

OSNA[®]-10/30

SHIPBUILDING

KME Special Products GmbH & Co. KG
SPECIAL DIVISION
[EN]

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



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KME - The Company

KME offers innovative product solutions tailored to the respective individual requirements of our customers from the most various industrial sectors. KME is divided into two corporate divisions – the COPPER DIVISION (rolled products) and the SPECIAL DIVISION (special products) – and has a worldwide sales network. The structure of KME into its two divisions provides important prerequisites for concentrating on the different markets for the respective product groups. This enables customised solutions to be developed and exemplary engineering and services to be provided.

Marine Applications

KME Special Products GmbH 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 CW352H	DIN 86019 WL 2.1972	EEMUA 2016, 234/1-2 UNS C 7060 x	MIL-T-16420K ASTM B 466 ¹⁾ /467 C 70620
Ni %	10.0 – 11.0	9.0 – 11.0	9.0 – 11.0	10.0 – 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
Mn %	0.6 – 1.0	0.5 – 1.0	0.5 – 1.0	0.5 – 1.0	max. 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
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
Sn %	max. 0.03	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

¹⁾ 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 CW354H	MIL-T-16420K ASTM B 466/467 ¹⁾ C 71520
Ni %	30.0 - 32.0	30.0 - 32.0	29.0 - 33.0
Fe %	0.6 - 1.0	0.4 - 1.0	0.4 - 1.0
Mn %	0.5 - 1.0	0.5 - 1.5	max. 1.0
C %	max. 0.04	max. 0.05	max. 0.05
Pb %	max. 0.01	max. 0.02	max. 0.02
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
Sn %		max. 0.05	
other imp.	max. 0.30	max. 0.20	
Cu %	rem.	rem.	min. 65

¹⁾ 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.
seamwelded

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.
seamwelded

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.

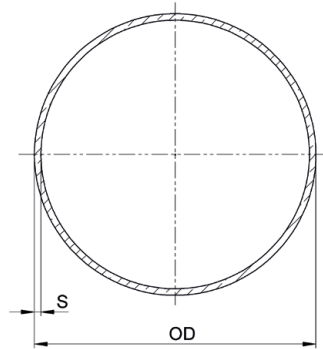


Specifications:

DIN 86019, DIN EN 12449

Material:

OSNA®-10 (CuNi 90/10) and
OSNA®-30 (CuNi 70/30)



Seamless Pipe

NPS inch	Size		Wall Thickness			
	DN mm	OD mm	Standard		Special	
			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	0.71
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	3.13
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	9.54
5	125	133	2.5	9.12	3	10.94
6	150	159	2.5	10.93	3	13.08
7	175	194	3	14.01		
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.

Seamwelded 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.

Elbows

Long radius 1.5 D

Specification:

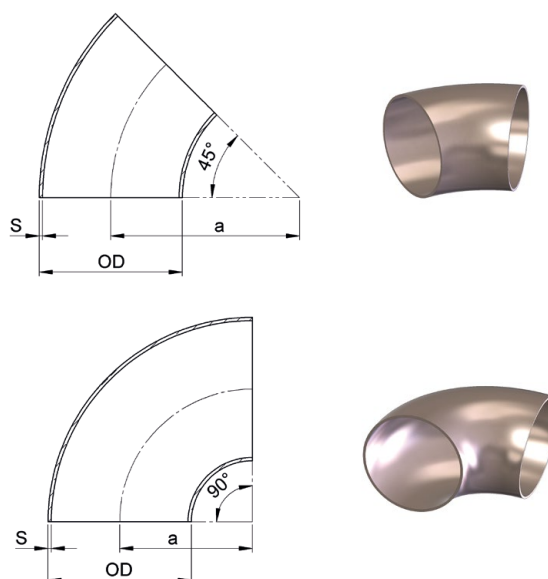
DIN 86090

Material:

OSNA®-10 - copper-nickel

Type and Construction:

Elbows for pipes up to and including 20"/ 508 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.

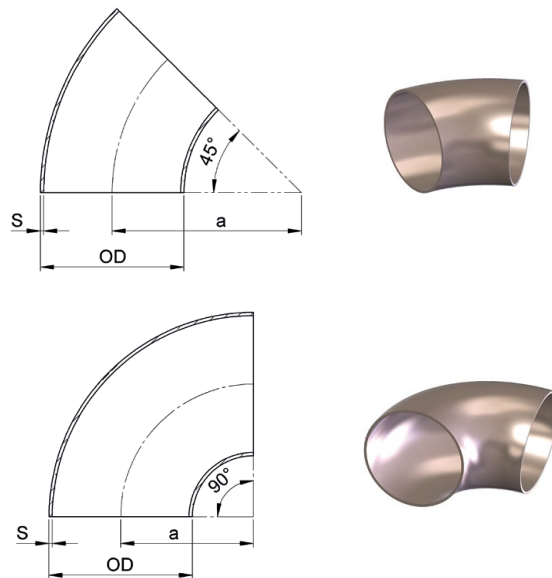


Size			Wall Thickness	Radius		Theoretical Weight	
NPS	DN	OD	S	a	~ e	(~ kg)	
inch	mm	mm	mm	mm	mm	45°	90°
1/2	16	20*	1	25	10.4	0.013	0.026
3/4	20	25*	1.5	27.5	11.4	0.029	0.058
1	25	30	1.5	33.5	14	0.035	0.07
1 1/4	32	38	1.5	45	19	0.06	0.12
1 1/2	40	44.5	1.5	51	21	0.07	0.15
2	50	57	1.5	72	30	0.14	0.29
2 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.

Elbows

Short radius 1.0 D



Size			Wall Thickness	Radius	e	Theoretical Weight (~ kg)	
NPS inch	DN mm	OD mm	S mm	a mm		45°	90°
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

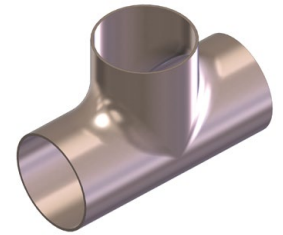
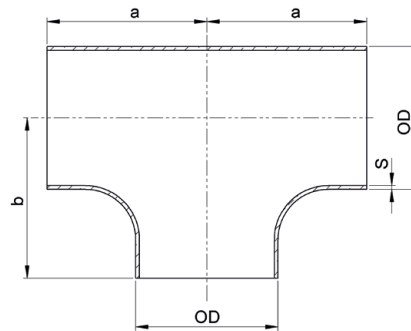
DIN 86088

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 mm	a mm	b mm	Theoretical Weight kg /piece
NPS inch	DN mm	OD mm				
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.

Tee Pieces, reduced ¹⁾

Specification

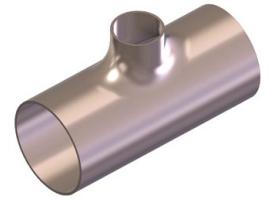
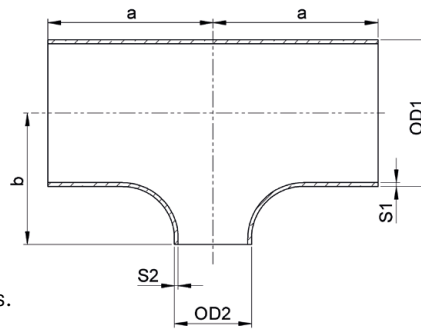
DIN 86088

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	Theoretical Weight kg /piece
NPS inch	DN mm	OD ₁ OD ₂ mm	S ₁ mm	S ₂ mm			
3/4 x 1/2	20 x 16	25 x 20*	1.5 x 1.0		29	29	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 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 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	Theoretical Weight kg /piece
NPS inch	DN mm	OD ₁ OD ₂ mm	S ₁ mm	S ₂ 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.

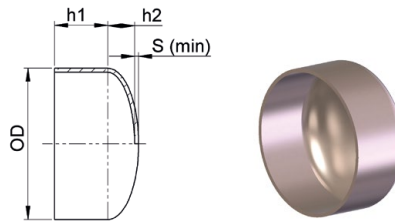
End Caps

Specification

DIN 28011

Material:

OSNA®-10 - copper-nickel



Size			S	h ₁	h ₂	Theoretical Weight
NPS inch	DN mm	OD mm				
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
36	900	914	8	35	173	72.65

Other dimensions on request.

Saddle Type Connections

Specification:

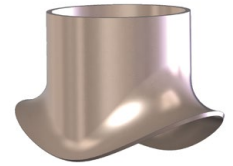
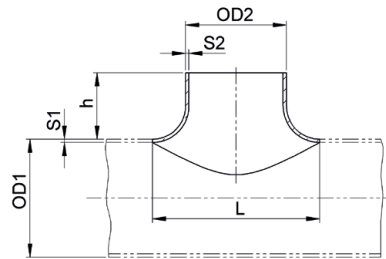
DIN 86087

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	Theoretical Weight
NPS	DN	OD ₁ OD ₂	S ₁	S ₂	h	L	kg /piece
inch	mm	mm	mm		mm	mm	
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

Saddle Type Connections *(continued)*

Specification:

DIN 86087

Material:

OSNA®-10 - copper-nickel

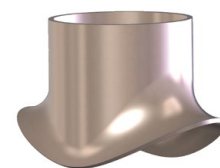
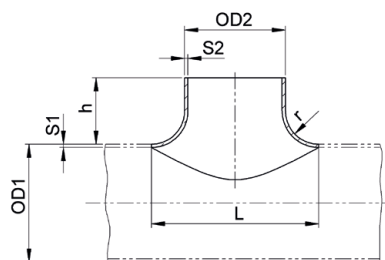
Dimensions:

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	Theoretical Weight
NPS	DN	OD ₁ OD ₂	S ₁	S ₂	h	L	kg /piece
inch	mm	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	Theoretical Weight
NPS	DN	OD ₁ OD ₂	S ₁	S ₂	h	L	kg /piece
inch	mm	mm	mm		mm	mm	
14 x 6	350 x 150	368 x 159	4 x 2.5		95	279	3.60
14 x 7	350 x 175	368 x 194	4 x 3		110	334	4.90
14 x 8	350 x 200	368 x 219	4 x 3		125	379	5.80
14 x 10	350 x 250	368 x 267	4 x 3		155	447	9.70
14 x 12	350 x 300	368 x 324	4 x 4		185	560	16.80
14 x 14	350 x 350	368 x 368	4 x 4		200	613	25.0
16 x 6	400 x 150	419 x 159*	4 x 2.5		95	279	3.65
16 x 7	400 x 175	419 x 194	4 x 3		110	334	4.90
16 x 8	400 x 200	419 x 219	4 x 3		125	379	5.80
16 x 10	400 x 250	419 x 267	4 x 3		155	447	9.70
16 x 12	400 x 300	419 x 324	4 x 4		185	560	16.80
16 x 14	400 x 350	419 x 368	4 x 4		200	613	25.0
16 x 16	400 x 400	419 x 419	4 x 4		225	680	33.0
18 x 6	450 x 150	457 x 159*	4.5 x 2.5		95	279	3.60
18 x 7	450 x 175	457 x 194*	4.5 x 3		110	334	4.90
18 x 8	450 x 200	457 x 219	4.5 x 3		125	379	5.80
18 x 10	450 x 250	457 x 267	4.5 x 3		155	447	9.70
18 x 12	450 x 300	457 x 324	4.5 x 4		185	560	16.80
18 x 14	450 x 350	457 x 368	4.5 x 4		200	613	25.0
18 x 16	450 x 400	457 x 419	4.5 x 4		225	680	33.0
18 x 18	450 x 450	457 x 457	4.5 x 4.5		250	800	41.0
20 x 6	500 x 150	508 x 159*	5 x 2.5		95	279	5.40
20 x 7	500 x 175	508 x 194*	5 x 3		110	334	6.50
20 x 8	500 x 200	508 x 219*	5 x 3		125	379	7.70
20 x 10	500 x 250	508 x 267	5 x 3		155	447	9.70
20 x 12	500 x 300	508 x 324	5 x 4		185	560	16.80
20 x 14	500 x 350	508 x 368	5 x 4		200	613	25.0
20 x 16	500 x 400	508 x 419	5 x 4		225	680	33.0
20 x 18	500 x 450	508 x 457	5 x 4.5		250	800	41.0
20 x 20	500 x 500	508 x 508	5 x 5		275	880	55.0
24 x 12	600 x 300	610 x 324	5 x 4		185	560	16.80
24 x 14	600 x 350	610 x 368	5 x 4		200	613	25.0
24 x 16	600 x 400	610 x 419	5 x 4		225	680	33.0
24 x 18	600 x 450	610 x 457	5 x 4.5		250	800	41.5

Other dimensions on request.

Specification:

DIN 86089

Material:

OSNA®-10 - copper-nickel

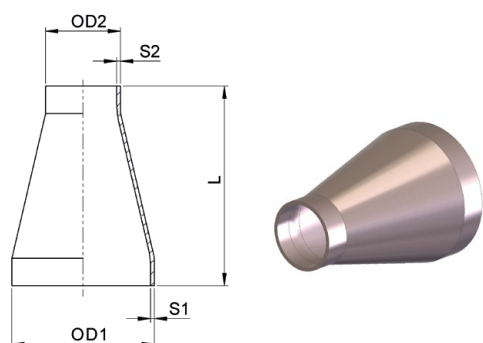
Type and Construction:

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

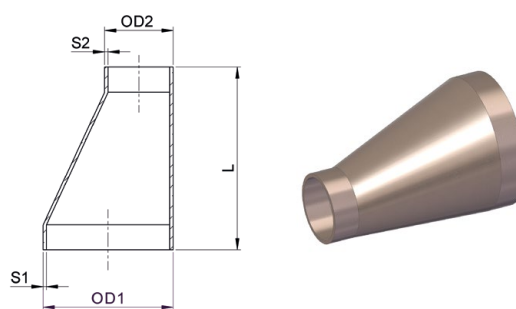
Eccentric reducers up to and including 14"/368mm are normally supplied as one-piece and seamless.

NPS inch	Size		Wall Thickness		Length L mm	Theoretical Weight kg /piece
	DN mm	OD ₁ mm	OD ₂ mm	S ₁ 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



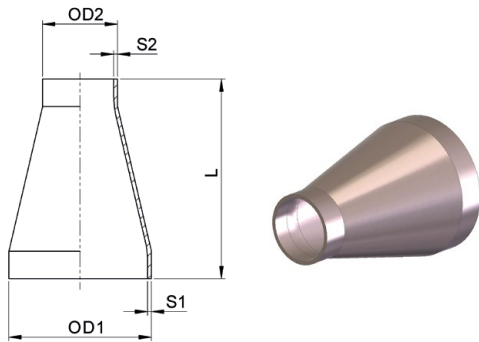
eccentric



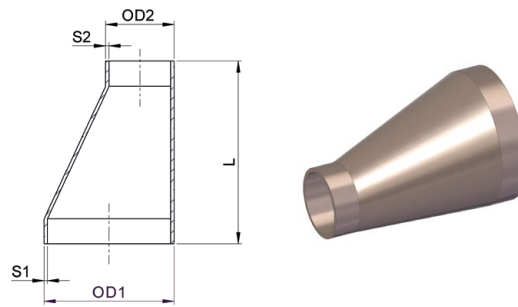
NPS inch	Size		Wall Thickness		Length L mm	Theoretical Weight kg /piece
	DN mm	OD ₁ OD ₂ mm	S ₁ mm	S ₂ mm		
5 x 2	125 x 50	133 x 57	2.5 x 1.5		140	1.22
5 x 2½	125 x 65	133 x 76	2.5 x 2		140	1.25
5 x 3	125 x 80	133 x 89	2.5 x 2		140	1.29
5 x 4	125 x 100	133 x 108	2.5 x 2.5		140	1.45
6 x 2½	150 x 65	159 x 76	2.5 x 2		150	1.53
6 x 3	150 x 80	159 x 89	2.5 x 2		150	1.57
6 x 4	150 x 100	159 x 108	2.5 x 2.5		150	1.76
6 x 5	150 x 125	159 x 133	2.5 x 2.5		150	1.89
7 x 3	175 x 80	194 x 89*	3 x 2		155	1.94
7 x 4	175 x 100	194 x 108	3 x 2.5		155	2.60
7 x 5	175 x 125	194 x 133	3 x 2.5		155	2.71
7 x 6	175 x 150	194 x 159	3 x 2.5		155	2.86
8 x 4	200 x 100	219 x 108	3 x 2.5		155	2.65
8 x 5	200 x 125	219 x 133	3 x 2.5		155	2.75
8 x 6	200 x 150	219 x 159	3 x 2.5		155	2.96
8 x 7	200 x 175	219 x 194	3 x 3		155	3.00
10 x 5	250 x 125	267 x 133	3 x 2.5		210	5.10
10 x 6	250 x 150	267 x 159	3 x 2.5		210	5.30
10 x 7	250 x 175	267 x 194	3 x 3		210	5.56
10 x 8	250 x 200	267 x 219	3 x 3		210	6.00
12 x 5	300 x 125	324 x 133*	4 x 2.5		210	6.85
12 x 6	300 x 150	324 x 159	4 x 2.5		210	7.02
12 x 7	300 x 175	324 x 194	4 x 3		210	7.28
12 x 8	300 x 200	324 x 219	4 x 3		210	7.40
12 x 10	300 x 250	324 x 267	4 x 3		210	7.55

Reducers (continued)

concentric



eccentric



NPS inch	Size		Wall Thickness		Length L mm	Theoretical Weight kg /piece
	DN mm	OD ₁ OD ₂ mm	S ₁ mm	S ₂ mm		
14 x 6	350 x 150	368 x 159*	4 x 2.5		300	10.75
14 x 7	350 x 175	368 x 194	4 x 3		300	10.95
14 x 8	350 x 200	368 x 219	4 x 3		300	11.10
14 x 10	350 x 250	368 x 267	4 x 3		300	11.80
14 x 12	350 x 300	368 x 324	4 x 4		300	12.20
16 x 7	400 x 175	419 x 194*	4 x 3		325	14.80
16 x 8	400 x 200	419 x 219	4 x 3		325	15.31
16 x 10	400 x 250	419 x 267	4 x 3		325	15.93
16 x 12	400 x 300	419 x 324	4 x 4		325	16.77
16 x 14	400 x 350	419 x 368	4 x 4		325	17.68
18 x 8	450 x 200	457 x 219*	4.5 x 3		350	21.40
18 x 10	450 x 250	457 x 267	4.5 x 3		350	21.90
18 x 12	450 x 300	457 x 324	4.5 x 3		350	22.70
18 x 14	450 x 350	457 x 368	4.5 x 4		350	23.20
18 x 16	450 x 400	457 x 419	4.5 x 4		350	23.70
20 x 10	500 x 250	508 x 267*	5 x 3		375	28.70
20 x 12	500 x 300	508 x 324	5 x 4		375	29.50
20 x 14	500 x 350	508 x 368	5 x 4		375	29.70
20 x 16	500 x 400	508 x 419	5 x 4		375	30.10
20 x 18	500 x 450	508 x 457	5 x 4.5		375	30.90
24 x 14	600 x 350	610 x 368	5 x 4		400	45.70
24 x 16	600 x 400	610 x 419	5 x 4		400	46.50
24 x 18	600 x 450	610 x 457	5 x 4.5		400	47.40
24 x 20	600 x 500	610 x 508	5 x 5		400	48.20

Other dimensions on request.

Welding Necks

Specification:

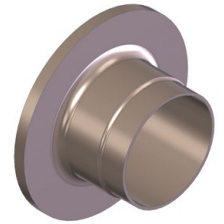
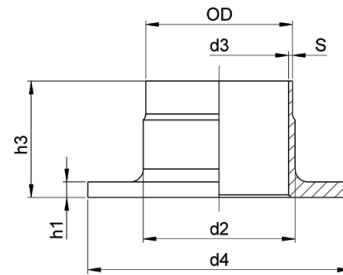
DIN 86037 -2 compatible
with Outer Flanges PN 10, 16

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						Theoretical Weight
NPS	DN	OD	S	d ₂	d ₃	d ₄	h ₁	h ₃	kg /piece
inch	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:

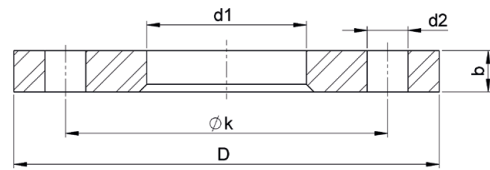
DIN 86037, EN 1092-3 (Type 04) PN10, 16

Material:

S235JR

Note:

Steel flanges will be supplied hot-dip galvanized.



PN 10

Size			D	d ₁	b	k	d ₂	Bolt Holes	Theoretical Weight kg /piece
NPS inch	DN mm	OD 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:

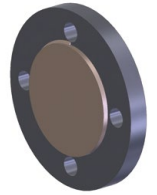
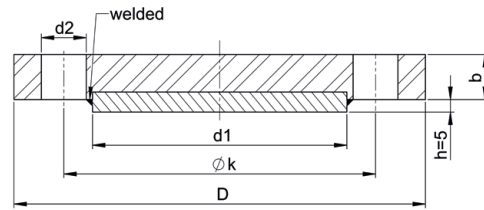
A105/P245GH EN 10222-2 (flanges)

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	Theoretical Weight kg /piece
NPS inch	DN mm	OD 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

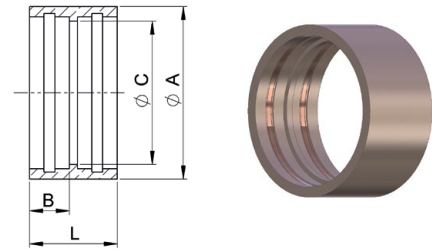
Other dimensions on request.

Couplings, straight

with silver solder
capillary x capillary ends

PN up to 63

Material:
OSNA[®]-10 - copper-nickel



Size			A	C	L	B	Theoretical Weight
NPS	DN	OD					
inch	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

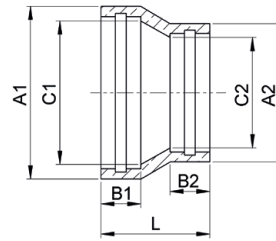
Other dimensions on request.

Couplings, reduced

with silver solder
capillary x capillary 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	L mm	Theoretical Weight
NPS inch	OD mm								kg /piece
	10 x 8	15	12	8	6	9	9	22	0.03
	12 x 8	17	12	10	6	9	9	25	0.03
1/4 x 1/8	12 x 10	17	15	10	8	9	9	21	0.04
	14 x 8	20	12	12	6	10	9	30	0.04
1/4 x 1/8	14 x 10	20	15	12	8	10	9	26	0.04
3/8 x 1/8	16 x 10	22	15	14	8	10	9	28	0.05
3/8 x 1/4	16 x 12	22	17	14	10	10	9	27	0.06
1/2 x 1/4	20 x 12	27	17	18	10	10	9	33	0.06
1/2 x 3/8	20 x 16	27	22	18	14	10	10	27	0.08
3/4 x 3/8	25 x 16	32	22	22	14	10	10	33	0.07
3/4 x 1/2	25 x 20	32	27	22	18	10	10	27	0.09
1 x 3/8	30 x 16	37	22	27	14	11	10	35	0.10
1 x 1/2	30 x 20	37	27	27	18	11	10	31	0.10
1 x 3/4	30 x 25	37	32	27	22	11	10	28	0.18
1 1/4 x 3/8	38 x 16	45	22	35	14	15	10	45	0.17
1 1/4 x 1/2	38 x 20	45	27	35	18	15	10	41	0.16
1 1/4 x 3/4	38 x 25	45	32	35	22	15	10	36	0.13
1 1/4 x 1	38 x 30	45	37	35	27	15	11	33	0.21
1 1/2 x 3/8	44.5 x 16	52	22	41.5	14	15	10	51	0.21
1 1/2 x 1/2	44.5 x 20	52	27	41.5	18	15	10	47	0.21
1 1/2 x 3/4	44.5 x 25	52	32	41.5	22	15	10	42	0.18
1 1/2 x 1	44.5 x 30	52	37	41.5	27	15	11	39	0.24
1 1/2 x 1 1/4	44.5 x 38	52	45	41.5	24	15	15	36	0.23
2 x 3/8	57 x 16	65	22	54	14	15	10	62	0.28
2 x 1/2	57 x 20	65	27	54	18	15	10	58	0.29
2 x 3/4	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 1 1/4	57 x 38	65	45	54	35	15	15	47	0.28
2 x 1 1/2	57 x 44.5	65	52	54	41.5	15	15	41	0.28

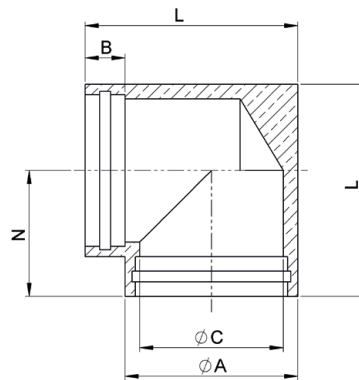
Other dimensions on request.

Elbows

with silver solder
capillary x capillary ends

PN up to 63

Material:
OSNA®-10 - copper-nickel



Size			A	B	C	L	N	Theoretical Weight
NPS	DN	OD						
inch	mm	mm	mm	mm	mm	mm	mm	kg /piece
¼	10	14	20	10	12	31	21	0.068
⅜	13	16	22	10	14	31	21	0.090
½	16	20	27	10	18	37	23.5	0.130
¾	20	25	32	10	22	42	26	0.185
1	25	30	37	11	27	48	29.5	0.260
1¼	32	38	45	15	35	60	36.5	0.370
1½	40	44.5	52	15	41.5	67	41	0.520
2	50	57	65	15	54	80	47.5	0.870

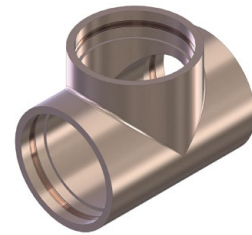
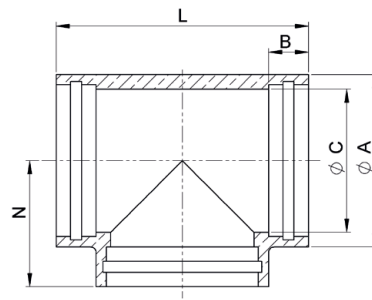
Other dimensions on request.

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	Theoretical Weight
NPS	DN	OD						
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 1/2	40	44.5	52	15	41.5	82	41	0.57
2	50	57	65	15	54	95	47.5	0.86

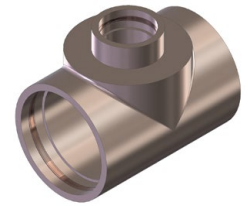
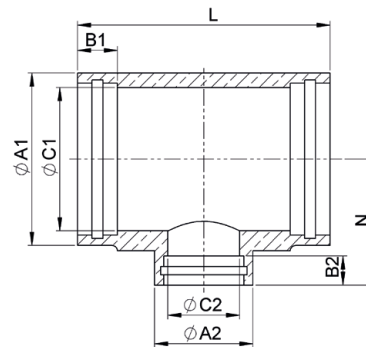
Other dimensions on request.

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	Theoretical Weight kg /piece
NPS inch	DN mm	OD ₁ x OD ₂ mm									
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

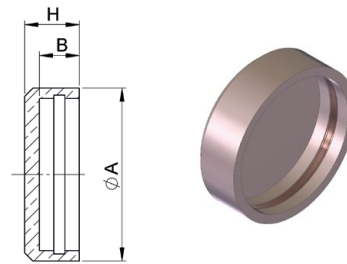
Other dimensions on request.

End Caps

with silver solder
capillary ends

PN up to 63

Material:
OSNA®-10 – copper-nickel



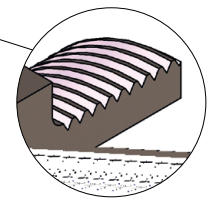
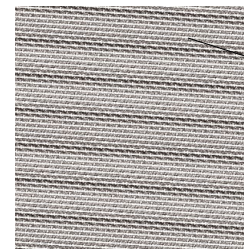
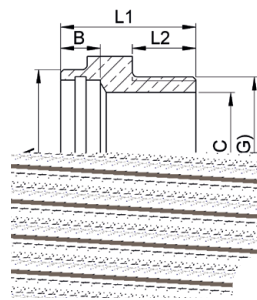
Size			A	B	H	Theoretical Weight
NPS	DN	OD				
inch	mm	mm	mm	mm	mm	kg /piece
1/4	10	14	20	10	14	0.030
3/8	12	16	22	10	14	0.040
1/2	16	20	27	10	14.5	0.055
3/4	20	25	32	10	15	0.070
1	25	30	37	11	16	0.085
1 1/4	32	38	45	15	20	0.135
1 1/4	40	44.5	52	15	20.5	0.195
2	50	57	65	15	20.5	0.225

Other dimensions on request.

Straight Male Connectors

E (male BSP thread)
capillary ends x male thread

Material:
OSNA®-10 - copper-nickel



section view

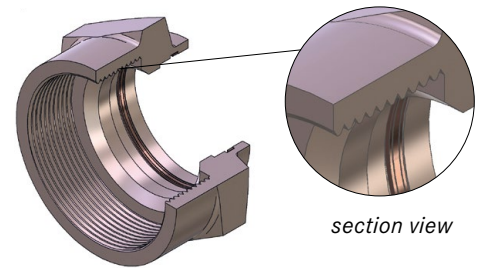
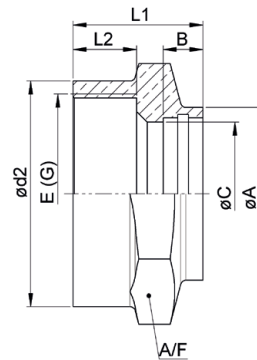
Outside Diameter of Pipe		A mm	B mm	C mm	L ₁ mm	L ₂ mm	A/F mm	Theoretical Weight kg /piece
NPS inch	OD mm x E"							
1/4 x 1/2	14 x 1/2	20	10	12	30	18	22	0.06
1/4 x 3/4	14 x 3/4	20	10	12	33	18	30	0.12
1/4 x 1	14 x 1	20	10	12	38	21	36	0.16
3/8 x 3/8	16 x 3/8	22	10	14	29	15	22	0.05
3/8 x 1/2	16 x 1/2	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 ends x female thread

Material:
OSNA®-10 - copper-nickel



Outside Diameter of Pipe		A	B	C	d ₂	L ₁	L ₂	A/F	Theoretical Weight
NPS	OD	mm	mm	mm	mm	mm	mm	mm	kg /piece
inch	mm x E"								
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

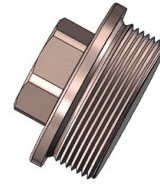
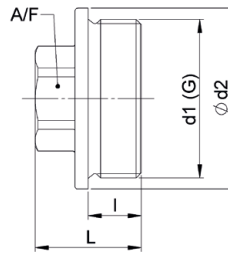
Miscellaneous

Specification:

DIN 910

Material:

OSNA®-10 – copper-nickel



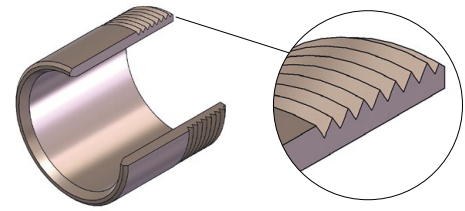
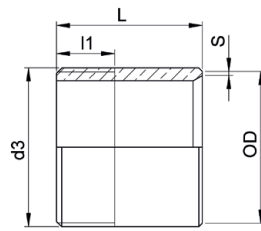
Size						Theoretical Weight
d ₁ (thread)	d ₂	l	L	A/F	kg /piece	
G"	mm	mm	mm	mm		
G 1/8	14	8	17	10	0.014	
G 1/4	18	8	17	13	0.023	
G 1/4	18	12	21	13	0.027	
G 3/8	22	8	17	17	0.037	
G 3/8	22	12	21	17	0.043	
G 1/2	26	10	22	19	0.066	
G 1/2	26	14	26	19	0.076	
G 3/4	32	12	26	24	0.124	
G 3/4	32	16	30	24	0.144	
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	Theoretical Weight kg /piece
NPS inch	DN mm	OD mm					
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.

Sockets

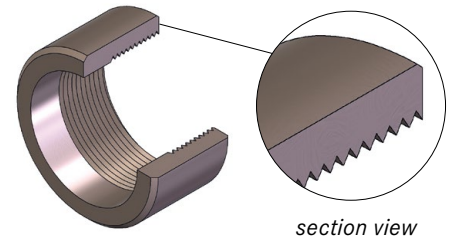
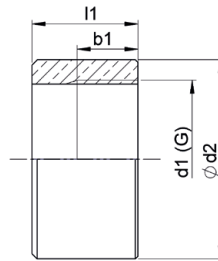
Miscellaneous

Specification:

DIN 86103 (Form B),
PN 40 up to 225°C

Material:

OSNA®-10 - copper-nickel



Size				Theoretical Weight
d ₁ (thread)	d ₂	b ₁	l ₁	kg /piece
inch	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

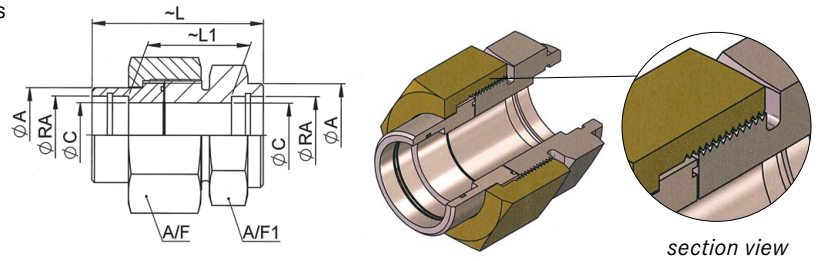
PN up to 63

Material:

OSNA®-10 – copper-nickel

Nut: Brass

Ring sealing: Elastomer FPM



Outside Diameter of Pipe		A mm	C mm	$\sim L$ mm	$\sim L_1$ mm	A/F mm	A/F ₁ mm	Theoretical Weight kg /piece
NPS inch	OD mm							
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 ends x male thread
equipped with sealing ring

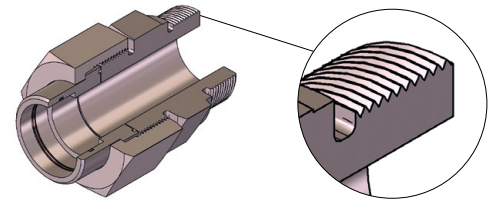
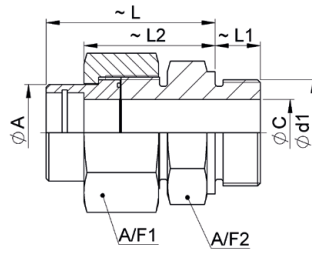
PN up to 63

Material:

OSNA®-10 – copper-nickel

Nut: Brass

Ring sealing: Elastomer FPM



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	Theoretical Weight kg /piece
NPS inch	OD mm x G"									
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	0.53
3/4	25 x 1	32	22	G 1	57	18	47	46	41	0.72
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

Miscellaneous

with silver solder
capillary ends x male thread
equipped with sealing ring

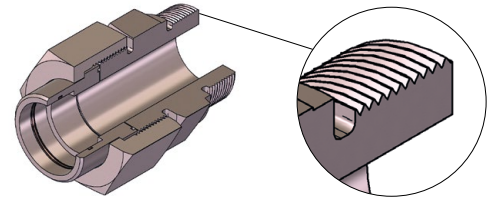
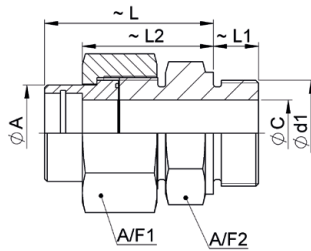
PN up to 63

Material:

OSNA®-10 – copper-nickel

Nut: Brass

Ring sealing: Elastomer FPM



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	Theoretical Weight kg /piece
NPS inch	OD mm x G"									
1/4	14 x 3/8	20	12	G x 3/8	47	12	36	32	27	
1/4	14 x 1/2	20	12	G x 1/2	47	14	37	32	27	0.24
1/4	14 x 3/4	20	12	G x 3/4	49	16	39	32	32	
1/4	14 x 1	20	12	G x 1	52	18	42	32	41	
3/8	16 x 1/2	22	10	G x 1/2	50	14	40	36	32	0.31
3/8	16 x 5/8	22	12	G x 5/8	50	14	40	36	32	
3/8	16 x 1 3/4	22	14	G x 1	53	18	43	36	41	
3/8	16 x 1 1/4	22	14	G x 1 1/4	56	20	46	36	50	
1/2	20 x 5/8	27	12	G x 5/8	54	14	44	41	36	
1/2	20 x 3/4	27	14	G x 3/4	54	16	44	41	36	0.45
1/2	20 x 1 1/4	27	18	G x 1 1/4	59	20	49	41	50	
1/2	20 x 1 1/2	27	18	G x 1 1/2	61	22	51	41	55	
3/4	25 x 5/8	32	12	G x 5/8	56	14	46	46	41	
3/4	25 x 3/4	32	14	G x 3/4	56	16	46	46	41	0.59
3/4	25 x 1 1/4	32	22	G x 1 1/4	60	20	50	46	50	
3/4	25 x 1 1/2	32	22	G x 1 1/2	62	22	52	46	55	
1	30 x 3/4	37	14	G x 3/4	61	16	50	50	46	
1	30 x 1	37	22	G x 1	62	18	51	50	46	0.72
1	30 x 1 1/2	37	27	G x 1 1/2	65	22	54	50	55	
1	30 x 1 3/4	37	27	G x 1 3/4	68	24	57	50	65	
1 1/4	38 x 3/4	45	14	G x 3/4	70	16	55	60	55	
1 1/4	38 x 1	45	22	G x 1	71	18	56	60	55	1.00
1 1/4	38 x 1 1/4	45	27	G x 1 1/4	71	20	56	60	55	1.07
1 1/4	38 x 1 3/4	45	35	G x 1 3/4	74	24	59	60	65	
1 1/2	44.5 x 1	52	22	G x 1	74	18	59	70	60	
1 1/2	44.5 x 1 1/4	52	27	G x 1 1/4	74	20	59	70	60	
1 1/2	44.5 x 1 1/2	52	35	G x 1 1/2	74	22	59	70	60	1.23
1 1/2	44.5 x 2	52	41	G x 2	77	24	62	70	70	1.57
2	57 x 1 1/4	65	27	G x 1 1/4	83	20	69	85	80	
2	57 x 1 1/2	65	35	G x 1 1/2	83	22	69	85	80	
2	57 x 1 3/4	65	41	G x 1 3/4	83	24	69	85	80	
2	57 x 2	65	48	G x 2	83	24	69	85	80	2.05

Other dimensions on request.



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.



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