x 2½	125 x 65	133 x 76	2.5 x 2		50	126	0.80
5 x 3	125 x 80	133 x 89	2.5 x 2		55	149	1.00
5 x 4	125 x 100	133 x 108	2.5 x 2.5		75	188	1.20
5 x 5	125 x 125	133 x 133	2.5 x 2.5		85	233	1.70
6 x 2½	150 x 65	159 x 76	2.5 x 2		50	126	0.65
6 x 3	150 x 80	159 x 89	2.5 x 2		55	149	1.18
6 x 4	150 x 100	159 x 108	2.5 x 2.5		75	188	1.20
6 x 5	150 x 125	159 x 133	2.5 x 2.5		85	233	2.00
6 x 6	150 x 150	159 x 159	2.5 x 2.5		95	279	2.60
7 x 2½	175 x 65	194 x 76*	3 x 2		50	126	1.20
7 x 3	175 x 80	194 x 89	3 x 2		55	149	1.35
7 x 4	175 x 100	194 x 108	3 x 2.5		75	188	1.42
7 x 5	175 x 125	194 x 133	3 x 2.5		85	233	1.90
7 x 6	175 x 150	194 x 159	3 x 2.5		95	279	2.55
7 x 7	175 x 175	194 x 194	3 x 3		110	334	3.25
8 x 3	200 x 80	219 x 89	3 x 2		55	149	1.32
8 x 4	200 x 100	219 x 108	3 x 2.5		75	188	1.80
8 x 5	200 x 125	219 x 133	3 x 2.5		85	233	2.70
8 x 6	200 x 150	219 x 159	3 x 2.5		95	279	3.80
8 x 7	200 x 175	219 x 194	3 x 3		110	334	4.50
8 x 8	200 x 200	219 x 219	3 x 3		125	379	5.70
10 x 4	250 x 100	267 x 108	3 x 2.5		75	188	1.85
10 x 5	250 x 125	267 x 133	3 x 2.5		85	233	2.35
10 x 6	250 x 150	267 x 159	3 x 2.5		95	279	3.70
10 x 7	250 x 175	267 x 194	3 x 3		110	334	4.70
10 x 8	250 x 200	267 x 219	3 x 3		125	379	6.10
10 x 10	250 x 250	267 x 267	3 x 3		155	447	7.90
12 x 5	300 x 125	324 x 133	4 x 2.5		85	233	2.60
12 x 6	300 x 150	324 x 159	4 x 2.5		95	279	3.80
12 x 7	300 x 175	324 x 194	4 x 3		110	334	4.90
12 x 8	300 x 200	324 x 219	4 x 3		125	379	5.80
12 x 10	300 x 250	324 x 267	4 x 3		155	447	10.30
12 x 12	300 x 300	324 x 324	4 x 4		185	560	16.50



Size			Wall Thickness		Height	Length	Approx. Weight
in	DN	mm	OD ₁	OD ₂	h	L	kg /piece
			mm		mm	mm	
			S ₁	S ₂			
			mm				
14 x 6		350 x 150	368	x 159	95	279	3.60
14 x 7		350 x 175	368	x 194	110	334	4.90
14 x 8		350 x 200	368	x 219	125	379	5.80
14 x 10		350 x 250	368	x 267	155	447	9.70
14 x 12		350 x 300	368	x 324	185	560	16.80
14 x 14		350 x 350	368	x 368	200	613	25.0
16 x 6		400 x 150	419	x 159*	95	279	3.65
16 x 7		400 x 175	419	x 194	110	334	4.90
16 x 8		400 x 200	419	x 219	125	379	5.80
16 x 10		400 x 250	419	x 267	155	447	9.70
16 x 12		400 x 300	419	x 324	185	560	16.80
16 x 14		400 x 350	419	x 368	200	613	25.0
16 x 16		400 x 400	419	x 419	225	680	33.0
18 x 6		450 x 150	457	x 159*	95	279	3.60
18 x 7		450 x 175	457	x 194*	110	334	4.90
18 x 8		450 x 200	457	x 219	125	379	5.80
18 x 10		450 x 250	457	x 267	155	447	9.70
18 x 12		450 x 300	457	x 324	185	560	16.80
18 x 14		450 x 350	457	x 368	200	613	25.0
18 x 16		450 x 400	457	x 419	225	680	33.0
18 x 18		450 x 450	457	x 457	250	800	41.0
20 x 6		500 x 150	508	x 159*	95	279	5.40
20 x 7		500 x 175	508	x 194*	110	334	6.50
20 x 8		500 x 200	508	x 219*	125	379	7.70
20 x 10		500 x 250	508	x 267	155	447	9.70
20 x 12		500 x 300	508	x 324	185	560	16.80
20 x 14		500 x 350	508	x 368	200	613	25.0
20 x 16		500 x 400	508	x 419	225	680	33.0
20 x 18		500 x 450	508	x 457	250	800	41.0
20 x 20		500 x 500	508	x 508	275	880	55.0
24 x 12		600 x 300	610	x 324	185	560	16.80
24 x 14		600 x 350	610	x 368	200	613	25.0
24 x 16		600 x 400	610	x 419	225	680	33.0
24 x 18		600 x 450	610	x 457	250	800	41.5

Other dimensions on request.

*) similar to

Specification:

DIN 86089 and similar*

Material:

OSNA®-10 – copper-nickel

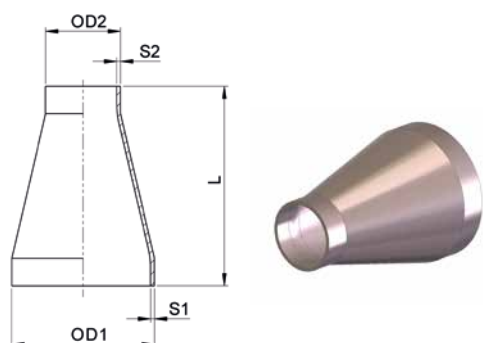
Type and Construction:

Concentric reducers up to and including 14"/368mm are normally supplied as one-piece and seamless.

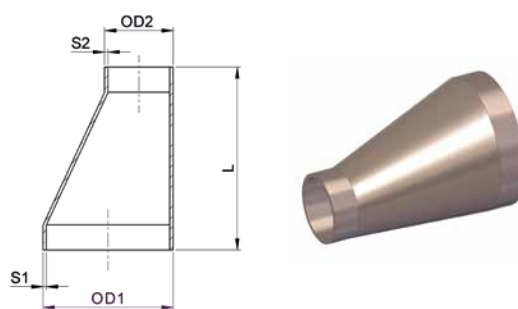
Eccentric reducers up to and including 14"/368mm are normally supplied as one-piece and seamless.

Size			Wall Thickness		Length	Approx. Weight	
DN		OD ₁	OD ₂	S ₁	S ₂	L	kg /piece
in	mm	mm		mm		mm	
1/2 x 3/8	16 x 12	20 x 16*		1 x 1		30	0.01
3/4 x 3/8	20 x 12	25 x 16*		1.5 x 1		30	0.02
3/4 x 1/2	20 x 16	25 x 20*		1.5 x 1		30	0.03
1 x 3/8	25 x 12	30 x 16*		1.5 x 1		35	0.03
1 x 1/2	25 x 16	30 x 20*		1.5 x 1		35	0.04
1 x 3/4	25 x 20	30 x 25		1.5 x 1.5		35	0.06
1 1/4 x 3/8	32 x 12	38 x 16*		1.5 x 1		50	0.05
1 1/4 x 1/2	32 x 16	38 x 20*		1.5 x 1		50	0.06
1 1/4 x 3/4	32 x 20	38 x 25		1.5 x 1.5		50	0.08
1 1/4 x 1	32 x 25	38 x 30		1.5 x 1.5		50	0.10
1 1/2 x 1/2	40 x 16	44.5 x 20*		1.5 x 1		80	0.09
1 1/2 x 3/4	40 x 20	44.5 x 25		1.5 x 1.5		80	0.15
1 1/2 x 1	40 x 25	44.5 x 30		1.5 x 1.5		80	0.16
1 1/2 x 1 1/4	40 x 32	44.5 x 38		1.5 x 1.5		80	0.17
2 x 3/4	50 x 20	57 x 25		1.5 x 1.5		80	0.17
2 x 1	50 x 25	57 x 30		1.5 x 1.5		80	0.18
2 x 1 1/4	50 x 32	57 x 38		1.5 x 1.5		80	0.19
2 x 1 1/2	50 x 40	57 x 44.5		1.5 x 1.5		80	0.21
2 1/2 x 1	65 x 25	76 x 30		2 x 1.5		90	0.28
2 1/2 x 1 1/4	65 x 32	76 x 38		2 x 1.5		90	0.29
2 1/2 x 1 1/2	65 x 40	76 x 44.5		2 x 1.5		90	0.30
2 1/2 x 2	65 x 50	76 x 57		2 x 1.5		90	0.31
3 x 1 1/4	80 x 32	89 x 38		2 x 1.5		90	0.33
3 x 1 1/2	80 x 40	89 x 44.5		2 x 1.5		90	0.35
3 x 2	80 x 50	89 x 57		2 x 1.5		90	0.37
3 x 2 1/2	80 x 65	89 x 76		2 x 2		90	0.39
4 x 1 1/2	100 x 40	108 x 44.5		2.5 x 1.5		100	0.59
4 x 2	100 x 50	108 x 57		2.5 x 1.5		100	0.61
4 x 2 1/2	100 x 65	108 x 76		2.5 x 2		100	0.63
4 x 3	100 x 80	108 x 89		2.5 x 2		100	0.65

concentric



eccentric

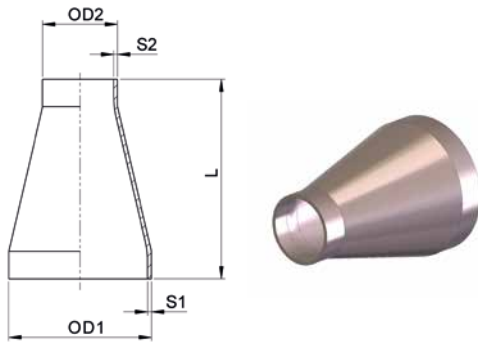


Size			Wall Thickness		Length	Approx. Weight
in	DN	mm	OD ₁	OD ₂	L	kg /piece
			mm		mm	
			S ₁	S ₂		
			mm			
5 x 2		125 x 50	133	57	140	1.22
5 x 2½		125 x 65	133	76	140	1.25
5 x 3		125 x 80	133	89	140	1.29
5 x 4		125 x 100	133	108	140	1.45
6 x 2½		150 x 65	159	76	150	1.53
6 x 3		150 x 80	159	89	150	1.57
6 x 4		150 x 100	159	108	150	1.76
6 x 5		150 x 125	159	133	150	1.89
7 x 3		175 x 80	194	89*	155	1.94
7 x 4		175 x 100	194	108	155	2.60
7 x 5		175 x 125	194	133	155	2.71
7 x 6		175 x 150	194	159	155	2.86
8 x 4		200 x 100	219	108	155	2.65
8 x 5		200 x 125	219	133	155	2.75
8 x 6		200 x 150	219	159	155	2.96
8 x 7		200 x 175	219	194	155	3.00
10 x 5		250 x 125	267	133	210	5.10
10 x 6		250 x 150	267	159	210	5.30
10 x 7		250 x 175	267	194	210	5.56
10 x 8		250 x 200	267	219	210	6.00
12 x 5		300 x 125	324	133*	210	6.85
12 x 6		300 x 150	324	159	210	7.02
12 x 7		300 x 175	324	194	210	7.28
12 x 8		300 x 200	324	219	210	7.40
12 x 10		300 x 250	324	267	210	7.55

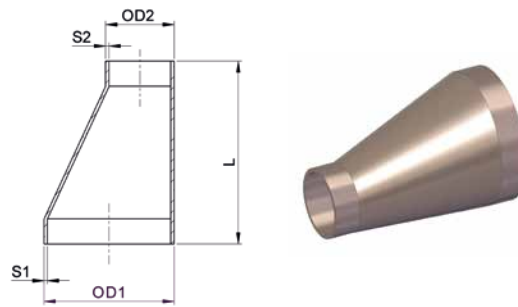
*) similar to

Reducers (continued)

concentric



eccentric



Size			Wall Thickness		Length	Approx. Weight kg /piece
in	DN	mm	OD ₁	OD ₂	L	
			mm		mm	
			S ₁	S ₂		
			mm			
14 x 6		350 x 150	368	159*	300	10.75
14 x 7		350 x 175	368	194	300	10.95
14 x 8		350 x 200	368	219	300	11.10
14 x 10		350 x 250	368	267	300	11.80
14 x 12		350 x 300	368	324	300	12.20
16 x 7		400 x 175	419	194*	325	14.80
16 x 8		400 x 200	419	219	325	15.31
16 x 10		400 x 250	419	267	325	15.93
16 x 12		400 x 300	419	324	325	16.77
16 x 14		400 x 350	419	368	325	17.68
18 x 8		450 x 200	457	219*	350	21.40
18 x 10		450 x 250	457	267	350	21.90
18 x 12		450 x 300	457	324	350	22.70
18 x 14		450 x 350	457	368	350	23.20
18 x 16		450 x 400	457	419	350	23.70
20 x 10		500 x 250	508	267*	375	28.70
20 x 12		500 x 300	508	324	375	29.50
20 x 14		500 x 350	508	368	375	29.70
20 x 16		500 x 400	508	419	375	30.10
20 x 18		500 x 450	508	457	375	30.90
24 x 14		600 x 350	610	368	400	45.70
24 x 16		600 x 400	610	419	400	46.50
24 x 18		600 x 450	610	457	400	47.40
24 x 20		600 x 500	610	508	400	48.20

Other dimensions on request.

*) similar to

Welding Necks

Specification:

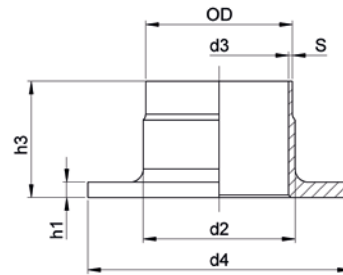
DIN 86037 -2 compatible
with Outer Flanges PN 10, 16

Material:

OSNA®-10 - copper-nickel

Type and Construction:

Weld neck flanges up to and including
12"/ 324 mm are normally supplied as
one-piece and seamless.



Size			Wall Thickness						Approx. Weight
in	DN	OD	S	d ₂	d ₃	d ₄	h ₁	h ₃	kg /piece
	mm	mm	mm	mm	mm	mm	mm	mm	
¾	20	25	1.5	27	22	58	5	40	0.15
¾	20	25	2	27	21	58	5	40	0.16
1	25	30	1.5	32	27	68	5	40	0.20
1	25	30	2	32	26	68	5	40	0.21
1¼	32	38	1.5	40	35	78	5	40	0.25
1¼	32	38	2	40	34	78	5	40	0.27
1½	40	44.5	1.5	46.5	41.5	88	6	45	0.36
1½	40	44.5	2	46.5	40.5	88	6	45	0.38
2	50	57	1.5	59	54	102	6	45	0.45
2	50	57	2	59	53	102	6	45	0.48
2½	65	76	2	78	72	122	6	45	0.62
3	80	89	2	91	85	138	7	50	0.86
4	100	108	2.5	110	103	158	7	50	1.10
5	125	133	2.5	135.5	128	188	7	50	1.50
6	150	159	2.5	161.5	154	212	9	50	2.00
7	175	194	3	197	188	242	9	50	2.40
8	200	219	3	222	213	268	9	50	2.70
10	250	267	3	270	261	320	9	50	3.40
12	300	324	4	327	316	370	11	50	4.60
14	350	368	4	371	360	430	11	50	6.30
16	400	419	4	422	411	482	12	50	7.50
18	450	457	4	460	449	530	12	50	9.00
20	500	508	4.5	511	499	585	12	50	11.00
24	600	610	4.5	613	601	685	14	60	15.00
28	700	711	6	714	699	800	14	60	21.00
32	800	813	6	816	801	905	14	60	24.00
36	900	914	8	918	898	1000	14	60	29.00
40	1000	1016	8	1018	1000	1110	14	60	34.00
48	1200	1220	8	1223.5	1204	1335	14	60	46.00

Other dimensions on request.

Outer Flanges

Specification:

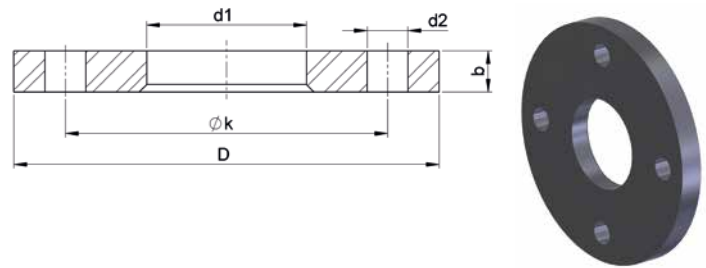
DIN 86037, EN 1092-3 (Type 04) PN10, 16

Material:

S235JR

Note:

Steel flanges will be supplied hot-dip galvanized.



PN 10

Size			D	d ₁	b	k	d ₂	Bolt Holes	Approx. Weight kg /piece
DN	OD								
in	mm	mm	mm	mm	mm	mm	mm		
¾	20	25	105	28	14	75	14	4	0.81
1	25	30	115	33	16	85	14	4	1.11
1¼	32	38	140	41	16	100	18	4	1.64
1½	40	44.5	150	48	16	115	18	4	1.86
2	50	57	165	62	16	125	18	4	2.20
2½	65	76	185	81	16	145	18	4	2.62
3	80	89	200	94	18	160	18	8	3.32
4	100	108	220	113	18	180	18	8	3.67
5	125	133	250	138	18	210	18	8	4.54
6	150	159	285	164	18	240	22	8	5.60
7	175	194	315	200	22	270	22	8	6.50
8	200	219	340	225	20	295	22	8	7.46
10	250	267	395	278	22	350	22	12	10.30
12	300	324	445	331	24	400	22	12	12.10
14	350	368	505	375	24	460	22	16	15.70
16	400	419	565	426	26	515	26	16	20.10
18	450	457	615	465	28	565	26	20	25.40
20	500	508	670	517	30	620	26	20	30.80
24	600	610	780	618	32	725	30	20	40.50
28	700	711	895	720	34	840	30	24	54.00
32	800	813	1015	822	38	950	33	24	76.00
36	900	914	1115	923	42	1050	33	28	92.00
40	1000	1016	1230	1025	46	1160	36	28	120.00
48	1200	1220	1455	1230	50	1380	39	32	170.00

PN 16

¾ - 6	20 - 150	25 - 159	see PN 10						
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	15.0
12	300	324	460	330	28	410	26	12	16.1
14	350	368	520	374	32	470	26	16	23.4
16	400	419	580	426	36	525	30	16	30.9

Other dimensions on request.

Composite Blind Flanges

Specification:

EN 1092-3 (Type 05-C) PN 10, 16

Material:

OSNA®-10 – copper-nickel

Material:

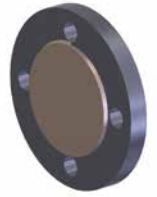
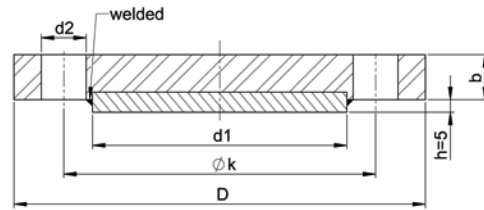
A105/P245GH EN 10222-2 (flanges)

Note:

Steel flanges will be supplied readily hot-dip galvanized.

DN 10 - DN 175 PN 16

DN 200 - DN 500 PN 10



Size			D	b	k	d ₁	d ₂	Bolt Holes	Approx. Weight kg /piece
DN	OD								
in	mm	mm	mm	mm	mm	mm	mm		
3/8	10	15	90	14	60	41	14	4	0.69
1/2	15	18	95	14	65	46	14	4	0.78
3/4	20	25	105	14	75	56	14	4	0.99
1	25	30	115	16	85	65	14	4	1.38
1 1/4	32	38	140	16	100	76	18	4	1.99
1 1/2	40	44.5	150	16	115	84	18	4	2.32
2	50	57	165	16	125	99	18	4	2.89
2 1/2	65	76	185	16	145	118	18	4	3.72
3	80	89	200	18	160	132	18	8	4.76
4	100	108	220	18	180	156	18	8	5.94
5	125	133	250	18	210	184	18	8	7.83
6	150	159	285	18	240	211	22	8	10.15
7	175	194	315	22	270	242	22	8	14.97
8	200	219	340	22	295	266	22	12	17.37
10	250	267	405	24	350	319	26	12	26.64
12	300	324	460	28	400	370	26	12	39.93
14	350	368	520	30	460	429	26	16	54.47
16	400	419	580	36	515	480	30	16	79.52
20	500	508	715	36	650	606	33	20	121.51

Other dimensions on request.

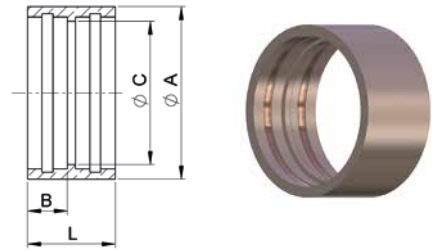
Couplings, straight

with silver solder
capillary x capillary end

PN up to 63

Material:

OSNA®-10 – copper-nickel



Size			A	C	L	B	Approx. Weight
in	DN	OD					
	mm	mm	mm	mm	mm	mm	kg /piece
	4	8	12	6	20	9	0.01
1/8	6	10	15	8	20	9	0.015
1/4	8	12	17	10	20	9	0.02
1/4	10	14	20	12	22	10	0.025
3/8	12	16	22	14	22	10	0.03
1/2	16	20	27	18	22	10	0.045
3/4	20	25	32	22	22	10	0.055
1	25	30	37	27	24	11	0.07
1 1/4	32	38	45	35	32	15	0.12
1 1/4	40	44.5	52	41.5	33	15	0.17
2	50	57	65	54	33	15	0.22
2 1/2	65	76	84	72	45	20	0.40
3	80	89	100	85	55	25	0.57
4	100	108	120	103	65	30	0.69

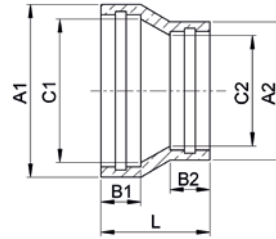
Other dimensions on request.

Couplings, reduced

with silver solder
capillary x capillary end

PN up to 63

Material:
OSNA®-10 – copper-nickel



Size		A ₁ mm	A ₂ mm	C ₁ mm	C ₂ mm	B ₁ mm	B ₂ mm	L mm	Approx. Weight kg /piece
nominal in	actual mm								
	10 x 8	15	12	8	6	9	9	22	0.03
	12 x 8	17	12	10	6	9	9	25	0.03
¼ x ⅛	12 x 10	17	15	10	8	9	9	21	0.04
	14 x 8	20	12	12	6	10	9	30	0.04
¼ x ⅛	14 x 10	20	15	12	8	10	9	26	0.04
⅜ x ⅛	16 x 10	22	15	14	8	10	9	28	0.05
⅜ x ¼	16 x 12	22	17	14	10	10	9	27	0.06
½ x ¼	20 x 12	27	17	18	10	10	9	33	0.06
½ x ⅜	20 x 16	27	22	18	14	10	10	27	0.08
¾ x ⅜	25 x 16	32	22	22	14	10	10	33	0.07
¾ x ½	25 x 20	32	27	22	18	10	10	27	0.09
1 x ⅜	30 x 16	37	22	27	14	11	10	35	0.10
1 x ½	30 x 20	37	27	27	18	11	10	31	0.10
1 x ¾	30 x 25	37	32	27	22	11	10	28	0.18
1¼ x ⅜	38 x 16	45	22	35	14	15	10	45	0.17
1¼ x ½	38 x 20	45	27	35	18	15	10	41	0.16
1¼ x ¾	38 x 25	45	32	35	22	15	10	36	0.13
1¼ x 1	38 x 30	45	37	35	27	15	11	33	0.21
1½ x ⅜	44.5 x 16	52	22	41.5	14	15	10	51	0.21
1½ x ½	44.5 x 20	52	27	41.5	18	15	10	47	0.21
1½ x ¾	44.5 x 25	52	32	41.5	22	15	10	42	0.18
1½ x 1	44.5 x 30	52	37	41.5	27	15	11	39	0.24
1½ x 1¼	44.5 x 38	52	45	41.5	24	15	15	36	0.23
2 x ⅜	57 x 16	65	22	54	14	15	10	62	0.28
2 x ½	57 x 20	65	27	54	18	15	10	58	0.29
2 x ¾	57 x 25	65	32	54	22	15	10	54	0.29
2 x 1	57 x 30	65	37	54	27	15	11	50	0.31
2 x 1¼	57 x 38	65	45	54	35	15	15	47	0.28
2 x 1½	57 x 44.5	65	52	54	41.5	15	15	41	0.28

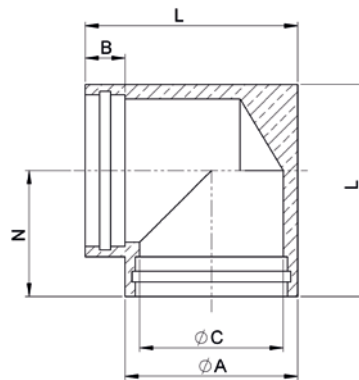
Other dimensions on request.

Elbows

with silver solder
capillary x capillary end

PN up to 63

Material:
OSNA®-10 – copper-nickel



Size			A	B	C	L	N	Approx. Weight
in	DN	OD						
	mm	mm	mm	mm	mm	mm	mm	kg /piece
	4	8	12	9	6	24	16.5	0.035
1/8	6	10	15	9	8	24	16.5	0.040
1/4	8	12	17	9	10	26	17.5	0.045
1/4	10	14	20	10	12	31	21	0.068
3/8	13	16	22	10	14	31	21	0.090
1/2	16	20	27	10	18	37	23.5	0.130
3/4	20	25	32	10	22	42	26	0.185
1	25	30	37	11	27	48	29.5	0.260
1 1/4	32	38	45	15	35	60	36.5	0.370
1 1/4	40	44.5	52	15	41.5	67	41	0.520
2	50	57	65	15	54	80	47.5	0.870

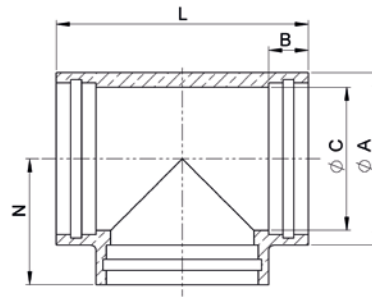
Other dimensions on request.

Tee Pieces, equal

with silver solder
capillary x capillary ends

PN up to 63

Material:
OSNA®-10 - copper-nickel



Size			A	B	C	L	N	Approx. Weight kg /piece	
in	DN	OD							
		4	8	15	9	6	33	16.5	0.02
1/8		6	10	15	9	8	33	16.5	0.03
1/4		8	12	17	9	10	35	17.5	0.04
1/4		10	14	22	10	12	42	21	0.06
3/8		13	16	22	10	14	42	21	0.08
1/2		16	20	27	10	18	47	23.5	0.12
3/4		20	25	32	10	22	52	26	0.19
1		25	30	37	11	27	57	28.5	0.25
1 1/4		32	38	45	15	35	73	36.5	0.47
1 1/4		40	44.5	52	15	41.5	82	41	0.57
2		50	57	65	15	54	95	47.5	0.86

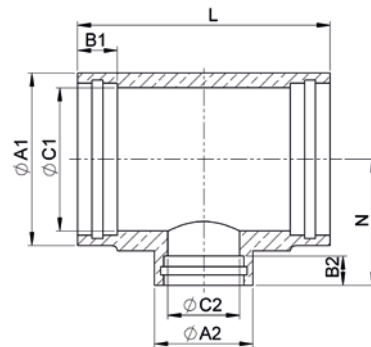
Other dimensions on request.

Tee Pieces, reduced

with silver solder
capillary x capillary ends

PN up to 63

Material:
OSNA®-10 - copper-nickel



Size			A ₁ mm	A ₂ mm	C ₁ mm	C ₂ mm	B ₁ mm	B ₂ mm	N mm	L mm	Approx. Weight kg /piece
DN	OD ₁ x OD ₂ mm	mm									
1/8	6 x 4	10 x 8	15	15	8	6	9	9	16.5	33	0.03
1/4	8 x 4	12 x 8	17	12	10	6	9	9	17.5	35	0.03
1/4 x 1/8	8 x 6	12 x 10	17	15	10	8	9	9	17.5	35	0.04
1/4	10 x 4	14 x 8	22	12	12	6	10	9	21	42	0.05
1/4 x 1/8	10 x 6	14 x 10	22	15	12	8	10	9	21	42	0.06
3/8 x 1/8	12 x 6	16 x 10	22	15	14	8	10	9	21	42	0.07
3/8 x 1/4	12 x 8	16 x 12	22	17	14	10	10	9	21	42	0.08
1/2 x 1/4	16 x 8	20 x 12	27	17	18	10	10	9	23.5	47	0.09
1/2 x 3/8	16 x 12	20 x 16	27	22	18	14	10	10	23.5	47	0.12
3/4 x 3/8	20 x 12	25 x 16	32	22	22	14	10	10	26	52	0.14
3/4 x 1/2	20 x 16	25 x 20	32	27	22	18	10	10	26	52	0.16
1 x 3/8	25 x 12	30 x 16	37	22	27	14	11	10	28.5	57	0.20
1 x 1/2	25 x 16	30 x 20	37	27	27	18	11	10	28.5	57	0.25
1 x 3/4	25 x 20	30 x 25	37	32	27	22	11	10	28.5	57	0.30
1 1/4 x 3/8	32 x 12	38 x 16	45	22	35	14	15	10	36.5	73	0.40
1 1/4 x 1/2	32 x 16	38 x 20	45	27	35	18	15	10	36.5	73	0.43
1 1/4 x 3/4	32 x 20	38 x 25	45	32	35	22	15	10	36.5	73	0.43
1 1/4 x 1	32 x 25	38 x 30	45	37	35	27	15	11	36.5	73	0.43
1 1/2 x 3/8	40 x 12	44.5 x 16	52	22	41.5	14	15	10	41	82	0.51
1 1/2 x 1/2	40 x 16	44.5 x 20	52	27	41.5	18	15	10	41	82	0.53
1 1/2 x 3/4	40 x 20	44.5 x 25	52	32	41.5	22	15	10	41	82	0.54
1 1/2 x 1	40 x 25	44.5 x 30	52	37	41.5	27	15	11	41	82	0.57
1 1/2 x 1 1/4	40 x 32	44.5 x 38	52	45	41.5	35	15	15	41	82	0.59
2 x 1/2	50 x 16	57 x 20	65	27	54	18	15	10	47.5	95	0.65
2 x 3/4	50 x 20	57 x 25	65	32	54	22	15	10	47.5	95	0.70
2 x 1	50 x 25	57 x 30	65	37	54	27	15	11	47.5	95	0.75
2 x 1 1/4	50 x 32	57 x 38	65	45	54	35	15	15	47.5	95	0.80
2 x 1 1/2	50 x 40	57 x 44.5	65	52	54	41.5	15	15	47.5	95	0.86

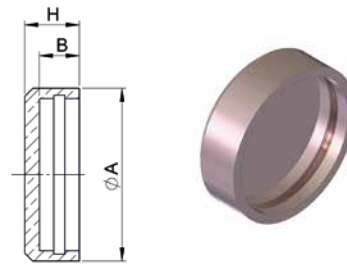
Other dimensions on request.

End Caps

with silver solder
capillary end

PN up to 63

Material:
OSNA®-10 – copper-nickel



Size			A	B	H	Approx. Weight
in	DN	OD				
	mm	mm	mm	mm	mm	kg /piece
	4	8	12	9	12	0.010
1/8	6	10	15	9	12.5	0.020
1/4	8	12	17	9	12.5	0.020
1/4	10	14	20	10	14	0.030
3/8	12	16	22	10	14	0.040
1/2	16	20	27	10	14.5	0.055
3/4	20	25	32	10	15	0.070
1	25	30	37	11	16	0.085
1 1/4	32	38	45	15	20	0.135
1 1/4	40	44.5	52	15	20.5	0.195
2	50	57	65	15	20.5	0.225

Other dimensions on request.

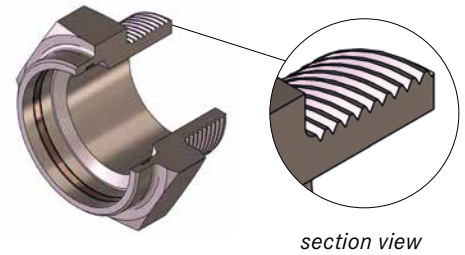
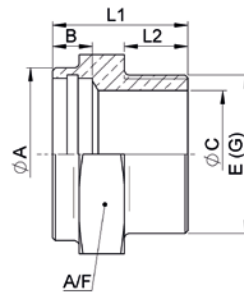
Straight Male Connectors

E (male BSP thread)

capillary end x male thread

Material:

OSNA®-10 - copper-nickel



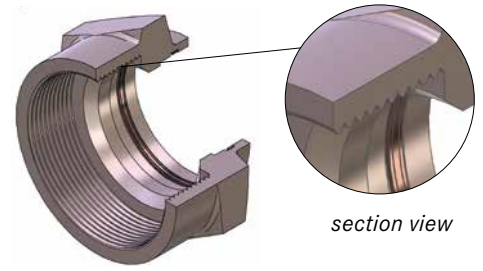
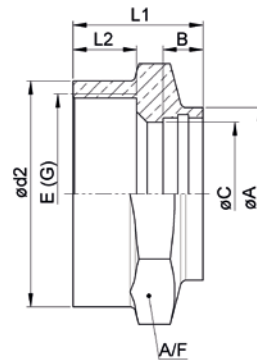
Outside Diameter of Pipe		A mm	B mm	C mm	L ₁ mm	L ₂ mm	A/F mm	Approx. Weight kg /piece
nominal in	actual mm x E"							
1/8 x 1/2	10 x 1/2	15	9	8	30	18	22	0.06
1/8 x 3/4	10 x 3/4	15	9	8	33	18	30	0.12
1/4 x 1/2	12 x 1/2	17	9	10	30	18	22	0.06
1/4 x 3/4	12 x 3/4	17	9	10	33	18	30	0.12
1/4 x 1/2	14 x 1/2	20	10	12	30	18	22	0.06
1/4 x 3/4	14 x 3/4	20	10	12	33	18	30	0.12
1/4 x 1	14 x 1	20	10	12	38	21	36	0.16
3/8 x 3/8	16 x 3/8	22	10	14	29	15	22	0.05
3/8 x 1/2	16 x 1/2	22	10	14	30	18	22	0.06
3/8 x 3/4	16 x 3/4	22	10	14	33	18	30	0.12
3/8 x 1	16 x 1	22	10	14	38	21	36	0.06
1/2 x 1/2	20 x 1/2	27	10	18	33	18	27	0.09
1/2 x 3/4	20 x 3/4	27	10	18	34	18	30	0.13
1/2 x 1	20 x 1	27	10	18	39	21	36	0.23
1/2 x 1 1/4	20 x 1 1/4	27	10	18	43	22	46	0.39
3/4 x 3/4	25 x 3/4	32	10	22	35	18	32	0.13
3/4 x 1	25 x 1	32	10	22	39	21	36	0.20
3/4 x 1 1/4	25 x 1 1/4	32	10	22	43	22	46	0.41
3/4 x 1 1/2	25 x 1 1/2	32	10	22	44	22	50	0.49
1 x 3/4	30 x 3/4	37	11	27	38	18	41	0.19
1 x 1	30 x 1	37	11	27	41	21	41	0.29
1 x 1 1/4	30 x 1 1/4	37	11	27	44	22	46	0.24
1 x 1 1/2	30 x 1 1/2	37	11	27	45	22	50	0.25
1 1/4 x 3/4	38 x 3/4	45	15	35	44	18	46	0.26
1 1/4 x 1	38 x 1	45	15	35	44	21	46	0.26
1 1/4 x 1 1/4	38 x 1 1/4	45	15	35	45	22	46	0.41
1 1/4 x 1 1/2	38 x 1 1/2	45	15	35	46	22	50	0.45
1 1/2 x 1	44.5 x 1	52	15	41.5	47	21	55	0.49
1 1/2 x 1 1/4	44.5 x 1 1/4	52	15	41.5	48	22	55	0.56
1 1/2 x 1 1/2	44.5 x 1 1/2	52	15	41.5	48	22	55	0.60
1 1/2 x 2	44.5 x 2	52	15	41.5	51	22	65	0.93
2 x 1 1/4	57 x 1 1/4	65	15	54	51	22	65	0.77
2 x 1 1/2	57 x 1 1/2	65	15	54	51	22	65	0.80
2 x 2	57 x 2	65	15	54	51	22	65	0.96
2 x 2 1/2	57 x 2 1/2	65	15	54	60	28	75	1.57

Other dimensions on request.

Straight Female Connectors

E (male BSP thread)
capillary end x female thread

Material:
OSNA®-10 – copper-nickel



Outside Diameter of Pipe

Outside Diameter of Pipe		A	B	C	d ₂	L ₁	L ₂	A/F	Approx. Weight
nominal in	actual mm x E"	mm	mm	mm	mm	mm	mm	mm	kg /piece
1/8 x 1/2	10 x 1/2	15	9	8	27	32	14	27	0.04
1/8 x 3/4	10 x 3/4	15	9	8	32	34	14	32	0.07
1/4 x 1/2	12 x 1/2	17	9	10	27	32	14	27	0.05
1/4 x 3/4	12 x 3/4	17	9	10	32	33	14	32	0.08
1/4 x 1/2	14 x 1/2	20	10	12	27	32	14	27	0.06
1/4 x 3/4	14 x 3/4	20	10	12	32	34	14	32	0.09
1/4 x 1	14 x 1	20	10	12	40	38	17	41	0.16
3/8 x 3/8	16 x 3/8	22	10	14	21.5	28	11	22	0.05
3/8 x 1/2	16 x 1/2	22	10	14	27	31	14	27	0.07
3/8 x 3/4	16 x 3/4	22	10	14	32	33	14	32	0.10
3/8 x 1	16 x 1	22	10	14	40	38	17	41	0.17
1/2 x 1/2	20 x 1/2	27	10	18	27	28	14	27	0.08
1/2 x 3/4	20 x 3/4	27	10	18	32	32	14	32	0.11
1/2 x 1	20 x 1	27	10	18	40	37	17	41	0.18
1/2 x 1 1/4	20 x 1 1/4	27	10	18	49	40	18	50	0.25
3/4 x 3/4	25 x 3/4	32	10	22	32	31	14	32	0.10
3/4 x 1	25 x 1	32	10	22	40	35	17	41	0.20
3/4 x 1 1/4	25 x 1 1/4	32	10	22	49	39	18	50	0.27
3/4 x 1 1/2	25 x 1 1/2	32	10	22	55	41	18	55	0.33
1 x 3/4	30 x 3/4	37	11	27	32	31	14	41	0.17
1 x 1	30 x 1	37	11	27	40	35	17	41	0.20
1 x 1 1/4	30 x 1 1/4	37	11	27	49	38	18	50	0.22
1 x 1 1/2	30 x 1 1/2	37	11	27	55	40	18	55	0.35
1 1/4 x 3/4	38 x 3/4	45	15	35	32	39	14	46	0.28
1 1/4 x 1	38 x 1	45	15	35	40	39	17	46	0.31
1 1/4 x 1 1/4	38 x 1 1/4	45	15	35	49	40	18	50	0.36
1 1/4 x 1 1/2	38 x 1 1/2	45	15	35	55	42	18	55	0.37
1 1/2 x 1	44.5 x 1	52	15	41.5	40	43	17	55	0.35
1 1/2 x 1 1/4	44.5 x 1 1/4	52	15	41.5	49	39	18	55	0.40
1 1/2 x 1 1/2	44.5 x 1 1/2	52	15	41.5	55	40	18	55	0.43
1 1/2 x 2	44.5 x 2	52	15	41.5	70	43	18	70	0.60
2 x 1 1/4	57 x 1 1/4	65	15	54	49	45	18	65	0.50
2 x 1 1/2	57 x 1 1/2	65	15	54	55	40	18	65	0.55
2 x 2	57 x 2	65	15	54	70	40	18	70	0.65
2 x 2 1/2	57 x 2 1/2	65	15	54	85	49	24	85	0.80

Other dimensions on request.

Hexagon Head Screw Plugs

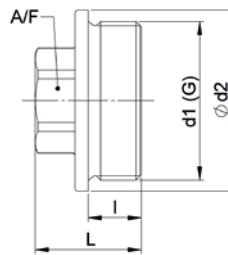
Miscellaneous

Specification:

DIN 910

Material:

OSNA®-10 – copper-nickel



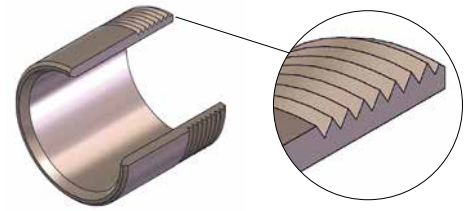
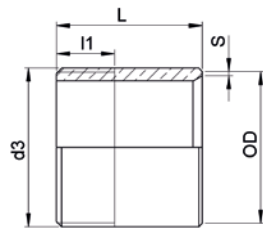
Size d ₁ (thread)	d ₂	l	L	A/F	Approx. Weight kg /piece
G*	mm	mm	mm	mm	
G 1/8	14	8	17	10	0.014
G 1/4	18	8	17	13	0.023
G 1/4	18	12	21	13	0.027
G 3/8	22	8	17	17	0.037
G 3/8	22	12	21	17	0.043
G 1/2	26	10	22	19	0.066
G 1/2	26	14	26	19	0.076
G 3/4	32	12	26	24	0.124
G 3/4	32	16	30	24	0.144
G 1	39	16	32	27	0.221
G 1 1/8	44	16	32	27	0.270
G 1 1/4	49	16	33	30	0.340
G 1 1/2	55	16	33	30	0.425
G 1 3/4	62	20	40	36	0.649
G 2	68	20	40	36	0.788

Other dimensions on request.

Welding Ends

Miscellaneous

Material:
OSNA®-10 - copper-nickel



section view

Size			S	d ₃ (thread) G	L	l ₁	Approx. Weight kg /piece
in	DN mm	OD mm					
	4	8	1	G 1/8	30	10	0.01
1/8	6	10	1	G 1/4	30	12	0.02
1/4	8	12	1	G 3/8	30	13	0.02
1/2	16	20	1	G 1/2	35	15	0.03
3/4	20	25	1.5	G 3/4	40	15	0.05
1	25	30	1.5	G 1	40	19	0.10
1 1/4	32	38	1.5	G 1 1/4	50	20	0.19
1 1/2	40	44.5	1.5	G 1 1/2	50	20	0.21
2	50	57	1.5	G 2	55	22	0.29
2 1/2	65	76	2	G 2 1/2	60	27	0.38
3	80	89	2	G 3	65	28	0.50

Other dimensions on request.

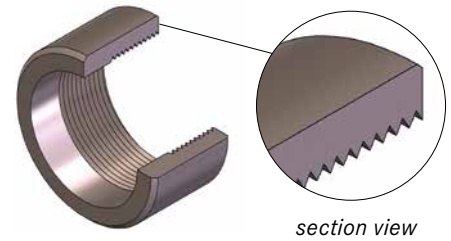
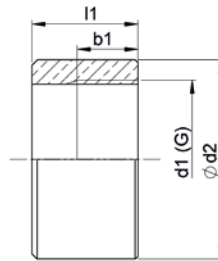
with Whitworth thread

Specification:

DIN 86103 PN 40 up to 225°C

Material:

OSNA®-10 – copper-nickel



Size				Approx. Weight
d ₁ (thread)	d ₂	b ₁	l ₁	kg /piece
in	mm	mm	mm	
G ¼	20	12	20	0.030
G ⅛	25	12	20	0.050
G ½	30	14	25	0.080
G ½	30	14	50	0.170
G ½	30	14	75	0.255
G ½	30	14	100	0.380
G ½	30	14	125	0.470
G ¾	38	16	25	0.140
G ¾	38	16	50	0.280
G ¾	38	16	75	0.445
G ¾	38	16	100	0.550
G ¾	38	16	125	0.700
G 1	45	18	28	0.190
G 1	45	18	50	0.350
G 1	45	18	75	0.545
G 1	45	18	100	0.700
G 1	45	18	125	0.950
G 1¼	55	20	30	0.290
G 1½	60	22	32	0.370
G 2	75	23	40	0.680

Other dimensions on request.

Unions

with silver solder capillary x capillary ends
equipped with sealing ring

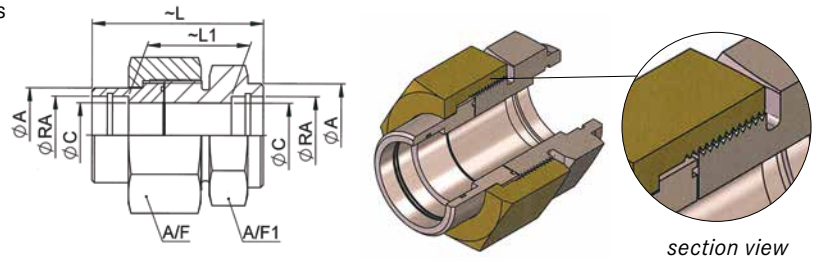
PN up to 63

Material:

OSNA®-10 – copper-nickel

Nut: Brass

Ring sealing: Elastomer FPM



Outside Diameter of Pipe		A mm	C mm	~L mm	~L ₁ mm	A/F mm	A/F ₁ mm	Approx. Weight kg /piece
nominal in	RA mm							
	8	12	6	40	22	22	17	0.05
1/8	10	15	8	44	26	27	22	0.09
1/4	12	17	10	45	27	27	24	0.11
1/4	14	20	12	50	30	32	27	0.18
3/8	16	22	14	52	32	36	32	0.24
1/2	20	27	18	58	38	41	36	0.31
3/4	25	32	22	61	41	46	41	0.44
1	30	37	27	67	45	50	46	0.45
1 1/4	38	45	35	79	42	60	55	0.73
1 1/2	44.5	52	41.5	80	50	70	60	1.08
2	57	65	54	93	63	85	80	1.54

Other dimensions on request.

Male Unions

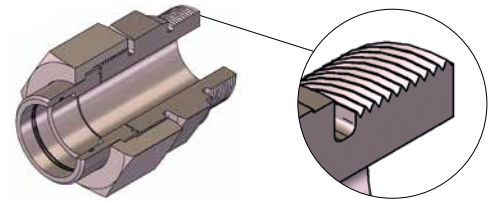
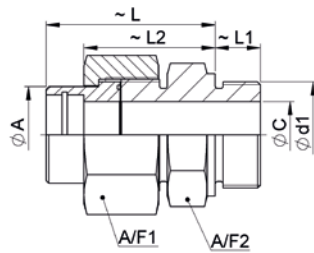
Miscellaneous

with silver solder
capillary x male thread
equipped with sealing ring

PN up to 63

Material:

OSNA®-10 – copper-nickel



section view

Outside Diameter of Pipe		A mm	C mm	d ₁ (Thread) G"	~L mm	~L ₁ mm	~L ₂ mm	A/F ₁ mm	A/F ₂ mm	Approx. Weight kg /piece
nominal in	actual mm xG"									
	8 x 1/4	12	6	G 1/4	40	12	30	22	19	0.09
1/8	10 x 3/8	15	8	G 3/8	40	12	32	27	22	0.14
1/4	12 x 1/2	17	10	G 1/2	43	14	34	27	27	0.18
1/4	14 x 5/8	20	12	G 5/8	49	14	39	32	32	0.25
3/8	16 x 3/4	22	14	G 3/4	50	16	40	36	32	0.35
1/2	20 x 1	27	18	G 1	56	18	46	41	41	0.72
3/4	25 x 1	32	22	G 1	57	18	47	46	41	0.53
1	30 x 1 1/4	37	27	G 1 1/4	63	20	52	50	50	0.78
1 1/4	38 x 1 1/2	45	35	G 1 1/2	71	22	56	60	55	0.90
1 1/2	44.5 x 1 3/4	52	41	G 1 3/4	76	24	61	70	65	1.15
2	57 x 2 1/2	65	54	G 2 1/2	87	30	72	85	85	1.36

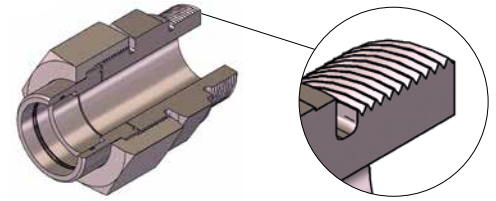
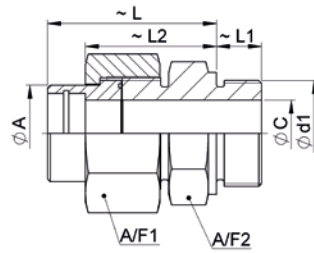
Other dimensions on request.

Male Unions, reduced

with silver solder
capillary x male thread
equipped with sealing ring

PN up to 63

Material:
OSNA®-10 – copper-nickel



section view

Outside Diameter of Pipe		A mm	C mm	d ₁ (Thread) G"	~L mm	~L ₁ mm	~L ₂ mm	A/F ₁ mm	A/F ₂ mm	Approx. Weight kg /piece
nominal in	actual mm xG"									
	8 x 1/8	12	4	Gx 1/2	39	8	30	22	17	
	8 x 3/8	12	6	Gx 3/8	40	12	30	22	22	
	8 x 1/2	12	6	Gx 1/2	42	14	33	22	27	
1/8	10 x 1/4	15	6	Gx 1/4	40	12	32	27	22	
1/8	10 x 1/2	15	8	Gx 1/2	43	14	34	27	27	0.19
1/8	10 x 5/8	15	8	Gx 5/8	45	14	36	27	32	
1/4	12 x 1/4	17	6	Gx 1/4	41	12	32	27	24	
1/4	12 x 3/8	17	8	Gx 3/8	41	12	32	27	24	0.15
1/4	12 x 5/8	17	10	Gx 5/8	45	14	36	27	32	
1/4	12 x 3/4	17	10	Gx 3/4	45	16	36	27	32	
1/4	14 x 3/8	20	12	Gx 3/8	47	12	36	32	27	
1/4	14 x 1/2	20	12	Gx 1/2	47	14	37	32	27	0.24
1/4	14 x 3/4	20	12	Gx 3/4	49	16	39	32	32	
1/4	14 x 1	20	12	Gx 1	52	18	42	32	41	
3/8	16 x 1/2	22	10	Gx 1/2	50	14	40	36	32	0.31
3/8	16 x 5/8	22	12	Gx 5/8	50	14	40	36	32	
3/8	16 x 1 3/4	22	14	Gx 1	53	18	43	36	41	
3/8	16 x 1 1/4	22	14	Gx 1 1/4	56	20	46	36	50	
1/2	20 x 5/8	27	12	Gx 5/8	54	14	44	41	36	
1/2	20 x 3/4	27	14	Gx 3/4	54	16	44	41	36	0.45
1/2	20 x 1 1/4	27	18	Gx 1 1/4	59	20	49	41	50	
1/2	20 x 1 1/2	27	18	Gx 1 1/2	61	22	51	41	55	
3/4	25 x 5/8	32	12	Gx 5/8	56	14	46	46	41	
3/4	25 x 3/4	32	14	Gx 3/4	56	16	46	46	41	0.59
3/4	25 x 1 1/4	32	22	Gx 1 1/4	60	20	50	46	50	
3/4	25 x 1 1/2	32	22	Gx 1 1/2	62	22	52	46	55	

Other dimensions on request.

Male Unions, reduced (continued)

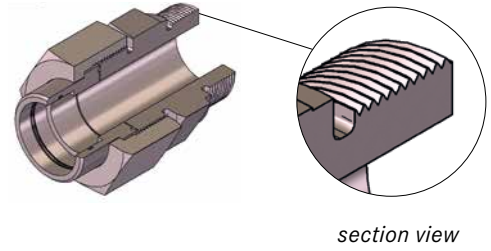
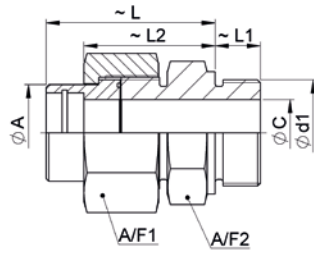
Miscellaneous

with silver solder
capillary x male thread
equipped with sealing ring

PN up to 63

Material:

OSNA®-10 – copper-nickel



Outside Diameter of Pipe		A mm	C mm	d ₁ (Thread) G"	~L mm	~L ₁ mm	~L ₂ mm	A/F ₁ mm	A/F ₂ mm	Approx. Weight kg /piece
nominal in	actual mm xG"									
1	30 x ¾	37	14	G x ¾	61	16	50	50	46	
1	30 x 1	37	22	G x 1	62	18	51	50	46	0.72
1	30 x 1½	37	27	G x 1½	65	22	54	50	55	
1	30 x 1¾	37	27	G x 1¾	68	24	57	50	65	
1¼	38 x ¾	45	14	G x ¾	70	16	55	60	55	
1¼	38 x 1	45	22	G x 1	71	18	56	60	55	1.00
1¼	38 x 1¼	45	27	G x 1¼	71	20	56	60	55	1.07
1¼	38 x 1¾	45	35	G x 1¾	74	24	59	60	65	
1½	44.5 x 1	52	22	G x 1	74	18	59	70	60	
1½	44.5 x 1¼	52	27	G x 1¼	74	20	59	70	60	
1½	44.5 x 1½	52	35	G x 1½	74	22	59	70	60	1.23
1½	44.5 x 2	52	41	G x 2	77	24	62	70	70	1.57
2	57 x 1¼	65	27	G x 1¼	83	20	69	85	80	
2	57 x 1½	65	35	G x 1½	83	22	69	85	80	
2	57 x 1¾	65	41	G x 1¾	83	24	69	85	80	
2	57 x 2	65	48	G x 2	83	24	69	85	80	2.05





KME Quality Management

KME is committed to the continuous improvement of all our business and production processes in terms of efficiency, effectiveness and reliability as regards their organisation, technological aspects and staff management.

The aim of our commitment is to increase the satisfaction of all stakeholders.

We are constantly engaged in:

- creating products of outstanding quality
- preventing errors and defects
- minimising the costs associated with errors and inefficiencies
- preventing the waste of resources
- establishing safe production conditions to protect both our employees and the environment

We aim for excellence by means of transparent management systems designed to satisfy the requirements of our clients together with the demands of the market and technology.

The quality management systems implemented throughout the KME Group are fully compliant with the provisions of ISO 9001 as well as, in the case of our automotive industry clients, ISO TS 16 949, and our staff is strongly committed to their implementation at all levels.



KME Germany GmbH & Co. KG

Marine Applications
P.O. Box 3320
49023 OSNABRÜCK
Klosterstraße 29
49074 OSNABRÜCK
GERMANY
Fon +49 541 321-3220
info-maritime@kme.com
www.kme.com/marine

Marine Applications



® = registered trademark

All changes reserved. Owing to limitations in printing technology, the colours reproduced in this brochure should be regarded as approximate equivalents to the colours described. We reserve the right to make changes in keeping with technical developments or to optimise our products. This brochure represents the current and actual version (Nov. 2018). All versions before this date (print or pdf) lose their validity.

1118.000.0108