

OSNA[®]-10 and OSNA[®]-30



Product Range
Shipbuilding

KME Germany AG & Co. KG
OSNA[®]-10 and OSNA[®]-30
[GB]



*Member of the
KME Group*

Contents

Range of Applications	1
The Material	2
The Elements	3
Pipes	4
Butt Welding Fittings	5
Flanges	18
Brazing Fittings	26
Miscellaneous	37
KME Quality Management	41



Range of Applications



The company KME

Copper and its alloys – for more than a century now this has been the material on which KME's reputation as one of the world's leading integrated metal manufacturers has been founded. Be it in large-scale plant construction projects, for the processing industries, or in building construction—wherever they are used, KME products can be considered safe investments for the future.

Hundred years of experience, a thorough understanding of the different industries' specific problems, a potent range of application-oriented products and services, plus qualified technical advice and assistance, have been the bedrock of KME's relations with its customers.

Marine Applications

KME's Division MA, which stands for Marine Applications, specializes in the production of copper base 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 cavitation erosion, crevice and galvanic corrosion as well as stress corrosion cracking. 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, semisubmersibles FPSOs etc.

The chemical composition of OSNA[®]-10 (CuNi 90/10) and OSNA[®]-30 (CuNi 70/30) coppernickel 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
- Outstanding erosion corrosion performance
- 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)	DIN CEN/TS 13388 CW352H	DIN 86019 WL 2.1972	BS 2871 ¹⁾ CN 102	DIN EN 12449	EEMUA 144-1987 UNS C 7060 x	MIL-T-16420K ASTM B 466 ²⁾ 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	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	1.0–2.0	1.0–2.0	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	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	max. 0.05	max. 0.05	–
Pb %	max. 0.01	max. 0.02	max. 0.01	max. 0.01	max. 0.02	max. 0.01	max. 0.02	max. 0.05
S %	max. 0.005	max. 0.05	max. 0.005	max. 0.05	max. 0.05	max. 0.02	max. 0.02	–
P %	max. 0.02	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. 0.50	max. 0.20	max. 0.50	max. 0.50
Sn %	–	max. 0.03	–	–	max. 0.03	–	–	–
other imp.	max. 0.20	max. 0.20	max. 0.20	max. 0.30	max. 0.20	max. 0.30	–	–
Cu %	rem.	rem.	rem.	rem.	rem.	rem.	rem.	+Ni+Fe+Mn min. 99.5

¹⁾ no longer valid

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)	DIN CEN/TS 13388 CW354H	BS 2871 ¹⁾ CN 107	DIN EN 12449	MIL-T-16420K ASTM B 466 ²⁾ C 71520	JIS H 3300 C 7150 T
Ni %	30.0 – 32.0	30.0 – 32.0	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	0.4 – 1.0	0.4 – 1.0
Mn %	0.5 – 1.0	0.5 – 1.5	0.5 – 1.5	0.5 – 1.5	max. 1.0	0.2 – 1.0
C %	max. 0.04	max. 0.05	max. 0.05	max. 0.05	max. 0.05	–
Pb %	max. 0.01	max. 0.02	max. 0.03	max. 0.02	max. 0.02	max. 0.05
S %	max. 0.01	max. 0.05	max. 0.02	max. 0.05	max. 0.02	–
P %	max. 0.01	max. 0.02	max. 0.02	max. 0.02	max. 0.02	–
Zn %	max. 0.20	max. 0.50	max. 0.50	max. 0.50	max. 0.50	max. 0.50
Sn %	–	max. 0.05	–	max. 0.05	–	–
other imp.	max. 0.30	max. 0.20	max. 0.30	max. 0.20	–	–
Cu %	rem.	rem.	rem.	rem.	rem.	+Ni+Fe+Mn min. 99.5

¹⁾ no longer valid

²⁾ equal to C 71500 for subsequent welding

The Elements

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

- DIN CEN/TS 13388 (CW352H)
- DIN 86019 2.1972
- BS 2871 CN 102
- EEMUA 144 UNS 7060x
- ASTM-B-466 C 70600
- MIL-T-16420 K C 70600
- JIS H 3300 C 7060T

OSNA®-30 (CuNi 70/30)

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

International Standards

- DIN CEN/TS 13388 (CW354H)
- DIN EN 12449
- ASTM-B-466 C 71500
- MIL-T-16420 K C 71500
- JIS H 3300 C 7150T

Besides pipes, KME offers a comprehensive range of fittings in different sizes and dimensions, enabling seawater pipe systems to be constructed for different applications.

Butt Welding Fittings

- Elbows
 - *eamless*
 - *welded*
- Tee Pieces
 - *equal and reduced*
- End Caps
- Branches
- Saddles
 - *equal and reduced*
- Reducers
 - *Eccentric*
(*seam less or seam-welded*)
 - *Concentric*
(*seamless or seam-welded*)

Brazing Fittings

- Couplings
 - *straight and reduced*
- Elbows
- Tee Pieces
 - *equal and reduced*
- End Caps
- Screw Plugs
- Welding Ends
- Sockets

Miscellaneous

- Unions
- Male Unions
 - *straight and reduced.*

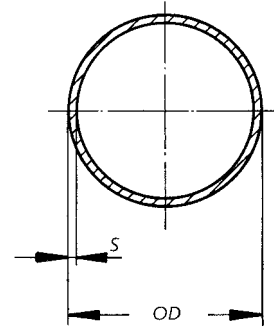
Flanges

- Composite Weld Neck
- Backing Flanges
- Blind Flanges
- Flanged Bulkhead Pieces



Pipes

OSNA®-10 seamless and seam-welded pipes for shipbuilding applications according to DIN 86019, DIN EN 12449 formerly (BS 2871 Part 2)



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	1.19	2	1.56
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	3.07
2 1/2	65	76	2	4.14	2.5	5.14
3	80	88.9 (89.0)	2	4.86	2.5	6.04
4	100	108	2.5	7.37	3	8.80
5	125	133	2.5	9.12	3	10.90
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	21.09
10	250	267	3	22.13	4	29.40
12	300	323.9 (324)	4	35.76	5	44.56
14	350	368	4	40.69	5.5	55.72
16	400	419	4	46.39	6	69.25
18	450	457	4.5	56.92		

For offshore wall thickness see separate catalogue.

Seam-welded Pipe

20	500	508	5	70.28
24	600	610	5	84.53
28	700	711	6	118.20
32	800	813	6	135.30
36	900	914	8	202.55

Other dimensions on request.



Butt Welding Fittings

Seamless butt welding fittings

Seamless butt welding fittings are produced from seamless tube and pipe by either a hot or cold forming process. Seamless butt welding fittings are available in standard sizes, as published in the relevant product tables, and in non-standard sizes. Standard size fittings are generally ex stock.

Terms of supply

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

Seam-welded butt welding fittings

Seam-welded butt welding fittings are produced from hotrolled, annealed and pickled sheet or plate, formed into half shells or segments and longitudinally seam-welded. Seam-welded butt welding fittings are available in standard sizes, as published in the relevant product tables, and in non-standard sizes. Standard size fittings are generally ex stock.

End preparation

Square cut and deburred, alternatively: bevelled as specified.

Welding

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

Marking

All butt welding fittings are marked with alloy name, outside diameter, wall thickness and heat number. Additional information like standard and alloy numbers can be added on request.

Butt Welding Fittings

Elbows (Long radius) 1.5 D

Elbows

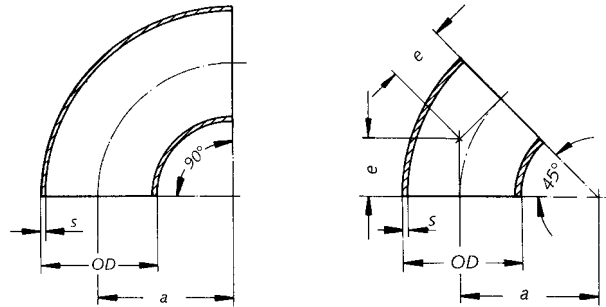
seamless and seam-welded DIN 86090

Material:

OSNA®-10 - copper-nickel-iron

Type and Construction:

Elbows for pipes up to and including 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.

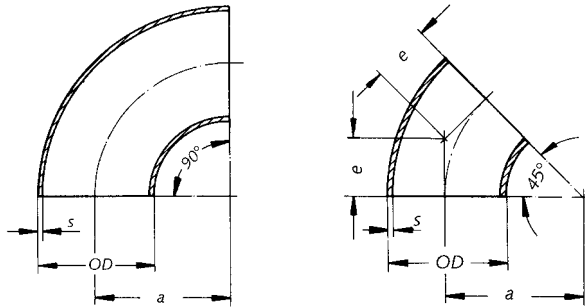


Size			Wall Thickness s mm	Radius a mm	≈e mm	Approx. Weight (kg)	
inch	DN mm	OD mm				45°	90°
Seamless							
1/2	16	20	1	25	10.4	0.013	0.026
3/4	20	25	1.5	27.5	11.4	0.029	0.058
1	25	30	1.5	33.5	14	0.030	0.06
1 1/4	32	38	1.5	45	19	0.06	0.12
1 1/2	40	44.5	1.5	51	21	0.07	0.14
2	50	57	1.5	72	30	0.13	0.26
2 1/2	65	76	2	95	39	0.31	0.62
3	80	89	2	114.5	47	0.44	0.88
4	100	108	2.5	142.5	59	0.88	1.66
5	125	133	2.5	181	75	1.30	2.60
6	150	159	2.5	216	89	1.85	3.70
7	175	194	3	270	112	2.85	5.70
8	200	219	3	305	126	4.35	8.70
10	250	267	3	378	157	6.55	13.10
12	300	324	4	457	189	12.80	25.60
14	350	368	4	533.5	221	17.00	34.00
16	400	419	4	609.5	252	24.85	49.70
18	450	457	4.5	686	284	30.95	61.90
20	500	508	5	762	316	41.95	83.90
24	600	610	5	914	379	60.75	121.50
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.

Butt Welding Fittings

Elbows (Short radius) 1.0 D



Size			Wall Thickness s mm	Radius a mm	e mm	Approx. Weight (kg)	
inch	DN mm	OD mm				45°	90°
Seamless							
1	25	30	1.5	30	12	0.027	0.054
1¼	32	38	1.5	32.5	14	0.033	0.076
1½	40	44.5	1.5	40	17	0.057	0.144
2	50	57	1.5	52.5	22	0.10	0.20
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	1.90	3.80
8	200	219	3	210	87	3.00	6.00
10	250	267	3	255	106	4.44	8.88
12	300	324	4	305	126	8.55	17.10
14	350	368	4	352.5	146	11.30	22.60
16	400	419	4	400	166	16.40	32.80
18	450	457	4.5	457	189	20.45	40.90
20	500	508	5	508	210	28.10	56.20
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.

Butt Welding Fittings

Tee Pieces

Equal Tee Pieces

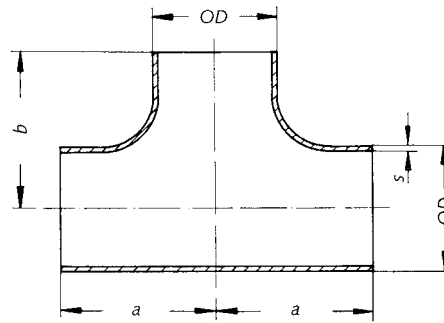
DIN 86088

Material:

OSNA®-10 – copper-nickel-iron

Type and Construction:

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



Size			Wall Thickness S mm	a mm	b mm	Theoretical Weight kg per piece
inch	DN	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	0.18
1 1/4	32	38	1.5	48	48	0.22
1 1/2	40	44.5	1.5	57	57	0.31
2	50	57	1.5	64	64	0.45
2 1/2	65	76	2	76	76	1.07
3	80	89	2	86	86	2.33
4	100	108	2.5	105	105	2.85
5	125	133	2.5	124	124	3.41
6	150	159	2.5	143	143	4.71
8	200	219	3	178	178	7.25
10	250	267	3	324	289	19.20
12	300	324	4	380	347	30.48
14	350	368	4	407	384	38.50
16	400	419	4	440	435	49.10
18	450	457	4.5	500	479	56.80
20	500	508	5	540	529	77.31

Other dimensions on request.

Reducing Tee Pieces

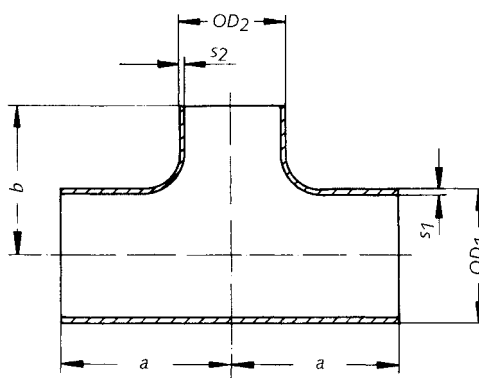
DIN 86088

Material:

OSNA®-10 – copper-nickel-iron

Type and Construction:

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



Size			Wall Thickness		a	b	Theoretical Weight kg per piece
DN	OD ₁	OD ₂	S ₁	S ₂			
inch	mm	mm	mm	mm	mm	mm	
¾ x ½	20 x 16	25 x 20	25 x 20	29	26	0.05	
1 x ½	25 x 16	30 x 20	30 x 20	38	29	0.07	
1 x ¾	25 x 20	30 x 25	30 x 25	38	35	0.07	
1¼ x ½	32 x 16	38 x 20	38 x 20	48	33	0.12	
1¼ x ¾	32 x 20	38 x 25	38 x 25	48	35	0.125	
1¼ x 1	32 x 25	38 x 30	38 x 30	48	42	0.125	
1½ x ½	40 x 16	44.5 x 20	44.5 x 20	57	36	0.185	
1½ x ¾	40 x 20	44.5 x 25	44.5 x 25	57	40	0.185	
1½ x 1	40 x 25	44.5 x 30	44.5 x 30	57	45	0.185	
1½ x 1¼	40 x 32	44.5 x 38	44.5 x 38	57	51	0.185	
2 x ¾	50 x 20	57 x 25	57 x 25	64	47	0.280	
2 x 1	50 x 25	57 x 30	57 x 30	64	51	0.285	
2 x 1¼	50 x 32	57 x 38	57 x 38	64	57	0.285	
2 x 1½	50 x 40	57 x 44.5	57 x 44.5	64	63	0.290	
2½ x 1	65 x 25	76 x 30	76 x 30	76	56	0.650	
2½ x 1¼	65 x 32	76 x 38	76 x 38	76	62	0.650	
2½ x 1½	65 x 40	76 x 44.5	76 x 44.5	76	71	0.650	
2½ x 2	65 x 50	76 x 57	76 x 57	76	73	0.650	
3 x 1¼	80 x 32	89 x 38	89 x 38	86	73	0.820	
3 x 1½	80 x 40	89 x 44.5	89 x 44.5	86	76	0.900	
3 x 2	80 x 50	89 x 57	89 x 57	86	80	1.10	
3 x 2½	80 x 65	89 x 76	89 x 76	86	83	1.25	
4 x 1½	100 x 40	108 x 44.5	108 x 44.5	105	89	2.30	
4 x 2	100 x 50	108 x 57	108 x 57	105	90	2.45	
4 x 2½	100 x 65	108 x 76	108 x 76	105	92	2.50	
4 x 3	100 x 80	108 x 89	108 x 89	105	96	2.60	
5 x 2	125 x 50	133 x 57	133 x 57	124	98	3.20	
5 x 2½	125 x 65	133 x 76	133 x 76	124	105	3.30	
5 x 3	125 x 80	133 x 89	133 x 89	124	108	3.40	
5 x 4	125 x 100	133 x 108	133 x 108	124	117	3.51	
6 x 2½	150 x 65	159 x 76	159 x 76	143	118	4.05	
6 x 3	150 x 80	159 x 89	159 x 89	143	121	4.15	
6 x 4	150 x 100	159 x 108	159 x 108	143	130	4.31	
6 x 5	150 x 125	159 x 133	159 x 133	143	136	4.51	
8 x 4	200 x 100	219 x 108	219 x 108	178	156	6.15	
8 x 5	200 x 125	219 x 133	219 x 133	178	162	6.30	
8 x 6	200 x 150	219 x 159	219 x 159	178	168	6.50	

Other dimensions on request.

Butt Welding Fittings

Tee Pieces

Reducing Tee Pieces

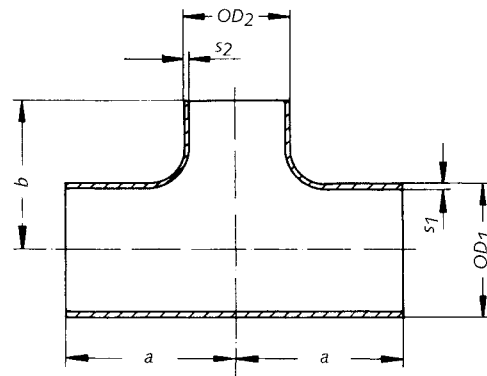
DIN 86088

Material:

OSNA®-10 – copper-nickel-iron

Type and Construction:

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



Size			Wall Thickness		a	b	Theoretical Weight kg per piece
DN	OD ₁	OD ₂	S ₁	S ₂			
inch	mm	mm	mm	mm	mm	mm	
10 x 4	250 x 100	267 x 108	3 x 2.5	194	209	8.58	
10 x 5	250 x 125	267 x 133	3 x 2.5	217	219	9.73	
10 x 6	250 x 150	267 x 159	3 x 2.5	240	229	10.62	
10 x 7	250 x 175	267 x 194	3 x 3	267	243	11.82	
10 x 8	250 x 200	267 x 219	3 x 3	290	259	13.28	
12 x 5	300 x 125	324 x 133	4 x 2.5	217	247	15.73	
12 x 6	300 x 150	324 x 159	4 x 2.5	240	257	17.16	
12 x 7	300 x 175	324 x 194	4 x 3	267	272	18.95	
12 x 8	300 x 200	324 x 219	4 x 3	290	287	20.74	
12 x 10	300 x 250	324 x 267	4 x 3	324	317	23.60	
14 x 6	350 x 150	368 x 159	4 x 2.5	240	279	19.53	
14 x 7	350 x 175	368 x 194	4 x 3	267	294	21.56	
14 x 8	350 x 200	368 x 219	4 x 3	290	309	23.60	
14 x 10	350 x 250	368 x 267	4 x 3	324	339	26.44	
14 x 12	350 x 300	368 x 324	4 x 4	380	369	30.92	
16 x 7	400 x 175	419 x 194	4 x 3	267	319	24.58	
16 x 8	400 x 200	419 x 219	4 x 3	290	335	26.90	
16 x 10	400 x 250	419 x 267	4 x 3	324	365	30.15	
16 x 12	400 x 300	419 x 324	4 x 4	380	395	35.25	
16 x 14	400 x 350	419 x 368	4 x 4	407	410	37.76	
18 x 8	450 x 200	457 x 219	4.5 x 3	290	354	33.00	
18 x 10	450 x 250	457 x 267	4.5 x 3	324	383	36.98	
18 x 12	450 x 300	457 x 324	4.5 x 4	380	413	43.16	
18 x 14	450 x 350	457 x 368	4.5 x 4	407	428	46.31	
18 x 16	450 x 400	457 x 419	4.5 x 4	440	453	50.01	
20 x 8	500 x 200	508 x 219	5 x 3	290	379	40.76	
20 x 10	500 x 250	508 x 267	5 x 3	324	409	45.68	
20 x 12	500 x 300	508 x 324	5 x 4	380	439	53.49	
20 x 14	500 x 350	508 x 368	5 x 4	407	454	57.20	
20 x 16	500 x 400	508 x 419	5 x 4	440	479	61.84	
20 x 18	500 x 450	508 x 457	5 x 4.5	500	504	70.28	

Butt Welding Fittings

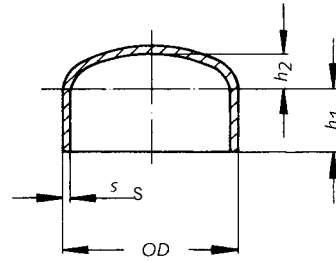
End Caps

End Caps

DIN 86011 Edition 10.70

Material:

OSNA®-10 –
copper-nickel-iron



Size			S mm	h ₁ mm	h ₂ mm	Approx. Weight kg per piece
inch	DN mm	OD mm				
1	25	30	1.5	15	4	0.02
1¼	32	38	1.5	15	5.5	0.06
1½	40	44.5	1.5	15	7	0.10
2	50	57	1.5	20	9	0.19
2½	65	76	2	20	13	0.25
3	80	89	2	20	15	0.30
4	100	108	2.5	20	19	0.65
5	125	133	2.5	20	24	1.10
6	150	159	2.5	20	29	1.98
7	175	194	3	20	36	2.10
8	200	219	3	20	38	2.50
10	250	267	3	20	50	3.18
12	300	324	4	20	61	4.90
14	350	368	4	20	69	7.10
16	400	419	4	20	79	9.10
18	450	457	4.5	20	87	12.90
20	500	508	5	20	96	16.90
24	600	610	5	20	116	22.60
28	700	711	6	25	134	30.00
32	800	813	6	25	154	36.90
36½	900	914.5	8	35	173.5	45.00

Butt Welding Fittings

Branches

Saddles

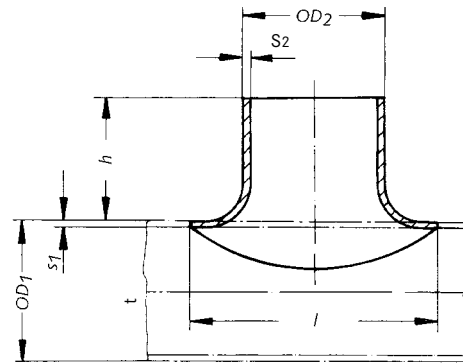
Seamless and seam-welded
DIN 86087

Material:

OSNA®-10 – copper-nickel-iron

Dimensions:

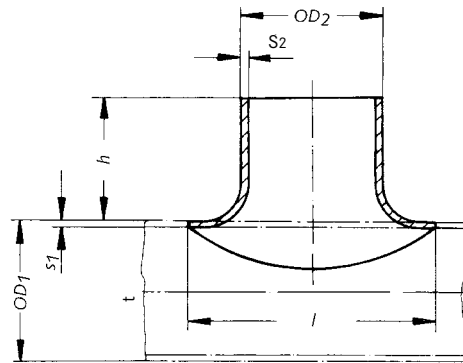
To suit appropriate header and branch pipe diameters and thicknesses.



Type and Construction:

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

Size			Wall Thickness		Height	Length	Theoretical Weight
inch	DN	OD ₁ OD ₂ mm	S ₁ mm	S ₂ mm	h mm	l mm	kg per piece
1/2 x 1/2	16 x 16	20 x 20	1 x 1		20	32	0.03
3/4 x 1/2	20 x 16	25 x 20	1.5 x 1		20	40	0.04
3/4 x 3/4	20 x 20	25 x 25	1.5 x 1.5		22	40	0.05
1 x 3/4	25 x 20	30 x 25	1.5 x 1.5		22	40	0.07
1 x 1	25 x 25	30 x 30	1.5 x 1.5		30	50	0.08
1 1/4 x 1	32 x 25	38 x 30	1.5 x 1.5		30	50	0.09
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	0.14
2 x 1 1/2	50 x 40	57 x 44.5	1.5 x 1.5		35	74	0.15
2 x 2	50 x 50	57 x 57	1.5 x 1.5		40	97	0.20
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	0.40
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 44.4	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	0.30
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	0.40
4 x 3	100 x 80	108 x 89	2.5 x 2		55	149	1.02
4 x 4	100 x 100	108 x 108	2.5 x 2.5		75	188	0.70



Size			Wall Thickness		Height	Length	Theoretical Weight	
DN		OD ₁	OD ₂	S ₁	S ₂	h	l	kg per piece
inch	mm	mm		mm		mm	mm	
5 x 2	125 x 50	133	57	2.5	1.5	40	97	0.40
5 x 2½	125 x 65	133	76	2.5	2	50	126	0.40
5 x 3	125 x 80	133	89	2.5	2	55	149	1.24
5 x 4	125 x 100	133	108	2.5	2.5	75	188	1.10
5 x 5	125 x 125	133	133	2.5	2.5	85	233	1.10
6 x 2½	150 x 65	159	76	2.5	2	50	126	0.40
6 x 3	150 x 80	159	89	2.5	2	55	149	1.18
6 x 4	150 x 100	159	108	2.5	2.5	75	188	1.30
6 x 5	150 x 125	159	133	2.5	2.5	85	233	2.10
6 x 6	150 x 150	159	159	2.5	2.5	95	279	2.25
7 x 2½	175 x 65	194	76	3	2	50	126	1.53
7 x 3	175 x 80	194	89	3	2	55	149	1.35
7 x 4	175 x 100	194	108	3	2.5	75	188	1.42
7 x 5	175 x 125	194	133	3	2.5	85	233	2.38
7 x 6	175 x 150	194	159	3	2.5	95	279	2.86
7 x 7	175 x 175	194	194	3	3	110	334	3.35
8 x 3	200 x 80	219	89	3	2	55	149	0.90
8 x 4	200 x 100	219	108	3	2.5	75	188	1.80
8 x 5	200 x 125	219	133	3	2.5	85	233	2.60
8 x 6	200 x 150	219	159	3	2.5	95	279	3.60
8 x 7	200 x 175	219	194	3	3	110	334	4.90
8 x 8	200 x 200	219	219	3	3	125	379	5.70
10 x 4	250 x 100	267	108	3	2.5	75	188	1.90
10 x 5	250 x 125	267	133	3	2.5	85	233	2.60
10 x 6	250 x 150	267	159	3	2.5	95	279	3.60
10 x 7	250 x 175	267	194	3	3	110	334	4.90
10 x 8	250 x 200	267	219	3	3	125	379	5.70
10 x 10	250 x 250	267	267	3	3	155	447	7.90
12 x 5	300 x 125	324	133	4	2.5	85	233	2.60
12 x 6	300 x 150	324	159	4	2.5	95	279	3.60
12 x 7	300 x 175	324	194	4	3	110	334	4.90
12 x 8	300 x 200	324	219	4	3	125	379	7.70
12 x 10	300 x 250	324	267	4	3	155	447	9.70
12 x 12	300 x 300	324	324	4	4	185	560	12.90

Butt Welding Fittings Branches

Saddles

Seamless and seam-welded
DIN 86087

Material:

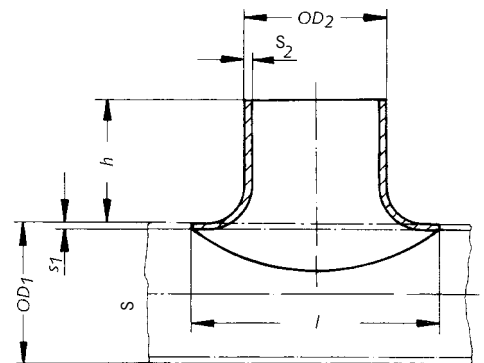
OSNA®-10 – copper-nickel-iron

Dimensions:

To suit appropriate header and branch
pipe diameters and thicknesses.

Type and Construction:

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



Size			Wall Thickness		Height	Length	Theoretical Weight
inch	DN	mm	OD ₁	OD ₂	h	L	kg per piece
			mm	mm	mm	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	7.70
14 x 10		350 x 250	368 x 267		155	447	9.90
14 x 12		350 x 300	368 x 324		185	560	12.90
14 x 14		350 x 350	368 x 368		200	613	14.85
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	7.70
16 x 10		400 x 250	419 x 267		155	447	9.70
16 x 12		400 x 300	419 x 324		185	560	12.90
16 x 14		400 x 350	419 x 368		200	613	14.85
16 x 16		400 x 400	419 x 419		225	680	18.51
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	7.70
18 x 10		450 x 250	457 x 267		155	447	9.70
18 x 12		450 x 300	457 x 324		185	560	12.90
18 x 14		450 x 350	457 x 368		200	613	14.85
18 x 16		450 x 400	457 x 419		225	680	18.51
18 x 18		450 x 450	457 x 457		250	800	24.80
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	12.90
20 x 14		500 x 350	508 x 368		200	613	14.85
20 x 16		500 x 400	508 x 419		225	680	18.51
20 x 18		500 x 450	508 x 457		250	800	24.80
20 x 20		500 x 500	508 x 508		275	880	31.80
24 x 16		600 x 400	610 x 419		225	680	18.51
24 x 18		600 x 450	610 x 457		250	800	24.80
24 x 20		600 x 500	610 x 508		275	880	31.80
24 x 24		600 x 600	610 x 610		300	1020	41.52

Butt Welding Fittings

Reducers

Reducers, concentric/eccentric

Seamless and seam-welded
DIN 86089

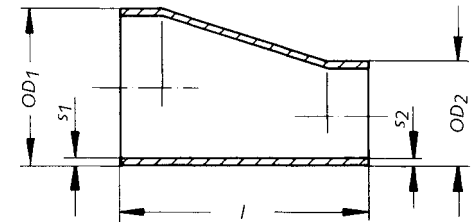
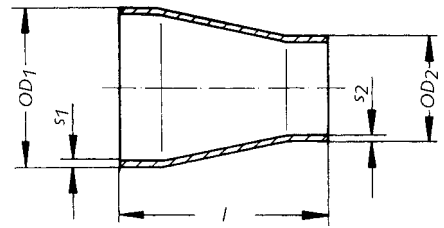
Material:

OSNA®-10 - copper-nickel-iron

Type and Construction:

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

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



Size			Wall Thickness		Length	Theoretical Weight
inch	DN	OD ₁ OD ₂ mm	S ₁ mm	S ₂ mm	L mm	kg per piece
1/2 x 3/8	16 x 12	20 x 16	1 x 1		30	0.015
3/4 x 3/8	20 x 12	25 x 16	1.5 x 1		30	0.020
3/4 x 1/2	20 x 16	25 x 20	1.5 x 1		30	0.023
1 x 3/8	25 x 12	30 x 16	1.5 x 1		35	0.030
1 x 1/2	25 x 16	30 x 20	1.5 x 1		35	0.033
1 x 3/4	25 x 20	30 x 25	1.5 x 1.5		35	0.035
1 1/4 x 3/8	32 x 12	38 x 16	1.5 x 1		50	0.038
1 1/4 x 1/2	32 x 16	38 x 20	1.5 x 1		50	0.040
1 1/4 x 3/4	32 x 20	38 x 25	1.5 x 1.5		50	0.043
1 1/4 x 1	32 x 25	38 x 30	1.5 x 1.5		50	0.045
1 1/2 x 1/2	40 x 16	44.5 x 20	1.5 x 1		80	0.05
1 1/2 x 3/4	40 x 20	44.5 x 25	1.5 x 1.5		80	0.06
1 1/2 x 1	40 x 25	44.5 x 30	1.5 x 1.5		80	0.07
1 1/2 x 1 1/4	40 x 32	44.5 x 38	1.5 x 1.5		80	0.08
2 x 3/4	50 x 20	57 x 25	1.5 x 1.5		80	0.11
2 x 1	50 x 25	57 x 30	1.5 x 1.5		80	0.12
2 x 1 1/4	50 x 32	57 x 38	1.5 x 1.5		80	0.14
2 x 1 1/2	50 x 40	57 x 44.5	1.5 x 1.5		80	0.16
2 1/2 x 1	65 x 25	76 x 30	2 x 1.5		90	0.25
2 1/2 x 1 1/4	65 x 32	76 x 38	2 x 1.5		90	0.27
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	0.33
3 x 1 1/4	80 x 32	89 x 38	2 x 1.5		90	0.46
3 x 1 1/2	80 x 40	89 x 44.5	2 x 1.5		90	0.48
3 x 2	80 x 50	89 x 57	2 x 1.5		90	0.49
3 x 2 1/2	80 x 65	89 x 76	2 x 2		90	0.51
4 x 1 1/2	100 x 40	108 x 44.5	2.5 x 1.5		100	0.58
4 x 2	100 x 50	108 x 57	2.5 x 1.5		100	0.60
4 x 2 1/2	100 x 65	108 x 76	2.5 x 2		100	0.66
4 x 3	100 x 80	108 x 89	2.5 x 2		100	0.72

Butt Welding Fittings

Reducers

Reducers, concentric/eccentric

Seamless and seam-welded
DIN 86089

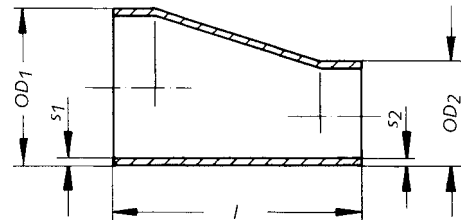
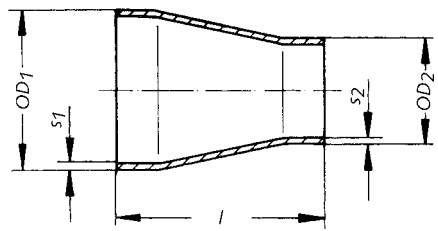
Material:

OSNA®-10 – copper-nickel-iron

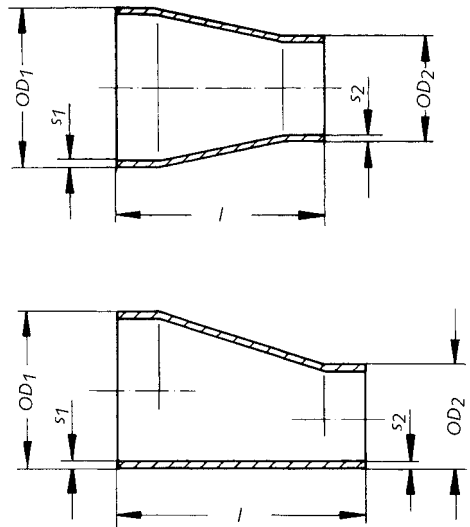
Type and Construction:

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

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



Size			Wall Thickness		Length	Theoretical Weight
inch	DN	OD ₁ OD ₂ mm	S ₁ mm	S ₂ mm	L mm	kg per piece
5 x 2	125	125 x 50	2.5	1.5	140	0.86
5 x 2½	125	125 x 65	2.5	2	140	0.90
5 x 3	125	125 x 80	2.5	2	140	0.94
5 x 4	125	125 x 100	2.5	2.5	140	0.98
6 x 2½	150	150 x 65	2.5	2	150	1.16
6 x 3	150	150 x 80	2.5	2	150	1.25
6 x 4	150	150 x 100	2.5	2.5	150	1.37
6 x 5	150	150 x 125	2.5	2.5	150	1.70
7 x 3	175	175 x 80	3	2	155	1.94
7 x 4	175	175 x 100	3	2.5	155	1.96
7 x 5	175	175 x 125	3	2.5	155	2.01
7 x 6	175	175 x 150	3	2.5	155	2.08
8 x 4	200	200 x 100	3	2.5	155	2.55
8 x 5	200	200 x 125	3	2.5	155	2.64
8 x 6	200	200 x 150	3	2.5	155	2.73
8 x 7	200	200 x 175	3	3	155	2.82
10 x 5	250	250 x 125	3	2.5	210	4.42
10 x 6	250	250 x 150	3	2.5	210	4.53
10 x 7	250	250 x 175	3	3	210	4.63
10 x 8	250	250 x 200	3	3	210	4.78
12 x 5	300	300 x 125	4	2.5	210	7.12
12 x 6	300	300 x 150	4	2.5	210	7.20
12 x 7	300	300 x 175	4	3	210	7.28
12 x 8	300	300 x 200	4	3	210	7.40
12 x 10	300	300 x 250	4	3	210	7.55



Size			Wall Thickness		Length	Theoretical Weight
inch	DN	OD ₁ OD ₂ mm	S ₁ mm	S ₂ mm	L mm	kg per piece
14 x 6	350	368 x 159	4	2.5	300	10.75
14 x 7	350	368 x 175	4	3	300	11.05
14 x 8	350	368 x 200	4	3	300	11.40
14 x 10	350	368 x 250	4	3	300	11.80
14 x 12	350	368 x 300	4	4	300	12.20
16 x 7	400	419 x 194	4	3	325	12.90
16 x 8	400	419 x 200	4	3	325	13.40
16 x 10	400	419 x 250	4	3	325	13.90
16 x 12	400	419 x 300	4	4	325	14.40
16 x 14	400	419 x 350	4	4	325	15.10
18 x 8	450	457 x 219	4.5	3	350	17.09
18 x 10	450	457 x 250	4.5	3	350	17.60
18 x 12	450	457 x 300	4.5	4	350	18.19
18 x 14	450	457 x 350	4.5	4	350	18.95
18 x 16	450	457 x 400	4.5	4	350	19.90
20 x 10	500	508 x 267	5	3	375	22.00
20 x 12	500	508 x 300	5	4	375	23.10
20 x 14	500	508 x 350	5	4	375	24.30
20 x 16	500	508 x 400	5	4	375	25.20
20 x 18	500	508 x 450	5	4.5	375	26.10
24 x 14	600	610 x 368	5	4	400	29.90
24 x 16	600	610 x 400	5	4	400	30.70
24 x 18	600	610 x 450	5	4.5	400	31.80
24 x 20	600	610 x 500	5	5	400	33.50

Flanges

Welding Necks

Welding Necks

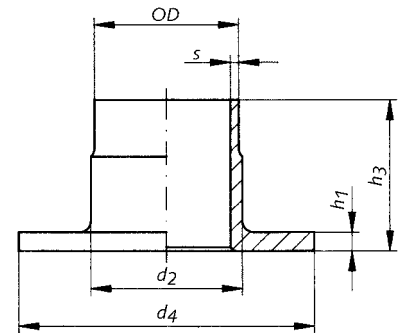
DIN 86037 PN 10, 16

Material:

OSNA®-10 – copper-nickel-iron

Type and Construction:

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



Size			Wall Thickness					Approx. Weight
inch	DN	OD mm	S mm	d_2 mm	d_4 mm	h_1 mm	h_3 mm	kg per piece
3/4	20	25	1.5	27	58	5	40	0.15
3/4	20	25	2	27	58	5	40	0.17
1	25	30	1.5	32	68	5	40	0.20
1	25	30	2	32	68	5	40	0.22
1 1/4	32	38	1.5	40	78	5	40	0.25
1 1/4	32	38	2	40	78	5	40	0.30
1 1/2	40	44.5	1.5	46.5	88	6	45	0.36
1 1/2	40	44.5	2	46.5	88	6	45	0.40
2	50	57	1.5	59	102	6	45	0.45
2	50	57	2	59	102	6	45	0.50
2 1/2	65	76	2	78	122	6	45	0.62
3	80	89	2	91	138	7	50	0.86
4	100	108	2.5	110	158	7	50	1.10
5	125	133	2.5	135.5	188	7	50	1.50
6	150	159	2.5	161.5	212	9	50	2.00
7	175	194	3	197	242	9	50	2.50
8	200	219	3	222	268	9	50	2.70
10	250	267	3	270	320	9	50	3.40
12	300	324	4	327	370	11	50	4.60
14	350	368	4	371	430	11	50	6.30
16	400	419	4	422	482	12	50	7.80
18	450	457	4.5	460	530	12	50	9.50
20	500	508	5	511	585	12	50	11.70
24	600	610	5	613	685	14	60	13.40
28	700	711	6	714	800	14	60	20.00
32	800	813	6	816	905	14	60	25.00
36	900	914	8	918	1000	14	60	29.00
40	1000	1016	8	1018	1110	14	60	34.00
48	1200	1220	8	1223.5	1335	14	60	46.00

Flanges

Outer Flanges

DN 20 - DN 150
DIN 2642 PN 10
DN 175
DIN 86037 PN 16
DN 200 - DN 250
DIN 2642 PN 10
DN 300 - DN 1200
DIN 86037 PN 10

Outer Flanges

DIN 86037 PN10, 16 and Outer Flanges
VG 85356 PN 10, 16, 25

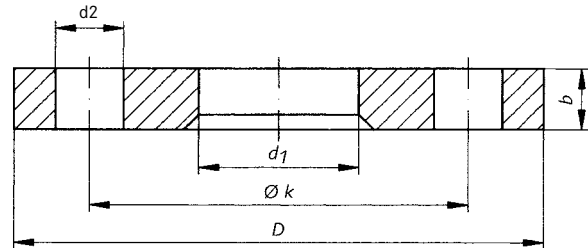
Material:

S235JRG2 formerly (RSt 37-2,
Werkst.-Nr. 1.0038 to DIN 17100)

Note:

Steel flanges will be supplied ready galvanized.

Other coatings on request.



Size			D mm	d ₁ mm	b mm	k mm	d ₂ mm	Approx. Weight kg per piece
inch	DN mm	OD mm						
¾	20	25	105	28	14	75	14	0.81
1	25	30	115	33	16	85	14	1.11
1¼	32	38	140	42	16	100	18	1.64
1½	40	44.5	150	50	16	110	18	1.86
2	50	57	165	62	16	125	18	2.20
2½	65	76	185	81	16	145	18	2.62
3	80	89	200	94	18	160	18	3.32
4	100	108	220	113	18	180	18	3.67
5	125	133	250	138	18	210	18	4.54
6	150	159	285	164	18	240	22	5.60
7	175	194	315	200	22	270	22	6.50
8	200	219	340	225	20	295	22	7.46
10	250	267	395	273	22	350	22	10.30
12	300	324	445	331	24	400	22	12.10
14	350	368	505	375	24	460	22	15.70
16	400	419	565	426	26	515	26	20.10
18	450	457	615	465	28	565	26	25.40
20	500	508	670	517	30	620	26	30.80
24	600	610	780	618	32	725	30	40.50
28	700	711	895	720	34	840	30	54.00
32	800	813	1015	822	38	950	33	76.00
36	900	914	1115	923	42	1050	33	92.00
40	1000	1016	1230	1025	46	1160	36	120.00
48	1200	1220	1455	1230	50	1380	39	170.00

Flanges

Outer Flanges

Outer Flanges

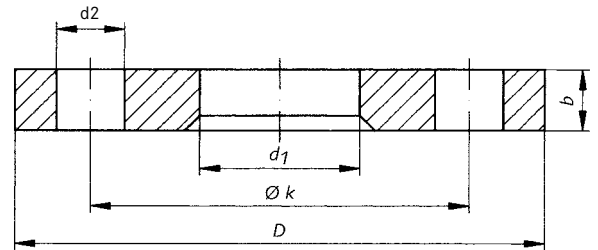
DIN 86037 PN 16

Material:

S235JRG2 formerly (RSt 37-2,
Werkst.-Nr. 1.0038 to DIN 17100)

Note:

Steel flanges will be supplied ready galvanized.
Other coatings on request.



DIN 86037 PN 16

Size			D mm	d ₁ mm	b mm	k mm	d ₂ mm	Bolt Holes	Approx. Weight kg per piece
inch	DN mm	OD mm							
¾ - 6	20 - 150	25 - 159							see page 25
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	331	28	410	26	12	16.1
14	350	368	520	375	32	470	26	16	23.4
16	400	419	580	426	36	525	30	16	30.9

Flanges

Welding Necks

Welding Necks

VG 85356 Sept. 1969

Material:

OSNA®-10 – copper-nickel-iron

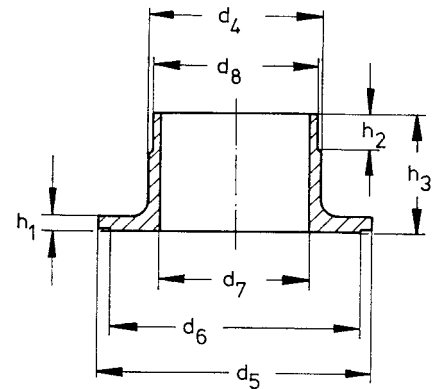
DN 20 – DN 32 PN 25

DN 40 – DN 150 PN 16

DN 175 – DN 300 PN 10

Type and Construction:

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



Size			Wall Thickness										Approx. Weight kg per piece
inch	DN	OD mm	S mm	d_4 mm	d_5 mm	d_6 mm	d_7 mm	d_8 mm	h_1 mm	h_2 mm	h_3 mm		
¾	20	25	1.5	27	51	45	22	25	5	8	28	0.10	
1	25	30	1.5	32	57	50	27	30	5	8	28	0.13	
1¼	32	38	1.5	40	65	59	35	38	5	8	28	0.14	
1½	40	44.5	1.5	46	73	66	41.5	45	5	8	28	0.19	
2	50	57	1.5	59	85	78	54	57.5	5	8	30	0.25	
2½	70	76	2	78	105	98	72	76.5	5	10	32	0.36	
3	80	89	2	91	115	108	85	89.5	6	10	32	0.43	
4	100	108	2.5	110	137	130	103	108.5	6	10	32	0.60	
5	125	133	2.5	135	165	158	128	134	8	10	36	0.97	
6	150	159	2.5	161	191	184	154	160	8	10	36	1.10	
7	175	194	3	196	229	212	189	195	8	12	38	1.46	
8	200	219	3	221	253	237	213	220	8	12	38	1.72	
10	250	267	3	269	305	288	261	268	8	12	40	2.31	
12	300	324	4	326	357	338	316	325	8	12	42	3.00	

Flanges

Outer Flanges

Outer Flanges

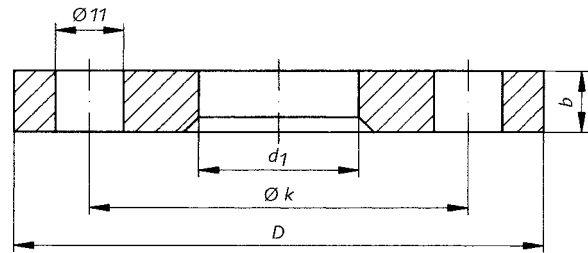
VG 85356 PN 10, 16, 25
 DN 20 - DN 32 PN 25
 DN 40 - DN 150 PN 16
 DN 175 - DN 300 PN 10

Material:

S235JRG2 formerly
 (RSt 37-2, Werkst.-Nr. 1.0038 to DIN 17100)

Note:

Steel flanges will be supplied ready galvanized.
 Other coatings on request.



Size			D mm	d_1 mm	b		k mm	Bolt Holes	Approx. Weight kg per piece
DN	OD	St			RG				
inch	mm	mm							
¾	20	25	86	28	10	10	62	4	0.41
1	25	30	92	33	10	10	68	4	0.46
1¼	32	38	100	42	10	10	76	6	0.51
1½	40	44.5	108	50	10	10	84	6	0.58
2	50	57	120	62	10	12	96	6	0.81
2½	70	76	140	81	10	14	116	8	1.15
3	80	89	150	94	10	14	126	8	1.10
4	100	108	172	113	10	16	148	10	1.68
5	125	133	200	138	10	18	176	10	2.41
6	150	159	226	164	10	18	202	12	2.75
7	175	194	264	200	10	18	240	14	3.43
8	200	219	288	225	10	20	264	16	4.17
10	250	267	340	273	10	22	316	20	6.08
12	300	324	392	331	10	22	368	24	6.60

Flanges

Flanged Bulkhead Pieces

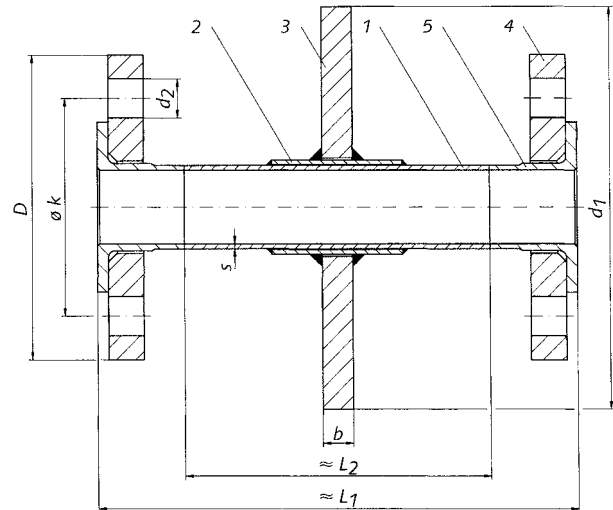
Flanged Bulkhead Pieces with fixing collar

DN 20 - DN 175 PN 16
 DN 200 - DN 400 PN 10

Pipe items 1 and 2 and inner flanges item 5
 made of OSNA®-10 - copper-nickel-iron

Material:

Flange items 3 and 4 made of steel
 S235JRG2 formerly
 (RSt 37-2, Werkst.-Nr. 1.0038 to DIN 17100)



Size			S	D	d ₁	k	d ₂	Bolt Holes	b	≈L ₁	≈L ₂
inch	DN	OD									
¾	20	25	2	105	150	75	13.5	4	14	200	120
1	25	30	2	115	160	85	13.5	4	14	200	120
1¼	32	38	2	140	185	100	17.5	4	14	220	140
1½	40	44.5	2	150	205	110	17.5	4	14	220	130
2	50	57	2	165	220	125	17.5	4	14	230	140
2½	65	76	2	185	240	145	17.5	4	14	240	150
3	80	89	2	200	255	160	17.5	8	14	260	160
4	100	108	2.5	220	275	180	17.5	8	14	260	160
5	125	133	2.5	250	305	210	22	8	16	260	160
6	150	159	2.5	285	340	240	22	8	16	270	170
7	175	194	3	315	370	270	22	8	16	280	180
8	200	219	3	340	395	295	22	8	16	280	180
10	250	267	3	395	460	350	22	12	16	300	200
12	300	324	4	445	525	400	22	12	20	300	220
14	350	368	4	505	585	460	22	16	20	320	240
16	400	419	4	565	645	515	26	16	20	360	260

Flanges

Blind Flanges

Blind Flanges

PN 10, 16

Discs

Material:

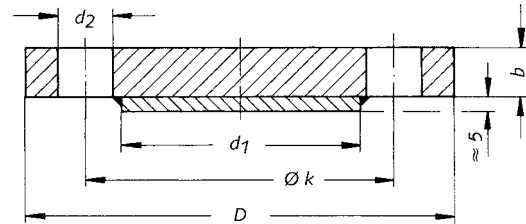
OSNA®-10 – copper-nickel-iron

Flanges

Material:

S235JRG2 formerly

(RSt 37-2, Werkst.-Nr. 1.0038 to DIN 17100)



Note:

Steel flanges will be supplied ready galvanized, if required. Other coatings are also available.

Connection sizes to DIN 2501

DN 12 - DN 175 PN 16

DN 200 - DN 500 PN 10

Size			D mm	b mm	k mm	d ₁ mm	d ₂ mm	Bolt Holes
inch	DN mm	OD mm						
3/8	12	16	90	14	60	40	14	4
1/2	16	20	95	14	65	45	14	4
3/4	20	25	105	16	75	58	14	4
1	25	30	115	16	85	68	14	4
1 1/4	32	38	140	16	100	78	18	4
1 1/2	40	44.5	150	16	110	88	18	4
2	50	57	165	18	125	102	18	4
2 1/2	65	76	185	18	145	122	18	4
3	80	89	200	20	160	138	18	8
4	100	108	220	20	180	158	18	8
5	125	133	250	22	210	188	18	8
6	150	159	285	22	240	212	22	8
7	175	194	315	24	270	242	22	8
8	200	219	340	24	295	268	22	8
10	250	267	395	26	350	320	22	12
12	300	324	445	26	400	370	22	12
14	350	368	505	26	460	430	22	16
16	400	419	565	26	515	482	26	16
20	500	508	670	28	620	585	26	20

Other dimensions on request.



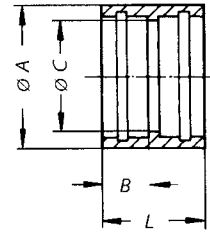
Brazing Fittings

Couplings, straight

Couplings, straight
with silver solder

PN up to 63

Material:
OSNA®-10 – copper-nickel-iron



Size			A mm	C mm	L mm	B mm
inch	DN mm	OD mm				
	4	8	12	6	20	9
1/8	6	10	15	8	20	9
1/4	8	12	17	10	20	9
1/4	10	14	20	12	22	10
3/8	12	16	22	14	22	10
1/2	16	20	27	18	22	10
3/4	20	25	32	22	22	10
1	25	30	37	27	24	11
1 1/4	32	38	45	35	32	15
1 1/4	40	44.5	52	41.5	33	15
2	50	57	65	54	33	15

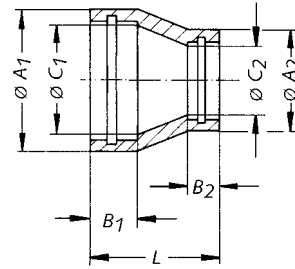
Brazing Fittings

Couplings, reduced

Couplings, reduced
with silver solder
capillary x capillary end

PN up to 63

Material:
OSNA®-10 – copper-nickel-iron



Size		A ₁ mm	A ₂ mm	C ₁ mm	C ₂ mm	B ₁ mm	B ₂ mm	L mm
nominal inch	actual mm							
	10 x 8	15	12	8	6	9	9	22
	12 x 8	17	12	10	6	9	9	25
1/4 x 1/8	12 x 10	17	15	10	8	9	9	21
	14 x 8	20	12	12	6	10	9	30
1/4 x 1/8	14 x 10	20	15	12	8	10	9	26
3/8 x 1/8	16 x 10	22	15	14	8	10	9	28
3/8 x 1/4	16 x 12	22	17	14	10	10	9	27
1/2 x 1/4	20 x 12	27	17	18	10	10	9	33
1/2 x 3/8	20 x 16	27	22	18	14	10	10	27
3/4 x 3/8	25 x 16	32	22	22	14	10	10	33
3/4 x 1/2	25 x 20	32	27	22	18	10	10	27
1 x 3/8	30 x 16	37	22	27	14	11	10	35
1 x 1/2	30 x 20	37	27	27	18	11	10	31
1 x 3/4	30 x 25	37	32	27	22	11	10	28
1 1/4 x 3/8	38 x 16	45	22	35	14	15	10	45
1 1/4 x 1/2	38 x 20	45	27	35	18	15	10	41
1 1/4 x 3/4	38 x 25	45	32	35	22	15	10	36
1 1/4 x 1	38 x 30	45	37	35	27	15	11	33
1 1/2 x 3/8	44.5 x 16	52	22	41.5	14	15	10	51
1 1/2 x 1/2	44.5 x 20	52	27	41.5	18	15	10	47
1 1/2 x 3/4	44.5 x 25	52	32	41.5	22	15	10	42
1 1/2 x 1	44.5 x 30	52	37	41.5	27	15	11	39
1 1/2 x 1 1/4	44.5 x 38	52	45	41.5	24	15	15	36
2 x 3/8	57 x 16	65	22	54	14	15	10	62
2 x 1/2	57 x 20	65	27	54	18	15	10	58
2 x 3/4	57 x 25	65	32	54	22	15	10	54
2 x 1	57 x 30	65	37	54	27	15	11	50
2 x 1 1/4	57 x 38	65	45	54	35	15	15	47
2 x 1 1/2	57 x 44.5	65	52	54	41.5	15	15	41

Brazing Fittings

Elbows

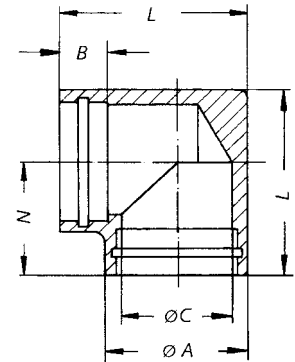
Elbows

with silver solder
capillary x capillary end

PN up to 63

Material:

OSNA®-10 – copper-nickel-iron



Size			A mm	B mm	C mm	L mm	N mm	
inch	DN mm	OD mm						
		4	8	12	9	6	24	16.5
1/8		6	10	15	9	8	24	16.5
1/4		8	12	17	9	10	26	17.5
1/4		10	14	20	10	12	31	21
3/8		13	16	22	10	14	31	21
1/2		16	20	27	10	18	37	23.5
3/4		20	25	32	10	22	42	26
1		25	30	37	11	27	48	29.5
1 1/4		32	38	45	15	35	60	36.5
1 1/4		40	44.5	52	15	41.5	67	41
2		50	57	65	15	54	80	47.5

Brazing Fittings

Tee Pieces

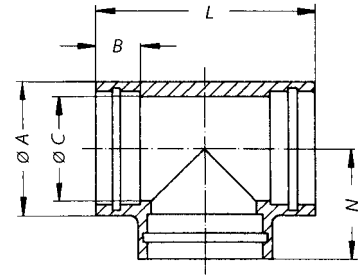
Equal Tee Pieces

with silver solder

PN up to 63

Material:

OSNA®-10 – copper-nickel-iron



Size			A mm	B mm	C mm	L mm	N mm
inch	DN mm	OD mm					
	4	8	15	9	6	33	16.5
1/8	6	10	15	9	8	33	16.5
1/4	8	12	17	9	10	35	17.5
1/4	10	14	22	10	12	42	21
3/8	13	16	22	10	14	42	21
1/2	16	20	27	10	18	47	23.5
3/4	20	25	32	10	22	52	26
1	25	30	37	11	27	57	28.5
1 1/4	32	38	45	15	35	73	36.5
1 1/4	40	44.5	52	15	41.5	82	41
2	50	57	65	15	54	95	47.5

Brazing Fittings

Tee Pieces

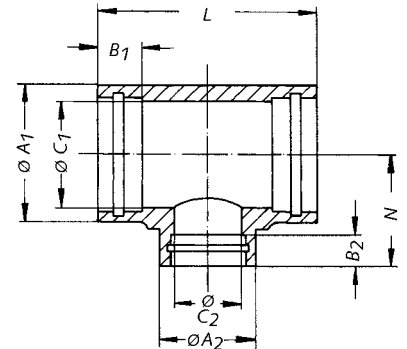
Reducing Tee Pieces

with silver solder

PN up to 63

Material:

OSNA®-10 – copper-nickel-iron



Size				A ₁ mm	A ₂ mm	C ₁ mm	C ₂ mm	B ₁ mm	B ₂ mm	N mm	L mm
inch	DN mm	OD ₁ mm	OD ₂ mm								
1/8	6 x 4	10	8	15	15	8	6	9	9	16.5	33
1/4	8 x 4	12	8	17	12	10	6	9	9	17.5	35
1/4 x 1/8	8 x 6	12	10	17	15	10	8	9	9	17.5	35
1/4	10 x 4	14	8	22	12	12	6	9	9	21	42
1/4 x 1/8	10 x 6	14	10	22	15	12	8	9	9	21	42
3/8 x 1/8	12 x 6	16	10	22	15	14	8	9	9	21	42
3/8 x 1/4	12 x 8	16	12	22	17	14	10	9	9	21	42
1/2 x 1/4	16 x 8	20	12	27	17	18	10	9	9	23.5	47
1/2 x 3/8	16 x 12	20	16	27	22	18	14	10	10	23.5	47
3/4 x 3/8	20 x 12	25	16	32	22	22	14	10	10	26	52
3/4 x 1/2	20 x 16	25	20	32	27	22	18	10	10	26	52
1 x 3/8	25 x 12	30	16	37	22	27	14	10	10	28.5	57
1 x 1/2	25 x 16	30	20	37	27	27	18	10	10	28.5	57
1 x 3/4	25 x 20	30	25	37	32	27	22	10	10	28.5	57
1 1/4 x 3/8	32 x 12	38	16	45	22	35	14	10	10	36.5	73
1 1/4 x 1/2	32 x 16	38	20	45	27	35	18	10	10	36.5	73
1 1/4 x 3/4	32 x 20	38	25	45	32	35	22	10	10	36.5	73
1 1/4 x 1	32 x 25	38	30	45	37	35	27	11	11	36.5	73
1 1/2 x 3/8	40 x 12	44.5	16	52	22	41.5	14	10	10	41	82
1 1/2 x 1/2	40 x 16	44.5	20	52	27	41.5	18	10	10	41	82
1 1/2 x 3/4	40 x 20	44.5	25	52	32	41.5	22	10	10	41	82
1 1/2 x 1	40 x 25	44.5	30	52	37	41.5	27	11	11	41	82
1 1/2 x 1 1/4	40 x 32	44.5	38	52	45	41.5	35	15	15	41	82
2 x 1/2	50 x 16	57	20	65	27	54	18	10	10	47.5	95
2 x 3/4	50 x 20	57	25	65	32	54	22	10	10	47.5	95
2 x 1	50 x 25	57	30	65	37	54	27	11	11	47.5	95
2 x 1 1/4	50 x 32	57	38	65	45	54	35	15	15	47.5	95
2 x 1 1/2	50 x 40	57	44.5	65	52	54	41.5	15	15	47.5	95

Brazing Fittings

End Caps

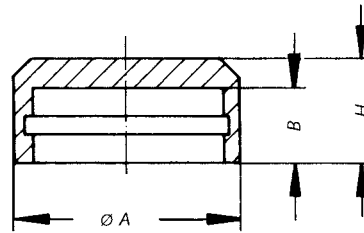
End Caps

with silver solder

PN up to 63

Material:

OSNA®-10 – copper-nickel-iron



Size			A mm	B mm	H mm
inch	DN mm	OD mm			
	4	8	12	9	12
1/8	6	10	15	9	12.5
1/4	8	12	17	9	12.5
1/4	10	14	20	10	14
3/8	12	16	22	10	14
1/2	16	20	27	10	14.5
3/4	20	25	32	10	15
1	25	30	37	11	16
1 1/4	32	38	45	15	20
1 1/4	40	44.5	52	15	20.5
2	50	57	65	15	20.5

Brazing Fittings

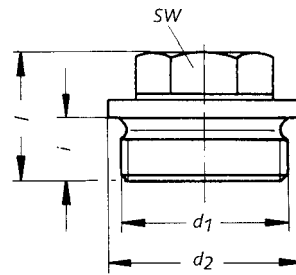
Hexagon Head Screw Plugs

Hexagon Head Screw Plugs

DIN 910

Material:

OSNA[®]-10 – copper-nickel-iron



Size				
d_1 (thread)	d_2	i	l	sw
G	mm	mm	mm	mm
G 1/8	14	8	17	10
G 1/4	18	8	17	13
G 1/4	18	12	21	13
G 3/8	22	8	17	17
G 3/8	22	12	21	17
G 1/2	26	10	22	19
G 1/2	26	14	26	19
G 3/4	32	12	26	24
G 3/4	32	16	30	24
G 1	39	16	32	27
G 1 1/8	44	16	32	27
G 1 1/4	49	16	33	30
G 1 1/2	55	16	33	30
G 1 3/4	62	20	40	36
G 2	68	20	40	36

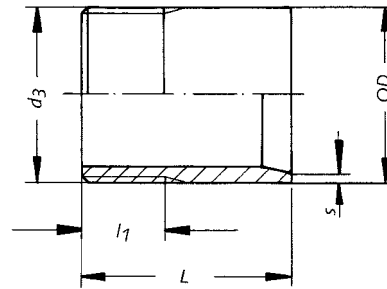
Brazing Fittings

Welding Ends

Welding Ends

Material:

OSNA®-10 - copper-nickel-iron



Size			S mm	d_3 (thread) G	L mm	l_1
inch	DN mm	OD mm				
	4	8	1	G 1/8	30	10
1/8	6	10	1	G 1/4	30	12
1/4	8	12	1	G 3/8	30	13
1/2	16	20	1	G 1/2	35	15
3/4	20	25	1.5	G 3/4	40	15
1	25	30	1.5	G 1	40	19
1 1/4	32	38	1.5	G 1 1/4	50	20
1 1/2	40	44.5	1.5	G 1 1/2	50	20
2	50	57	1.5	G 2	55	22
2 1/2	65	76	2	G 2 1/2	60	27
3	80	89	2	G 3	65	28

Brazing Fittings

Sockets

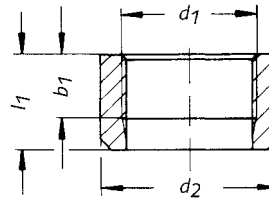
Sockets

with Whitworth thread

DIN 86103 PN 40 up to 225°C

Material:

OSNA®-10 - copper-nickel-iron



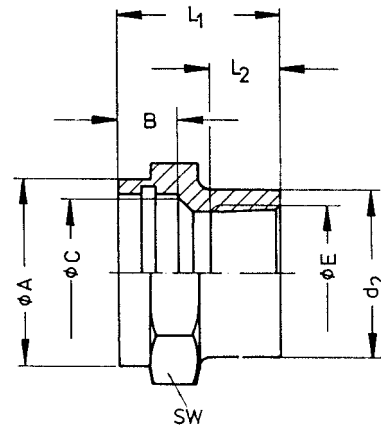
Size	d_2	b_1	l_1
d_1 (thread)	mm	mm	mm
inch			
G 1/4	20	12	20
G 1/8	25	12	20
G 1/2	30	14	23
G 1/2	30	14	50
G 1/2	30	14	75
G 1/2	30	14	100
G 1/2	30	14	125
G 3/4	38	16	25
G 3/4	38	16	50
G 3/4	38	16	75
G 3/4	38	16	100
G 3/4	38	16	125
G 1	45	18	28
G 1	45	18	50
G 1	45	18	75
G 1	45	18	100
G 1	45	18	125
G 1 1/4	55	20	30
G 1 1/2	60	22	32
G 2	75	23	40

Brazing Fittings

Straight Female Connectors

Straight Female Connectors

Material:
OSNA®-10 – copper-nickel-iron



Outside Diameter of Piepe

nominal inch	actual mm xG"	E (Thread) "NPT"	A mm	B mm	C mm	d_2 mm	L_1 mm	L_2 mm	SW mm
1/8 x 1/2	10 x 1/2	1/2	15	9	8	27	32	14	27
1/8 x 3/4	10 x 3/4	3/4	15	9	8	32	34	14	32
1/4 x 1/2	12 x 1/2	1/2	17	9	10	27	32	14	27
1/4 x 3/4	12 x 3/4	3/4	17	9	10	32	33	14	32
1/4 x 1/2	14 x 1/2	1/2	20	10	12	27	32	14	27
1/4 x 3/4	14 x 3/4	3/4	20	10	12	32	34	14	32
1/4 x 1	14 x 1	1	20	10	12	40	38	17	41
3/8 x 3/8	16 x 3/8	3/8	22	10	14	21.5	28	11	22
3/8 x 1/2	16 x 1/2	1/2	22	10	14	27	31	14	27
3/8 x 3/4	16 x 3/4	3/4	22	10	14	32	33	14	32
3/8 x 1	16 x 1	1	22	10	14	40	38	17	41
1/2 x 1/2	20 x 1/2	1/2	27	10	18	27	28	14	27
1/2 x 3/4	20 x 3/4	3/4	27	10	18	32	32	14	32
1/2 x 1	20 x 1	1	27	10	18	40	37	17	41
1/2 x 1 1/4	20 x 1 1/4	1 1/4	27	10	18	49	40	18	50
3/4 x 3/4	25 x 3/4	3/4	32	10	22	32	31	14	32
3/4 x 1	25 x 1	1	32	10	22	40	35	17	41
3/4 x 1 1/4	25 x 1 1/4	1 1/4	32	10	22	49	39	18	50
3/4 x 1 1/2	25 x 1 1/2	1 1/2	32	10	22	55	41	18	55
1 x 3/4	30 x 3/4	3/4	37	11	27	32	31	14	41
1 x 1	30 x 1	1	37	11	27	40	35	17	41
1 x 1 1/4	30 x 1 1/4	1 1/4	37	11	27	49	38	18	50
1 x 1 1/2	30 x 1 1/2	1 1/2	37	11	27	55	40	18	55
1 1/4 x 3/4	38 x 3/4	3/4	45	15	35	32	39	14	46
1 1/4 x 1	38 x 1	1	45	15	35	40	39	17	46
1 1/4 x 1 1/4	38 x 1 1/4	1 1/4	45	15	35	49	40	18	50
1 1/4 x 1 1/2	38 x 1 1/2	1 1/2	45	15	35	55	42	18	55
1 1/2 x 1	44.5 x 1	1	52	15	41.5	40	43	17	55
1 1/2 x 1 1/4	44.5 x 1 1/4	1 1/4	52	15	41.5	49	39	18	55
1 1/2 x 1 1/2	44.5 x 1 1/2	1 1/2	52	15	41.5	55	40	18	55
1 1/2 x 2	44.5 x 2	2	52	15	41.5	70	43	18	70
2 x 1 1/4	57 x 1 1/4	1 1/4	65	15	54	49	45	18	65
2 x 1 1/2	57 x 1 1/2	1 1/2	65	15	54	55	40	18	65
2 x 2	57 x 2	2	65	15	54	70	40	18	70
2 x 2 1/2	57 x 2 1/2	2 1/2	65	15	54	85	49	24	85

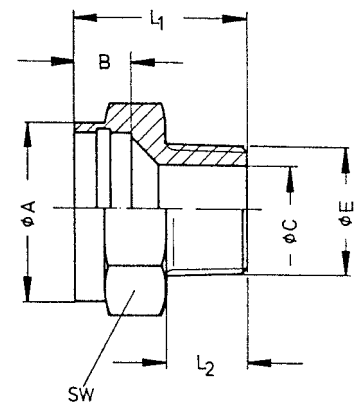
Brazing Fittings

Straight Male Connectors

Straight Male Connectors

Material:

OSNA®-10 – copper-nickel-iron



Outside Diameter of Pipe		E (Thread) "NPT"	A mm	B mm	C mm	L ₁ mm	L ₂ mm	SW mm
nominal inch	actual mm x G"							
1/8 x 1/2	10 x 1/2	1/2	15	9	8	30	18	22
1/8 x 3/4	10 x 3/4	3/4	15	9	8	33	18	30
1/4 x 1/2	12 x 1/2	1/2	17	9	10	30	18	22
1/4 x 3/4	12 x 3/4	3/4	17	9	10	33	18	30
1/4 x 1/2	14 x 1/2	1/2	20	10	12	30	18	22
1/4 x 3/4	14 x 3/4	3/4	20	10	12	33	18	30
1/4 x 1	14 x 1	1	20	10	12	38	21	36
3/8 x 3/8	16 x 3/8	3/8	22	10	14	29	15	22
3/8 x 1/2	16 x 1/2	1/2	22	10	14	30	18	22
3/8 x 3/4	16 x 3/4	3/4	22	10	14	33	18	30
3/8 x 1	16 x 1	1	22	10	14	38	21	36
1/2 x 1/2	20 x 1/2	1/2	27	10	18	33	18	27
1/2 x 3/4	20 x 3/4	3/4	27	10	18	34	18	30
1/2 x 1	20 x 1	1	27	10	18	39	21	36
1/2 x 1 1/4	20 x 1 1/4	1 1/4	27	10	18	43	22	46
3/4 x 3/4	25 x 3/4	3/4	32	10	22	35	18	32
3/4 x 1	25 x 1	1	32	10	22	39	21	36
3/4 x 1 1/4	25 x 1 1/4	1 1/4	32	10	22	43	22	46
3/4 x 1 1/2	25 x 1 1/2	1 1/2	32	10	22	44	22	50
1 x 3/4	30 x 3/4	3/4	37	11	27	38	18	41
1 x 1	30 x 1	1	37	11	27	41	21	41
1 x 1 1/4	30 x 1 1/4	1 1/4	37	11	27	44	22	46
1 x 1 1/2	30 x 1 1/2	1 1/2	37	11	27	45	22	50
1 1/4 x 3/4	38 x 3/4	3/4	45	15	35	44	18	46
1 1/4 x 1	38 x 1	1	45	15	35	44	21	46
1 1/4 x 1 1/4	38 x 1 1/4	1 1/4	45	15	35	45	22	46
1 1/4 x 1 1/2	38 x 1 1/2	1 1/2	45	15	35	46	22	50
1 1/2 x 1	44.5 x 1	1	52	15	41.5	47	21	55
1 1/2 x 1 1/4	44.5 x 1 1/4	1 1/4	52	15	41.5	48	22	55
1 1/2 x 1 1/2	44.5 x 1 1/2	1 1/2	52	15	41.5	48	22	55
1 1/2 x 2	44.5 x 2	2	52	15	41.5	51	22	65
2 x 1 1/4	57 x 1 1/4	1 1/4	65	15	54	51	22	65
2 x 1 1/2	57 x 1 1/2	1 1/2	65	15	54	51	22	65
2 x 2	57 x 2	2	65	15	54	51	22	65
2 x 2 1/2	57 x 2 1/2	2 1/2	65	15	54	60	28	75

Miscellaneous Unions

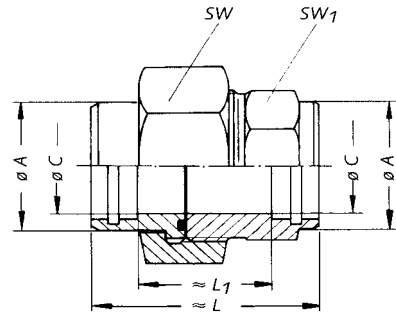
Unions

with silver solder capillary x capillary ends

PN up to 63

Material:

OSNA®-10 – copper-nickel-iron



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

Miscellaneous

Male Unions

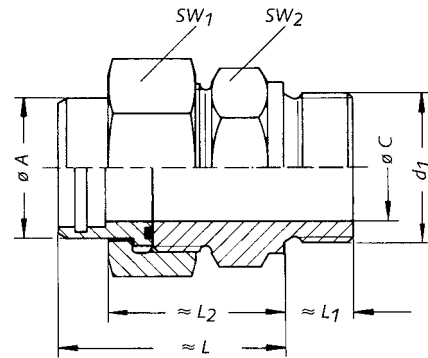
Male Unions

with silver solder capillary x male thread

PN up to 63

Material:

OSNA[®]-10 - copper-nickel-iron



Outside Diameter of Pipe		A mm	C mm	d ₁ (Thread) G"	≈L mm	≈L ₁ mm	≈L ₂ mm	SW ₁ mm	SW ₂ mm
nominal inch	actual mm x G"								
	8 x 1/4	12	6	G 1/4	40	12	30	22	19
1/8	10 x 3/8	15	8	G 3/8	40	12	32	27	22
1/4	12 x 1/2	17	10	G 1/2	43	14	34	27	27
1/4	14 x 5/8	20	12	G 5/8	49	14	39	32	32
3/8	16 x 3/4	22	14	G 3/4	50	16	40	36	32
1/2	20 x 1	27	18	G 1	56	18	46	41	41
3/4	25 x 1	32	22	G 1	57	18	47	46	41
1	30 x 1 1/4	37	27	G 1 1/4	63	20	52	50	50
1 1/4	38 x 1 1/2	45	35	G 1 1/2	71	22	56	60	55
1 1/2	44.5 x 1 3/4	52	41	G 1 3/4	76	24	61	70	65
2	57 x 2 1/2	65	54	G 2 1/2	87	30	72	85	85

Miscellaneous

Male Unions, reduced

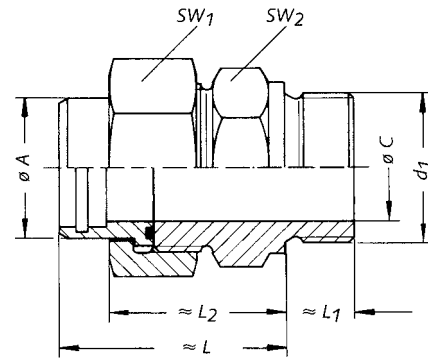
Male Unions, reduced

with silver solder capillary x male thread

PN up to 63

Material:

OSNA®-10 - copper-nickel-iron



Outside Diameter of Pipe		A mm	C mm	d ₁ (Thread) G"	≈L mm	≈L ₁ mm	≈L ₂ mm	SW ₁ mm	SW ₂ mm
nominal inch	actual mm x G"								
	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
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
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
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
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
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
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

Miscellaneous

Male Unions, reduced

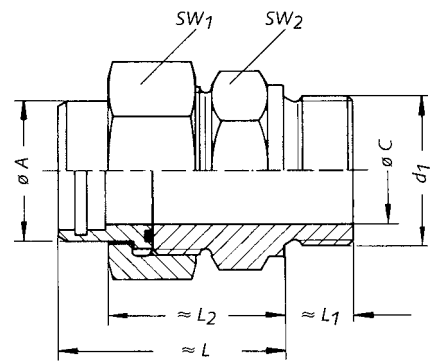
Male Unions, reduced

with silver solder capillary x male thread

PN up to 63

Material:

OSNA®-10 – copper-nickel-iron



Outside Diameter of Pipe		A mm	C mm	d ₁ (Thread) G"	≈L mm	≈L ₁ mm	≈L ₂ mm	SW ₁ mm	SW ₂ mm
nominal inch	actual mm x G"								
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
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
1¼	38 x 1¼	45	27	G x 1¼	71	20	56	60	55
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
1½	44.5 x 2	52	41	G x 2	77	24	62	70	70
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

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Quality is the very basis of reliability – quality in every detail, in every step of work.

For decades now, KME has been consistently putting into action the corporate idea of quality, and, with it, gained the reputation of being a reliable supplier throughout the world. The fulfilment of our customer's expectations of KME's products and services in all respects is our declared corporate policy. To assure this, a KME Quality Management System has been set up, implemented and certified to DIN EN ISO 9001 by LLOYD'S REGISTER QUALITY ASSURANCE .

The KME Quality Management System comprehends process-integrated quality controls, internal product and system audits, the systematic training of all employees and the operation of computer-aided statistical methods.

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