

# **EUROPRESS**

STAINLESS STEEL AND CARBON STEEL  
PRESS FIT PIPE SYSTEMS

- 316 Stainless Steel System
- 316 Stainless Steel System Gas
- 304 Stainless Steel System
- Carbon Steel System

## **PRODUCT AND TECHNICAL MANUAL**

*Efficient • Easy • Effortless*





The EUROPRESS Pressfitting System is an extremely fast and simple assembly system, producing reliable joints with high mechanical resistance, for civil, industrial and naval pipework system installations. Standard diameters range from 15 to 108 mm. Other sizes are available for special applications.

### 1.1 MATERIALS

Depending on the application, the following materials are used:

- stainless steel 316L
- stainless steel 304
- carbon steel

### 1.2 BENEFITS

The main benefits of the Europress System are:

- fast and easy assembly
- reliable, secure and long-lasting seals
- no fire risk during installation
- high corrosion resistance using 316 Stainless Steel

### PRESS CHECK SLEEVES

Europress are at the forefront of pressing systems with the innovative Press check sleeve. Rather than wait to fill an installation with fluid to see if any joint leaks because it has not been pressed, Europress fittings up to and including 54mm have a thin coloured film applied externally on the O ring seat.

When the joint is pressed the film is shredded and detaches from the fitting for easy removal and visual witness to the completed press cycle.

- Blue sleeves – Stainless steel
- Yellow sleeves – Gas fittings
- Red sleeves – Carbon steel fittings



*This Technical Manual provides basic information as a guide. It remains the responsibility of the user to ascertain the suitability and compatibility with their specific application.*

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# FEATURES AND BENEFITS OF THE EUROPRESS



316L polished S/S tubing for a superior finish. High alloy austenitic Cr-Ni-Mo Fittings made from the same high grade 316 S/S with a choice of O-Rings for chemical suitability.



The speed of a pressfit system will amaze you. Competent tradesmen can install a press fit system without the need of qualified welders.

- Faster and Cheaper
- Less time on the job
- Cuts Costs up to 30%



Using Press fittings is up to 10 times faster than conventional Tig welding techniques for stainless steel. No need to completely drain pipe contents prior to alterations. Press Fittings can be crimped wet or dry.



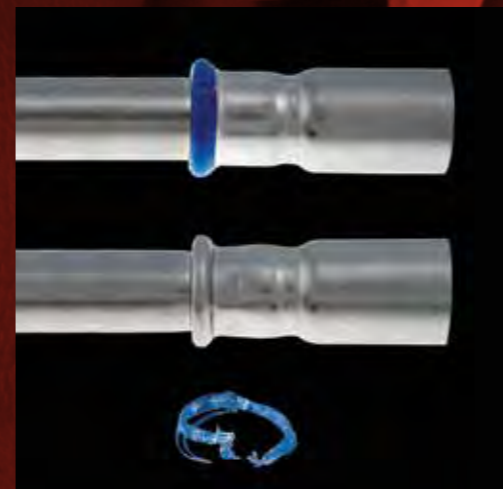
Pressing Tool with inbuilt safety features ensures each press is the same every time, no uncertainty of weld integrity.



25 Year Manufacturer backed product guarantee for all approved applications. Additionally, pressfit tightness is guaranteed by the manufacturer to be in excess of 30 years.



The Europress System is designed for use with common "M" profile Press Jaws, the system is bulk stocked in a number of locations Australia wide and is available through many Plumbing and Industrial outlets.



With the innovative Press Check Sleeve you don't have to wait until the system is full of product to discover leaks! The Press Check Sleeve, makes it easy to immediately identify any joints that have not been pressed.



**NO NAKED FLAME**  
**NO HOT WORK PERMITS**  
**NO GAS BOTTLES**  
No fire hazard or heavy installation equipment, makes it easier to comply with OH&S requirements.



### 1.4 THE EUROPRESS PRESSFIT SYSTEM

The Europress Press Fit System is the ideal solution for installing Stainless Steel or Carbon Steel pipework.

Pressfitted pipe joints are fast, easy and risk-free.

Standard Europress Pipe is available in O.D. tube sizes – **15, 22, 28, 35, 42, 54, 76.1, 88.9, & 108**

This Technical Manual provides basic information as a guide. It remains the responsibility of the user to ascertain the suitability and compatibility with their specific application.

The pipe is pushed into the fitting, up to the stop, then the jaw attachments of the pressing tool press the toroidal end of the fitting into the pipe.

Pressing produces two deformations. The first, radial deformation, compresses the O-ring in the toroidal chamber and guarantees that the pipe is hermetically sealed. The second, geometric deformation of both fitting and pipe, creates a mechanical joint, resistant to slipping and rotation.

The resulting pressing profile varies according to diameter. **Fig 1** shows an assembled joint before and after pressing. Joints produced in this way are extremely strong, but flexible enough to withstand the stresses resulting from initial installation and those, such as vibrations and thermal expansion etc., that occurs in normal operating conditions. This is provided that installation has been carried out according to the instructions in this manual.

### Certifications

The Europress 316L Stainless Steel pipe and standard fittings have been certified for drinking water use by many national and international authorities. Notably it exceeds the demanding quality requirements of the Australian Watermark and the German Standard DVGW W534.



Watermark  
AS 3688  
AS 5200.053  
WMKA22265



Activfire  
AS 4118.2.1  
VdS2344en  
VdS2100-26en



### 2.0 EUROPRESS STAINLESS STEEL

All 316L pipes and pressfittings are made of austenitic stainless Cr- Ni-Mo steel, n. 1.4404 which conforms to Standard UNI EN 10088 (AISI 316L).

304 grade SS pipe n. 1.4307 is available as a more economic alternative to 316L. The nominal dimension used to identify both components of the joint refers to the outside diameter of the pipe.

### 2.1 PIPES

Pipes for use in mains systems are manufactured to AS 5200.053 and conform to Standard DVGW- GW 547/2004 and are marked as such. Dimensional tolerances conform to Standard EN ISO 1127 D4/T4. These pipes are sold in 6-metre lengths and are capped both ends.

Outside diam mm	15	22	28	35	42	54	76.1	88.9	108	139.7	168.3
Thickness	1	1.2	1.2	1.5	1.5	1.5	2	2	2	2	2

### 2.2 STAINLESS STEEL PRESSFITTINGS

Press fittings are manufactured from the same material as the pipes and conform to AS 3688

The special process used to make the press fittings can be broken down into the following main stages:

- cutting the pipe into sections and mechanical working
- forming the toroidal seat
- any welding of other parts of the fitting
- heat treatment in a controlled atmosphere at 1050°C to restore the material's original characteristics

All process stages conform to Standards UNI EN ISO 9001 and in compliance with related technical specifications from DVGW, VdS, etc.

### 2.3 GENERAL APPLICATIONS

The Europress Stainless Steel system is the ideal solution for drinking water systems as the AISI 316L stainless steel used is completely hygienic and highly corrosion resistant. The standard o-rings made of black EPDM, are resistant to aging, heat and chemical additives and are particularly suitable for all types of treated water.

The reliable, high-quality components are suitable for heating, cooling, compressed air, oil and diesel lines in the civil, industrial and manufacturing sectors.

### Conditions of use

- Maximum operating pressure: 16 bar
- Operating temperature: -20°C +95°C
- Maximum temperature: 120°C (On approved applications.)
- Up to 40 Bar/580 psi available on approved applications. Please refer to technical department.

The Europress Pressfitting System complies with the CSIRO ACTIVFIRE certification and has been evaluated and verified as conforming to AS 4118.2.1-1995. It also has been granted the internationally recognized VdS-certification for fire extinguisher systems according to VdS CEA 4001 for both carbon steel and stainless steel products 22mm-108mm (DN20-DN100).

### 2.4 GAS APPLICATION

The Europress System meets AS 5200.053 and is approved in Australia, New Zealand and many European countries for use in gas distribution systems, with external above-ground pipes, installed inside or outside buildings. It can be used for all types of combustible gas, both natural and liquid. The O-ring gaskets are made of yellow HNBR, and are compatible with any of the gas varieties used and are resistant to ageing and heat.

### Conditions of use

- Maximum operating pressure: 5 bar
- Operating temperature: -20 °C +70 °C

### Certification

The Europress pressfittings comply with AS NZS 5601.1.2013 which requires certification as conforming to the German Standard DVGW VP614 for gas applications. To conform to this standard, each of the welded fittings, complete with o-rings, undergoes a special helium test. These fittings have a yellow label with

the letters "PN5" or equivalent yellow mark, to indicate their application.

### 3. EUROPRESS CARBON STEEL

#### 3.1 Pipes and pressfittings

All pipes and pressfitting are made of carbon steel, E195 or E235 n. 1.0034 which conforms to Standard EN 10305.

The nominal dimension used to identify both components of the joint refers to the outside diameter of the pipe.

The following range of diameters and thicknesses can be used:

Outside diam mm	15	22	28	35	42	54	76.1	88.9	108
Thickness	1.2	1.2	1.2	1.5	1.5	1.5	2	2	2

Pipes are sold in 6-metre lengths and dimensional tolerances must conform to Standard EN 10305.

### Pressfitting

The types of pressfittings available are listed in p 34-43 The special process used to make the press fittings can be broken down into the following main stages:

- cutting the pipe into sections and mechanical working
- forming the toroidal seat
- any welding of other parts of the fitting
- any annealing heat treatments
- zinc surface treatments

All process stages are subjected to a quality certified system conforming to Standard UN1 EN ISO 9001/2000.

### Marking

All Europress pipes and press fittings are stamped in accordance with the relevant standard to indicate their application.

### 3.2 Various applications

The Europress Pressfit System in carbon steel is indicated for use in various types of civil and industrial installations where stainless steel pipework is not essential.

Typical applications are:

- closed-circuit heating and cooling water systems
- compressed air and inert gas systems
- closed-circuit sprinkler systems
- oil and diesel lines.

All applications should be checked with Europress Technical department.

The O-ring gaskets, made of black EPDM, are resistant to ageing, heat and chemical additives and are therefore particularly suitable for all types of treated water.

### Conditions of use

- Maximum operating pressure: 16 bar
- Operating temperature: -20°C +85°C
- Maximum temperature: 120°C (On approved applications. Please refer to tech. dept.)

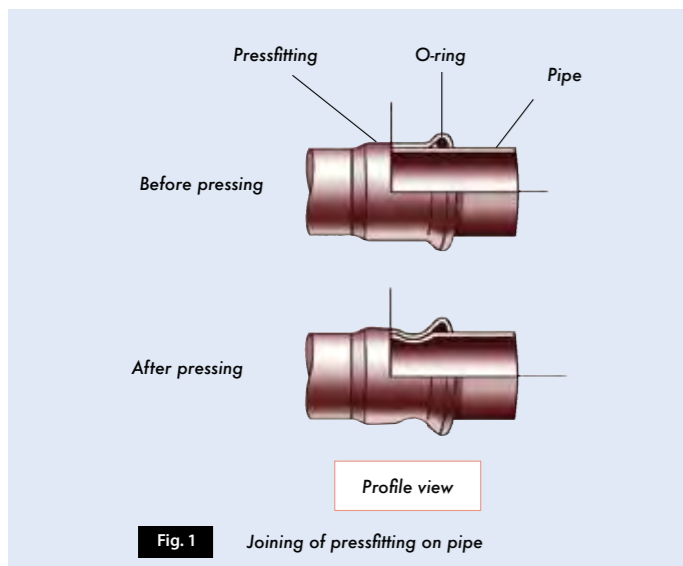


Fig. 1 Joining of pressfitting on pipe

## Pipe-Austenitic – 6 metre lengths

Part No. 316L	304	ext. Ø [mm]	thickness [mm]	weight kg/m	weight kg/6m
STTO.316015	STTO.304015	15	1	0.351	2.11
STTO.316022	STTO.304022	22	1.2	0.625	3.75
STTO.316028	STTO.304028	28	1.2	0.805	4.83
STTO.316035	STTO.304035	35	1.5	1.258	7.55
STTO.316042	STTO.304042	42	1.5	1.521	9.13
STTO.316054	STTO.304054	54	1.5	1.972	11.83
STTO.316076	STTO.304076	76.1	2	3.711	22.27
STTO.316089	STTO.304089	88.9	2	4.352	26.11
STTO.316108	STTO.304108	108	2	5.308	31.8

Stainless steel pipes type 1.4404 (316L) with Watermarked approval for potable water



## Coupling

Part No.	d	L	Z	weight gram
SPP0.000015	15	52	10	39
SPP0.000022	22	59	13	62
SPP0.000028	28	61	13	78
SPP0.000035	35	72	18	109
SPP0.000042	42	79	15	147
SPP0.000054	54	90	16	205
SPP0.000076	76.1	142	32	604
SPP0.000089	88.9	163	37	837
SPP0.000108	108	192	38	1,193



## Reducing Coupling (Spigot x Adaptor) Other Sizes Available

Part No.	d-d1	L	H	weight gram
SSPO.022015	22-15	60	39	45
SSPO.028015	28-15	72	51	56
SSPO.028022	28-22	67	44	65
SSPO.035015	35-15	82	61	89
SSPO.035022	35-22	83	60	98
SSPO.035028	35-28	73	49	112
SSPO.042015	42-15	91	70	118
SSPO.042022	42-22	87	64	125
SSPO.042028	42-28	98	74	140
SSPO.042035	42-35	79	52	120
SSPO.054015	54-15	110	89	197
SSPO.054022	54-22	107	84	191
SSPO.054028	54-28	99	75	193
SSPO.054035	54-35	128	101	237
SSPO.054042	54-42	97	65	191
SSPO.076042	76,1-42	151	119	425
SSPO.076054	76,1-54	140	103	451
SSPO.089054	88,9-54	156	119	586
SSPO.089076	88,9-76,1	156	101	653
SSPO.108054	108-54	204	167	880
SSPO.108076	108-76,1	196	141	978
SSPO.108089	108-88,9	190	127	992



## Slip Coupling

Part No.	d	L	E	weight gram
SPPS.000015	15	71	24	47
SPPS.000022	22	82	27	85
SPPS.000028	28	90	28	114
SPPS.000035	35	99	31	149
SPPS.000042	42	115	35	216
SPPS.000054	54	139	40	316
SPPS.000076	76.1	230	60	874
SPPS.000089	88.9	258	70	1,196
SPPS.000108	108	305	80	1,775



## Elbow 90°

Part No.	d	L	Z	weight gram	Radius
SPP9.000015	15	48	27	57	1.5d
SPP9.000022	22	60	37	97	1.5d
SPP9.000028	28	71	47	143	1.5d
SPP9.000035	35	87	60	198	1.5d
SPP8.000035	35	75	48	173	1.2d
SPP9.000042	42	15	83	314	1.5d
SPP8.000042	42	89	57	261	1.2d
SPP9.000054	54	142	105	499	1.5d
SPP8.000054	54	107	70	391	1.2d
SPP8.000076	76.1	150	95	977	1.2d
SPP8.000089	88.9	174	111	1,325	1.2d
SPP8.000108	108	215	138	2,091	1.2d



## Elbow 90° with Spigot End

Part No.	d	L	H	Z	weight gram	Radius
SPS9.000015	15	48	56	27	58	1.5d
SPS9.000022	22	60	68	37	98	1.5d
SPS9.000028	28	71	80	47	147	1.5d
SPS9.000035	35	87	93	60	200	1.5d
SPS8.000035	35	75	83	48	179	1.2d
SPS9.000042	42	115	125	83	331	1.5d
SPS8.000042	42	89	97	57	260	1.2d
SPS9.000054	54	142	149	105	505	1.5d
SPS8.000054	54	107	116	70	400	1.2d
SPS8.000076	76.1	150	165	95	982	1.2d
SPS8.000089	88.9	174	190	111	1,317	1.2d
SPS8.000108	108	215	238	138	2,068	1.2d



## Elbow 45°

Part No.	d	L	Z	weight gram	Radius
SPP4.000015	15	37	16	49	1.5d
SPP4.000022	22	44	21	81	1.5d
SPP4.000028	28	51	27	118	1.5d
SPP4.000035	35	59	32	161	1.5d
SPP2.000035	35	49	22	152	1.2d
SPP4.000042	42	77	45	254	1.5d
SPP2.000042	42	63	31	216	1.2d
SPP4.000054	54	88	51	369	1.5d
SPP2.000054	54	75	38	323	1.2d
SPP2.000076	76.1	98	43	773	1.2d
SPP2.000089	88.9	112	49	991	1.2d
SPP2.000108	108	138	61	1,600	1.2d





### Elbow 45° with Spigot End

Part No.	d	L	H	Z	weight gram	Radius
SPS4.000015	15	37	48	16	53	1.5d
SPS4.000022	22	44	53	21	85	1.5d
SPS4.000028	28	51	60	27	117	1.5d
SPS4.000035	35	59	66	32	160	1.5d
SPS2.000035	35	49	51	22	155	1.2d
SPS4.000042	42	77	80	45	237	1.5d
SPS2.000042	42	63	72	31	203	1.2d
SPS4.000054	54	88	97	51	366	1.5d
SPS2.000054	54	75	83	38	310	1.2d
SPS2.000076	76.1	98	117	43	767	1.2d
SPS2.000089	88.9	112	131	49	998	1.2d
SPS2.000108	108	138	154	61	1,510	1.2d



### Elbow Adaptor 90° with Female Thread

Part No.	d-Rp	L	L1	H	weight gram
SPF9.015015	15-1/2	48	58	27	76
SPF9.022020	22-3/4	60	68	37	123
SPF9.028025	28-1	71	81	47	172
SPF9.035032	35-1/4	87	95	60	267



### Elbow Adaptor 90° with Male Thread

Part No.	d-R	L	L1	H	weight gram
SPM9.015015	15-1/2	48	58	27	75
SPM9.022020	22-3/4	60	69	37	119
SPM9.028025	28-1	71	81	47	184
SPM9.035032	35-1/4	87	94	60	262
SPM9.042040	42-1/2	115	116	83	376
SPM9.054050	54-2	142	143	105	667



### Elbow Adaptor 45° with Male Thread

Part No.	d-R	L	L1	H	weight gram
SPM4.015015	15-1/2	37	38	16	64
SPM4.022020	22-3/4	44	51	21	102



### 90° Female Elbow with Flush Wall Mount

Part No.	d-G [ISO 228]	L	L1	Z	I	I1	H	g	weight gram
SPFL.015015	15-1/2	46	43	25	12	12	34	5	104
SPFL.022020	22-3/4	52	51	29	16	13	40	6	147



### 90° Female Elbow with Extended Offset Wall Mount

Part No.	d-G [ISO 228]	L	I	L1	z	I1	weight gram
SPFW.015015	15-1/2	46	36	65	25	12	148
SPFW.022020	22-3/4	52	2	65	29	13	176



### Elbow Adaptor 90° with Female Thread

Part No.	d-R	L	H	Z	Z1	weight gram
SPFA.015015	15-1/2	53	36	32	24	121
SPFA.022020	22-3/4	57	46	34	33	180
SPFA.028025	28-1	71	54	47	38	329
SPFA.035032	35-1/4	72	62	45	45	455



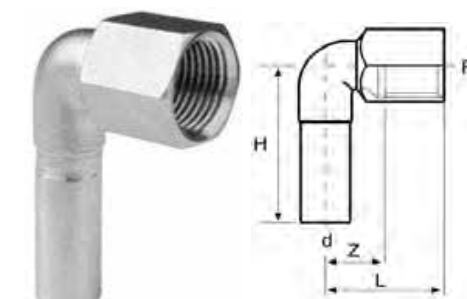
### Elbow Adaptor 90° with Male Thread

Part No.	d-R	L	H	Z	weight gram
SPMA.015015	15-1/2	53	36	32	91
SPMA.015020	15-3/4	62	38	41	137
SPMA.022020	22-3/4	58	40	35	145
SPMA.028025	28-1	63	44	39	245
SPMA.035032	35-1/4	71	48	44	338
SPMA.042040	42-1/2	81	53	49	425
SPMA.054050	54-2	92	59	55	716



### Elbow 90 Spigot with Female Thread

Part No.	d-R	L	H	Z	weight gram
SSFA.015015	15-1/2	35	53	23	66



## Equal Tee



Part No.	d	L	L1	Z	Z1	I	weight gram
SPPT.000015	15	74	35	16	14	37	67
SPPT.000022	22	82	40	18	17	41	112
SPPT.000028	28	92	45	22	21	46	149
SPPT.000035	35	102	55	24	28	51	189
SPPT.000042	42	118	61	27	29	59	27
SPPT.000054	54	142	72	34	35	71	382
SPPT.000076	76.1	232	115	61	60	116	1,192
SPPT.000089	88.9	262	127	68	64	131	1,617
SPPT.000108	108	312	155	79	78	156	2,450

## Reducing Tee



Part No.	d-d1-dv	L	L1	Z	Z1	I	weight gram
SPPT.022015	22-15-22	82	39	18	18	41	98
SPPT.028015	28-15-28	92	42	22	21	46	130
SPPT.028022	28-22-28	92	45	22	22	46	140
SPPT.035015	35-15-35	102	45	24	24	51	164
SPPT.035022	35-22-35	102	46	24	23	51	172
SPPT.035028	35-28-35	102	48	24	24	51	175
SPPT.042015	42-15-42	118	48	27	27	59	213
SPPT.042022	42-22-42	118	51	27	28	59	239
SPPT.042028	42-28-42	118	53	27	29	59	240
SPPT.042035	42-35-42	118	60	27	33	59	242
SPPT.054015	54-15-54	142	56	34	35	71	326
SPPT.054022	54-22-54	142	57	34	34	71	325
SPPT.054028	54-28-54	142	60	34	36	71	348
SPPT.054035	54-35-54	142	66	34	39	71	344
SPPT.054042	54-42-54	142	64	34	32	71	368
SPPT.076022	76.1-22-76.1	232	68	61	45	116	942
SPPT.076028	76.1-28-76.1	232	71	61	47	116	956
SPPT.076035	76.1-35-76.1	232	75	61	48	116	968
SPPT.076042	76.1-42-76.1	232	79	61	47	116	981
SPPT.076054	76.1-54-76.1	232	80	61	43	116	1,067
SPPT.089022	88.9-22-88.9	262	76	68	53	131	1,256
SPPT.089028	88.9-28-88.9	262	76	68	52	131	1,244
SPPT.089035	88.9-35-88.9	262	83	68	56	131	1,267
SPPT.089042	88.9-42-88.9	262	85	68	53	131	1,271
SPPT.089054	88.9-54-88.9	262	93	68	56	131	1,297
SPPT.089076	88.9-76.1-88.9	262	116	68	61	131	1,479
SPPT.108022	108-22-108	312	85	79	62	156	1,919
SPPT.108028	108-28-108	312	88	79	64	156	1,939
SPPT.108032	108-35-108	312	94	79	67	156	1,955
SPPT.108042	108-42-108	312	96	79	64	156	1,886
SPPT.108054	108-54-108	312	102	79	65	156	1,967
SPPT.108076	108-76.1-108	312	125	79	70	156	2,147
SPPT.108089	108-88.9-108	312	135	79	72	156	2,255

## Female Centred Tee

Part No.	d-Rp	L	L1	Z	Z1	I	weight gram
SPFT.015015	15-1/2-15	74	37	16	25	37	83
SPFT.022015	22-1/2-22	82	41	18	29	41	117
SPFT.022020	22-3/4-22	82	41	18	28	41	131
SPFT.028015	28-1/2-28	92	44	22	32	46	144
SPFT.028020	28-3/4-28	92	45	22	32	46	159
SPFT.028025	28-1-28	92	48	22	32	46	175
SPFT.035015	35-1/2-35	102	48	24	36	51	178
SPFT.035020	35-3/4-35	102	48	24	35	51	189
SPFT.035032	35-1 1/4-35	102	57	24	40	51	255
SPFT.042015	42-1/2-42	118	46	27	34	59	240
SPFT.042020	42-3/4-42	118	52	27	39	59	254
SPFT.042040	42-1 1/2-42	118	59	27	42	59	384
SPFT.054015	54-1/2-54	142	55	34	43	71	362
SPFT.054020	54-3/4-54	142	58	34	45	71	364
SPFT.054050	54-2-54	142	69	34	47	71	523
SPFT.076020	76.1-3/4-76.1	232	68	61	55	116	1,009
SPFT.076050	76.1-2-76.1	232	81	61	59	116	1,194
SPFT.089020	88.9-3/4-88.9	262	87	68	74	131	1,210
SPFT.089050	88.9-2-88.9	262	88	68	66	131	1,450
SPFT.108020	108-3/4-108	312	86	79	73	156	1,956
SPFT.108050	108-2-108	312	98	79	76	156	2,118



## Male Centred Tee

Part No.	d	L	L1	Z	Z1	I	weight gram
SPMT.015015	15-1/2-15	74	38	16	15	37	75
SPMT.022020	22-3/4-22	82	43	18	17	41	105
SPMT.028025	28-1-28	92	50	22	21	46	130
SPMT.035032	35-1 1/4-35	102	56	24	28	51	170



## Adaptor with Female Thread and Spigot End

Part No.	d-Rp	L	H	weight gram
SSF0.015015	15-1/2	148	136	95
SSF0.022015	22-1/2	152	140	150
SSF0.022020	22-3/4	152	139	148
SSF0.028025	28-1	110	94	145
SSF0.035032	35-1 1/4	110	93	210
SSF0.042040	42-1 1/2	110	93	300
SSF0.054050	54-2	120	98	408





### Adaptor with Male Thread and Spigot End



Part No.	d-R	L	weight gram
SSM0.015015	15-1/2	70	55
SSM0.022020	22-3/4	75	80
SSM0.028025	28-1	75	120
SSM0.035032	35-1 1/4	80	170
SSM0.042040	42-1 1/2	91	220
SSM0.054050	54-2	102	384

### Adaptor with Female Thread



Part No.	d-Rp	L	H	weight gram
SPFO.015015	15-1/2	53	20	52
SPFO.015020	15-3/4	67	33	81
SPFO.022015	22-1/2	52	17	77
SPFO.022020	22-3/4	56	20	75
SPFO.022025	22-1	70	31	105
SPFO.028020	28-3/4	73	36	105
SPFO.028025	28-1	62	22	103
SPFO.028032	28-1 1/4	80	39	171
SPFO.035025	35-1	81	38	136
SPFO.035032	35-1 1/4	72	28	170
SPFO.035040	35-1 1/2	83	39	259
SPFO.042032	42-1 1/4	94	45	221
SPFO.042040	42-1 1/2	74	25	252
SPFO.054040	54-1 1/2	106	52	328
SPFO.054050	54-2	84	25	342

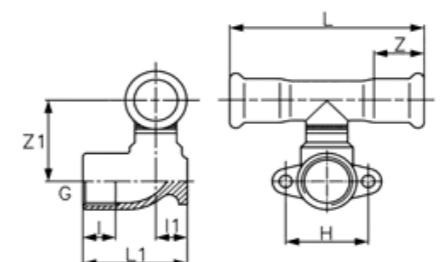
### Adaptor with Male Thread



Part No.	d-R	L	H	weight gram
SPM0.015010	15-3/8	50	29	50
SPM0.015015	15-1/2	52	31	52
SPM0.015020	15-3/4	64	43	66
SPM0.022015	22-1/2	68	45	73
SPM0.022020	22-3/4	58	35	74
SPM0.022025	22-1	72	49	116
SPM0.028020	28-3/4	73	49	100
SPM0.028025	28-1	62	38	115
SPM0.028032	28-1 1/4	79	55	166
SPM0.035025	35-1	82	55	148
SPM0.035032	35-1 1/4	70	43	165
SPM0.035040	35-1 1/2	84	57	198
SPM0.042032	42-1 1/4	93	61	216
SPM0.042040	42-1 1/2	75	43	204
SPM0.054040	54-1 1/2	105	68	271
SPM0.054050	54-2	87	50	368
SPM0.076065	76.1- 2 1/2	125	70	820
SPM0.089080	88.9- 3	138	75	1,158

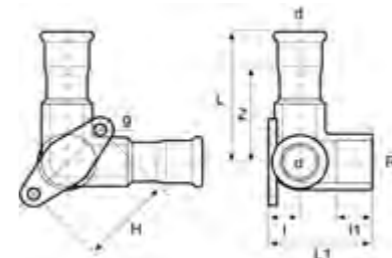
### Off Centred Tee with Female Thread

Part No.	d-G	L	L1	Z	Z1	H	I	I1	weight gram
SPFM.015015	15-1/2	74	43	21	31	34	12	13	130



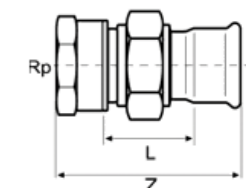
### Lugged Elbow with Female Tap Outlet

Part No.	d-G	L	L1	I	I1	Z	H	weight gram
SPFQ.015015	15-1/2	56	44	15	12	35	139	166



### Female Barrel Union Brass / Stainless Steel Nut EPDM Flat Seal

Part No.	D-RP	NUT	L	Z	weight gram
SPFQ.015015	15-1/2	BRASS	73	40	145
SPFQ.015020	15-3/4	BRASS	75	41	182
SPFQ.022020	22-3/4	BRASS	76	40	212
SPFQ.022025	22-1	BRASS	79	40	242
SPFQ.028025	28-1	BRASS	83	43	398
SPFQ.035032	35-1 1/4	BRASS	93	49	467
SPFQ.042040	42-1 1/2	BRASS	96	47	562
SPFQ.054050	54-2	BRASS	113	54	973

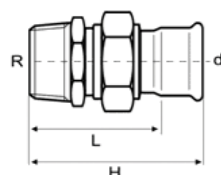


Part No.	D-RP	NUT	L	Z	weight gram
SPFN.015015	15-1/2	ST. STEEL	73	40	139
SPFN.015020	15-3/4	ST. STEEL	75	41	176
SPFN.022020	22-3/4	ST. STEEL	76	40	205
SPFN.022025	22-1	ST. STEEL	79	40	235
SPFN.028025	28-1	ST. STEEL	83	43	387
SPFN.035032	35-1 1/4	ST. STEEL	93	49	448
SPFN.042040	42-1 1/2	ST. STEEL	96	47	542
SPFN.054050	54-2	ST. STEEL	113	54	943





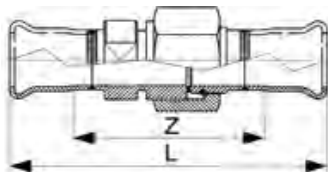
## Male Barrel Union Brass / Stainless Steel Nut EPDM Flat Seal



Part No.	D-RP	NUT	L	H	weight gram
SPMQ.015015	15-1/2	BRASS	76	55	147
SPMQ.015020	15-3/4	BRASS	80	59	166
SPMQ.022015	22-1/2	BRASS	80	57	239
SPMQ.022020	22-3/4	BRASS	82	59	222
SPMQ.022025	22-1	BRASS	86	63	256
SPMQ.028025	28-1	BRASS	88	64	360
SPMQ.035032	35-1 1/4	BRASS	100	73	544
SPMQ.042040	42-1 1/2	BRASS	106	74	628
SPMQ.054050	54-2	BRASS	122	85	1008

Part No.	D-RP	NUT	L	H	weight gram
SPMN.015015	15 -1/2	ST. STEEL	76	55	141
SPMN.015020	15 -3/4	ST. STEEL	80	59	160
SPMN.022015	22 -1/2	ST. STEEL	80	57	232
SPMN.022020	22 - 3/4	ST. STEEL	82	59	215
SPMN.022025	22-1	ST. STEEL	86	63	249
SPMN.028025	28-1	ST. STEEL	88	64	349
SPMN.035032	35 - 1 1/4	ST. STEEL	100	73	525
SPMN.042040	42 - 1 1/2	ST. STEEL	106	74	608
SPMN.054050	54 - 2	ST. STEEL	122	85	978

## Pipe - Pipe Barrel Union Brass / Stainless Steel Nut EPDM Flat



Part No.	D-RP	NUT	L	Z	weight gram
SPPQ.015015	15	BRASS	97	55	170
SPPQ.022022	22	BRASS	105	59	222
SPPQ.028028	28	BRASS	111	63	345
SPPQ.035035	35	BRASS	124	70	540
SPPQ.042042	42	BRASS	134	70	640
SPPQ.054054	54	BRASS	144	70	970

Part No.	D-RP	NUT	L	Z	weight gram
SPPN.015015	15	ST. STEEL	97	55	154
SPPN.022022	22	ST. STEEL	105	59	215
SPPN.028028	28	ST. STEEL	111	63	334
SPPN.035035	35	ST. STEEL	124	70	521
SPPN.042042	42	ST. STEEL	134	70	620
SPPN.054054	54	ST. STEEL	144	70	940

## 3 Piece Ball Valve Adaptor Ends

Part No.	d	L	L1	C	A	M	H	weight gram
SPPV.00015	15	118	48	22	20	105	57	454
SPPV.00022	22	133	51	31	21	110	67	860
SPPV.00028	28	147.9	55	37.9	24	130	85	1.054
SPPV.00035	35	177	65	47	27	130	85	1.922
SPPV.00042	42	205	74	57	32	160	100	2.584
SPPV.00054	54	228	80	68	38	160	110	3.500
SPPV.00076	76.1	316	115	86	55	235	130	9.180
SPPV.00089	88.9	346	124	98	64	245	140	12.98
SPPV.00108	108	432	153	126	78	330	170	20.24

## Cap

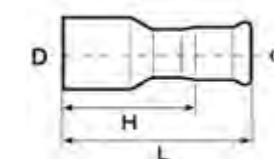
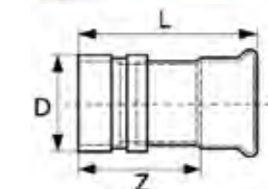
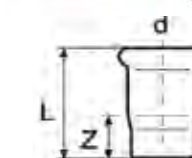
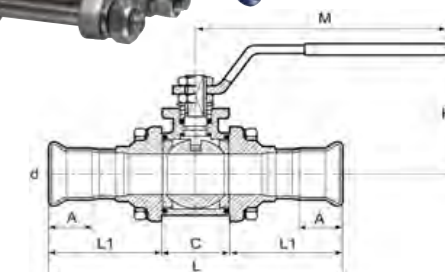
Part No.	d	L	Z	weight gram
SPE0.000015	15	37	16	27
SPE0.000022	22	41	18	44
SPE0.000028	28	46	22	63
SPE0.000035	35	51	24	81
SPE0.000042	42	59	27	119
SPE0.000054	54	72	35	171
SPE0.000076	76.1	95	40	427
SPE0.000089	88.9	107	44	559
SPE0.000108	108	127	50	821

## Roll Groove Adaptor

Part No.	d-D	L	Z	weight gram
SPRO.028025	28 x 33.7	87	63	171
SPRO.035032	35 x 42.4	94.5	67.5	239
SPRO.042040	42 x 48.3	105.5	73.5	298
SPRO.054050	54 x 60.3	124	87	429
SPRO.076065	76.1 x 76.1	150	95	986
SPRO.089080	88.9 x 88.9	165.5	102.5	1.229
SPRO.108100	108 x 114.4	184	107	1.393

## Imperial Weld Adaptor

Part No.	d1	D imp	OD imp/mm	L	H	weight gram
SPBJ.015015	15	1/2	0.840/21.3	60	39	0.045
SPBJ.022020	22	3/4	1.050/26.7	67	44	0.065
SPBJ.028025	28	1	1.315/33.4	73	49	0.112
SPBJ.035032	35	1 1/4	1.900/42.2	79	52	0.12
SPBJ.042040	42	1 1/2	1.900/48.3	97	65	0.191
SPBJ.054050	54	2	2.375/60.3	140	103	0.451
SPBJ.076065	76.1	2 1/2	2.87/73.0	156	101	0.653
SPBJ.076080	76.1	3	3.50/88.9	190	127	0.653
SPBJ.089080	88.9	3	3.50/88.9	190	127	0.992
SPBJ.108100	108	4	4.50/114.3	184	107	1.393





## Adaptor Flange (small)

Part No.	d	L	D	D1	Z	C	S	weight gram
SPJF.015015	15	38	34	14	17	4	10	57
SPJF.022020	22	39	39	21	16	4	9	70
SPJF.028025	28	42	45	27	18	4	9	89
SPJF.035032	35	46	56	32	19	4	9	127
SPJF.042040	42	50	62	39	18	4	9	156

Use in conjunction with backing rings on page 23

## Adaptor Flange (large) Table E standard DIN & ANSI available

Part No.	d	Nominal flange size	Inch size	D	P	L	T
SPEF.015015	15	15	1/2"	95	67	30	6
SPEF.022020	22	20	3/4"	102	73	32	6
SPEF.028025	28	25	1"	114	83	36	7
SPEF.035032	35	32	1 1/4"	121	87	41	8
SPEF.042040	42	40	1 1/2"	133	98	46	9
SPEF.054050	54	50	2"	152	114	50	10
SPEF.076080	76.1	80	3"	185	146	77	11
SPEF.089080	88.9	80	3"	185	146	91	11
SPEF.108100	108	100	4"	215	178	107	13

## Welding Joint

Part No.	d	L	weight gram
SPBO.000015	15	25	17
SPBO.000022	22	27	30
SPBO.000028	28	30	37
SPBO.000035	35	34	51
SPBO.000042	42	38	67
SPBO.000054	54	44	100
SPBO.000076	76	68	290
SPBO.000089	89	78	390
SPBO.000108	108	94	595

## Stub Flange

Part No.	d	D	Z	L	T
SSJF.076080	76.1	106	28	128	3
SSJF.089080	88.9	125	26	149	3
SSJF.108100	108	158	22	175	4

Use in conjunction with backing rings on page 23

## 15° Bend

Part No.	d	H1	H	K	K1	weight gram
SSS1.000015	15	122	60	21	83	76
SSS1.000022	22	124	50	7	81	110
SSS1.000028	28	136	45	7	47	146
SSS1.000035	35	234	62	30	110	381
SSS1.000042	42	276	94	41	144	558
SSS1.000054	54	337	117	65	165	869
SSS1.000076	76.1	230	226	65	65	1.607
SSS1.000089	88.9	260	240	80	80	2.109
SSS1.000108	108	291	222	95	95	2.546

## 30° Bend

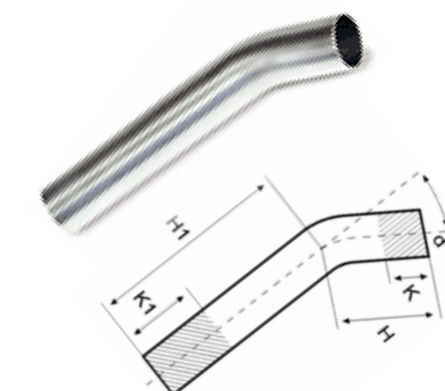
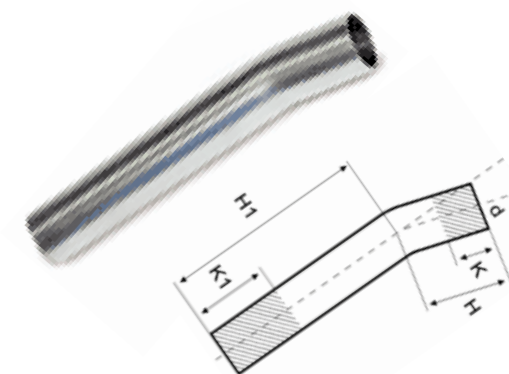
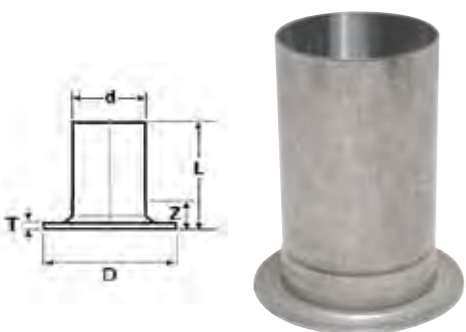
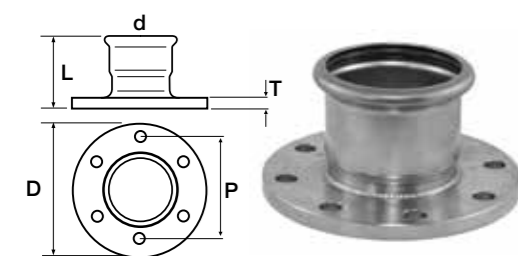
Part No.	d	H1	H	K	K1	weight gram
SSS3.000015	15	122	60	21	83	76
SSS3.000022	22	124	50	6	80	110
SSS3.000028	28	130	54	7	47	144
SSS3.000035	35	218	80	30	110	382
SSS3.000042	42	274	98	44	144	560
SSS3.000054	54	324	137	65	165	905
SSS3.000076	76.1	200	202	66	66	1.41
SSS3.000089	88.9	262	264	80	80	2.183
SSS3.000108	108	259	272	95	95	2.622

## 45° Bend

Part No.	d	H1	H	K	K1	weight gram
SSS4.000015	15	120	62	19	77	76
SSS4.000022	22	120	56	7	71	111
SSS4.000028	28	122	58	2	66	146
SSS4.000035	35	206	94	20	132	380
SSS4.000042	42	262	114	1	149	576
SSS4.000054	54	321	146	37	212	928
SSS4.000076	76.1	225	225	69	69	1.577
SSS4.000089	88.9	267	267	103	103	2.323
SSS4.000108	108	293	293	66	66	2.901

## 60° Bend

Part No.	d	H1	H	K	K1	weight gram
SSS6.000015	15	122	60	21	83	76
SSS6.000022	22	118	60	5	63	112
SSS6.000028	28	116	71	7	47	140
SSS6.000035	35	226	101	30	110	383
SSS6.000042	42	251	124	44	145	564
SSS6.000054	54	308	162	65	165	889
SSS6.000076	76.1	219	223	70	70	1.479
SSS6.000089	88.9	250	257	80	80	1.996
SSS6.000108	108	288	298	95	95	2.78





### 75° Bend

Part No.	d	H1	H	K	K1	weight gram
SSS7.000015	15	117	66	22	73	77
SSS7.000022	22	118	64	9	63	114
SSS7.000028	28	114	71	7	50	150
SSS7.000035	35	200	110	26	119	393
SSS7.000042	42	251	137	44	158	595
SSS7.000054	54	305	178	60	187	960
SSS7.000076	76.1	240	240	62	62	1.682
SSS7.000089	88.9	280	280	90	90	2.436
SSS7.000108	108	345	345	60	60	3.416

### 90° Bend

Part No.	d	H1	H	K	K1	weight gram
SSS9.000015	15	120	70	22	72	59
SSS9.000022	22	120	70	9	59	102
SSS9.000028	28	125	97	7	47	153
SSS9.000035	35	200	120	30	110	183
SSS9.000042	42	250	160	44	144	565
SSS9.000054	54	305	200	65	165	868
SSS9.000076	76.1	250	250	62	62	1.752
SSS9.000089	88.9	291	291	90	90	2.532
SSS9.000108	108	364	364	45	45	3.604

### Pipe Bridge

Part No.	d	L1	L2	L	weight gram
SSSB.000015	15	202	38	65	74
SSSB.000022	22	233	40	68	158
SSSB.000028	28	303	64	93	258

### Pipe Bridge Short

Part No.	d	L1	L2	L	weight gram
SSSZ.000015	15	145	37	57	54
SSSZ.000022	22	181	40	60	122
SSSZ.000028	28	241	55	83	215

### Pipe – Austenitic – 6 metre lengths

316 L Part No.	DN	Ext Ø (mm)	Thickness (mm)	weight kg/m
STTO.316140	125	139.7	2	6.896
STTO.316168	150	168.3	2	8.328

304 Part No.	DN	Ext Ø (mm)	Thickness (mm)	weight kg/m
STTO.304140	125	139.7	2	6.896
STTO.304168	150	168.3	2	8.328

### Coupling

316 L Part No.	d	L	Z	weight kg
SPP0.000140	139.7	258.5	62.3	2.031
SPP0.000168	168.3	308.8	72.6	2.835

304 Part No.	d	L	Z	weight kg
RPP0.000140	139.7	258.5	62.3	2.031
RPP0.000168	168.3	308.8	72.6	2.835

### Elbow 90°

316 L Part No.	d	Wall thickness	L	Z	weight kg
SPP9.000140	139.7	2.6	319.3	221.2	3.813
SPP9.000168	168.3	2.6	383.4	265.3	5.651

304 Part No.	d	Wall thickness	L	Z	weight kg
RPP9.000140	139.7	2.6	319.3	221.2	3.813
RPP9.000168	168.3	2.6	383.4	265.3	5.651

### Elbow 45°

316 L Part No.	d	Wall thickness	L	Z	weight kg
SPP4.000140	139.7	2.6	208	109.9	1.906
SPP4.000168	168.3	2.6	249.3	131.2	2.825

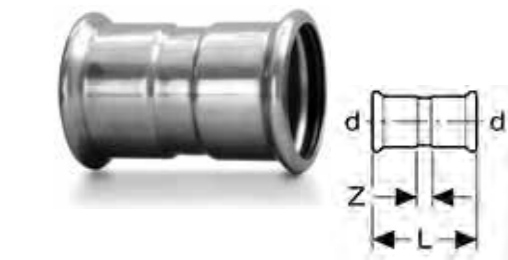
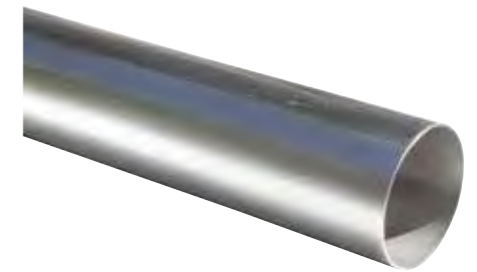
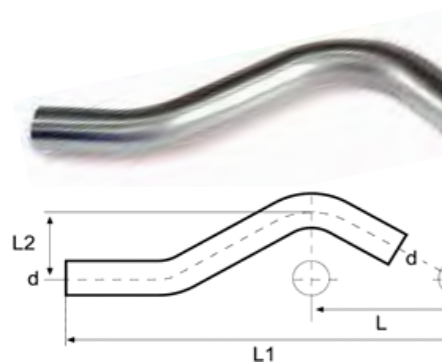
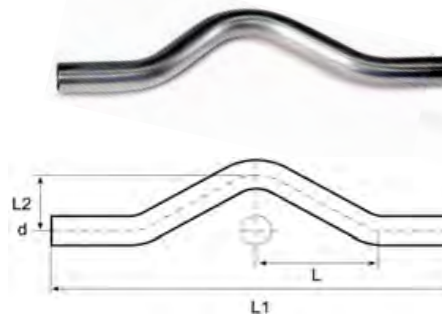
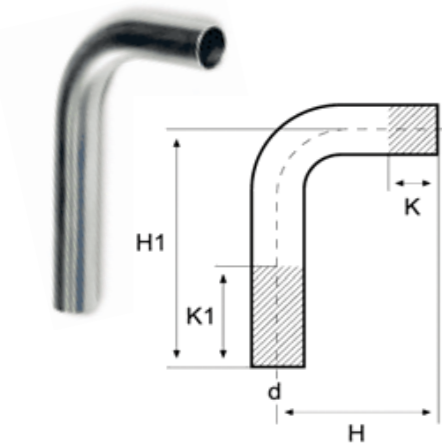
304 Part No.	d	Wall thickness	L	Z	weight kg
RPP4.000140	139.7	2.6	208	109.9	1.906
RPP4.000168	168.3	2.6	249.3	131.2	2.825

### Adaptor Flange

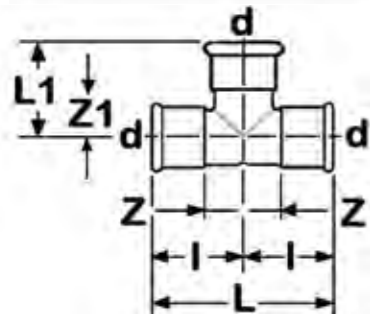
316 L Part No.	d	D	P (pcd)	L	T	Z	weight kg
SPEF.140125	139.7	250	210	144	25	46	3.26
SPEF.168150	168.3	285	235	170	26	53	3.94

304 Part No.	d	D	P (pcd)	L	T	Z	weight kg
RPEF.140125	139.7	250	210	144	25	46	3.26
RPEF.168150	168.3	285	235	170	26	53	3.94



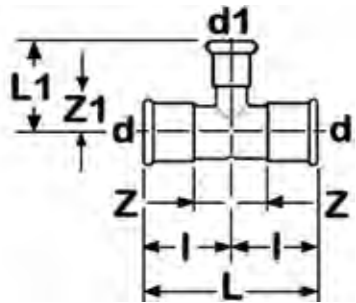
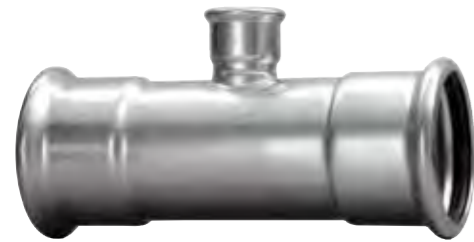




### Equal Tee

316 L Part No.	d	Wall thickness	L	L1	Z	Z1	I	weight kg
SPPT.000140	139.7	2.6	433	192	98.5	93.9	216.5	3.94
SPPT.000168	168.3	2.6	520	243.6	118	125.1	260	5.69

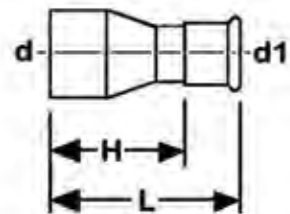
304 Part No.	d	Wall thickness	L	L1	Z	Z1	I	weight kg
RPPT.000140	139.7	2.6	433	192	98.5	93.9	216.5	3.94
RPPT.000168	168.3	2.6	520	243.6	118	125.1	260	5.69



### Reducing Tee

316 L Part No.	d	d1	L	L1	Z	Z1	I	weight kg
SPPT.140076	139.7	76.1	433	145	98.5	90.4	216.5	3.33
SPPT.140089	139.7	88.9	433	155	98.5	97.4	216.5	3.62
SPPT.140108	139.7	108	433	171	98.5	100	216.5	3.65
SPPT.168076	168.3	76.1	520	160	118	105.4	260	4.71
SPPT.168089	168.3	88.9	520	170	118	112.4	260	4.71
SPPT.168108	168.3	108	520	186	118	114.7	260	4.93
SPPT.168140	168.3	139.7	520	218	118	120	260	5.22

304 Part No.	d	d1	L	L1	Z	Z1	I	weight kg
RPPT.140076	139.7	76.1	433	145	98.5	90.4	216.5	3.33
RPPT.140089	139.7	88.9	433	155	98.5	97.4	216.5	3.62
RPPT.140108	139.7	108	433	171	98.5	100	216.5	3.65
RPPT.168076	168.3	76.1	520	160	118	105.4	260	4.71
RPPT.168089	168.3	88.9	520	170	118	112.4	260	4.71
RPPT.168108	168.3	108	520	186	118	114.7	260	4.93
RPPT.168140	168.3	139.7	520	218	118	120	260	5.22



### Reducing Coupler (Spigot x Adaptor)

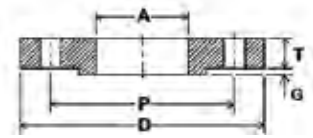
316 L Part No.	d	d1	#	L	H	Kg
SSPO.140089	139.7	88.9	2.6	363	305.4	2.22
SSPO.140108	139.7	108	2.6	-	-	2.1
SSPO.168089	168.3	88.9	2.6	470	421.4	3.23
SSPO.168108	168.3	108	2.6	-	-	3.11
SSPO.168140	168.3	139.7	2.6	365.3	267.2	2.93

304 Part No.	d	d1	#	L	H	Kg
RSP0.140089	139.7	88.9	2.6	363	305.4	2.22
RSP0.140108	139.7	108	2.6	-	-	2.1
RSP0.168089	168.3	88.9	2.6	470	421.4	3.23
RSP0.168108	168.3	108	2.6	-	-	3.11
RSP0.168140	168.3	139.7	2.6	365.3	267.2	2.93

### DIN Backing Rings – EN 1092-1

Part No	Pipe size d	Nominal flange size	Inch size	P (mm)	A (mm)	D (mm)	T (mm)	Bolt holes No. x dia	Bolt
SBD6.000015	15	15	1/2"	65.0	29	95	14.0	4 x 14	M12
SBD6.000020	22	20	3/4"	75.0	34	105	16.0	4 x 14	M12
SBD6.000025	28	25	1"	85.0	40	115	16.0	4 x 14	M12
SBD6.000035	35	32	1 1/4"	100.0	46	140	18.0	4 x 18	M16
SBD6.000040	42	40	1 1/2"	110.0	54	150	18.0	4 x 18	M16
SBD6.000050	Size not relevant								
SBD6.000075	76.1	80	3"	145.0	83	185	20.0	8 x 18	M16
SBD6.000089	88.9	80	3"	160.0	97	200	20.0	8 x 18	M16
SBD6.000100	108	100	4"	180.0	110	220	22.0	8 x 18	M16

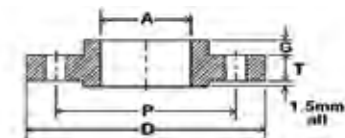
For Backing Rings in 304 grade – change 6 to 4



### ANSI Backing Rings – CLASS 150

Part No	Pipe size d	Nominal flange size	Inch size	P (mm)	A (mm)	D (mm)	T (mm)	Bolt holes No. x dia	Bolt
SBA6.000015	15	15	1/2"	60.5	29	90	11.5	4 x 16	M12
SBA6.000020	22	20	3/4"	70.0	34	98	13.0	4 x 16	M12
SBA6.000025	28	25	1"	79.5	40	108	14.5	4 x 16	M12
SBA6.000035	35	32	1 1/4"	89.0	46	117	16.0	4 x 16	M12
SBA6.000040	42	40	1 1/2"	98.5	54	127	17.5	4 x 16	M12
SBA6.000050	Size not relevant								
SBA6.000075	76.1	65	2 1/2"	139.5	83	178	22.5	4 x 20	M16
SBA6.000089	88.9	80	3"	152.5	97	191	24.0	4 x 20	M16
SBA6.000100	108	100	4"	190.5	110	229	24.0	8 x 20	M16

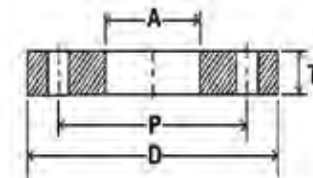
For Backing Rings in 304 grade – change 6 to 4



### TABLE E Backing Rings – B16.5a 1992– Table ASA.150

Part No	Pipe size d	Nominal flange size	Inch size	P (mm)	A (mm)	D (mm)	T (mm)	Bolt holes No. x dia	Bolt
SBE6.000015	15	15	1/2"	67.0	29	95	6.0	4 x 14	M12
SBE6.000020	22	20	3/4"	73.0	34	100	6.0	4 x 14	M12
SBE6.000025	28	25	1"	83.0	40	115	7.0	4 x 14	M12
SBE6.000035	35	32	1 1/4"	87.0	46	120	8.0	4 x 14	M12
SBE6.000040	42	40	1 1/2"	98.0	54	135	9.0	4 x 14	M12
SBE6.000050	Size not relevant								
SBE6.000075	76.1	65	2 1/2"	127	76.1	165	10.0	4 x 18	M16
SBE6.000089	88.9	80	3"	146.0	88.9	184	11.0	4 x 18	M16
SBE6.000100	108	100	4"	178.0	114.3	216	13.0	8 x 18	M16

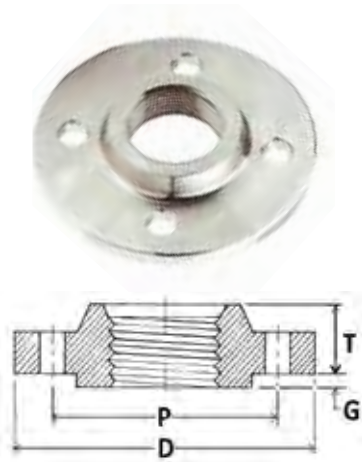
For Backing Rings in 304 grade – change 6 to 4





## 4.3 BACKING RINGS & FLANGES

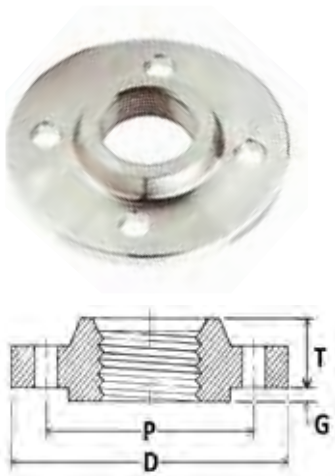
### DIN Scr Flanges EN 1092-1



Part No	Nominal flange size	Inch size	P (mm)	D (mm)	T (mm)	G (mm)	Bolt holes No. x dia	Bolt
SFD6.000015	15	1/2"	65.0	95	16.0	2.0	4 x 14	M12
SFD6.000020	20	3/4"	75.0	105	18.0	2.0	4 x 14	M12
SFD6.000025	25	1"	85.0	115	18.0	2.0	4 x 14	M12
SFD6.000035	32	1 1/4"	100.0	140	18.0	2.0	4 x 18	M16
SFD6.000040	40	1 1/2"	110.0	150	18.0	3.0	4 x 18	M16
SFD6.000050	50	2"	125.0	165	18.0	3.0	4 x 18	M16
SFD6.000065	65	2 1/2"	145.0	185	22.0	3.0	8 x 18	M16
SFD6.000075	80	3"	160.0	200	22.0	3.0	8 x 18	M16
SFD6.000100	100	4"	180.0	220	22.0	3.0	8 x 18	M16
SFD6.000125	125	5"	210.0	250	22.0	3.0	8 x 18	M16
SFD6.000150	150	6"	240.0	285	24.0	3.0	8 x 22	M20

For Screwed Flanges in 304 grade – change 6 to 4

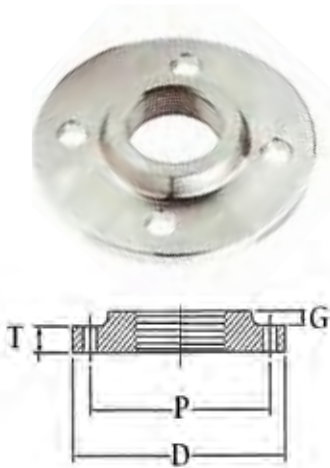
### ANSI Scr Flanges B16.5a 1992 - Table ASA. 150



Part No	Nominal flange size	Inch size	P (mm)	D (mm)	T (mm)	G (mm)	Bolt holes No. x dia	Bolt
SFA6.000015	15	1/2"	60.5	90	14	1.6	4 x 16	M12
SFA6.000020	20	3/4"	70.0	99	14	1.6	4 x 16	M12
SFA6.000025	25	1"	79.5	108	16	1.6	4 x 16	M12
SFA6.000035	32	1 1/4"	89.0	117	19	1.6	4 x 16	M12
SFA6.000040	40	1 1/2"	98.5	127	21	1.6	4 x 16	M12
SFA6.000050	50	2"	120.5	152	24	1.6	4 x 19	M16
SFA6.000065	65	2 1/2"	140	178	27	1.6	4 x 19	M16
SFA6.000075	80	3"	152.5	191	28	1.6	4 x 19	M16
SFA6.000100	100	4"	190.5	229	32	1.6	8 X 19	M16
SFA6.000125	125	5"	216.0	254	35	1.6	8 X 22	M20
SFA6.000150	150	6"	241.5	279	38	1.6	8 X 22	M20

For Screwed Flanges in 304 grade – change 6 to 4

### TABLE E Scr Flanges NP 16 bar AS 2129 1994



Part No	Nominal flange size	Inch size	P (mm)	D (mm)	T (mm)	Bolt holes No. x dia	Bolt
SFE6.000015	15	1/2"	67.0	95	16	4 x 14	M12
SFE6.000020	20	3/4"	73.0	100	17	4 x 14	M12
SFE6.000025	25	1"	83.0	115	18	4 x 14	M12
SFE6.000035	32	1 1/4"	87.0	120	19	4 x 14	M12
SFE6.000040	40	1 1/2"	98.0	135	21	4 x 14	M12
SFE6.000050	50	2"	114.0	150	22	4 x 18	M16
SFE6.000065	65	2 1/2"	127.0	165	26	4 x 18	M16
SFE6.000075	80	3"	146.0	185	27	4 x 18	M16
SFE6.000100	100	4"	178.0	215	33	8 x 18	M16
SFE6.000125	125	5"	210.0	255	33	8 x 18	M16
SFE6.000150	150	6"	235.0	280	36	8 x 22	M20

For Screwed Flanges in 304 grade – change 6 to 4



# 4.5 STAINLESS STEEL GAS AISI 316L

**EUROPRESS**  
STAINLESS STEEL  
CARBON STEEL

## Pipe-Austenitic – 6 metre lengths

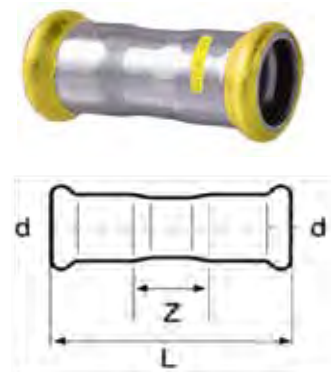
Part No. 316L	ext. Ø [mm]	thickness [mm]	length [m]	weight [kg/m]
STT0.316015	15	1	6	0.351
STT0.316022	22	1.2	6	0.625
STT0.316028	28	1.2	6	0.805
STT0.316035	35	1.5	6	1.258
STT0.316042	42	1.5	6	1.521
STT0.316054	54	1.5	6	1.972
STT0.316076	76.1	2	6	3.711
STT0.316089	88.9	2	6	4.352
STT0.316108	108	2	6	5.308

Stainless steel type 1.4404 (316L) has AS 3688 and DVGW approval for natural gas as per AS 5601.1:2013



## Coupling

Part No.	d	L	Z	weight gram
GPP0.000015	15	52	10	39
GPP0.000022	22	59	13	62
GPP0.000028	28	61	13	78
GPP0.000035	35	72	18	109
GPP0.000042	42	79	15	147
GPP0.000054	54	90	16	205
GPP0.000076	76.1	142	32	604
GPP0.000089	88.9	163	37	837
GPP0.000108	108	192	38	1,193

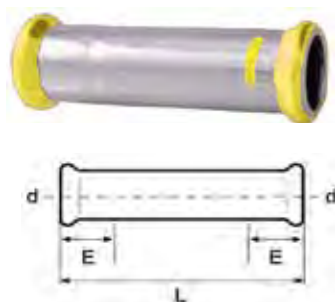


## Reducing Coupling (Spigot x Adaptor) Other Sizes Available

Part No.	d-d1	L	H	weight gram
GSP0.022015	22-15	60	39	45
GSP0.028015	28-15	72	51	56
GSP0.028022	28-22	67	44	65
GSP0.035022	35-22	83	60	98
GSP0.035028	35-28	73	49	112
GSP0.042028	42-28	98	74	140
GSP0.042035	42-35	79	52	120
GSP0.054028	54-28	99	75	193
GSP0.054035	54-35	128	101	237
GSP0.054042	54-42	97	65	191
GSP0.076042	76.1-42	151	119	425
GSP0.076054	76.1-54	140	103	451
GSP0.089054	88.9-54	156	119	586
GSP0.089076	88.9-76.1	156	101	653
GSP0.108054	108-54	204	167	880
GSP0.108076	108-76.1	196	141	978
GSP0.108089	108-88.9	190	127	992







### Slip Coupling

Part No.	d	L	E	weight gram
GPPS.000015	15	71	24	47
GPPS.000022	22	82	27	85
GPPS.000028	28	90	28	114
GPPS.000035	35	99	31	149
GPPS.000042	42	115	35	216
GPPS.000054	54	139	40	316



### Elbow 90°

Part No.	d	L	Z	weight gram	Radius
GPP9.000015	15	48	27	57	1.5d
GPP9.000022	22	60	37	97	1.5d
GPP9.000028	28	71	47	143	1.5d
GPP9.000035	35	87	60	198	1.5d
GPP9.000042	42	115	83	314	1.5d
GPP9.000054	54	142	105	499	1.5d
GPP8.000076	76.1	150	95	977	1.2d
GPP8.000089	88.9	174	111	1,325	1.2d
GPP8.000108	108	215	138	2,091	1.2d



### Elbow 90° with Spigot End

Part No.	d	L	H	Z	weight gram	Radius
GPS9.000015	15	48	56	27	58	1.5d
GPS9.000022	22	60	68	37	98	1.5d
GPS9.000028	28	71	80	47	147	1.5d
GPS9.000035	35	87	93	60	200	1.5d
GPS9.000042	42	115	125	83	331	1.5d
GPS9.000054	54	142	149	105	505	1.5d
GPS8.000076	76.1	150	165	95	982	1.2d
GPS8.000089	88.9	174	190	111	1,317	1.2d
GPS8.000108	108	215	238	138	2,068	1.2d



### Elbow 45°

Part No.	d	L	Z	weight gram	Radius
GPP4.000015	15	37	16	49	1.5d
GPP4.000022	22	44	21	81	1.5d
GPP4.000028	28	51	27	118	1.5d
GPP4.000035	35	59	32	161	1.5d
GPP4.000042	42	77	45	254	1.5d
GPP4.000054	54	88	51	369	1.5d
GPP2.000076	76.1	98	43	773	1.2d
GPP2.000089	88.9	112	49	991	1.2d
GPP2.000108	108	138	61	1,600	1.2d

### Elbow 45° with Spigot End

Part No.	d	L	H	Z	weight gram	Radius
GPS4.000015	15	37	48	16	53	1.5d
GPS4.000022	22	44	53	21	85	1.5d
GPS4.000028	28	51	60	27	117	1.5d
GPS4.000035	35	59	66	32	160	1.5d
GPS4.000042	42	77	80	45	237	1.5d
GPS4.000054	54	88	97	51	366	1.5d
GPS2.000076	76.1	98	117	43	767	1.2d
GPS2.000089	88.9	112	131	49	998	1.2d
GPS2.000108	108	138	154	61	1,510	1.2d



### Adaptor with Female Thread

Part No.	d-Rp	L	H	weight gram
GPF0.015015	15-1/2	53	20	52
GPF0.022015	22-1/2	52	17	77
GPF0.022020	22-3/4	56	20	75
GPF0.022025	22-1	70	31	105
GPF0.028025	28-1	62	22	103
GPF0.035025	35-1	81	38	136
GPF0.035032	35-1 1/4	72	28	170
GPF0.042040	42-1 1/2	74	25	252
GPF0.054040	54-1 1/2	106	52	328



### Adaptor with Male Thread

Part No.	d-R	L	H	weight gram
GPM0.015015	15-1/2	52	31	52
GPM0.022015	22-1/2	68	45	73
GPM0.022020	22-3/4	58	35	74
GPM0.022025	22-1	72	49	116
GPM0.028020	28-3/4	73	49	100
GPM0.028025	28-1	62	38	115
GPM0.035025	35-1	82	55	148
GPM0.035032	35-1 1/4	70	43	165
GPM0.035040	35-1 1/2	84	57	198
GPM0.042040	42-1 1/2	75	43	204
GPM0.054050	54-2	87	50	368
GPM0.076065	76.1- 2 1/2	125	70	820
GPM0.089080	88.9- 3	138	75	1,158



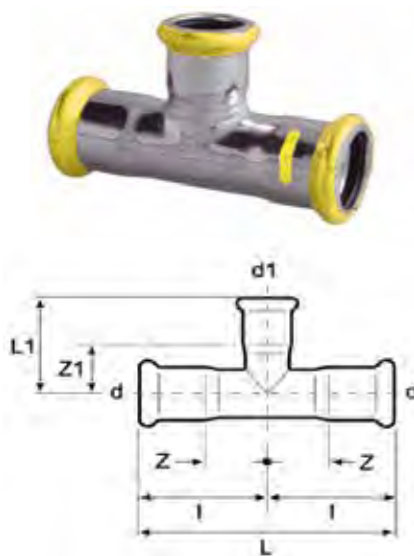


## 90° Female Elbow with Flush Wall Mount



Part No.	d-G [ISO 228]	L	L1	Z	I	I1	H	g	weight gram
GPFL.015015	15-1/2	46	43	25	12	12	34	5	104
GPFL.022020	22-3/4	52	51	29	16	13	40	6	147

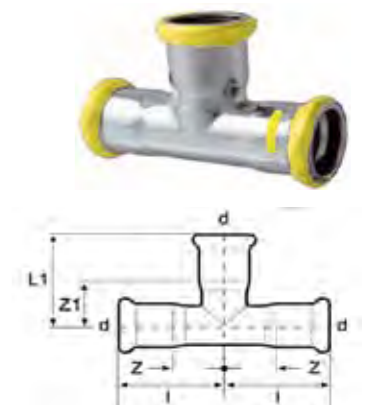
## Reducing Tee



Part No.	d-d1-d	L	L1	Z	Z1	I	weight gram
GPPT.022015	22-15-22	82	39	18	18	41	98
GPPT.028015	28-15-28	92	42	22	21	46	130
GPPT.028022	28-22-28	92	45	22	22	46	140
GPPT.035015	35-15-35	102	45	24	24	51	164
GPPT.035022	35-22-35	102	46	24	23	51	172
GPPT.035028	35-28-35	102	48	24	24	51	175
GPPT.042022	42-22-42	118	51	27	28	59	239
GPPT.042028	42-28-42	118	53	27	29	59	240
GPPT.042035	42-35-42	118	60	27	33	59	242
GPPT.054022	54-22-54	142	57	34	34	71	325
GPPT.054028	54-28-54	142	60	34	36	71	348
GPPT.054035	54-35-54	142	66	34	39	71	344
GPPT.054042	54-42-54	142	64	34	32	71	368
GPPT.076022	76.1-22-76.1	232	68	61	45	116	942
GPPT.076028	76.1-28-76.1	232	71	61	47	116	956
GPPT.076035	76.1-35-76.1	232	75	61	48	116	968
GPPT.076042	76.1-42-76.1	232	79	61	47	116	981
GPPT.076054	76.1-54-76.1	232	80	61	43	116	1,067
GPPT.089022	88.9-22-88.9	262	76	68	53	131	1,256
GPPT.089028	88.9-28-88.9	262	76	68	52	131	1,244
GPPT.089035	88.9-35-88.9	262	83	68	56	131	1,267
GPPT.089042	88.9-42-88.9	262	85	68	53	131	1,271
GPPT.089054	88.9-54-88.9	262	93	68	56	131	1,297
GPPT.108022	108-22-108	312	85	79	62	156	1,919
GPPT.108028	108-28-108	312	88	79	64	156	1,939
GPPT.108035	108-35-108	312	94	79	67	156	1,955
GPPT.108042	108-42-108	312	96	79	64	156	1,886
GPPT.108054	108-54-108	312	102	79	65	156	1,967

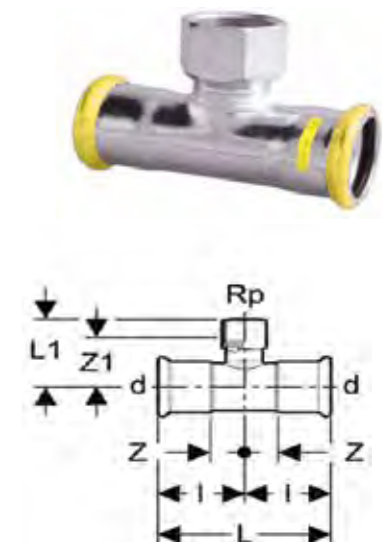
## Equal Tee

Part No.	d	L	L1	Z	Z1	I	weight gram
GPPT.000015	15	74	35	16	14	37	67
GPPT.000022	22	82	40	18	17	41	112
GPPT.000028	28	92	45	22	21	46	149
GPPT.000035	35	102	55	24	28	51	189
GPPT.000042	42	118	61	27	29	59	275
GPPT.000054	54	142	72	34	35	71	382
GPPT.000076	76.1	232	115	61	60	116	1,192
GPPT.000089	88.9	262	127	68	64	131	1,617
GPPT.000108	108	312	155	79	78	156	2,450



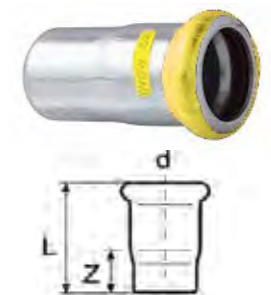
## Female Centred Tee

Part No.	d-Rp	L	L1	Z	Z1	I	weight gram
GPFT.015015	15-1/2-15	74	37	16	25	37	83
GPFT.022015	22-1/2-22	82	41	18	29	41	117
GPFT.022020	22-3/4-22	82	41	18	28	41	131
GPFT.028015	28-1/2-28	92	44	22	32	46	144
GPFT.028020	28-3/4-28	92	45	22	32	46	159
GPFT.035015	35-1/2-35	102	48	24	36	51	178
GPFT.035020	35-3/4-35	102	48	24	35	51	189
GPFT.042015	42-1/2-42	118	46	27	34	59	240
GPFT.054015	54-1/2-54	142	55	34	43	71	362
GPFT.054020	54-3/4-54	142	58	34	45	71	364
GPFT.054050	54-2-54	142	69	34	47	71	523
GPFT.076020	76.1-3/4-76.1	232	68	61	55	116	1,009
GPFT.076050	76.1-2-76.1	232	81	61	59	116	1,194
GPFT.089020	88.9-3/4-88.9	262	87	68	74	131	1,210
GPFT.089050	88.9-2-88.9	262	88	68	66	131	1,450
GPFT.108020	108-3/4-108	312	86	79	73	156	1,956
GPFT.108050	108-2-108	312	98	79	76	156	2,118



## Cap

Part No.	d	L	Z	weight gram
GPE0.000015	15	37	16	27
GPE0.000022	22	41	18	44
GPE0.000028	28	46	22	63
GPE0.000035	35	51	24	81
GPE0.000042	42	59	27	119
GPE0.000054	54	72	35	171







### Elbow Adaptor 90° with Female Thread

Part No.	d-Rp	L	L1	Z	Z1	weight gram
GPFA.015015	15-1/2	53	36	32	24	121
GPFA.022020	22-3/4	57	46	34	33	180
GPFA.028025	28-1	71	54	47	38	329
GPFA.035032	35-1/4	72	62	45	45	455

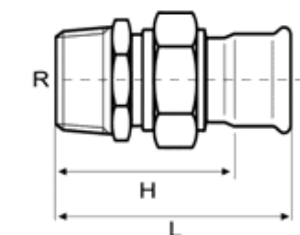


### Elbow Adaptor 90° with Male Thread

Part No.	d-R	L	H	Z	weight gram
GPMA.015015	15-1/2	53	36	32	91
GPMA.022020	22-3/4	58	40	35	145
GPMA.028025	28-1	63	44	39	245
GPMA.035032	35-1/4	71	48	44	338

### Male Barrel Union Brass/Stainless Steel Nut EPDM Flat Seal

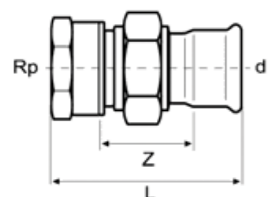
Part No.	D-RP	NUT	L	H	weight gram
GPMQ.015015	15-1/2	BRASS	76	55	147
GPMQ.015020	15-3/4	BRASS	80	59	166
GPMQ.022015	22-1/2	BRASS	80	57	239
GPMQ.022020	22-3/4	BRASS	82	59	222
GPMQ.022025	22-1	BRASS	86	63	256
GPMQ.028025	28-1	BRASS	88	64	360
GPMQ.035032	35-1/4	BRASS	100	73	544
GPMQ.042040	42-1/2	BRASS	106	74	628
GPMQ.054050	54-2	BRASS	122	85	1.008



Part No.	D-RP	NUT	L	H	weight gram
GPMN.015015	15-1/2	ST. STEEL	76	55	147
GPMN.015020	15-3/4	ST. STEEL	80	59	166
GPMN.022015	22-1/2	ST. STEEL	80	57	239
GPMN.022020	22-3/4	ST. STEEL	82	59	222
GPMN.022025	22-1	ST. STEEL	86	63	256
GPMN.028025	28-1	ST. STEEL	88	64	360
GPMN.035032	35-1/4	ST. STEEL	100	73	544
GPMN.042040	42-1/2	ST. STEEL	106	74	628
GPMN.054050	54-2	ST. STEEL	122	85	1.008

### Female Barrel Union Brass/Stainless Steel Nut EPDM Flat Seal

Part No.	D-RP	NUT	L	Z	weight gram
GPFQ.015015	15-1/2	BRASS	73	40	145
GPFQ.015020	15-3/4	BRASS	75	41	182
GPFQ.022020	22-3/4	BRASS	76	40	212
GPFQ.022025	22-1	BRASS	79	40	242
GPFQ.028025	28-1	BRASS	83	43	398
GPFQ.035032	35-1/4	BRASS	93	49	467
GPFQ.042040	42-1/2	BRASS	96	47	562
GPFQ.054050	54-2	BRASS	113	54	973



Part No.	D-RP	NUT	L	Z	weight gram
GPFN.015015	15-1/2	ST. STEEL	73	40	145
GPFN.015020	15-3/4	ST. STEEL	75	41	182
GPFN.022020	22-3/4	ST. STEEL	76	40	212
GPFN.022025	22-1	ST. STEEL	79	40	242
GPFN.028025	28-1	ST. STEEL	83	43	398
GPFN.035032	35-1/4	ST. STEEL	93	49	467
GPFN.042040	42-1/2	ST. STEEL	96	47	562
GPFN.054050	54-2	ST. STEEL	113	54	973

### Seal Ring HNBR (yellow) for Gas

Part No.	Ø	E	C	weight gram
EOOY.000015	15	15	2.6	0.3
EOOY.000022	22	22	3.2	0.7
EOOY.000028	28	28	3.1	0.8
EOOY.000035	35	35	3.1	1.0
EOOY.000042	42	42	4.1	2.2
EOOY.000054	54	54	4.1	2.8
EOOY.000076	76.1	76.8	8	11.5
EOOY.000089	88.9	89.3	8.2	17.5
EOOY.000108	108	108.6	11	33.8



\* Check with technical department before ordering

### FLAT GASKET HNBR (yellow) Gas

Part No.	Ø	A	B	C	weight gram
EGGY.000015	15	15	23	2	0.5
EGGY.000022	22	22.5	29.6	2	0.7
EGGY.000028	28	27	38.6	2	1.4
EGGY.000035	35	35	44.6	2	1.3
EGGY.000042	42	40	50.6	2	1.7
EGGY.000054	54	53.5	67	3	4

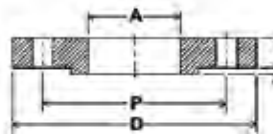




# 4.6 STAINLESS STEEL BACKING RINGS & FLANGES

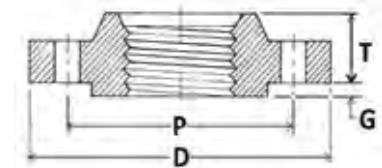
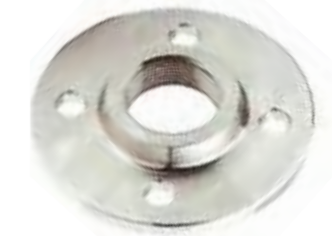
## DIN Backing Rings – EN 1092-1

Part No	Pipe size d	Nominal flange size	Inch size	P (mm)	A (mm)	D (mm)	T (mm)	Bolt holes No. x dia	Bolt
SBD6.000015	15	15	1/2"	65.0	29	95	14.0	4 x 14	M12
SBD6.000020	22	20	3/4"	75.0	34	105	16.0	4 x 14	M12
SBD6.000025	28	25	1"	85.0	40	115	16.0	4 x 14	M12
SBD6.000035	35	32	1 1/4"	100.0	46	140	18.0	4 x 18	M16
SBD6.000040	42	40	1 1/2"	110.0	54	150	18.0	4 x 18	M16
SBD6.000050	Size not relevant								
SBD6.000075	76.1	80	3"	145.0	83	185	20.0	8 x 18	M16
SBD6.000089	88.9	80	3"	160.0	97	200	20.0	8 x 18	M16
SBD6.000100	108	100	4"	180.0	110	220	22.0	8 x 18	M16



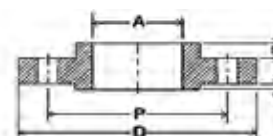
## DIN Scr Flanges EN 1092-1

Part No	Nominal flange size	Inch size	P (mm)	D (mm)	T (mm)	G (mm)	Bolt holes No. x dia	Bolt
SFD6.000015	15	1/2"	65.0	95	16.0	2.0	4 x 14	M12
SFD6.000020	20	3/4"	75.0	105	18.0	2.0	4 x 14	M12
SFD6.000025	25	1"	85.0	115	18.0	2.0	4 x 14	M12
SFD6.000035	32	1 1/4"	100.0	140	18.0	2.0	4 x 18	M16
SFD6.000040	40	1 1/2"	110.0	150	18.0	3.0	4 x 18	M16
SFD6.000050	50	2"	125.0	165	18.0	3.0	4 x 18	M16
SFD6.000065	65	2 1/2"	145.0	185	22.0	3.0	8 x 18	M16
SFD6.000075	80	3"	160.0	200	22.0	3.0	8 x 18	M16
SFD6.000100	100	4"	180.0	220	22.0	3.0	8 x 18	M16
SFD6.000125	125	5"	210.0	250	22.0	3.0	8 x 18	M16
SFD6.000150	150	6"	240.0	285	24.0	3.0	8 x 22	M20



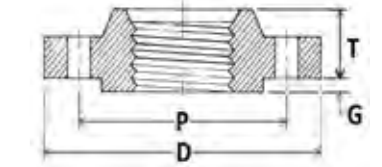
## ANSI Backing Rings – CLASS 150

Part No	Pipe size d	Nominal flange size	Inch size	P (mm)	A (mm)	D (mm)	T (mm)	Bolt holes No. x dia	Bolt
SBA6.000015	15	15	1/2"	60.5	29	90	11.5	4 x 16	M12
SBA6.000020	22	20	3/4"	70.0	34	98	13.0	4 x 16	M12
SBA6.000025	28	25	1"	79.5	40	108	14.5	4 x 16	M12
SBA6.000035	35	32	1 1/4"	89.0	46	117	16.0	4 x 16	M12
SBA6.000040	42	40	1 1/2"	98.5	54	127	17.5	4 x 16	M12
SBA6.000050	Size not relevant								
SBA6.000075	76.1	65	2 1/2"	139.5	83	178	22.5	4 x 20	M16
SBA6.000089	88.9	80	3"	152.5	97	191	24.0	4 x 20	M16
SBA6.000100	108	100	4"	190.5	110	229	24.0	8 X 20	M16



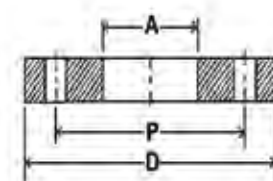
## ANSI Scr Flanges B16.5a 1992 - Table ASA. 150

Part No	Nominal flange size	Inch size	P (mm)	D (mm)	T (mm)	G (mm)	Bolt holes No. x dia	Bolt
SFA6.000015	15	1/2"	60.5	90	14	1.6	4 x 16	M12
SFA6.000020	20	3/4"	70.0	99	14	1.6	4 x 16	M12
SFA6.000025	25	1"	79.5	108	16	1.6	4 x 16	M12
SFA6.000035	32	1 1/4"	89.0	117	19	1.6	4 x 16	M12
SFA6.000040	40	1 1/2"	98.5	127	21	1.6	4 x 16	M12
SFA6.000050	50	2"	120.5	152	24	1.6	4 x 19	M16
SFA6.000065	65	2 1/2"	140	178	27	1.6	4 x 19	M16
SFA6.000075	80	3"	152.5	191	28	1.6	4 x 19	M16
SFA6.000100	100	4"	190.5	229	32	1.6	8 X 19	M16
SFA6.000125	125	5"	216.0	254	35	1.6	8 X 22	M20
SFA6.000150	150	6"	241.5	279	38	1.6	8 X 22	M20



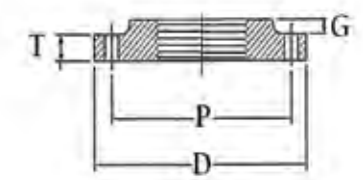
## TABLE E Backing Rings – B16.5a 1992– Table ASA.150

Part No	Pipe size d	Nominal flange size	Inch size	P (mm)	A (mm)	D (mm)	T (mm)	Bolt holes No. x dia	Bolt
SBE6.000015	15	15	1/2"	67.0	29	95	6.0	4 x 14	M12
SBE6.000020	22	20	3/4"	73.0	34	100	6.0	4 x 14	M12
SBE6.000025	28	25	1"	83.0	40	115	7.0	4 x 14	M12
SBE6.000035	35	32	1 1/4"	87.0	46	120	8.0	4 x 14	M12
SBE6.000040	42	40	1 1/2"	98.0	54	135	9.0	4 x 14	M12
SBE6.000050	Size not relevant								
SBE6.000075	76.1	65	2 1/2"	127	76.1	165	10.0	4 x 18	M16
SBE6.000089	88.9	80	3"	146.0	88.9	184	11.0	4 x 18	M16
SBE6.000100	108	100	4"	178.0	114.3	216	13.0	8 x 18	M16



## TABLE E Scr Flanges NP 16 bar AS 2129 1994

Part No	Nominal flange size	Inch size	P (mm)	D (mm)	T (mm)	Bolt holes No. x dia	Bolt
SFE6.000015	15	1/2"	67.0	95	16	4 x 14	M12
SFE6.000020	20	3/4"	73.0	100	17	4 x 14	M12
SFE6.000025	25	1"	83.0	115	18	4 x 14	M12
SFE6.000035	32	1 1/4"	87.0	120	19	4 x 14	M12
SFE6.000040	40	1 1/2"	98.0	135	21	4 x 14	M12
SFE6.000050	50	2"	114.0	150	22	4 x 18	M16
SFE6.000065	65	2 1/2"	127.0	165	26	4 x 18	M16
SFE6.000075	80	3"	146.0	185	27	4 x 18	M16
SFE6.000100	100	4"	178.0	215	33	8 x 18	M16
SFE6.000125	125	5"	210.0	255	33	8 x 18	M16
SFE6.000150	150	6"	235.0	280	36	8 x 22	M20



### Hot Galvanising

Part No.	ext. Ø	thickness	length	weight	
External Only	External & Internal	[mm]	[mm]	[m]	[kg/m]
CTT0.000015	CTT0.INT015	15	1.2	6m	0.408
CTT0.000022	CTT0.INT022	22	1.5	6m	0.758
CTT0.000028	CTT0.INT028	28	1.5	6m	0.980
CTT0.000035	CTT0.INT035	35	1.5	6m	1.239
CTT0.000042	CTT0.INT042	42	1.5	6m	1.498
CTT0.000054	CTT0.INT054	54	1.5	6m	1.942
CTT0.000076	CTT0.INT076	76.1	2	6m	3.655

### Electrolytic Galvanising

Part No.	ext. Ø	thickness	length	weight	
External Only	External & Internal	[mm]	[mm]	[m]	[kg/m]
CTT0.000089	CTT0.INT089	88.9	2	6m	4.286
CTT0.000108	CTT0.INT108	108	2	6m	5.228

### Coupling

Part No.	d	L	Z	weight gram
CPP0.000015	15	52	10	36
CPP0.000022	22	59	13	60
CPP0.000028	28	61	13	77
CPP0.000035	35	72	18	103
CPP0.000042	42	79	15	142
CPP0.000054	54	90	16	202
CPP0.000076	76.1	142	32	619
CPP0.000089	88.9	163	37	817
CPP0.000108	108	192	38	1,204

### Reducing Coupling (Spigot x Adaptor)

Part No.	d-d1	L	H	weigh gram
CSP0.022015	22-15	60	39	42
CSP0.028015	28-15	81	60	62
CSP0.028022	28-22	70	47	67
CSP0.035015	35-15	84	63	84
CSP0.035022	35-22	76	53	95
CSP0.035028	35-28	74	48	87
CSP0.042022	42-22	87	64	177
CSP0.042028	42-28	100	76	128
CSP0.042035	42-35	78	52	115
CSP0.054022	54-22	110	88	185
CSP0.054028	54-28	100	76	185
CSP0.054035	54-35	129	102	206
CSP0.054042	54-42	108	76	189
CSP0.076042	76.1-42	151	119	425
CSP0.076054	76.1-54	145	108	454
CSP0.089054	88.9-54	157	120	591
CSP0.089076	88.9-76.1	157	105	660
CSP0.108054	108-54	204	167	880
CSP0.108076	108-76.1	196	144	948
CSP0.108089	108-88.9	192	133	962

### Slip Coupling

Part No.	d	L	Z	weight gram
CPPS.000015	15	75	24	51
CPPS.000022	22	86	27	81
CPPS.000028	28	92	28	112
CPPS.000035	35	99	31	136
CPPS.000042	42	119	35	203
CPPS.000054	54	145	40	280
CPPS.000076	76.1	230	60	875
CPPS.000089	88.9	262	70	1,200
CPPS.000108	108	304	80	1,705

### Elbow 90° R 1.2

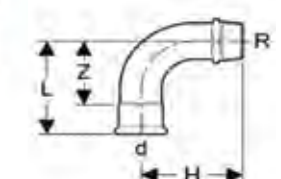
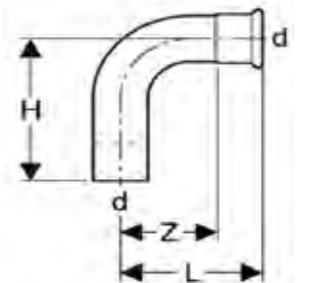
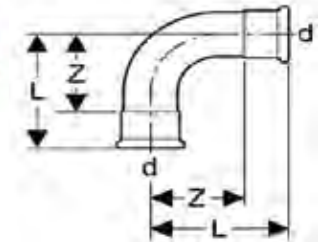
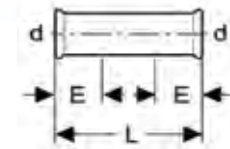
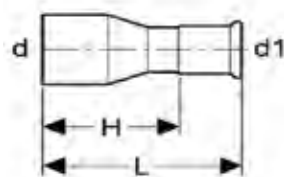
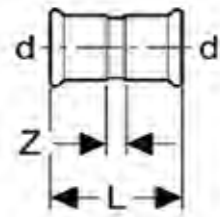
Part No.	d	L	Z	weight gram
CPP8.000015	15	41	20	47
CPP8.000022	22	49	26	78
CPP8.000028	28	59	35	112
CPP8.000035	35	72	45	175
CPP8.000042	42	91	59	246
CPP8.000054	54	110	73	395
CPP8.000076	76.1	150	95	977
CPP8.000089	88.9	174	111	1,324
CPP8.000108	108	215	138	1,991

### Elbow 90° with Spigot End R1.2

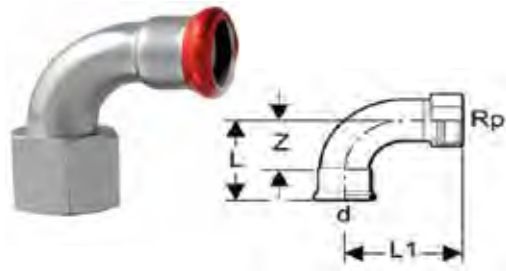
Part No.	d	L	H	Z	weight gram
CPS8.000015	15	41	49	20	47
CPS8.000022	22	49	59	26	80
CPS8.000028	28	59	69	35	113
CPS8.000035	35	72	83	45	175
CPS8.000042	42	91	96	59	250
CPS8.000054	54	110	116	73	392
CPS8.000076	76.1	150	166	95	991
CPS8.000089	88.9	174	190	111	1,329
CPS8.000108	108	215	230	138	1,988

### Elbow Adaptor 90° with Male Thread

Part No.	d	R	L	H	Z	weight gram
CPM9.015010	15	3/8	41	39	20	54
CPM9.015015	15	1/2	41	40	20	62
CPM9.022020	22	3/4	49	54	26	100
CPM9.028025	28	1	59	68	35	180
CPM9.035032	35	1 1/4	72	102	45	259
CPM9.042040	42	1 1/2	91	116	59	375
CPM9.054050	54	2	110	142	73	670







### Elbow Adaptor 90° with Female Thread

Part No.	d	Rp	L	L1	Z	weight gram
CPF9.015010	15	3/8	41	44	20	60
CPF9.015015	15	1/2	41	44	20	74
CPF9.022020	22	3/4	49	56	26	119
CPF9.028015	28	1/2	59	64	35	97

### Elbow 45° with Spigot End R1.2

Part No.	d	L	H	Z	weight gram
CPS2.000015	15	30	42	9	39
CPS2.000022	22	35	47	12	66
CPS2.000028	28	41	47	17	90
CPS2.000035	35	36	66	29	153
CPS2.000042	42	63	70	31	202
CPS2.000054	54	75	82	38	316
CPS2.000076	76.1	98	119	43	800
CPS2.000089	88.9	113	130	50	1,054
CPS2.000108	108	138	160	61	1,580

### Elbow 45° R 1.2

Part No.	d	L	Z	weight gram
CPP2.000015	15	30	9	39
CPP2.000022	22	35	12	63
CPP2.000028	28	41	17	90
CPP2.000035	35	56	29	150
CPP2.000042	42	63	31	201
CPP2.000054	54	75	38	304
CPP2.000076	76.1	98	43	800
CPP2.000089	88.9	113	50	1,034
CPP2.000108	108	138	61	1,550

### Short Elbow Adaptor 90° with Male Thread

Part No.	d	R	L	H	Z	weight gram
CPMA.015010	15	3/8	34	23	13	82
CPMA.015015	15	1/2	34	28	13	95
CPMA.022020	22	3/4	39	36	16	189

### Short Elbow Adaptor 90° with Female Thread

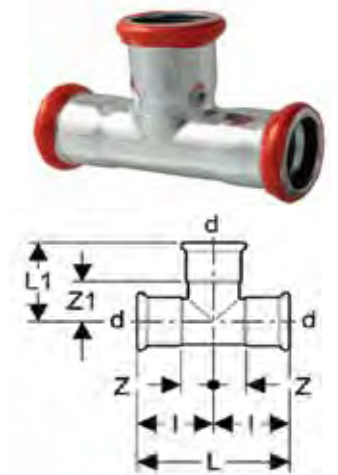
Part No.	d	Rp	L	L1	Z	Z1	weight gram
CPFA.015015	15	1/2	36	27	15	15	173
CPFA.022015	22	1/2	42	40	19	28	254
CPFA.022020	22	3/4	42	30	19	17	285
CPFA.028015	28	1/2	47	43	23	31	436

### Equal Tee

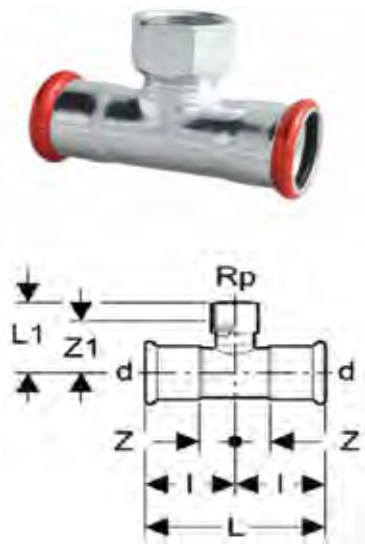
Part No.	d	L	L1	Z	Z1	I	weight gram
CPPT.000015	15	74	36	16	15	37	67
CPPT.000022	22	82	43	18	20	41	109
CPPT.000028	28	92	46	22	22	46	144
CPPT.000035	35	102	55	24	28	51	189
CPPT.000042	42	118	60	27	28	59	270
CPPT.000054	54	142	73	34	36	71	396
CPPT.000076	76.1	232	121	61	66	116	1,150
CPPT.000089	88.9	262	126	68	63	131	1,600
CPPT.000108	108	312	152	79	75	156	2,319

### Reducing Tee

Part No.	d-d1-d	L	L1	Z	Z1	I	weight gram
CPPT.022015	22-15-22	82	40	18	19	41	98
CPPT.028015	28-15-28	92	42	22	21	46	126
CPPT.028022	28-22-28	92	46	22	23	46	135
CPPT.035015	35-15-35	102	45	24	24	51	159
CPPT.035022	35-22-35	102	48	24	25	51	169
CPPT.035028	35-28-35	102	50	24	25	51	178
CPPT.042015	42-15-42	118	52	27	31	59	224
CPPT.042022	42-22-42	118	54	27	31	59	233
CPPT.042028	42-28-42	118	53	27	29	59	239
CPPT.042035	42-35-42	118	57	27	30	59	254
CPPT.054015	54-15-54	142	54	34	33	71	349
CPPT.054022	54-22-54	142	56	34	33	71	360
CPPT.054028	54-28-54	142	59	34	35	71	339
CPPT.054035	54-35-54	142	64	34	37	71	350
CPPT.054042	54-42-54	142	68	34	36	71	378
CPPT.076022	76.1-22-76.1	232	68	61	45	116	942
CPPT.076028	76.1-28-76.1	232	71	61	47	116	956
CPPT.076035	76.1-35-76.1	232	75	61	48	116	968
CPPT.076042	76.1-42-76.1	232	79	61	47	116	981
CPPT.076054	76.1-54-76.1	232	80	61	43	116	1,050
CPPT.089022	88.9-22-88.9	262	76	68	53	131	1,256
CPPT.089028	88.9-28-88.9	262	75.5	68	51.5	131	1,244
CPPT.089035	88.9-35-88.9	262	83	68	56.5	131	1,267
CPPT.089042	88.9-42-88.9	262	85	68	53	131	1,271
CPPT.089054	88.9-54-88.9	262	92.5	68	55.5	131	1,297
CPPT.089076	88.9-76.1-88.9	262	128	68	73	131	1,500
CPPT.108022	108-22-108	312	85	79	62	156	1,838
CPPT.108028	108-28-108	312	87.5	79	63.5	156	1,939
CPPT.108035	108-35-108	312	93.5	79	66	156	1,955
CPPT.108042	108-42-108	312	96	79	64	156	1,886
CPPT.108054	108-54-108	312	102	79	65	156	1,967
CPPT.108076	108-76.1-108	312	125.2	79	70.2	156	2,147
CPPT.108089	108-88.9-108	312	135	79	72	156	2,184



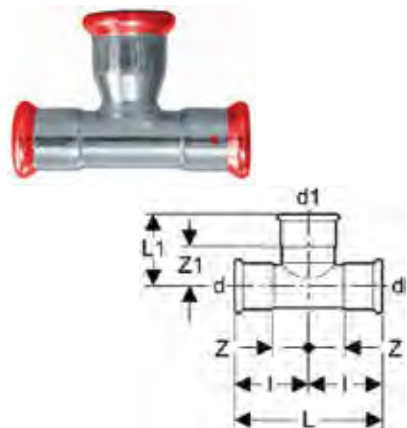
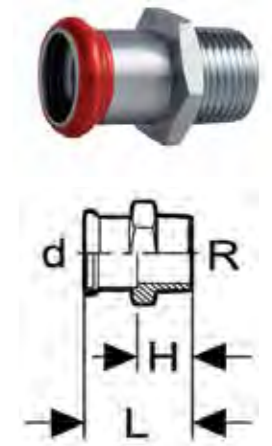
### Female Centred Tee



Part No.	d-Rp-d	L	L1	Z	Z1	I	weight gram
CPFT.015015	15-1/2-15	74	38	16	23	37	82
CPFT.022015	22-1/2-22	82	42	18	30	41	113
CPFT.022020	22-3/4-22	82	43	18	30	41	120
CPFT.028015	28-1/2-28	92	44	22	32	46	140
CPFT.028020	28-3/4-28	92	45	22	32	46	159
CPFT.035015	35-1/2-35	102	48	24	36	51	176
CPFT.035020	35-3/4-35	102	48	24	35	51	191
CPFT.042015	42-1/2-42	118	46	27	34	59	250
CPFT.042020	42-3/4-42	118	51	27	38	59	255
CPFT.054015	54-1/2-54	142	58	34	46	74	333
CPFT.054020	54-3/4-54	142	59	34	46	74	350
CPFT076020	76.1-3/4-76.1	232	69	61	56	116	950
CPFT.089020	88.9-3/4-88.9	262	76	68	63	131	1,240
CPFT.108020	108-3/4-108	312	86	79	73	156	1,830

### Adaptor with Male Thread

Part No.	d	R	L	H	weight gram
CPM0.015010	15	3/8	43	22	41
CPM0.015015	15	1/2	43	22	55
CPM0.015020	15	3/4	44	23	87
CPM0.022015	22	1/2	44	21	75
CPM0.022020	22	3/4	45	22	95
CPM0.022025	22	1	47	24	154
CPM0.028020	28	3/4	47	23	101
CPM0.028025	28	1	49	25	107
CPM0.035032	35	1 1/4	54	27	169
CPM0.035040	35	1 1/2	54	27	172
CPM0.042040	42	1 1/2	58	26	226
CPM0.054050	54	2	69	32	368
CPM0.076065	76.1	2 1/2	123	68	830
CPM0.089080	88.9	3	134	71	1,160
CPM0.108100	108	4	156	78	2,005

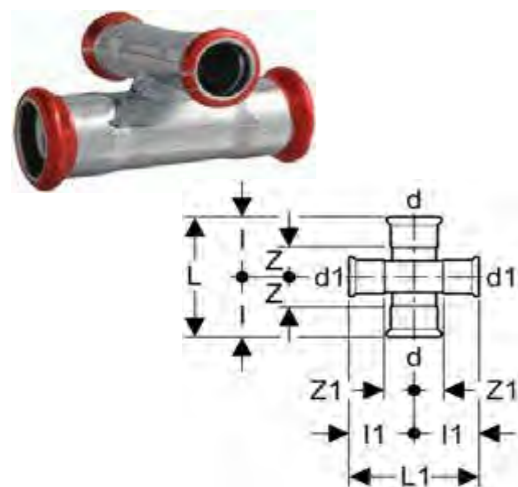
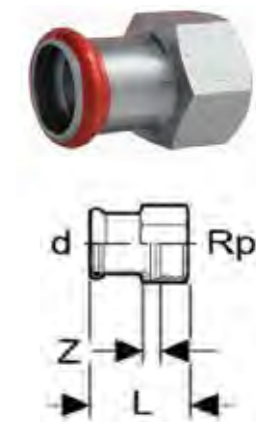


### Large Inlet Tee

Part No.	d-d1-d	L	L1	Z	Z1	I	weight gram
CPPT.015022	15-22-15	74	42	16	19	37	84
CPPT.022028	22-28-22	82	45	18	21	41	123

### Adaptor with Female Thread

Part No.	d	Rp	L	Z	weight gram
CPF0.015010	15	3/8	35	4	65
CPF0.015015	15	1/2	37	4	70
CPF0.015020	15	3/4	38	4	71
CPF0.022015	22	1/2	37	3	87
CPF0.022020	22	3/4	40	4	80
CPF0.022025	22	1	43	4	114
CPF0.028015	28	1/2	45	9	191
CPF0.028020	28	3/4	43	6	139
CPF0.028025	28	1	45	5	119
CPF0.035025	35	1	45	8	130
CPF0.035032	35	1 1/4	73	25	300
CPF0.045032	42	1 1/2	75	20	270
CPF0.054050	54	2	85	18	360



### Off Centre Cross

Part No.	d	d1	L	L1	Z	Z1	I	I1	weight gram
CPPX.015015	15	15	74	74	16	16	37	37	100
CPPX.022015	22	15	82	74	18	16	41	37	130
CPPX.028015	28	15	92	74	22	16	46	37	156
CPPX.028022	28	22	92	82	22	18	46	41	186
CPPX.035022	35	22	102	82	18	18	51	41	218
CPPX.042022	42	22	118	82	27	18	59	41	280
CPPX.054022	54	22	142	82	34	18	71	41	376

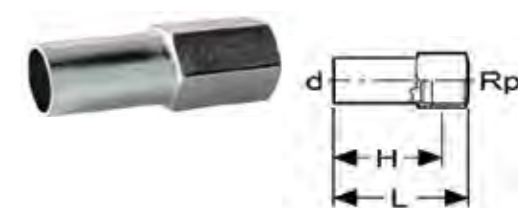
### Adaptor with Male Thread and Spigot End

Part No.	d	R	H	weight gram
CSM0.015015	15	1/2	57	70
CSM0.022015	22	1/2	57	77
CSM0.022020	22	3/4	59	105



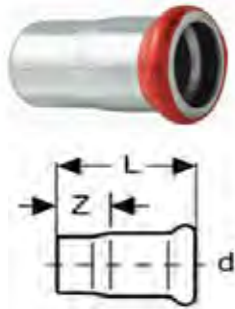
### Adaptor with Female Thread and Spigot End

Part No.	d	Rp	L	Z	weight gram
CSF0.015010	15	3/8	74	64	57
CSF0.015015	15	1/2	61	49	60
CSF0.022015	22	1/2	61	49	65
CSF0.022020	22	3/4	65	52	93



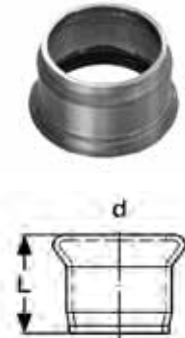


### Cap



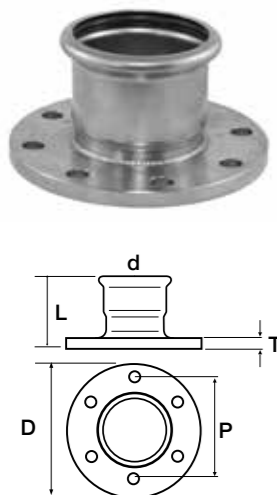
Part No.	d	L	Z	weight gram
CPE0.000015	15	38	17	27
CPE0.000022	22	42	19	45
CPE0.000028	28	46	22	62
CPE0.000035	35	51	24	79
CPE0.000042	42	59	27	123
CPE0.000054	54	73	36	179
CPE0.000076	76.1	95	40	361
CPE0.000089	88.9	115	52	495
CPE0.000108	108	130	53	707

### Welding Joint



Part No.	d	L	weight gram
CPB0.000015	15	25	17
CPB0.000022	22	27	29
CPB0.000028	28	30	36
CPB0.000035	35	34	50
CPB0.000042	42	38	65
CPB0.000054	54	44	97
CPB0.000076	76.1	68	282
CPB0.000089	88.9	78	375
CPB0.000108	108	94	578

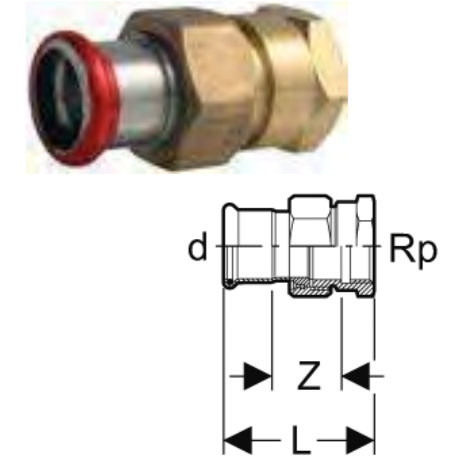
### Adaptor Flange (large) Table E standard DIN & ANSI available



Part No	Pipe size d	Nominal flange size	Inch size	P (mm)	D (mm)	T (mm)	L (mm)	Bolt holes No. x dia	Bolt
CPEF.015015	15	15	1/2"	67.0	95	6.0	29.0	4x14	M12
CPEF.022020	22	20	3/4"	73.0	100	6.0	31.0	4x14	M12
CPEF.028025	28	25	1"	83.0	115	7.0	35.0	4x14	M12
CPEF.035032	35	32	1 1/4"	87.0	120	8.0	40.0	4x14	M12
CPEF.042040	42	40	1 1/2"	98.0	135	9.0	45.0	4x14	M12
CPEF.054050	54	50	2"	114.0	150	10.0	52.0	4x18	M16
CPEF.076065	76.1	65	2 1/2"	146.0	185	11.0	77.0	4x18	M16
CPEF.089080	88.9	80	3"	146.0	185	11.0	91.0	4x18	M16
CPEF.108100	108	100	4"	178.0	215	13.0	107.0	8x18	M16

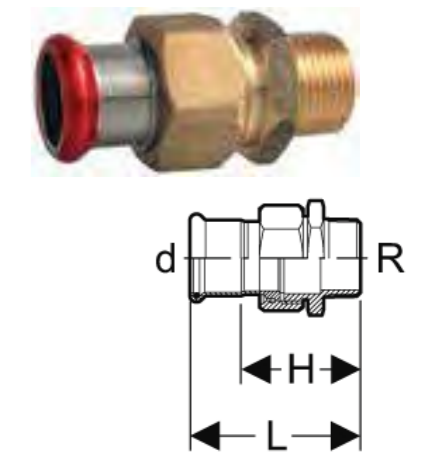
### Female Barrel Union Adaptor Brass Nut EPDM Flat Seal

Part No.	d	Rp	NUT	L	Z	weight gram
CPFQ.015015	15	1/2	BRASS	59	26	188
CPFQ.015020	15	3/4	BRASS	61	26	157
CPFQ.022020	22	3/4	BRASS	63	27	184
CPFQ.022025	22	1	BRASS	66	28	212
CPFQ.028025	28	1	BRASS	71	31	388
CPFQ.035032	35	1 1/4	BRASS	77	32	429
CPFQ.042040	42	1 1/2	BRASS	82	33	509
CPFQ.054050	54	2	BRASS	95	37	872



### Male Barrel Union Adaptor Brass Nut EPDM Flat Seal

Part No.	d	R	NUT	L	Z	weight gram
CPMQ.015015	15	1/2	BRASS	61	40	136
CPMQ.015020	15	3/4	BRASS	63	42	124
CPMQ.022015	22	1/2	BRASS	67	44	210
CPMQ.022020	22	3/4	BRASS	68	45	195
CPMQ.022025	22	1	BRASS	73	50	227
CPMQ.028025	28	1	BRASS	75	51	384
CPMQ.035032	35	1 1/4	BRASS	80	53	462
CPMQ.042040	42	1 1/2	BRASS	85	53	560
CPMQ.054050	54	2	BRASS	97	60	863



### Roll Groove Adaptor

Part No.	d	D	L	Z	weight gram
CPR0.028025	28	33.7	74	50	152
CPR0.035032	35	42.4	79	52	212
CPR0.042040	42	48.3	86	54	260
CPR0.054050	54	60.3	99	62	367
CPR0.076065	76.1	76.1	108	53	802
CPR0.089080	88.9	88.9	119	56	991
CPR0.108100	108	114.4	128	51	1055



## 15° Bend

Part No.	d	H1	H	K	K1	weight gram
CSS1.000015	15	122	60	21	83	76
CSS1.000022	22	124	50	7	81	110
CSS1.000028	28	136	45	7	47	146
CSS1.000035	35	234	62	30	110	381
CSS1.000042	42	276	94	41	144	558
CSS1.000054	54	337	117	65	165	869
CSS1.000076	76.1	230	226	65	65	1.607
CSS1.000089	88.9	260	240	80	80	2.109
CSS1.000108	108	291	222	95	95	2.546

## 30° Bend

Part No.	d	H1	H	K	K1	weight gram
CSS3.000015	15	122	60	21	83	76
CSS3.000022	22	124	50	6	80	110
CSS3.000028	28	130	54	7	47	144
CSS3.000035	35	218	80	30	110	382
CSS3.000042	42	274	98	44	144	560
CSS3.000054	54	324	137	65	165	905
CSS3.000076	76.1	200	202	66	66	1.41
CSS3.000089	88.9	262	264	80	80	2.183
CSS3.000108	108	259	272	95	95	2.622

## 45° Bend

Part No.	d	H1	H	K	K1	weight gram
CSS4.000015	15	120	62	19	77	76
CSS4.000022	22	120	56	7	71	111
CSS4.000028	28	122	58	2	66	146
CSS4.000035	35	206	94	20	132	380
CSS4.000042	42	262	114	1	149	576
CSS4.000054	54	321	146	37	212	928
CSS4.000076	76.1	225	225	69	69	1.577
CSS4.000089	88.9	267	267	103	103	2.323
CSS4.000108	108	293	293	66	66	2.901

## 60° Bend

Part No.	d	H1	H	K	K1	weight gram
CSS6.000015	15	122	60	21	83	76
CSS6.000022	22	118	60	5	63	112
CSS6.000028	28	116	71	7	47	140
CSS6.000035	35	226	101	30	110	383
CSS6.000042	42	251	124	44	145	564
CSS6.000054	54	308	162	65	165	889
CSS6.000076	76.1	219	223	70	70	1.479
CSS6.000089	88.9	250	257	80	80	1.996
CSS6.000108	108	288	298	95	95	2.78

## 90° Bend

Part No.	d	H1	H	K	K1	weight gram
CSS9.000015	15	120	70	22	72	88
CSS9.000022	22	120	70	9	59	132
CSS9.000028	28	125	97	7	47	190
CSS9.000035	35	201	121	62	62	359
CSS9.000042	42	254	160	90	90	553
CSS9.000054	54	302	202	45	45	877
CSS9.000076	76.1	250	250	62	60	1.752
CSS9.000089	88.9	291	291	90	90	2.532
CSS9.000108	108	364	364	45	45	3.604

## Pipe Bridge

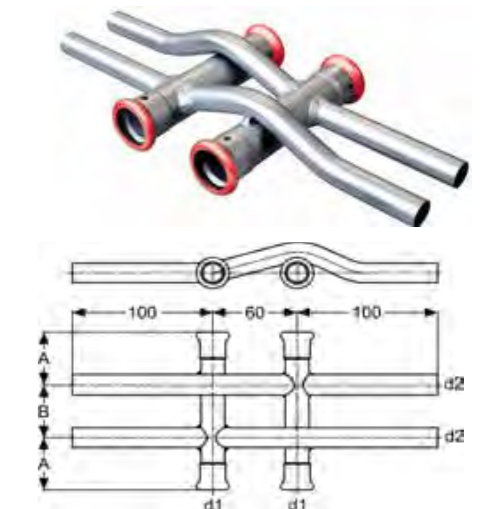
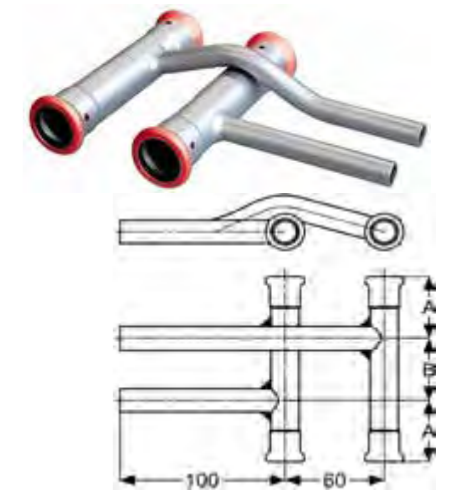
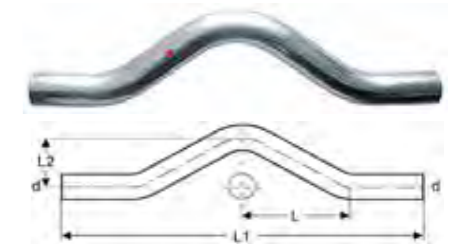
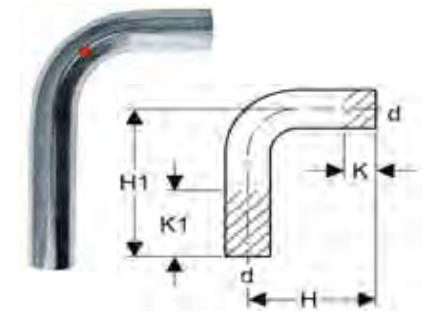
Part No.	d	L1	L2	L	weight gram
CSSB.00015	15	37	64	64	110
CSSB.00022	22	42	58	58	159
CSSB.00028	28	50	102	102	335

## Single Crossover

Part No.	d1-d2	A	B	weight gram
CPSI.015015	15-15	40	40	250
CPSI.022015	22-15	40	40	320
CPSI.028015	28-15	40	40	450

## Double Crossover

Part No.	d1 -d2	A	B	weight gram
CPSH.015015	15-15	40	40	355
CPSH.022015	22-15	40	40	420
CPSH.028015	28-15	40	40	560
CPSH.035015	35-15	40	40	660





## 5.2 GALVANISED THREADED FLANGES

### DIN Scr Flanges EN 1092-1



Part No	Pipe size d	Nominal flange size	Inch size	P (mm)	D (mm)	T (mm)	G (mm)	Bolt holes No. x dia	Bolt
CFDF.000015	15	15	1/2"	65.0	95	14.0	2.0	4 x 14	M12
CFDF.000020	22	20	3/4"	75.0	105	16.0	2.0	4 x 14	M12
CFDF.000025	28	25	1"	85.0	115	16.0	2.0	4 x 14	M12
CFDF.000035	35	32	1 1/4"	100.0	140	18.0	2.0	4 x 18	M16
CFDF.000040	42	40	1 1/2"	110.0	150	18.0	3.0	4 x 18	M16
CFDF.000050	54	50	2"	125.0	165	20.0	3.0	4 x 18	M16
CFDF.000065	76.1	65	2 1/2"	145.0	185	20.0	3.0	8 x 18	M16
CFDF.000080	88.9	80	3"	160.0	200	20.0	3.0	8 x 18	M16
CFDF.000100	108	100	4"	180.0	220	22.0	3.0	8 x 18	M16
CFDF.000125	139	125	5"	210.0	250	22.0	3.0	8 x 18	M16
CFDF.000150	168	150	6"	240.0	285	24.0	3.0	8 x 22	M20

### ANSI Scr Flanges B16.5a 1992 - Table ASA. 150



Part No	Pipe size d	Nominal flange size	Inch size	P (mm)	D (mm)	T (mm)	G (mm)	Bolt holes No. x dia	Bolt
CFAF.000015	15	15	1/2"	60.5	90	9.7	4.5	4 x 16	M12
CFAF.000020	22	20	3/4"	70.0	99	11.2	3.0	4 x 16	M12
CFAF.000025	28	25	1"	79.5	108	12.7	3.0	4 x 16	M12
CFAF.000035	35	32	1 1/4"	89.0	117	14.2	4.9	4 x 16	M12
CFAF.000040	42	40	1 1/2"	98.5	127	15.7	4.9	4 x 16	M12
CFAF.000050	54	50	2"	120.5	152	17.5	6.4	4 x 19	M16
CFAF.000065	76.1	65	2 1/2"	139.7	177.8	20.6	6.3	4 x 19	M16
CFAF.000080	88.9	80	3"	152.5	191	22.4	6.0	4 x 19	M16
CFAF.000100	108	100	4"	190.5	229	22.4	9.4	8 X 19	M16
CFAF.000125	139	125	5"	216.0	254	22.4	12.7	8 X 22	M20
CFAF.000150	168	150	6"	241.5	279	23.9	14.2	8 X 22	M20

### TABLE E Scr Flanges NP 16 bar AS 2129 1994

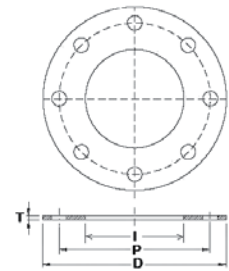


Part No	Pipe size d	Nominal flange size	Inch size	P (mm)	D (mm)	T (mm)	G (mm)	Bolt holes No. x dia	Bolt
CFEF.000015	15	15	1/2"	67.0	95	6.0	9.5	4 x 14	M12
CFEF.000020	22	20	3/4"	73.0	100	6.0	11.1	4 x 14	M12
CFEF.000025	28	25	1"	83.0	115	7.0	11.1	4 x 14	M12
CFEF.000035	35	32	1 1/4"	87.0	120	8.0	11.1	4 x 14	M12
CFEF.000040	42	40	1 1/2"	98.0	135	9.0	12.7	4 x 14	M12
CFEF.000050	54	50	2"	114.0	150	10.0	12.7	4 x 18	M16
CFEF.000065	76.1	65	2 1/2"	127	165.1	10.3	15.9	4 x 18	M16
CFEF.000080	88.9	80	3"	146.0	185	11.0	15.9	4 x 18	M16
CFEF.000100	108	100	4"	178.0	215	13.0	19	8 x 18	M16
CFEF.000125	139	125	5"	210.0	255	14.0	20	8 x 18	M16
CFEF.000150	168	150	6"	235.0	280	17.0	20	8 x 22	M20

# 6.1 GASKETS

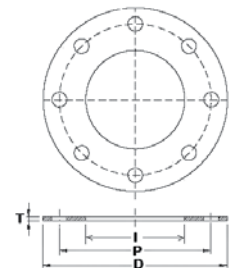
## DIN Gaskets EPDM

Part No	Pipe size (mm)	Nominal flange size	Inch size	P (mm)	I (mm)	D (mm)	T (mm)	Bolt holes No. x dia
EGDE.000015	15	15	1/2"	65	22	95	3	4 x 14
EGDE.000020	22	20	3/4"	75	27.0	105	3	4 x 14
EGDE.000025	28	25	1"	85	34.0	115	3	4 x 14
EGDE.000032	35	32	1 1/4"	100	43	140	3	4 x 18
EGDE.000040	42	40	1 1/2"	110	49	150	3	4 x 18
EGDE.000050	54	50	2"	125	61	165	3	4 x 18
EGDE.000065	76.1	65	2 1/2"	145	77	185	3	8 x 18
EGDE.000080	88.9	80	3"	160	89	200	3	8 x 18
EGDE.000100	108	100	4"	180	115	220	3	8 x 18
EGDE.000125	139	125	5"	210	141	250	3	8 x 18
EGDE.000150	168	150	6"	240	169	285	3	8 x 22



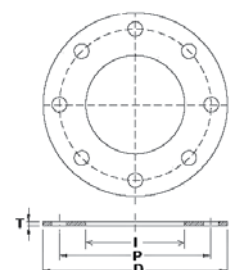
## DIN Gaskets NBR

Part No	Pipe size (mm)	Nominal flange size	Inch size	P (mm)	I (mm)	D (mm)	T (mm)	Bolt holes No. x dia
EGDR.000015	15	15	1/2"	65	22	95	3	4 x 14
EGDR.000020	22	20	3/4"	75	27.0	105	3	4 x 14
EGDR.000025	28	25	1"	85	34.0	115	3	4 x 14
EGDR.000032	35	32	1 1/4"	100	43	140	3	4 x 18
EGDR.000040	42	40	1 1/2"	110	49	150	3	4 x 18
EGDR.000050	54	50	2"	125	61	165	3	4 x 18
EGDR.000065	76.1	65	2 1/2"	145	77	185	3	8 x 18
EGDR.000080	88.9	80	3"	160	89	200	3	8 x 18
EGDR.000100	108	100	4"	180	115	220	3	8 x 18
EGDR.000125	139	125	5"	210	141	250	3	8 x 18
EGDR.000150	168	150	6"	240	169	285	3	8 x 22



## DIN Gaskets FPM (known as FKM)

Part No	Pipe size (mm)	Nominal flange size	Inch size	P (mm)	I (mm)	D (mm)	T (mm)	Bolt holes No. x dia
EGDG.000015	15	15	1/2"	65	22	95	3	4 x 14
EGDG.000020	22	20	3/4"	75	27.0	105	3	4 x 14
EGDG.000025	28	25	1"	85	34.0	115	3	4 x 14
EGDG.000032	35	32	1 1/4"	100	43	140	3	4 x 18
EGDG.000040	42	40	1 1/2"	110	49	150	3	4 x 18
EGDG.000050	54	50	2"	125	61	165	3	4 x 18
EGDG.000065	76.1	65	2 1/2"	145	77	185	3	8 x 18
EGDG.000080	88.9	80	3"	160	89	200	3	8 x 18
EGDG.000100	108	100	4"	180	115	220	3	8 x 18
EGDG.000125	139	125	5"	210	141	250	3	8 x 18
EGDG.000150	168	150	6"	240	169	285	3	8 x 22







**Table E Gaskets EPDM**

Part No	Pipe size (mm)	Nominal flange size	Inch size	P (mm)	I (mm)	D (mm)	T (mm)	Bolt holes No. x dia
EGEE.000015	15	15	1/2"	67	21	95	3	4 x 14
EGEE.000020	22	20	3/4"	73	27.0	101	3	4 x 14
EGEE.000025	28	25	1"	83	34.0	114	3	4 x 14
EGEE.000032	35	32	1 1/4"	87	43	121	3	4 x 14
EGEE.000040	42	40	1 1/2"	98	48	133	3	4 x 14
EGEE.000050	54	50	2"	114	60	152	3	4 x 19
EGEE.000065	76.1	65	2 1/2"	127	76	165	3	4 x 19
EGEE.000080	88.9	80	3"	146	89	184	3	4 x 19
EGEE.000100	108	100	4"	178	114	216	3	4 x 19
EGEE.000125	139	125	5"	210	140	254	3	8 x 17
EGEE.000150	168	150	6"	235	168	279	3	8 x 22

**ANSI Gaskets Class 150 EPDM**

Part No	Pipe size (mm)	Nominal flange size	Inch size	P (mm)	I (mm)	D (mm)	T (mm)	Bolt holes No. x dia
EGAE.000015	15	15	1/2"	61	21	89	3	4 x 14
EGAE.000020	22	20	3/4"	70	26.9	99	3	4 x 14
EGAE.000025	28	25	1"	79	33.3	108	3	4 x 14
EGAE.000032	35	32	1 1/4"	89	42	118	3	4 x 14
EGAE.000040	42	40	1 1/2"	99	49	127	3	4 x 14
EGAE.000050	54	50	2"	121	61	152	3	4 x 18
EGAE.000065	76.1	65	2 1/2"	140	73	178	3	4 x 18
EGAE.000080	88.9	80	3"	152	89	191	3	4 x 18
EGAE.000100	108	100	4"	191	114	229	3	8 X 19
EGAE.000125	139	125	5"	216	141	254	3	8 X 19
EGAE.000150	168	150	6"	241	168	279	3	8 X 22



**Table E Gaskets NBR**

Part No	Pipe size (mm)	Nominal flange size	Inch size	P (mm)	I (mm)	D (mm)	T (mm)	Bolt holes No. x dia
EGER.000015	15	15	1/2"	67	21	95	3	4 x 14
EGER.000020	22	20	3/4"	73	27.0	101	3	4 x 14
EGER.000025	28	25	1"	83	34.0	114	3	4 x 14
EGER.000032	35	32	1 1/4"	87	43	121	3	4 x 14
EGER.000040	42	40	1 1/2"	98	48	133	3	4 x 14
EGER.000050	54	50	2"	114	60	152	3	4 x 19
EGER.000065	76.1	65	2 1/2"	127	76	165	3	4 x 19
EGER.000080	88.9	80	3"	146	89	184	3	4 x 19
EGER.000100	108	100	4"	178	114	216	3	4 x 19
EGER.000125	139	125	5"	210	140	254	3	8 x 17
EGER.000150	168	150	6"	235	168	279	3	8 x 22

**ANSI Gaskets Class 150 NBR**

Part No	Pipe size (mm)	Nominal flange size	Inch size	P (mm)	I (mm)	D (mm)	T (mm)	Bolt holes No. x dia
EGAR.000015	15	15	1/2"	61	21	89	3	4 x 14
EGAR.000020	22	20	3/4"	70	26.9	99	3	4 x 14
EGAR.000025	28	25	1"	79	33.3	108	3	4 x 14
EGAR.000032	35	32	1 1/4"	89	42	118	3	4 x 14
EGAR.000040	42	40	1 1/2"	99	49	127	3	4 x 14
EGAR.000050	54	50	2"	121	61	152	3	4 x 18
EGAR.000065	76.1	65	2 1/2"	140	73	178	3	4 x 18
EGAR.000080	88.9	80	3"	152	89	191	3	4 x 18
EGAR.000100	108	100	4"	191	114	229	3	8 X 19
EGAR.000125	139	125	5"	216	141	254	3	8 X 19
EGAR.000150	168	150	6"	241	168	279	3	8 X 22

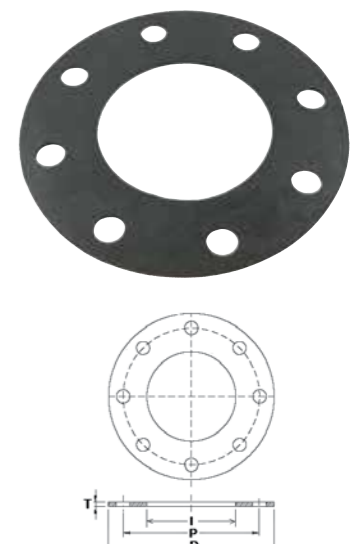


**Table E Gaskets FPM (known as FKM)**

Part No	Pipe size (mm)	Nominal flange size	Inch size	P (mm)	I (mm)	D (mm)	T (mm)	Bolt holes No. x dia
EGEG.000015	15	15	1/2"	67	21	95	3	4 x 14
EGEG.000020	22	20	3/4"	73	27.0	101	3	4 x 14
EGEG.000025	28	25	1"	83	34.0	114	3	4 x 14
EGEG.000032	35	32	1 1/4"	87	43	121	3	4 x 14
EGEG.000040	42	40	1 1/2"	98	48	133	3	4 x 14
EGEG.000050	54	50	2"	114	60	152	3	4 x 19
EGEG.000065	76.1	65	2 1/2"	127	76	165	3	4 x 19
EGEG.000080	88.9	80	3"	146	89	184	3	4 x 19
EGEG.000100	108	100	4"	178	114	216	3	4 x 19
EGEG.000125	139	125	5"	210	140	254	3	8 x 17
EGEG.000150	168	150	6"	235	168	279	3	8 x 22

**ANSI Gaskets Class 150 FPM (known as FKM)**

Part No	Pipe size (mm)	Nominal flange size	Inch size	P (mm)	I (mm)	D (mm)	T (mm)	Bolt holes No. x dia
EGAG.000015	15	15	1/2"	61	21	89	3	4 x 14
EGAG.000020	22	20	3/4"	70	26.9	99	3	4 x 14
EGAG.000025	28	25	1"	79	33.3	108	3	4 x 14
EGAG.000032	35	32	1 1/4"	89	42	118	3	4 x 14
EGAG.000040	42	40	1 1/2"	99	49	127	3	4 x 14
EGAG.000050	54	50	2"	121	61	152	3	4 x 18
EGAG.000065	76.1	65	2 1/2"	140	73	178	3	4 x 18
EGAG.000080	88.9	80	3"	152	89	191	3	4 x 18
EGAG.000100	108	100	4"	191	114	229	3	8 X 19
EGAG.000125	139	125	5"	216	141	254	3	8 X 19
EGAG.000150	168	150	6"	241	168	279	3	8 X 22



## 6.2 O-RINGS



\* Check with technical department before ordering

### Seal Ring EPDM (black) for potable water STANDARD for stainless and carbon steel

Part No.	Ø	E	C	weight gram
E00E.000015	15	15	2.6	0.3
E00E.000022	22	22	3.2	0.7
E00E.000028	28	28	3.1	0.8
E00E.000035	35	35	3.1	1.0
E00E.000042	42	42	4.1	2.2
E00E.000054	54	54	4.1	2.8
E00E.000076	76.1	76.8	8	11.5
E00E.000089	88.9	89.3	8.2	17.5
E00E.000108	108	108.6	11	33.8

### Seal Ring FPM (green) for Oil, Hydrocarbon up to 180° C

Part No.	Ø	E	C	weight gram
E00G.000015	15	15	2.6	0.3
E00G.000022	22	22	3.2	0.7
E00G.000028	28	28	3.1	0.8
E00G.000035	35	35	3.1	1.0
E00G.000042	42	42	4.1	2.2
E00G.000054	54	54	4.1	2.8
E00G.000076	76.1	76.8	8	11.5
E00G.000089	88.9	89.3	8.2	17.5
E00G.000108	108	108.6	11	33.8

### Seal Ring HNBR (yellow) for Gas

Part No.	Ø	E	C	weight gram
E00Y.000015	15	15	2.6	0.3
E00Y.000022	22	22	3.2	0.7
E00Y.000028	28	28	3.1	0.8
E00Y.000035	35	35	3.1	1.0
E00Y.000042	42	42	4.1	2.2
E00Y.000054	54	54	4.1	2.8
E00Y.000076	76.1	76.8	8	11.5
E00Y.000089	88.9	89.3	8.2	17.5
E00Y.000108	108	108.6	11	33.8

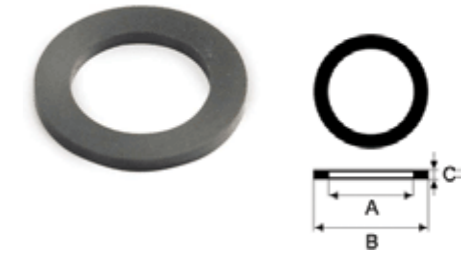


\* Check with technical department before ordering

## 6.3 FLAT GASKETS

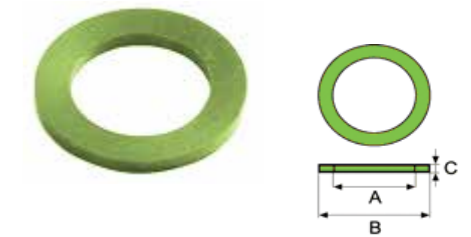
### FLAT GASKET EPDM (black) Potable Water

Part No.	Ø	A	B	C	weight gram
EGGE.000015	15	15	23	2	0.5
EGGE.000022	22	22.5	29.6	2	0.7
EGGE.000028	28	27	38.6	2	1.4
EGGE.000035	35	35	44.6	2	1.3
EGGE.000042	42	40	50.6	2	1.7
EGGE.000054	54	53.5	67	3	4



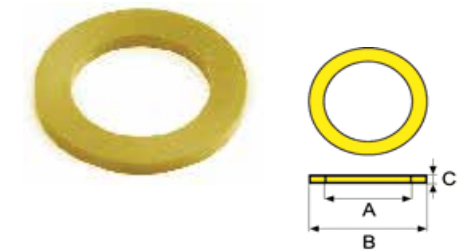
### FLAT GASKET FPM (green) Oil, Hydrocarbon to 180° C

Part No.	Ø	A	B	C	weight gram
EGGG.000015	15	15	23	2	0.5
EGGG.000022	22	22.5	29.6	2	0.7
EGGG.000028	28	27	38.6	2	1.4
EGGG.000035	35	35	44.6	2	1.3
EGGG.000042	42	40	50.6	2	1.7
EGGG.000054	54	53.5	67	3	4



### FLAT GASKET HNBR (yellow) Gas

Part No.	Ø	A	B	C	weight gram
EGGY.000015	15	15	23	2	0.5
EGGY.000022	22	22.5	29.6	2	0.7
EGGY.000028	28	27	38.6	2	1.4
EGGY.000035	35	35	44.6	2	1.3
EGGY.000042	42	40	50.6	2	1.7
EGGY.000054	54	53.5	67	3	4



### O-RINGS and FLAT GASKETS

Made of synthetic rubber they guarantee that a joint is hermetically sealed. In no instance can common commercially available O-rings be substituted. Depending on the application, o-rings with the following materials are used:

**EPDM - black** (commonly associated to WATER applications)

The standard material, available in diameters from 15 to 168.3 mm, suitable for temperatures between -20 and +120 °C and for pressures up to a maximum of 16 bar. It has a host of applications and is used for drinking water, heating, cooling, steam, fire fighting, compressed air (oil free) and inert gas systems.

**HNBR - yellow** (commonly associated to GAS applications)

This material is used in gas systems. It is available in diameters from 15 to 108 mm and is suitable for temperatures between -20 and +70 °C and for pressures up to a maximum of 5 bar.

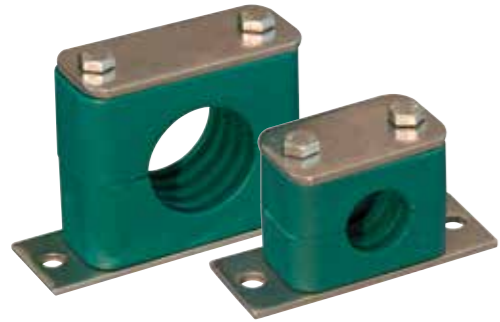
**FPM – green**, coinciding with FKM

This material is used for particularly testing conditions, with temperatures between -20 and + 180 °C and for pressures up to a maximum of 16 bar. It is available in diameters from 12 to 108 mm and is particularly suitable for solar systems. It is not recommended for systems with the presence of steam.

To fully understand the compatibility of the seals with the various types of fluids a brief chemical compatibility list is on page 73. All applications should be confirmed with the Technical department. Temperature, pressure and exact chemical specification needs to be known.

Flat seals are used in barrel union assemblies and as such are subject to multiple deformations when assembling/ disassembling unions. The manufacturer recommends that seals are replaced each time the joint is disassembled.





Order Code

**Kova Clamp** **K S L P G . 4 2 0 1 5 0**

**Plates & Bolts**  
S: 316  
U: 304  
Z: Galvanised

**Series**  
L: Light  
T: Twin  
H: Heavy

**Interior Surface**  
G: Grooved  
S: Smooth

**Material**  
P: Polypropylene  
M: Polyamide  
A: Aluminium Alloy  
C: Steel  
O: POM  
S: Stainless Steel

**Clamp Body Group**

**Combination**

**Pipe O.D.**

Order Code

**Kova Clamp** **K S H P G . 4 2 0 7 6 1**

**Plates & Bolts**  
S: 316  
U: 304  
Z: Galvanised

**Series**  
L: Light  
T: Twin  
H: Heavy

**Interior Surface**  
G: Grooved  
S: Smooth

**Material**  
P: Polypropylene  
M: Polyamide  
A: Aluminium Alloy  
C: Steel  
O: POM  
S: Stainless Steel

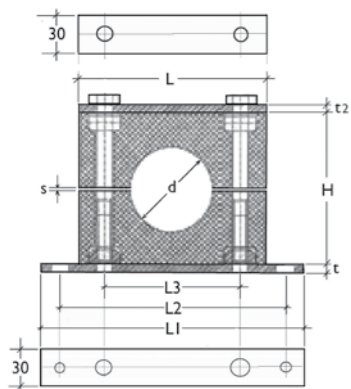
**Clamp Body Group**

**Combination**

**Pipe O.D.**

### Light Duty Clamp Sets

Light series Combination 4  
Bolted base, Hex head bolts, Cover plate, Clamp body, Long base plate



Part No	Clamp body group	d dia.	dia. code	L	L1	L2	L3	H	S tension clearance	t	t2
KZLPG.420150	2	15	0150	42	70	56	26	33	0.6	3	3
KZLPG.430220	3	22	0220	50	78	64	33	36	0.6	3	3
KZLPG.440280	4	28	0280	59	87	73	40	42	0.6	3	3
KZLPG.450350	5	35	0350	71	100	86	52	58	0.8	3	3
KZLPG.450420	5	42	0420	71	100	86	52	58	0.8	3	3
KZLPG.460540	6	54	0540	86	115	100	66	66	0.8	3	3
KZLPG.470761	7	76.1	0761	121	150	136	94	93	0.8	3	5
KZLPG.480889	8	88.9	0889	147	178	162	120	118	0.8	3	5

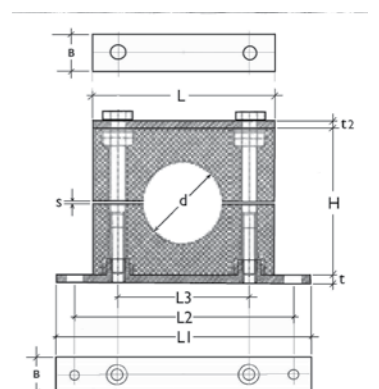
Other Sizes Available on Request

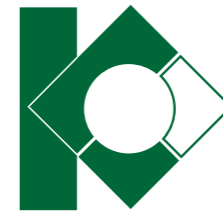
### Heavy Duty Clamp Sets

Heavy series Combination 4  
Long base plate, Clamp body, Hex head bolts, Cover plate

Part No	Clamp body group	d dia.	dia. code	L	L1	B	L2	L3	H	s	t	t2
KZHPG.450761	5	76.1	0761	150	238	60	198	122	120	3	10	8
KZHPG.450889	5	88.9	889	150	238	60	198	122	120	3	10	8
KZHPG.461080	6	108	1080	205	309	80	259	168	167	4	15	12
KZHPG.471400	7	140	1400	250	370	90	310	205	200	4	15	12
KZHPG.471680	7	168	1680	250	370	90	310	205	200	4	15	12

Other Sizes Available on Request





**Kova Clamp** **K S L P G . 9 2 0 1 5 0**

**Plates & Bolts**  
S: 316  
U: 304  
Z: Galvanised

**Series**  
L: Light  
T: Twin  
H: Heavy

**Interior Surface**  
G: Grooved  
S: Smooth

**Material**  
P: Polypropylene  
M: Polyamide  
A: Aluminium Alloy  
C: Steel  
O: POM  
S: Stainless Steel

**Order Code**  
K S L P G . 9 2 0 1 5 0  
K: Kova Clamp  
S: Plates & Bolts  
L: Series  
P: Material  
G: Interior Surface  
. 9: Combination  
2: Clamp Body Group  
0 1 5 0: Pipe O.D.

**Order Code**  
K H P G . 9 6 0 5 4 0  
K: Kova Clamp  
H: Series  
P: Material  
G: Interior Surface  
. 9: Combination  
6 0 5 4 0: Pipe O.D.

**Series**  
L: Light  
T: Twin  
H: Heavy

**Material**  
P: Polypropylene  
M: Polyamide  
A: Aluminium Alloy  
C: Steel  
O: POM  
S: Stainless Steel

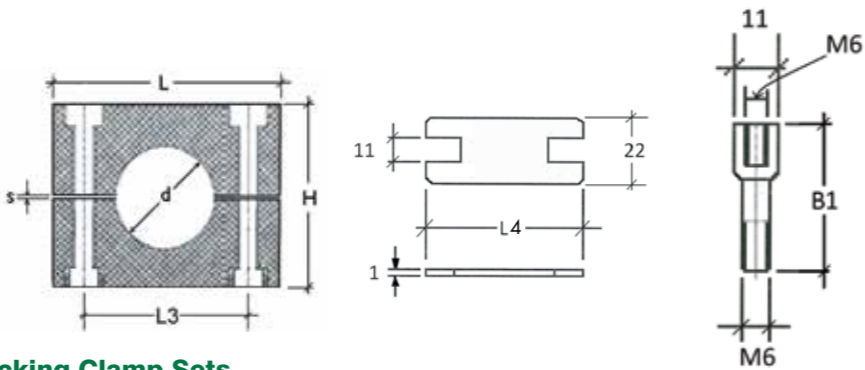
**Interior Surface**  
G: Grooved  
S: Smooth



Stacking Bolts

Lock Plate

Clamp Body

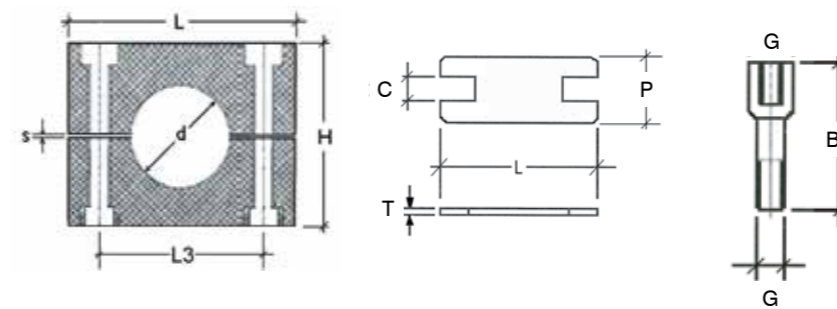


**Stacking Clamp Sets**

Light Series Combination 9  
1 Clamp body, 1 Safety locking plate, 2 Stacking bolts  
(Base plate separate option)

Part No	Clamp body group	d dia.	dia. code	L	L3	H	S tension clearance	L4 Lock Plate	B1 Bolt
KZLPG.920150	2	15	0150	42	26	33	0.6	40	40
KZLPG.930220	3	22	0220	50	33	36	0.6	47	44
KZLPG.940280	4	28	0280	59	40	42	0.6	56	48
KZLPG.950350	5	35	0350	71	52	58	0.8	69	64
KZLPG.950420	5	42	0420	71	52	58	0.8	69	64
KZLPG.960540	6	54	0540	86	66	66	0.8	85	73
KZLPG.970761	7	76.1	0761	121	94	93	0.8	117	99
KZLPG.980889	8	88.9	0889	147	120	118	0.8	143	124

Other Sizes Available on Request

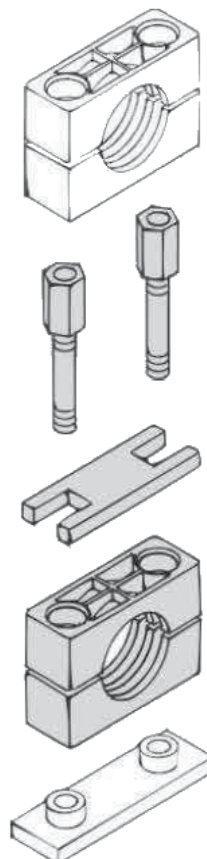


**Stacking Clamp Sets**

Heavy series Combination 9  
1 Clamp body, 1 Safety locking plate, 2 Stacking bolts  
(Base plate separate option)

Part #	Clamp body group	d dia.	dia. code	inch OD	L	L3	H	s	P	C	T	G	B1
KZHGP.45761	5	76.1	0761	2½	150	122	120	3	60	22	8	M16	144
KZHGP.45889	5	88.9	889	3	150	122	120	3	60	22	8	M16	
KZHGP.46108	6	108	1080	4	205	168	167	4	80	28	12	M20	200
KZHGP.47140	7	140	1400	5	250	205	200	4	90	31	12	M24	240
KZHGP.47168	7	168	1680	6	250	205	200	4	90	31	12	M24	240

Other Sizes Available on Request



Stacking Bolts

Lock Plate

Clamp Body

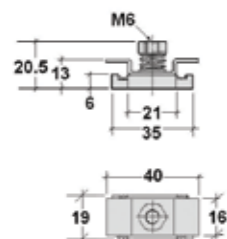
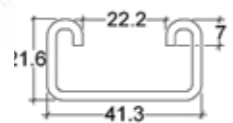
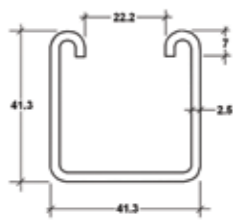


## 6.5 KOVA PIPE CLAMP



Strut components

Universal Strut,  
Strut nut



### Kova Clamp components

Universal Strut

Part No.	Description
T1000GB	Universal Strut 41.3 X 41.3 X 6 metre Galvanised
T1000SS	Universal Strut 41.3 X 41.3 X 6 metre Stainless steel

Part No.	Description
T3300GB	Universal Strut 41.3 X 21.6 X 6 metre Galvanised
T3300SS	Universal Strut 41.3 X 21.6 X 6 metre Stainless steel

Strut nut

Part No.	Description
KSN	Strut nut. zinc coated Strut nuts are specifically designed for bolting Kova clamps to universal strut. Other universal strut components are available in galvanized or SS check with sales dept.

## 6.6 BOLTED CLIPS

### Bolted Clip Head Stainless Steel

Part No.	Description
HSNP000015	S.S. Bolted Clip Head M10
HSNP000022	S.S. Bolted Clip Head M10
HSNP000028	S.S. Bolted Clip Head M10
HSNP000035	S.S. Bolted Clip Head M10
HSNP000042	S.S. Bolted Clip Head M10
HSNP000054	S.S. Bolted Clip Head M10
HSNP000076	S.S. Bolted Clip Head M10
HSNP000089	S.S. Bolted Clip Head M10
HSNP000108	S.S. Bolted Clip Head M10
HSNP000140	S.S. Bolted Clip Head M12
HSNP000168	S.S. Bolted Clip Head M12



### Bolted Clip Head Insulated Zinc

Part No.	Pipe size	Description
HZIP012015	15	Insulated Zinc Bolted Clip Head M10
HZIP020025	22	Insulated Zinc Bolted Clip Head M10
HZIP026028	28	Insulated Zinc Bolted Clip Head M10
HZIP032035	35	Insulated Zinc Bolted Clip Head M10
HZIP040042	42	Insulated Zinc Bolted Clip Head M10
HZIP050054	54	Insulated Zinc Bolted Clip Head M10
HZIP074076	76.1	Insulated Zinc Bolted Clip Head M10
HZIP083090	88.9	Insulated Zinc Bolted Clip Head M10
HZIP108114	108	Insulated Zinc Bolted Clip Head M10
HZIP140144	139.7	Insulated Zinc Bolted Clip Head M10
HZIP165169	168.3	Insulated Zinc Bolted Clip Head M10



### Mounting Plate Stainless Steel

Part No.	Description
HSCMP10SS	Stainless Steel mounting plate M 10



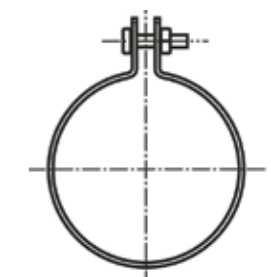
### All Thread Stainless Steel

Part No.	Description
HSROD10SS	Allthread Stainless Steel 10mm 3m



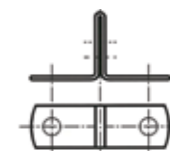
### Clip Head Stainless Steel

Part No.	Description
HUNP000015	S.S. Clip head w bolt, no bracket
HUNP000022	S.S. Clip head w bolt, no bracket
HUNP000028	S.S. Clip head w bolt, no bracket
HUNP000035	S.S. Clip head w bolt, no bracket
HUNP000042	S.S. Clip head w bolt, no bracket
HUNP000054	S.S. Clip head w bolt, no bracket
HUNP000076	S.S. Clip head w bolt, no bracket



### Tee Bracket Stainless Steel

Part No.	Description
HTNP015108	Tee Bracket Stainless Steel



## 7.1 PRESSING TOOLS

The pressing process is achieved using pressing tools with a range of jaw attachments that vary according to the fitting and pipe diameters.

Various types of pressing tools are commercially available:

- **electromechanical tools**, either battery or mains-powered versions (18V or 240 V), may be used for the full range of diameters
- **electrohydraulic tools** are used primarily for larger diameters, from 76.1 to 168 mm.

The Europress System can be used with a wide variety of pressing tools, provided that these are equipped with Europress approved “M”-profile jaws. Please refer to the technical department to ensure the proposed presstool is suitable for the Europress system.

### Features and benefits common to all these 3 models below

- LED display of tool information
- LED light illuminates workpiece
- “Quickstop” function for extra safety
- “Autostop” extends battery and tool life
- HPC monitoring gives precise press force
- Jaws rotate approx 350° for max access
- 2 component grip
- Automatic piston return
- Ergonomic design
- Mains power option

### TB02 unique features

- Compact lightweight unit only 1.7Kg without jaws, 2.3Kg incl. jaws
- 18volt/1.5Ah Li-ion Makita battery
- Constant thrust for nominal sizes up to 28mm
- One-handed operation
- Interchangeable mini jaws 15, 22, 28
- Short press cycle 5–6 seconds
- 15 min charge time
- 1.5 Ah produces 150 pressings (NS20),
- 3.0 Ah produces 300+ pressings (NS20)

### TB05 unique features

- Compact lightweight unit only 3.5Kg
- 18volt/3.0 Ah Li-ion Makita battery
- Constant thrust for nominal sizes to 54mm
- One-handed operation
- Interchangeable jaws or pressing chain
- Short press cycle
- 22 min charge time
- 3.0 Ah produces 300+ pressings (NS20)

### TB08 unique features

- Compact unit only 4.3Kg
- 18volt/3.0 Ah Li-ion Makita battery
- Constant thrust for nominal sizes to 108mm
- One-handed operation
- Interchangeable jaws or pressing chains
- Short press cycle
- 22 min charge time
- 3.0 Ah produces 300+ pressings (NS20)

The Comfort-line range of press tools have many valuable features to make working easier, faster and safer. The LED indicators located under the transparent start button gives information about the battery condition and the status of the pressing units or non-conformances.

### TB03

- 1.7Kg including battery
- One hand operation
- Rotatable head
- 240W
- 30mm stroke
- 19 kN piston force
- Patented no leak internal seal design
- 40 – 180 press cycles

- 30 / 60 min charge time
- Suitable for 15, 22 & 28 mm sizes (use MK...Y series jaws)
- Takes either 12volt 1.5 Ah or 3.0 Ah Li-ion Milwaukee batteries



### TB06

- 2.8 Kg including battery
- 450W
- 32 kN piston force
- 40 mm piston stroke
- 80 – 160 press cycles
- 30 / 60 min charge time
- Brushless motor technology
- Data downloadable with NovoCheck app
- 2 year maintenance interval with unlimited press cycles

- Suitable for up to 35mm sizes (use MJ...Y series jaws)
- Suitable for 42 mm & 54 sizes (use press collars with TA054Y adaptor)
- Takes either 18volt 1.5 Ah or 3.0 Ah Li-ion Milwaukee batteries



### TB09

- 3.9 Kg including battery
- 450W
- 32 kN piston force
- 80 mm piston stroke
- Up to 250 press cycles
- 30 / 60 min charge time
- Brushless motor technology
- Back stroke limitation for smaller sizes saves time
- Data downloadable with NovoCheck app
- 2 year maintenance interval with unlimited press cycles

- Suitable for up to 35mm sizes (use MJ...Y jaws)
- Suitable for 42 & 54 mm sizes (use press collars with TA054Y adaptor)
- Suitable for 76, 89 & 108 mm sizes (use press collars with TA221 & TA222 adaptor)
- Takes either 18volt 1.5 Ah or 3.0 Ah Li-ion Milwaukee batteries



### TB10

- Press sizes - suitable for 76 - 168 sizes, using MU collars
- Weight incl. permanently attached adaptor jaw, incl battery 13kg
- 18 volt/3.0 Ah Li-ion battery
- Power consumption 400 W
- Piston force 100 kN
- Piston stroke 60 mm
- Battery capacity 15-20 press cycles
- Charging time approx 60 min
- Jaws rotate 180°





## Features and benefits of the EUROPRESS TB02, TB05 & TB08 tools

Now the latest models have Increased efficiency through modern communication technology making a completely wireless connection to your tool to receive reliable information about the work done so far and the status of the tool.

You can record each and every crimp. The integrated memory system allows you to save your project-specific pressing data and provide it to customers, for instance.

Check out all important tool data and get a pdf log which shows you the performance parameter.

The new software is downloadable under <http://www.klauke.com/support/download/connectivity-select-tool-data/> or download at **Apple App Store** or **Google Play Store**.

The **“Quickstop”** function on the motor permits an immediate reaction if the operator realises they have made potential mistake. As soon as the trigger is released, the tool comes to an immediate standstill — without even the slightest follow-up movement — so that the user can make the necessary corrections without delay.

The **“Autostop”** function advises the user that the pressing operation has finished. This function reduces tool wear and prolongs battery life.

**“Low battery”** When 20% battery power remains: visual LED signal

**“Service”** notification: visual LED signal

**“Pressure Deviation”** audible signal buzzer

Key data such as the tool’s year of manufacture, serial number, revision status of the integrated machine parts, number of pressing cycles and the last or next service are also downloadable by our Service Centre and by the new i-press software hence guaranteeing the best possible service result.

The high-contrast OLED display provides an overview of your pressing performance, so you can see the charge status of the integrated quality Bosch or Makita battery.



It is recommended to follow the use and maintenance methods for tools and jaws as set by the manufacturer closely, including:

- Regularly checking the working surfaces of the jaws
- Frequently cleaning the jaws with a degreaser
- keeping the jaws correctly lubricated
- when the batteries come to the end of their life, dispose according to local regulations



No claim will be accepted, unless the compliance with the maintenance programme specified by the manufacturers is documented.

Only use M profile jaws and chains, the use of jaws and chain with a V profile, or supposedly declared valid for both M and V profiles is absolutely not tolerated for any diameter.

EuroPress tools are **environmentally friendly**, and use exclusively synthetic hydraulic oils. These oils are highly biodegradable and harmless to water and are tested to the most stringent standards and are available worldwide.

**Improved ergonomics and comfort.** The EuroPress tool incorporates a 2-component plastic housing with soft inlay, which gives a pleasant, secure grip, prevents slipping and avoids pressure points in the grip area. The optimised centre of gravity makes work effortless - even when continuously assembling overhead.

**Optimum illumination.** The new, integrated workplace illumination for EuroPress tools makes it easier to identify the pressing location and to correctly mount the pressing jaw on the fittings in difficult light conditions.

**Hydraulic Pressure Check, HPC** for short, monitors the oil pressure in the tool’s oil circuit, hence ensuring a continuous, consistent press quality. During each pressing cycle, the achieved pressing pressure is determined by a pressure sensor and compared to the required minimum value. An audible warning signal sounds if the achieved pressure differs from the specified working pressure. The user will know immediately that the fitting has not been pressed to the correct pressure and the fitting must be replaced and the tool must be serviced. If three consecutive pressings occur outside the required pressure range, the tools switch off automatically and must be sent in for service.



## Features and benefits of the EUROPRESS TB03, TB06, TB09 & TB10 tools

These 4 models now feature **Bluetooth** wireless technology device related data which can be transferred or downloaded with the **Novocheck app**.



The **LED indicators** that surround the ‘On’ button are an easy visual indicator of the tool function.

The new Comfortline range have reduced weight and improved design making the tools even handier and easier to use

for overhead situations. Even in difficult lighting conditions, the new **LED illumination** of the press area makes installation easier.

The need for maintenance is significantly reduced due to the new **brushless motor technology** and up to 40% more press cycles per battery charge.



## Advantages

- Low weight
- Illumination of the Press area
- No limitation of the number of press cycles within the 2 year maintenance cycle
- Rotatable head
- Backstroke limitation means faster turnaround between pressings
- 24 month warranty

The NovoCheck-App connects Smartphone Technology with Pressing Technology. With the bluetooth connection between the tool and the mobile phone or tablet the operator will have the possibility to retrieve device-related data.

By controlling the force build-up, through the functionality of the LEDs the operator will determine whether its tool works properly without the help of the servicepoint due to the NovoCheck-App.

In addition, the NovoCheck-App offers the user the opportunity to read out the tools logbook. Due to an integrated clock, performed pressings can be reviewed and downloaded to confirm if successful. Moreover, thanks to an implemented report function, the operator will be able to document performed pressings by creating a construction site pdf report. The files will be stored in the app and can be called up and sent by email or printed out anytime.

## Features

- Data transfer between pressing tool and app
- Possibility to check the pressing tool’s current status
- Analysis of the pressing tool performance
- Integrated report function for documentation of the installation

### TOOLCHECK

- General info
- Tool check
- Settings
- Logbook
- Press data
- Report



### DEVICE DATA

- Maintenance record
- Hours used
- Tool temp C
- Battery voltage
- Error count



Press cycle performance



Logbook record of presses



# 7.1 PRESS TOOLS AND ACCESSORIES

## PRESS TOOLS, PRESS HEADS, JAWS, CHAINS & ADAPTORS



Part No.	Description	Sizes	Weight
TB02	compact one-hand press tool	15, 22, 28	2.3 Kg
TB05	balanced pistol style press tool	15, 22, 28, 35, 42, 54	3.5 Kg
TB08	balanced pistol style press tool	15, 22, 28, 35, 42, 54, 76, 89, 108	4.3 Kg



Part No.	Description	To suit
MK015	15 mm Jaw mini	TB02 mini crimp tool
MK022	22 mm Jaw mini	TB02 mini crimp tool
MK028	28 mm Jaw mini	TB02 mini crimp tool



Part No.	Description	To Suit	Comments
MJ015	15 mm press Jaw	TB05 & TB08	
MJ022	22 mm press Jaw	TB05 & TB08	
MJ028	28 mm press Jaw	TB05 & TB08	
MJ035	35 mm press Jaw	TB05 & TB08	
MC042	42 mm Pressing Chain	TB05 & TB08	Requires TA054 Adaptor
MC054	54 mm Pressing Chain	TB05 & TB08	Requires TA054 Adaptor
TA054	42/54 Chain adaptor	TB05 & TB08	suits MC042 & MC054



Part No.	Description	To Suit	Comments
MC076	76.1 mm Pressing Chain	TB08	Requires TA108 Adaptor
MC089	88.9 mm Pressing Chain	TB08	Requires TA108 Adaptor
MC108	108 mm Pressing Chain	TB08	Requires TA108 Adaptor
TA108	Jaw Adaptor	TB08	suits 76,89 & 108 press chains



Part No.	Description	To Suit	Comments
TD054	Pressing Chain set 42, 54mm, Adaptor	TB 05 & TB08	Complete in metal case



Press Tools TB02, TB05 & TB08 come complete with carry case, battery & Battery charger as pictured.

Press heads are sold separately as required.

Part No.	Description	Sizes	Weight
TB03	Compact one-hand press tool	15, 22, 28	1.7 Kg
TB06	Comfortline press tool	15, 22, 28, 35, 42, 54	2.8 Kg
TB09	Comfortline press tool	15, 22, 28, 35, 42, 54, 76, 89, 108	3.9 Kg
TB10	Extra heavy duty tool for super sizes	76, 89, 108, 139.7, 168.3	13 Kg



Part No.	Description	To Suit Tool
MK015Y	15 mm Jaw mini	TB03 mini press tool
MK022Y	22 mm Jaw mini	TB03 mini press tool
MK028Y	28 mm Jaw mini	TB03 mini press tool



Part No.	Description	To Suit Tool	Requires
MJ015Y	15 mm Jaw	TB06 or TB09	no adaptor needed
MJ022Y	22 mm Jaw	TB06 or TB09	no adaptor needed
MJ028Y	28 mm Jaw	TB06 or TB09	no adaptor needed
MJ035Y	35 mm Jaw	TB06 or TB09	no adaptor needed



Part No.	Description	To Suit Tool	Requires
MU042Y	Ø42mm Spring press sling	TB06 or TB09	TA054Y
MU054Y	Ø54mm Spring press sling	TB06 or TB09	TA054Y
MU076Y	Ø76 mm Spring press sling	TB09	TA221
MU089Y	Ø89 mm Spring press sling	TB09	TA221
MU108Y	Ø108 mm press sling	TB09	2 stage TA221 + TA222



Part No.	Description	To Suit Tool	Requires
MX028Y	Ø28 mm Spring Press Collar High Pressure	TB06 or TB09	TA054Y
MX035Y	Ø35 mm Spring Press Collar High Pressure	TB06 or TB09	TA054Y
MX042Y	Ø42mm Spring Press Collar High Pressure	TB06 or TB09	TA054Y
MX054Y	Ø54 mm Spring Press Collar High Pressure	TB06 or TB09	TA054Y
MX076Y	Ø76.1 mm Spring Press Collar High Pressure	TB10	Adaptor attached TB10
MX089Y	Ø88.9 mm Spring Press Collar High Pressure	TB10	Adaptor attached TB10
MX108Y	Ø108 mm Spring Press Collar High Pressure	TB10	Adaptor attached TB10



Press Tools TB03, TB06 & TB09 & TB10 come complete with carry case, battery & Battery charger as pictured



Press heads are sold separately as required.

Part No.	Description	To Suit Tool
TA054Y	Jaw Adaptor	TB06, TB09
TA221Y	Jaw Adaptor	TB09
TA222Y	Jaw Adaptor	TB09



Part No.	Description	To Suit Tool	Requires
MU140Y	139.7 mm Press Sling	TB10	Adaptor attached TB10
MU168Y	Ø168.3 mm Press Sling	TB10	Adaptor attached TB10





## 7.1 PRESS TOOLS AND ACCESSORIES



### PRESSING HEADS & ACCESSORIES

Item No.	Description
TBC18	18V Battery Charger

Part No.	Description
TBT12	240V to 12V Adaptor (replaces Battery)
TBT18	240V to 18V Adaptor (replaces Battery)

Part No.	Description
TBB23	12V 3.0 Ah Lithium Ion Battery
TBB81	18V 1.5 Ah Lithium Ion Battery
TBB83	18V 3.0 Ah Lithium Ion Battery
TBB92	9.6V 2.0 Ah Lithium Ion Battery
TBB93	9.6V 3.0 Ah Lithium Ion Battery

Item No.	Description
TM05	Manual Hydraulic Pressing Tool

Item No.	Description
TXH	Remote Hydraulic Power Pack 18 V Battery Drive unit 700 Bar, Suits 15–108mm, LED Display, High Capacity Motor for Continuous and Maximum Working Speed. Only 6.4 kg, Shatter Proof Housing, Data Transmission via USB Adaptor. 2 Batteries, Charger, 2m Hydraulic, Upholstered Carry Belt, 1.5m Remote operation.

Part No.	Description
TXHH2	2m Hydraulic Oil Filled Hose to Suit TBH
TXHH4	4m Hydraulic Oil Filled Hose to Suit TBH
TXHH6	6m Hydraulic Oil Filled Hose to Suit TBH

Part No.	Description
TXRC15	Remote Controlled, Hand Operated 1.5m
TXFC15	Remote Controlled, Foot Operated 1.5m

Part No.	Description	To Suit
TX02	Hydraulic Pressing Head	15 – 28mm
TX05	Hydraulic Pressing Head	15 – 54mm
TX08	Hydraulic Pressing Head	15 – 108mm

## 7.5 PIPE TOOLS

Item No.	Description
TR054	Multi Reamer 15—54mm Inside & Outside Deburring tool. Hand operated or with adaptor mounts into power drill for fast and easy deburring.

Item No.	Description
TS-TR	Power tool reamer adaptor

Item No.	Description
TE121	Bench mount orbital Tube and Pipe Cutters give a burr-free square cut. Having a multiple jaw concentric clamping system, optimal cutting speed, a cold cutting blade to match different wall thickness, Basic jaws Ø 24 to 121 mm <ul style="list-style-type: none"> <li>• Additional jaws Ø 5 to 108 mm</li> <li>• Cutting precision: Square cuts &lt; 0.25 mm</li> <li>• Scalability: May be transformed into a bevelling and orbital welding machine</li> <li>• Dual-output cutting motor with 2 blade positions for uptake</li> <li>• Weight: 37 kg (easy handling)</li> </ul>

Item No.	Description
TE108	Bench mount 240 v Right angle power cutter with foot switch. Ball bearing roller support. Chip free, no outer burr, dry cuts 22 – 108mm

Item No.	Description
TE1618	Hand held, fast, orbital action, reciprocating saw with pipe clamp for 90° guide support up to 4". Free cuts up to 6". Variable speed for easy start, stepless control up to optimised 2400rpm. Needle bearings. 230V, 1050W. Other options available.

Item No.	Description
PEC170E	Powerful, lightweight and handy PipeCut 170E can be used for cutting both metal and plastic pipes. Because of its adjustable speed and steady torque feature it is ideal for cutting stainless steel. The gripper arms adjust to the pipe diameter and keep the cut square to the pipe

Item No.	Description
TI054	Insertion depth gauge 15 - 54





Item No.	Description
TT015168	Pipe deburrer for steel pipe 15 –168mm. 3 spare blades in handle



Item No.	Description
TF015028	Mini rotary cutter 15—28mm



Item No.	Description
TF015035	Cu/Al/SS Rotary pipe cutter 15 –35mm. Built-in Deburrer



Item No.	Description
TF015076	Cu/Al/SS Rotary pipe cutter 15 –76mm. Built-in Deburrer



Item No.	Description
TF054108	Cu/Al/SS Rotary pipe cutter 54—108mm



Item No.	Description
TF108168	Cu/Al/SS Rotary pipe cutter 108 –168mm



Part No.	Description
TG015035	Replacement wheel suits TFO15035
TG015076	Replacement wheel suits TFO15076
TG054108	Replacement wheel suits TFO54108



Item No.	Description
TP015035	SS Rotary pipe cutter 15—35mm. Bearings in cutter and rollers. Deburrer tool built in.



Item No.	Description
TQ015035	Replacement wheel suit TP015035 Cu/Al/SS, bearings in cutter

## TB02, TB03 & TB08 Intelligent, Self Monitoring Press Tools

Red LED	White LED torch	Audible Alarm	When	Why
20 Sec				Battery low, recharge before any more presses
2 x			After inserting battery	Self check, OK to use
20 Sec/2 Hz			After working cycle	Return tool to authorised service centre
20 Sec/5 Hz			While exceeding the temp. limit	Unit too hot, allow to cool before further use
20 Sec 20 Sec/2 Hz			After working cycle	Battery is low and tool requires service
1 x			After working cycle	Error: Joint is not correctly pressed <ul style="list-style-type: none"> <li>required pressure has not been achieved</li> <li>the operator has interrupted the pressing cycle manually while motor was not running</li> </ul>
3 x	3 x		After working cycle	Serious Error: <ul style="list-style-type: none"> <li>the pressure has not been reached while the motor was running</li> </ul>

## 8.1 PIPE EXPANSION

Tube length (m)	Change in length (mm)									
	Temp difference ° Celsius	10	20	30	40	50	60	70	80	90
1	0.16	0.33	0.50	0.66	0.82	1.00	1.16	1.30	1.45	1.60
6	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
10	1.65	3.30	5.00	6.60	8.30	10.00	11.60	13.20	14.90	16.60
20	3.30	6.60	10.00	13.00	16.00	20.00	23.00	26.00	29.00	32.00
30	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00
40	6.60	13.00	20.00	26.00	33.00	44.00	46.00	52.00	59.00	66.00
50	8.25	16.50	25.00	33.00	46.50	50.00	58.00	66.00	74.50	83.00
60	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00
70	11.60	23.00	35.00	46.00	67.00	70.00	82.00	90.00	102.00	114.00
80	12.00	26.00	40.00	53.00	65.00	80.00	93.00	104.00	117.00	130.00
90	14.80	30.00	45.00	60.00	74.00	90.00	105.00	117.00	133.00	148.00
100	16.50	33.00	50.00	66.00	93.00	100.00	116.00	132.00	149.00	166.00

	Chemical composition % of stainless steels							
	Chromium	Nickel	Molybdenum	Manganese max%	Silicon max %	Phosphorus max %	Sulphur max %	Carbon max %
AISI 316L	16.5 - 18.5	10 - 13	2 - 2.5	2	1	0.045	0.015	0.03
AISI 304	17 - 19.5	8 - 10.5		2	1	0.045	0.015	0.07



## 8.1 Thermal expansion

Pipes expand as a function of the materials they are made of and the temperature variation to which they are subjected. Therefore, when installing pipework systems three rules must be followed to ensure good results:

- leave sufficient room for expansion
- use expansion compensators
- position both fixed and sliding collars correctly

The following formula is used to calculate longitudinal expansion:  $\Delta L = \alpha \cdot L \cdot \Delta T \div 1.000$  where:

- $\Delta L$  is the expansion in mm.
- $\alpha$  is the coefficient of expansion of the material expressed in mm/m • °C
- L is the length of the pipe in m.
- $\Delta T$  is the permitted temperature difference

For a practical calculation of the thermal expansion, according to the pipe length and the temperature variation, see the graph in Figure 4, which applies to stainless steel and is also applicable to carbon steel, but allowing for the fact that the thermal expansion of carbon steel is reduced by 1/3 (-33%). Example: The thermal expansion of a 20-metre stainless steel pipe, subjected to a temperature variation of

70°C is the following:

$$\Delta L = 16.5 \times 20 \times 70 / 1000 = 23.1 \text{ mm}$$

The same result can also be obtained from the graph in fig. 4

If the pipe is carbon steel, the expansion is:

$$\Delta L = 11 \times 20 \times 70 / 1000 = 15.4 \text{ mm}$$

The same result can also be obtained from the graph in fig 4, but reduce the expansion for stainless steel by 1/3 (-7.7mm).

### PIPE MATERIAL

Coefficient of thermal expansion

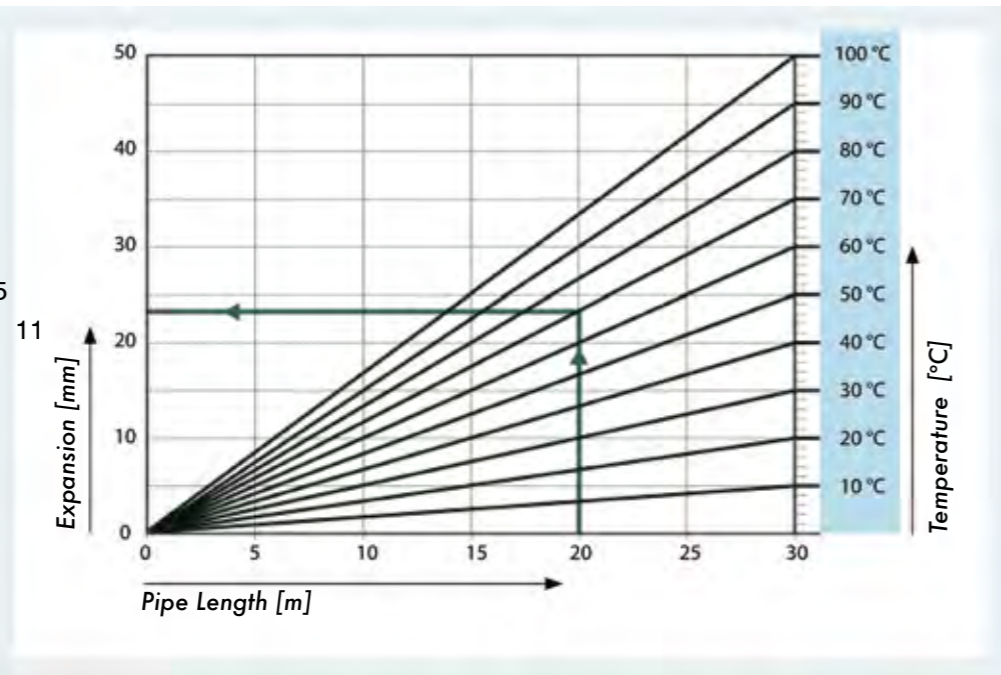
STAINLESS STEEL 16.5

CARBON STEEL 11

Fig. 4

Thermal expansion in stainless steel as a function of the length and the temperature variation.

Carbon steel is 30% less

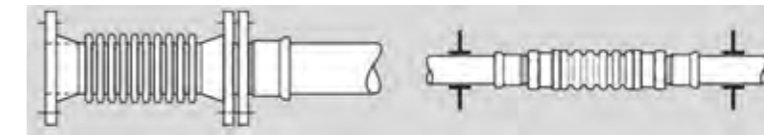


## 8.2 Expansion room

When installing pipework, distinctions should be made between:

- visible pipes
- chased pipes
- pipes under “floating” floors

Expansion in visible pipes is absorbed by the elasticity of the run itself provided that the pipes are correctly fixed. Chased pipes must not be in direct contact with the plaster, but wrapped in a pad of elastic material, such as glass wool or plastic foam fig. 5 Thus fitted, soundproofing requirements are also satisfied. Under a “floating” floor, pipes are laid below the isolation layer and can expand freely fig. 6 Vertical channels must be coated in elastic insulating materials. The same type of coating must be applied to pipes passing through walls and ceilings.



Flanged and threaded expansion compensators

## 8.3 Expansion compensators

Minimum pipe expansion can sometimes be compensated for by the degree of elasticity of the pipe system itself. If this is not possible, expansion compensators must be used.

Compensators can be either U or Z-shaped, and can be preformed or made up when the Europress Pressfitting components are being assembled.

fig. 7 shows the configuration of U-shaped compensators, while the diagram in fig.8 allow the compensation length to be calculated, for the estimated expansion, in steel pipes. Similarly, fig. 10 shows the configuration of a Z-shaped compensators, while the diagrams in figs. 12 and 13 allow the compensation length to be calculated, for the estimated expansion, in steel pipes. The latter diagrams can also be used to calculate compensation in T-shaped branches (fig 11).

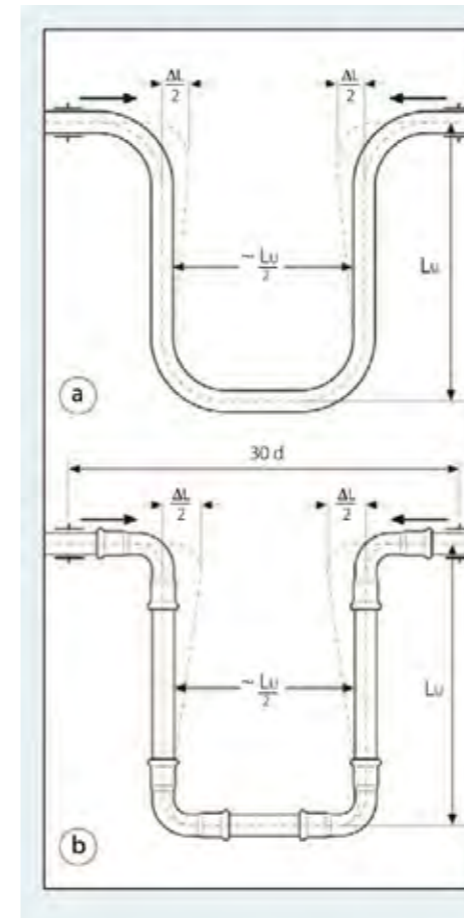


Fig. 7  
Expansion compensators U-shaped  
a) through preformed pipe  
b) with pressfittings

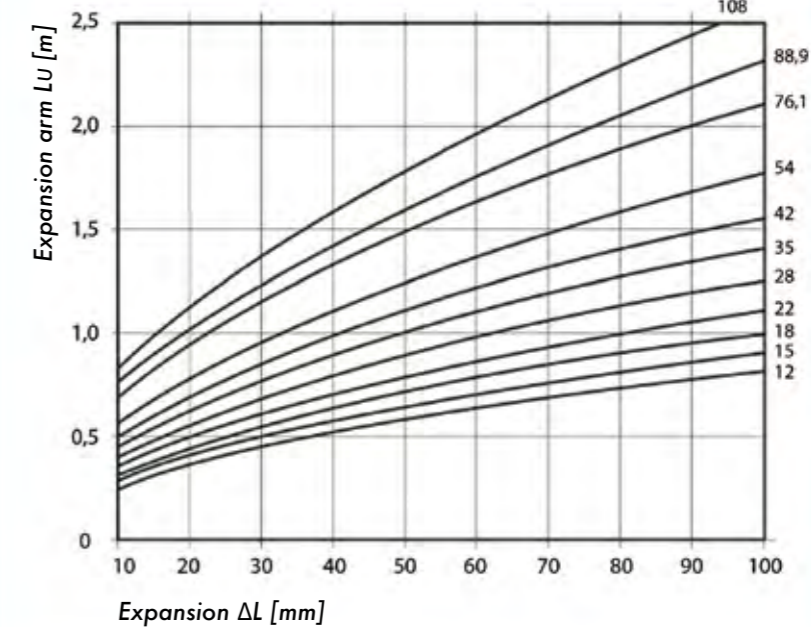


Fig. 8  
Length Lu of compensator U-shaped in stainless steel and carbon steel

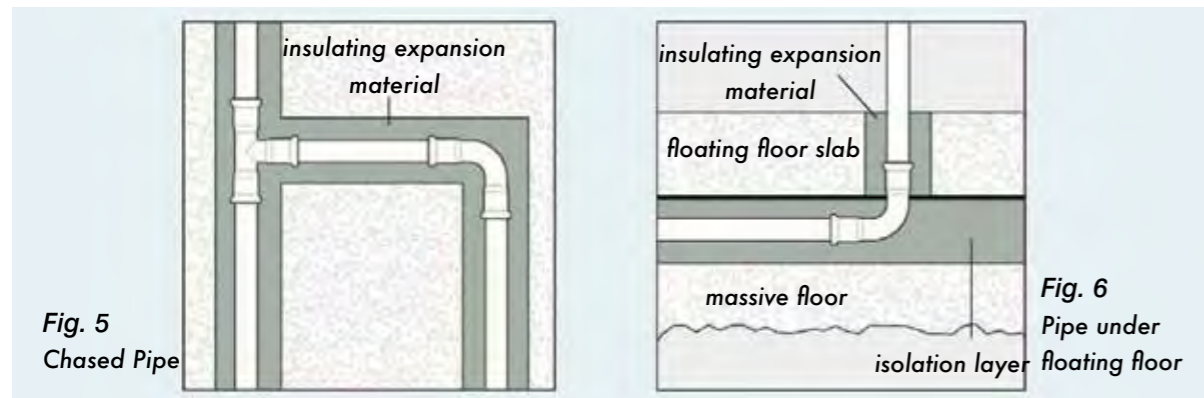
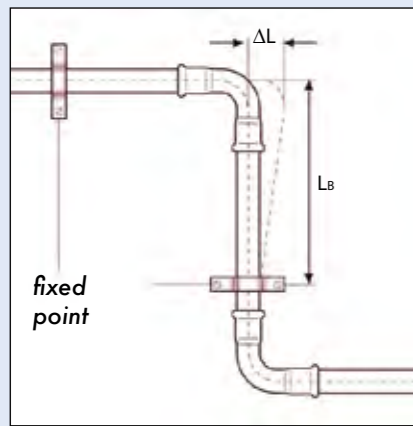


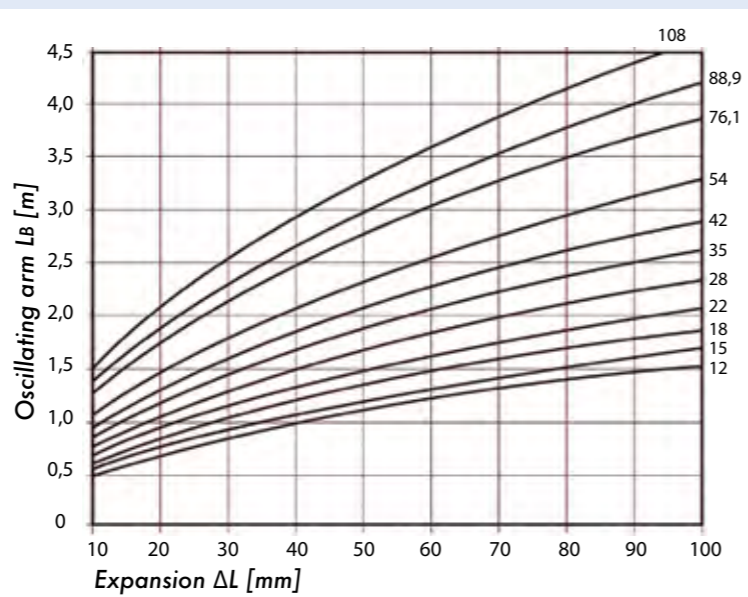
Fig. 5  
Chased Pipe

Fig. 6  
Pipe under floating floor

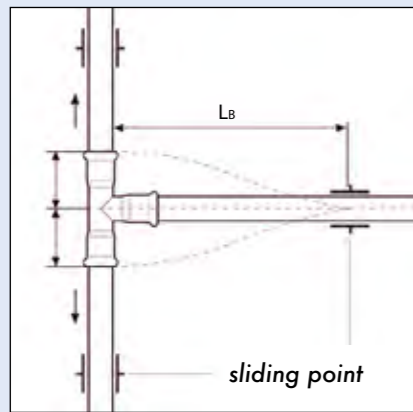




**Fig. 10**  
Expansion compensators  
Z-shaped



**Fig. 12**  
Length  $L_B$  of compensator  
Z-shaped in stainless steel and  
carbon steel



**Fig. 11**  
T-shaped branch

**Maximum distance between fixing point**

Pipe	15	22	28	35	42	54	76.1	88.9	108	139.7	168.3
Recommended	1.5	2	2.3	2.5	3	3	3.5	3.7	4	4.5	4.8
Maximum (refer tech dept)	1.5	2.5	2.5	3.5	3.5	3.5	5	5	5	5	5

### 8.4 Pipe fixing

The pipe support collars serve two purposes:

- locking the pipe
- orienting expansion caused by temperature fluctuations

#### Collars or fixing points

There are two types of collars or fixing points:

- fixed, which lock pipes rigidly
- sliding, which allow axial movement

#### Positioning fixing points

A pipe with no changes of direction or expansion compensators must have only one fixed anchoring point (fig. 14). In the case of long pipes, we recommend placing this collar towards the centre of the section so as to allow expansion in both directions. This solution is also particularly suitable for vertical pipes that pass through many floors precisely because it allows for expansion in two directions, also decreasing stress on the branches.

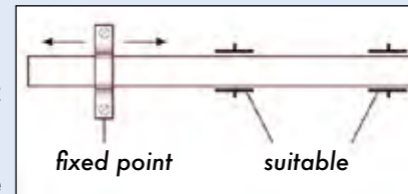
Fixed collars must not be placed on fittings (fig. 15) and even sliding collars must be positioned so as not to foul fittings and become potentially dangerous fixed points (fig. 16).

#### Minimum distances

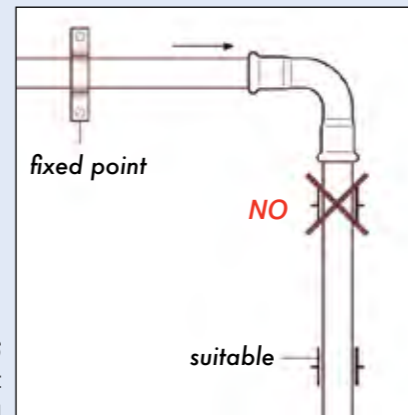
Installing pipework correctly involves observing certain minimum distances, which depend on several different factors:

- **Distance between fixing points**  
Fixing points must be placed at an adequate distance from each other. If the brackets are too close together they can prevent the absorption of expansion. If they are too far apart they can increase vibration and amplify noise. **Tab. 2** shows the distances recommended by Europress.
- **Manoeuvring space for the pressing tool**  
Adequate space for manoeuvring and avoidance of obstacles must be allowed for, and this will vary according to the size of the pressing tool. **Tab. 3** shows the minimum space to be allowed.
- **Distance between fittings**  
Two pressfittings too close together can compromise the perfect seal of the joints. **Tab. 4** shows the minimum distances to observe.

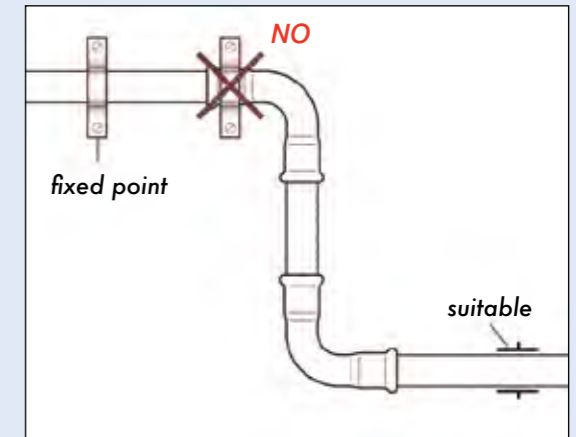
**Fig. 14**  
Pipe fixing: straight pipe,  
only one fixed point:  
suitable



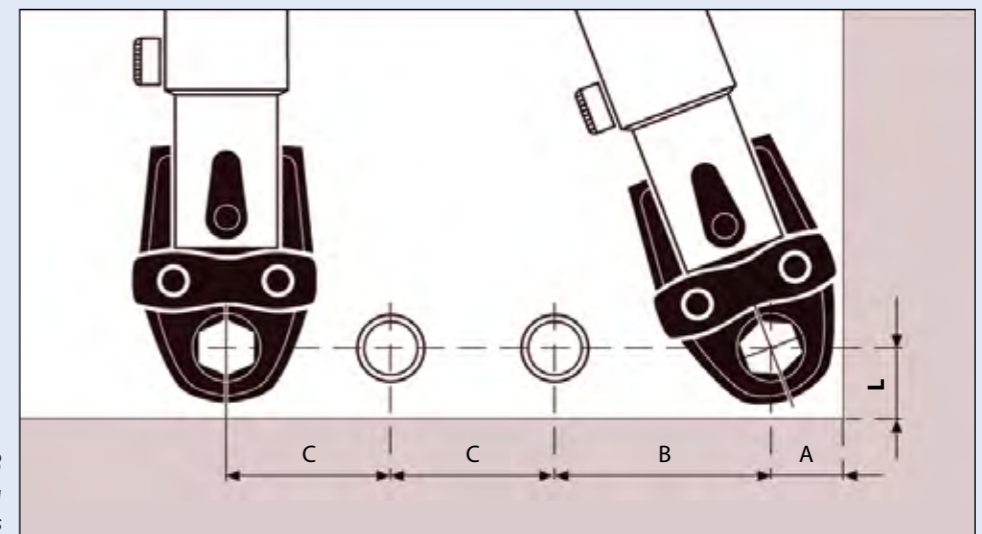
**Fig. 16**  
Pipe fixing: sliding point  
too near to fitting: wrong



**Fig. 15**  
Pipe fixing: fixed point on fitting: wrong

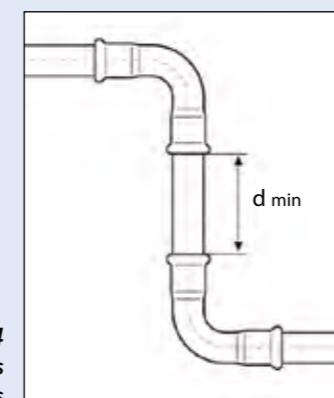


**Table 3**  
Minimum pressing  
spaces



Ø / pipe	15	22	28	35	42	54	76,1	88,9	108	139	168
A (mm)	25	35	35	45	76	86	190	210	210	230	260
B (mm)	75	81	81	85	120	125	200	250	250	290	330
C (mm)	56	76	76	76	120	125	200	250	250	290	330
L (mm)	24	32	32	32	78	88	170	170	170	230	260

**Table 4**  
Minimum distances  
between fittings



pipe size	d <sub>min</sub> (mm)
15	10
22-28	10
35	10
42	20
54	20
76,1	20
88,9	20
108	20
139	32
168	37



# 8.0 SYSTEM DESIGN

## 8.5 CORROSION RESISTANCE

### Stainless steel installations for drinking water

#### Resistance to internal corrosion

Stainless steel does not change the characteristics of drinking water, nor does the water affect it in any way. For this reason, drinking water, even when treated, is absolutely compatible with the AISI 316L stainless steel used by Europress.

Perfect hygiene is thus guaranteed.

#### Resistance to bimetallic corrosion

Stainless steel is resistant to corrosion, even in systems where it is in contact with non-ferrous metals (bronze, copper and brass). If however, it is in direct contact with carbon steel, bimetallic corrosion can occur. This risk can be reduced by inserting a nonferrous joint between the two metals or it can be completely eliminated by using non-ferrous spacers at least 50mm in length

#### Resistance to external corrosion

External corrosion can only occur on a stainless steel system in very particular situations, such as prolonged contact with high concentrations of chlorides. In these cases, we recommend covering the pipes with a closed-cell coating, taking care to apply waterproof glue to the cutting and junction points. Alternatively, protective anti-corrosion tape can be used. Felt sheathing must not be used as it holds moisture that can lead to corrosion.

### 8.6 Carbon steel installations for heating/cooling

#### Resistance to internal corrosion

Oxygen is not normally able to penetrate closed-circuit water heating systems from the outside so carbon steel pipes are not subject to internal corrosion. Carbon steel components can also be used in mixed installations with other non-ferrous metals, such as copper, aluminium, etc.

However, such systems must always be kept filled, even when not operating, or should be emptied and kept dry, to avoid both air and water being in contact with the metal, a situation that can lead to corrosion.

#### Resistance to external corrosion

External corrosion can frequently occur on carbon steel systems in chased installations, or in humid conditions. To prevent this, we recommend covering the pipes with closed-cell coating or protective anti-corrosion tape, ensuring that the pipes are entirely covered. Felt sheathing must not be used as it holds moisture that can lead to corrosion.

## 8.7 COMMISSIONING & TESTING

### System commissioning

After installation and before enclosing in any walls, insulation or painting, the system must undergo testing to ensure its carrying capacity and seal integrity. The test method and result must be documented in a report

(contact Technical Department for approved Work method and report form).

The choice of the test method depends on the type of installation, the medium that the system is designed for, the fluid selected for testing with, and the progress over time of the building works as well as the requirements related to hygiene and corrosion.

### Seal testing

If using a dry test with compressed air it must be done with oil-free compressed air so there is no residual oil left in the pipework. This is done in 2 phases - a seal test followed by the load test.

Drinking water or heating installations are tested using water at a pressure at least 1.5 times the operating pressure. If no leaks are detected during testing, it is best practice to flush the pipes thoroughly before charging the system with water.

Gas systems are to be tested in accordance with the relevant Australian Standard for the type of gas. Test procedures involving pressures greater than 20 bar should be confirmed with Europress technical department.

## 8.8 Noise insulation

Pipes are a possible means of transmitting noise from other sources (pumps, valves, etc.) and, for this reason, they must be insulated with elastic materials to avoid direct contact with collars, walls, etc.

## 8.9 Thermal insulation

Hot water pipes must be insulated in compliance with the codes of practice relating to energy conservation and heating systems. This also acts as a safety precaution against accidental contact.

Cold water pipes must also be adequately insulated to prevent condensation and dripping. For stainless steel installations the insulating material has to be without chlorine or its compounds.

### Protection against freezing

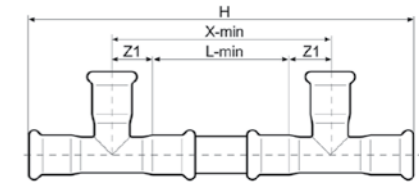
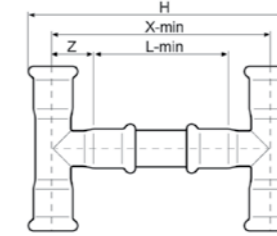
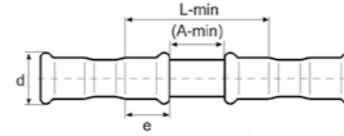
Where there is a danger of water freezing in pipes, they must be protected with insulating material of sufficient thickness, or antifreeze should be used to avoid leaks caused by loosened joints or swelling.

## 9.0 GUARANTEE

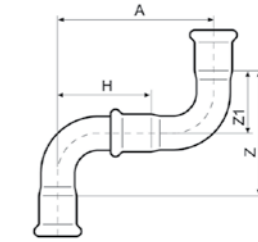
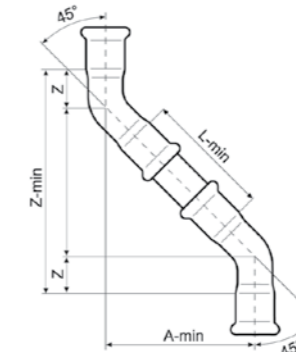
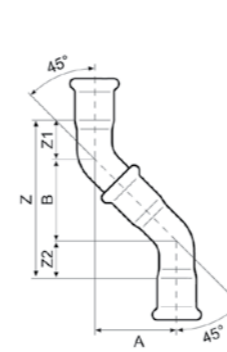
The use of original Europress fittings, with the correct pipes and approved pressing tools, coupled with strict adherence to the technical instructions given for both the design and installation of the system, will guarantee the longevity of the system for 25 years. Furthermore, the manufacturer's guarantee that when installation is done in accordance with guidelines, pressfit tightness guarantee is in excess of 30 years.

# 10.0 MINIMUM PROXIMITY TABLES

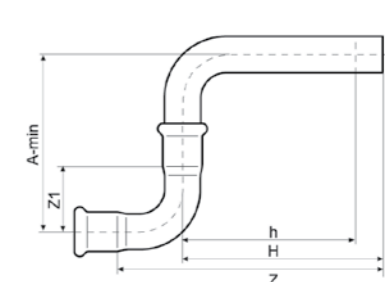
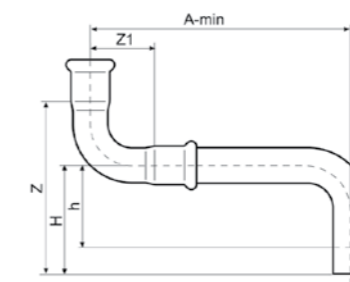
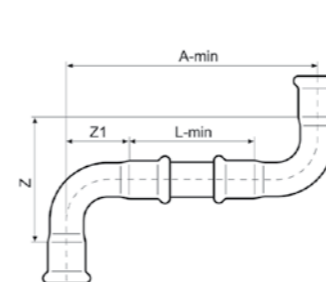
## 10.0 MINIMUM PROXIMITY TABLES



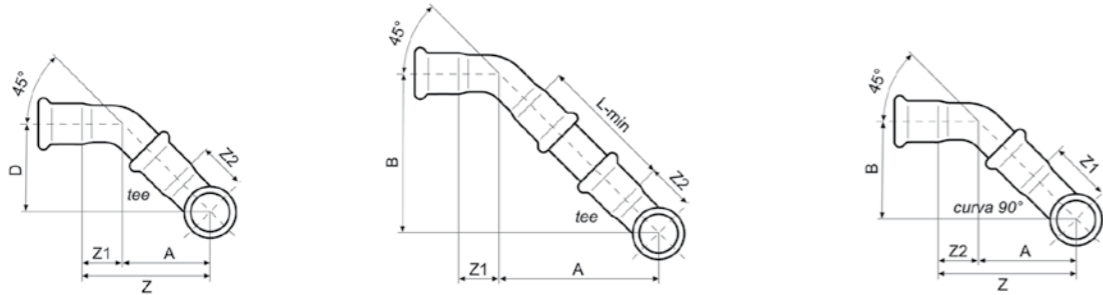
MINIMUM DISTANCE BETWEEN TWO PRESSES					DOUBLE TEE					SIDE MOUNTED TEES				
DN	d	L-min	A-min	e	DN	H	L-min	X-min	Z	DN	H	L-min	X-min	Z1
15	23	52	10	21	15	103	52	83	16	15	158	52	93	21
22	32	56	10	23	22	123	56	96	20	22	178	56	104	24
28	37	58	10	24	28	135	58	102	22	28	194	58	106	24
35	44	64	10	27	35	161	64	121	29	35	213	64	116,5	26
42	54	84	20	32	42	187	84	140	28	42	256	84	148	32
54	65	94	20	37	54	225	94	166	36	54	304	94	168	37
76	96	130	20	55	76	333	130	252	61	76	484	130	240	55
89	110	146	20	63	88	365	146	272	63	88	544	146	272	63
108	133	176	20	78	108	437	176	324	74	108	644	176	332	78



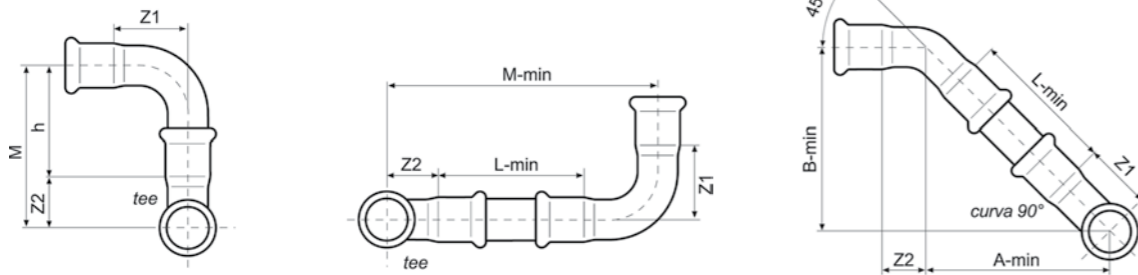
ELBOW 45°FF WITH ELBOW 45°MF						2 ELBOWS 45°FF WITH PIPE					ELBOW 90°FF WITH ELBOW 90°MF				
DN	A	Z	Z1	Z2	B	DN	L-min	A-min	Z-min	Z	DN	A	H	Z	Z1
Radius 1.5						Radius 1.5					Radius 1.5				
15	45	77	16	16	45	15	52	59	91	16	15	83	56	54	27
22	52	94	21	21	52	22	56	69	111	21	22	105	68	74	37
28	62	116	27	27	62	28	58	79	133	27	28	127	80	94	47
35	69	133	32	32	69	35	64	91	155	32	35	154	93	122	61
42	88	178	45	45	88	42	84	123	213	45	42	208	125	166	83
54	105	207	51	51	105	54	94	139	241	51	54	255	149	212	106
Radius 1.2						Radius 1.2					Radius 1.2				
76	115	201	43	43	115	76	130	153	239	43	76	261	166	190	95
89	127	227	50	50	127	88	146	174	274	50	88	301	190	222	111
108	156	276	62	62	152	108	176	209	329	60	108	367	230	274	137



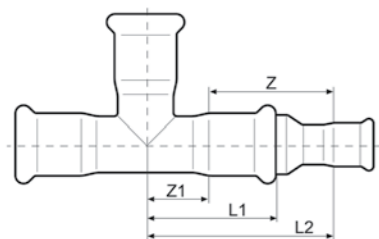
2 ELBOWS 90°FF WITH PIPE					ELBOW 90°FF AND ELBOW WITH PLAIN ENDS 90° (long side)					ELBOW 90°FF AND ELBOW WITH PLAIN ENDS 90° (short side)						
DN	L-min	A-min	Z	Z1	DN	A-min	Z1	Z	H	h	DN	A-min	Z1	Z	H	h
Radius 1.5					Radius 1.5					Radius 1.5						
15	52	114	54	27	15	147	27	97	70	48	15	97	27	147	120	48
22	56	122	74	37	22	157	37	107	70	61	22	107	37	157	120	61
28	58	126	94	47	28	172	47	144	97	90	28	144	47	172	125	78
35	64	138	122	61	35	262	61	182	121	59	35	182	61	262	201	139
42	84	188	166	83	42	337	83	243	160	70	42	243	83	337	254	164
54	94	208	212	106	54	408	106	308	202	157	54	308	106	408	302	257
Radius 1.2					Radius 1.2					Radius 1.2						
76	130	280	190	95	76	345	95	345	250	190	76	345	95	345	250	190
88	146	312	222	111	88	402	111	402	291	201	88	402	111	402	291	201
108	176	372	274	137	108	501	137	501	364	319	108	501	137	501	364	319



ELBOW 45°MF WITH LATERAL TEE					ELBOW 45°MF WITH LATERAL TEE AND PIPE					ELBOW 45°MF AND LATERAL ELBOW 90°FF							
DN	Z	A	D	Z1	Z2	DN	A	B	L-min	Z1	Z2	DN	Z	A	B	Z1	Z2
Radius 1.5					Radius 1.5					Radius 1.5							
15	60	44	44	16	16	15	59	59	52	16	16	15	60	44	44	27	16
22	72	51	51	21	20	22	69	69	56	21	20	22	72	51	51	37	21
28	85	58	58	27	22	28	76	76	58	27	22	28	85	58	58	47	27
35	98	66	66	32	29	35	88	88	64	32	29	35	98	66	66	61	32
42	121	76	76	45	28	42	111	111	84	45	28	42	121	76	76	83	45
54	145	94	94	51	36	54	128	128	94	51	36	54	145	94	94	106	51
Radius 1.2					Radius 1.2					Radius 1.2							
76	174	131	131	43	61	76	165	165	130	43	61	76	174	131	131	95	43
88	186	136	136	50	63	88	183	183	146	50	63	88	186	136	136	111	50
108	225	165	165	60	74	108	219	219	176	60	74	108	225	165	165	137	60



ELBOW 90°MF WITH LATERAL TEE					ELBOW 90°MF WITH LATERAL TEE AND PIPE					LATERAL ELBOW 90°FF AND PIPE					
DN	M	h	Z1	Z2	DN	M-min	L-min	Z1	Z2	DN	A-min	B-min	L-min	Z1	Z2
Radius 1.5					Radius 1.5					Radius 1.5					
15	71	55	27	16	15	94	52	27	16	15	67	67	52	27	16
22	88	68	37	20	22	113	56	37	20	22	81	81	56	37	21
28	102	80	47	22	28	127	58	47	22	28	93	93	58	47	27
35	121	93	61	29	35	153	64	61	29	35	111	111	64	61	32
42	153	125	83	28	42	195	94	83	28	42	150	150	84	83	45
54	185	149	106	36	54	236	104	106	36	54	178	178	94	106	51
Radius 1.2					Radius 1.2					Radius 1.2					
76	232	171	95	61	76	291	140	95	61	76	190	190	130	95	43
88	253	190	111	63	88	320	156	111	63	88	217	217	146	111	50
108	304	230	137	74	108	387	186	137	74	108	264	264	176	137	60



TEE AND REDUCER									
DN	L2	L1	Z	Z1	DN	L2	L1	Z	Z1
22-15	61	42	42	19	54-28	109	71	75	34
28-15	83	46	61	22	54-35	135	71	101	34
28-22	67	46	45	22	54-42	112	71	78	34
35-15	88	51	64	24	76.1-42	182	116	121	61
35-22	78	51	54	24	76.1-54	170	116	109	61
35-28	73	51	49	24	88.9-54	190	131	122	68
42-22	82	59	55	27	88.9-76.1	173	131	105	68
42-28	104	59	77	27	108-54	245	156	167	78
42-35	74	59	47	27	108-76.1	222	156	144	78
54-22	122	71	88	34	108-88.9	211	156	133	78

## 11. CHEMICAL COMPATIBILITY OF EUROPRESS PIPES AND O-RINGS

Refer to the Europress Technical Department to obtain confirmation of suitability of individual liquids for food process applications. As every aspect of an application may not be known by the supplier, applications remain the responsibility of the user.

FLUID	PIPE AND SEALS					FLUID	PIPE AND SEALS				
	AISI 316L	C-STEEL	EPDM	HNBR	FKM-FPM		AISI 316L	C-STEEL	EPDM	HNBR	FKM-FPM
Acetic acid 20%	A	D	A	D	D	Linseed oil	A	A	D	D	A
Acetone 100 %	A	A	A	D	D	Lubricating oils	A	A	D	A	A
Acetylene	A	A	A	A	A	Machine oil	A	B	D	A	A
Ammonia dry	A	A	A	A	D	Magnesium chloride ≤20%	A	B	A	A	A
Ammonium chloride 1%	A	D	A	A	A	Magnesium hydroxide 100°C	C	B	A	B	A
Ammonium nitrate 10±50%	A	D	A	A	A	Magnesium sulfate <40%	A	B	A	A	A
Ammonium phosphate 10%	C	X	A	A	D	Methane	A	A	D	A	A
Ammonium sulfate 10%	C	C	A	A	D	Methanol	A	B	A	B	D
Aniline	A	A	B	A	C	Mineral oil	A	A	D	A	A
Aqua regia, aqua fortis	A	D	C	D	B	Naphtha	A	A	D	B	A
Battery acid	A	D	B	X	A	Naphthalene	A	A	D	X	A
Benzene	A	A	D	D	A	Nickel chloride 10±30%	C	D	A	A	A
Boric acid 5%	A	D	A	A	A	Nickel sulfate	A	D	A	A	A
Butane	A	A	D	A	A	Nitric acid ≤20%	A	D	D	B	A
Butanol	A	A	A	D	A	Paraffin	A	B	D	A	A
Calcium Hydroxide ≤ 10°C	C	B	A	A	A	Phosphoric acid	A	D	A	D	A
Calcium Hypochlorite	D	D	B	B	A	Potassium chloride	A	D	A	A	A
Carbon dioxide	A	C	B	A	A	Potassium hydroxide ≤ 50°C	C	D	A	B	D
Caustic soda ≤ 50%	A	D	B	B	C	Potassium sulfate 10%	A	B	A	A	A
Chlorine (dry)	B	B	A	B	A	Propane (liquefied)	A	A	D	A	A
Citric acid 5%	A	D	A	A	A	Prussic acid	C	D	A	X	A
Compressed air *	A	B	D	A	A	Sea water	A	D	A	A	A
Copper chloride	D	D	A	A	A	Sodium bicarbonate	A	C	A	A	A
Copper nitrate	A	D	A	A	A	Sodium chloride 5%	A	C	A	A	A
Copper sulfate 10%	A	D	A	A	A	Sodium nitrate ≤ 40%	A	C	A	B	A
Photo developer/fixing bath	A	X	B	A	A	Sodium phosphate	C	D	A	A	A
Engine oil	A	B	D	A	A	Sodium sulfate 10%	A	B	A	A	A
Ethane	A	A	D	A	A	Sulfuric acid 10% 60°C	D	D	B	X	A
Ethylene glycol	A	A	A	A	A	Sulfuric acid, smoking	D	D	D	X	A
Ethylene Oxide	A	X	C	D	D	Sulfuric acid 100%, moist	C	D	C	X	A
Ferric chloride, watery	D	D	A	A	A	Sulphur dioxide (dry)	C	B	A	D	B
Ferric sulfate	C	D	A	A	A	Tannin	A	D	A	X	A
Formaldehyde	A	D	A	B	D	Tanning agents for leather	A	X	B	A	A
Formic acid	C	D	A	D	D	Tartaric Acid 10% 100°C	A	D	B	X	A
Gas oil	A	X	D	A	A	Toluol 20°C	A	C	A	D	D
Gasoline	A	A	D	A	A	Trichloroethylene	C	B	D	D	A
Gear oil	A	B	D	A	A	Turpentine	C	B	D	A	B
Hexane	A	A	B	D	A	Water ≤ 100°C	A	C	A	A	B
Hydrochloric acid 100%	D	D	D	A	A	Water, deionised	A	X	B	B	A
Hydrogen fluoride	D	D	D	D	D	Water, distilled	A	X	A	A	A
Hydrogen peroxide 10%	A	D	A	D	A	Zinc chloride	A	X	A	A	A
Kerosene	A	B	D	A	A	Zinc sulfate 10%	A	X	A	A	A

A: Excellent - Material not affected  
 B: Good - Material slightly affected but suitable  
 C: Fair - Some degree of reaction but suitable

D: Severe effect - Not recommended  
 X: Not useful data



## 12.1 Pressure drops

Water or gas flow in the pipes, gradually lose its pressure, because of the different resistances it meets. These resistances are due both to straight pipe resistance or to single casual conditions such as direction changes, section reductions, etc.

Therefore the total pressure drop for a pipe system is calculated according to the following formula:

$$\Delta p = \Delta p_1 + \Delta p_2$$

where:

- $\Delta p_1$  is the pressure drop due to straight lengths
- $\Delta p_2$  is the pressure drop due to single localized resistances

## 12.2 Pressure drop of a straight pipe

The following formula is used to calculate pressure drop, due to straight lengths

$$\Delta p_1 = \Sigma R \cdot l$$

where:

- $R$  is the unitary pressure drop expressed in mbar o in Pa/m
- $l$  is the straight pipe length in m

As well, the following formula is used to calculate the unitary pressure drop:

$$R = \lambda \rho v^2 \div 2 \times d$$

where:

- $\lambda$  is the pipe friction coefficient
- $\rho$  is the fluid density expressed in kg/m<sup>3</sup>
- $v$  is the fluid speed expressed in m/s
- $d$  is the internal pipe diameter in mm

For a practical calculation of pressure drops it is possible to refer to the following tables.

## 12.3 Pressure drop of single localised resistances

The following formula is used to calculate pressure drops due to single localized resistances.

$$\Delta p_2 = \Sigma Z$$

where:

- $Z$  is the pressure drop of the single fitting expressed in mbar

As well, the following formula is used to calculate the pressure drop of the single fitting

$$Z = \xi \rho v^2 \div 2$$

where:

- $\xi$  is the coefficient, which depends on the fitting type
- $\rho$  is the fluid density expressed in Kg/m<sup>3</sup>
- $v$  is the fluid speed expressed in m/s

For a practical calculation of pressure drops it is possible to refer to the following tables on pages 38 to 46.

## 13. POSSIBLE CAUSES OF LEAKS

1. Tube inserted into the fitting could be creased or damaged.
2. Tube not pushed fully home in the fitting.
3. Non-standard connection between tubes or non-matched sizes.
4. Incorrect installation fixing.
5. Connection made to the fitting by the operator using incompatible products.
6. Installations subject to mechanical stress, e.g. mountings not properly lined up.
7. Other objects anchored to the hanging system.
8. Thermal expansion not compensated for by adequate fitting techniques or equipment.
9. Freezing of the installation.
10. Pressure or temperature specifications outside those indicated in the conditions of use.
11. Unforeseen external causes such as accidental impacts
12. Fittings welded by the operator rather than pressed.
13. Double pressing by the operator either of the fitting itself or near it.
14. Minimum distance between two fittings not observed.
15. Poor storage and handling of the fittings with deterioration of the o-ring, caused by external agents such as light, temperature, dirt, ozone etc.
16. Mechanical damage to the fitting (cuts, bending, crushing).
17. Replacement of washers or spare parts not supplied by Europress.
18. Tearing of the o-ring, for example caused by pipes not properly deburred.
19. Incorrect tube insertion causing the o-ring to become dislodged from its position.
20. Use of unsuitable o-ring lubricants. Use only soap and water.
21. Internal or external liquids not compatible with the o-ring composition.
22. Pressing carried out with worn clamp jaws.
23. Use of a pressing-fitting tool no longer capable of exerting sufficient force (the result of wear and tear, operator error or lack of maintenance).
24. Clamp jaws not correctly positioned in relation to the fitting when pressed.
25. Clamp jaws not fully pressed home.
26. Use of non-standard clamp jaws or jaws made for other section types.

Tab. 1

Stainless steel pipes for drinkable water (roughness  $k=0,0015$  mm). Pressure drops  $R$  as a function of peak flow rate  $Vp$  and speed  $v$  at 10 °C temperature.

Nominal size $d_e \times s / OD \times t$ (mm)	Pipe outside diameter x wall thickness			Peak flow rate $Vp$ l/s	
	$d_e \times s / OD \times t$ (mm)	$d_e \times s / OD \times t$ (mm)	$d_e \times s / OD \times t$ (mm)		
104	108 x 2,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	88,9 x 2,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	76,1 x 2,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	84,9	108 x 2,0	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
88,9 x 2,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
76,1 x 2,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
72,1		108 x 2,0	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	88,9 x 2,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	76,1 x 2,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	51	54 x 1,5	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
42 x 1,5		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
35 x 1,5		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
39		54 x 1,5	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	42 x 1,5	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	35 x 1,5	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	32	54 x 1,5	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
42 x 1,5		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
35 x 1,5		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
10		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	25,6	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
19,5		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	13,0	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
13,0		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	25,6	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
19,5		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	13,0	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
25,6		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	19,5	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
13,0		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	25,6	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
19,5		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	13,0	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
25,6		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	19,5	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
13,0		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	25,6	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
19,5		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	13,0	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
25,6		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	19,5	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
13,0		28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
	22 x 1,2	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	15 x 1,0	V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
	25,6	28 x 1,2	V	m/s	0,1
			R	mbar/m	0,1
			V	m/s	0,2
22 x 1,2		V	m/s	0,1	
		R	mbar/m	0,1	
		V	m/s	0,2	
15 x 1,0		V	m/s	0,1	
		R	mbar/m		

**Tab. 2** Stainless steel pipes for gas (roughness  $k=0,0015$  mm).  
Pressure drops  $R$  as a function of peak flow rate  $V_p$  and speed  $v$  at  $10^\circ\text{C}$  temperature.

Nominal size $d_e \times s / OD \times t$ [mm]	Pipe outside diameter x wall thickness											
	15 x 1.0		22 x 1.2		28 x 1.2		35 x 1.5		42 x 1.5		54 x 1.5	
$d_i / ID$ [mm]	13.0		19.5		25.6		32		39		51	
Peak flow rate $V_p$ $\frac{m^3}{h}$	$R$ mbar m	$v$ $\frac{m}{s}$	$R$ mbar m	$v$ $\frac{m}{s}$	$R$ mbar m	$v$ $\frac{m}{s}$	$R$ mbar m	$v$ $\frac{m}{s}$	$R$ mbar m	$v$ $\frac{m}{s}$	$R$ mbar m	$v$ $\frac{m}{s}$
	1	0,0629	2,1									
1,5	0,0943	3,1	0,0168	1,3								
2	0,1257	4,2	0,0224	1,8	0,0092	1,1						
2,5	0,3032	5,2	0,0281	2,2	0,0115	1,4						
3	0,4137	6,3	0,0337	2,7	0,0138	1,7	0,0051	1				
3,5	0,5386	7,3	0,0705	3,1	0,0161	2	0,0060	1,2				
4	0,6777	8,3	0,0883	3,5	0,0184	2,3	0,0069	1,4				
4,5			0,1079	4	0,0377	2,5	0,0077	1,6	0,0035	1		
5			0,1292	4,4	0,0451	2,8	0,0086	1,7	0,0039	1,2		
5,5			0,1520	4,9	0,0530	3,1	0,0166	1,9	0,0043	1,3		
6			0,1764	5,3	0,0615	3,4	0,0192	2,1	0,0047	1,4		
6,5			0,2024	5,7	0,0705	3,7	0,0220	2,2	0,0050	1,5		
7			0,2300	6,2	0,0800	4	0,0250	2,4	0,0099	1,6	0,0020	1
7,5			0,2593	6,6	0,0900	4,2	0,0281	2,6	0,0111	1,7	0,0022	1,1
8					0,1006	4,5	0,0313	2,8	0,0124	1,9	0,0023	1,1
8,5					0,1116	4,8	0,0347	2,9	0,0137	2	0,0043	1,2
9					0,1231	5,1	0,0383	3,1	0,0151	2,1	0,0047	1,3
9,5					0,1351	5,4	0,0420	3,3	0,0165	2,2	0,0051	1,3
10					0,1476	5,7	0,0459	3,5	0,0181	2,3	0,0056	1,4
10,5					0,1607	5,9	0,0499	3,6	0,0196	2,4	0,0061	1,5
11					0,1740	6,2	0,0540	3,8	0,0212	2,6	0,0066	1,6
11,5					0,1881	6,5	0,0583	4	0,0229	2,7	0,0071	1,6
12					0,2024	6,8	0,0628	4,1	0,0246	2,8	0,0076	1,7
12,5					0,2172	7,1	0,0673	4,3	0,0264	2,9	0,0082	1,8
13					0,2328	7,4	0,0720	4,5	0,0282	3	0,0088	1,8
13,5					0,2485	7,6	0,0769	4,7	0,0301	3,1	0,0093	1,9
14					0,2647	7,9	0,0818	4,8	0,0321	3,3	0,0099	2
14,5							0,0869	5	0,0341	3,4	0,0105	2,1
15							0,0923	5,2	0,0361	3,5	0,0112	2,1
15,5							0,0977	5,4	0,0382	3,6	0,0118	2,2
16							0,1032	5,5	0,0404	3,7	0,0125	2,3
16,5							0,1088	5,7	0,0426	3,8	0,0131	2,3
17							0,1146	5,9	0,0448	4	0,0138	2,4
17,5							0,1204	6	0,0471	4,1	0,0145	2,5
18							0,1265	6,2	0,0495	4,2	0,0153	2,5
18,5							0,1327	6,4	0,0519	4,3	0,0160	2,6
19							0,1390	6,6	0,0543	4,4	0,0167	2,7
19,5							0,1455	6,7	0,0568	4,5	0,0175	2,8
20							0,1519	6,9	0,0593	4,7	0,0183	2,8
21							0,1655	7,3	0,0646	4,9	0,0199	3
22								0,0700	5,1	0,0215	3,1	
23								0,0757	5,3	0,0233	3,3	
24								0,0814	5,6	0,0250	3,4	
25								0,0874	5,8	0,0269	3,5	
26								0,0936	6	0,0288	3,7	
27								0,0999	6,3	0,0307	3,8	
28								0,1065	6,5	0,0327	4	
29								0,1132	6,7	0,0347	4,1	
30								0,1201	7	0,0368	4,2	
31								0,1273	7,2	0,0390	4,4	

**Tab. 3** Carbon steel pipes for heating (roughness  $k=0,0015$  mm).  
Pressure drops  $R$  as a function of mass flow  $m$  and speed  $v$  at  $80^\circ\text{C}$  water temperature.

Nominal size $d_e \times s / OD \times t$ [mm]	Pipe outside diameter x wall thickness											
	15 x 1,2		22 x 1,5		28 x 1,5		35 x 1,5		42 x 1,5		54 x 1,5	
$d_i / ID$ [mm]	12,6		19		25		32		39		51	
Pressure drops $R$ [Pa/m]	$m$ [kg/h]	$v$ [m/s]	$m$ [kg/h]	$v$ [m/s]	$m$ [kg/h]	$v$ [m/s]	$m$ [kg/h]	$v$ [m/s]	$m$ [kg/h]	$v$ [m/s]	$m$ [kg/h]	$v$ [m/s]
	29	61	0,14	187	0,19	393	0,23	766	0,27	1050	0,36	1450
32	64	0,15	197	0,2	414	0,24	807	0,29	1150	0,39	1600	0,47
35	67	0,15	207	0,21	435	0,25	847	0,30	1250	0,41	1750	0,5
39	72	0,16	219	0,22	461	0,27	898	0,32	1350	0,43	1900	0,53
44	77	0,17	234	0,24	493	0,29	958	0,34	1450	0,45	2050	0,56
49	81	0,19	249	0,25	522	0,3	1016	0,36	1550	0,47	2200	0,59
54	86	0,2	262	0,26	551	0,32	1070	0,38	1650	0,49	2350	0,62
59	90	0,2	275	0,28	578	0,34	1123	0,40	1750	0,51	2500	0,65
64	94	0,22	288	0,29	604	0,35	1173	0,42	1850	0,53	2650	0,68
69	98	0,23	300	0,3	629	0,37	1222	0,43	1950	0,55	2800	0,71
74	102	0,23	312	0,31	654	0,38	1269	0,46	2050	0,57	2950	0,74
78	106	0,24	323	0,33	678	0,4	1315	0,47	2150	0,59	3100	0,77
88	113	0,26	345	0,35	723	0,42	1402	0,50	2300	0,62	3350	0,82
98	120	0,28	366	0,37	766	0,45	1485	0,53	2450	0,65	3600	0,88
108	127	0,29	386	0,39	807	0,47	1565	0,56	2600	0,68	3850	0,94
118	133	0,31	405	0,41	846	0,49	1640	0,58	2750	0,71	4100	1,0
128	140	0,32	423	0,43	884	0,52	1713	0,61	2900	0,74	4350	1,06
137	145	0,33	440	0,44	921	0,54	1783	0,63	3050	0,77	4600	1,12
147	151	0,35	457	0,46	956	0,56	1851	0,66	3200	0,8	4850	1,18
157	156	0,36	474	0,48	990	0,58	1916	0,68	3350	0,83	5100	1,24
167	162	0,37	490	0,49	1023	0,6	1980	0,70	3500	0,86	5350	1,3
177	167	0,38	505	0,51	1056	0,62	2042	0,73	3650	0,89	5600	1,36
186	172	0,39	521	0,53	1087	0,63	2102	0,75	3800	0,92	5850	1,42
196	177	0,41	535	0,54	1118	0,66	2161	0,77	3950	0,95	6100	1,48
216	186	0,43	564	0,57	1177	0,69	2275	0,81	4200	1,01	6600	1,58
235	196	0,45	591	0,6	1234	0,72	2384	0,85	4450	1,07	7100	1,68
255	204	0,47	618	0,62	1288	0,75	2488	0,89	4700	1,13	7600	1,78
275	213	0,49	643	0,65	1341	0,78	2589	0,92	4950	1,19	8100	1,88
294	221	0,51	668	0,67	1391	0,81	2687	0,96	5200	1,25	8600	1,98
324	233	0,53	703	0,71	1464	0,85	2827	1,00	5450	1,31	9100	2,08
353	244	0,56	737	0,74	1534	0,89	2961	1,05	5700	1,37	9600	2,18
392	259	0,59	780	0,79	1624	0,95	3132	1,11	5950	1,43	10100	2,28
441	276	0,63	831	0,84	1729	1	3334	1,19	6200	1,49	10600	2,38
490	292	0,67	880	0,89	1829	1,07	3526	1,26	6450	1,55	11100	2,48
540	308	0,71	926	0,93	1924	1,12	3709	1,32	6700	1,61	11600	2,58
589	323	0,74	970	0,98	2016	1,17	3883	1,38	6950	1,67	12100	2,68
638	337	0,77	1012	1,02	2103	1,23	4051	1,44	7200	1,73	12600	2,78
687	351	0,8	1053	1,06	2188	1,27	4213	1,50	7450	1,79	13100	2,88
736	364	0,82	1093	1,1	2269	1,32	4369	1,55	7700	1,85	13600	2,98
785	377	0,87	1131	1,14	2348	1,37	4520	1,61	7950	1,91	14100	3,08
883	402	0,92	1204	1,21	2499	1,46	4808	1,71	8200	1,97	14600	3,18
981	425	0,98	1274	1,28	2642	1,54	5082	1,81	8450	2,03	15100	3,28
1079	448	1,03	1340	1,35	2778	1,61	5342	1,90	8700	2,09	15600	3,38
1177	469	1,08	1403	1,41	2908	1,69	5591	1,99	8950	2,15	16100	3,48
1275	489	1,12	1464	1,48	3033	1,77	5829	2,07	9200	2,21	16600	3,58
1373	509	1,17	1522	1,53	3153	1,84	6059	2,15	9450	2,27	17100	3,68
1471	528	1,21	1578	1,59	3269	1,9	6281	2,23	9700	2,33	17600	3,78
1570	547	1,25	1633	1,65	3381	1,97	6496	2,31	9950	2,39	18100	3,88
1669	564	1,29	1686	1,7	3490	2,03	6704	2,38	10200	2,45	18600	3,98
1766	582	1,33	1737	1,75	3596	2,09	6907	2,46	10450	2,51	19100	4,08
1864	599	1,38	1787	1,8	3699	2,15	7103	2,52	10700	2,57	19600	4,18
1962	615	1,41	1836	1,85	3799	2,21	7295	2,59	10950	2,63	20100	4,28



Tab. 5 Coefficients  $\xi$  of low resistance.

Name	Pressfitting	Pressure drops $\zeta$	Drinkable water	Heating	Gas
Elbow or bend		0,7	X	X	X
Angle adapter		1,5		X	
Preformed pipe bridge		0,5	X	X	X
45°elbow		0,5	X	X	X
Reducer		0,2	X	X	X
Coupling, male adapter		0,1	X	X	X
Combination pipe		0,1	X	X	X
Tee Main flow from line into branch		1,3	X	X	X
Tee Main flow from branch into line		0,9	X	X	X
Tee Mainly through, some line into branch		0,3	X	X	X
Tee Mainly through, some branch into line		0,2	X	X	X
Tee, Counterflow from line into branch		1,5	X	X	X
Tee Counterflow from branch into line		3,0	X	X	X

Tab. 6 Stainless steel pipes for drinkable water. Pressure drops  $Z$  as a function of speed  $v$  and addition of resistance values  $\Sigma \xi$  at 10 °C temperature.

$\Sigma \xi$ v(m/s)	Pressure drop $Z$ (mbar) due to minor losses																										
	0,2	0,4	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0	7,5	8,0	8,5	9,0	9,5	10,0	
0,1	0,01	0,02	0,03	0,04	0,05	0,06	0,07	0,08	0,09	0,10	0,12	0,15	0,17	0,20	0,22	0,25	0,27	0,30	0,32	0,35	0,37	0,40	0,42	0,45	0,47	0,50	
0,2	0,04	0,08	0,12	0,16	0,20	0,24	0,28	0,32	0,36	0,40	0,45	0,50	0,55	0,60	0,65	0,70	0,75	0,80	0,85	0,90	0,95	1,00	1,05	1,10	1,15	1,20	
0,3	0,09	0,18	0,27	0,36	0,45	0,54	0,63	0,72	0,81	0,90	1,00	1,10	1,20	1,30	1,40	1,50	1,60	1,70	1,80	1,90	2,00	2,10	2,20	2,30	2,40	2,50	
0,4	0,16	0,32	0,48	0,64	0,80	0,96	1,12	1,28	1,44	1,60	1,80	2,00	2,20	2,40	2,60	2,80	3,00	3,20	3,40	3,60	3,80	4,00	4,20	4,40	4,60	4,80	
0,5	0,25	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,80	3,10	3,40	3,70	4,00	4,30	4,60	4,90	5,20	5,50	5,80	6,10	6,40	6,70	7,00	7,30	
0,6	0,36	0,72	1,08	1,44	1,80	2,16	2,52	2,88	3,24	3,60	4,00	4,40	4,80	5,20	5,60	6,00	6,40	6,80	7,20	7,60	8,00	8,40	8,80	9,20	9,60	10,00	
0,7	0,49	0,98	1,47	1,96	2,45	2,94	3,43	3,92	4,41	4,90	5,39	5,88	6,37	6,86	7,35	7,84	8,33	8,82	9,31	9,80	10,29	10,78	11,27	11,76	12,25	12,74	
0,8	0,64	1,28	1,92	2,56	3,20	3,84	4,48	5,12	5,76	6,40	7,04	7,68	8,32	8,96	9,60	10,24	10,88	11,52	12,16	12,80	13,44	14,08	14,72	15,36	16,00	16,64	
0,9	0,81	1,62	2,43	3,24	4,05	4,86	5,67	6,48	7,29	8,10	8,91	9,72	10,53	11,34	12,15	12,96	13,77	14,58	15,39	16,20	17,01	17,82	18,63	19,44	20,25	21,06	
1,0	1,00	2,00	3,00	4,00	5,00	6,00	7,00	8,00	9,00	10,00	11,00	12,00	13,00	14,00	15,00	16,00	17,00	18,00	19,00	20,00	21,00	22,00	23,00	24,00	25,00	26,00	
1,1	1,21	2,42	3,63	4,84	6,05	7,26	8,47	9,68	10,89	12,10	13,31	14,52	15,73	16,94	18,15	19,36	20,57	21,78	22,99	24,20	25,41	26,62	27,83	29,04	30,25	31,46	
1,2	1,44	2,88	4,32	5,76	7,20	8,64	10,08	11,52	12,96	14,40	15,84	17,28	18,72	20,16	21,60	23,04	24,48	25,92	27,36	28,80	30,24	31,68	33,12	34,56	36,00	37,44	
1,3	1,69	3,38	5,07	6,76	8,45	10,14	11,83	13,52	15,21	16,90	18,59	20,28	21,97	23,66	25,35	27,04	28,73	30,42	32,11	33,80	35,49	37,18	38,87	40,56	42,25	43,94	
1,4	1,96	3,92	5,88	7,84	9,80	11,76	13,72	15,68	17,64	19,60	21,56	23,52	25,48	27,44	29,40	31,36	33,32	35,28	37,24	39,20	41,16	43,12	45,08	47,04	49,00	50,96	
1,5	2,25	4,50	6,75	9,00	11,25	13,50	15,75	18,00	20,25	22,50	24,75	27,00	29,25	31,50	33,75	36,00	38,25	40,50	42,75	45,00	47,25	49,50	51,75	54,00	56,25	58,50	
1,6	2,56	5,12	7,68	10,24	12,80	15,36	17,92	20,48	23,04	25,60	28,16	30,72	33,28	35,84	38,40	40,96	43,52	46,08	48,64	51,20	53,76	56,32	58,88	61,44	64,00	66,56	
1,7	2,89	5,78	8,67	11,56	14,45	17,33	20,22	23,11	26,00	28,89	31,78	34,67	37,56	40,45	43,34	46,23	49,12	52,01	54,90	57,79	60,68	63,57	66,46	69,35	72,24	75,13	
1,8	3,24	6,48	9,72	12,96	16,20	19,44	22,67	25,91	29,15	32,39	35,63	38,87	42,11	45,35	48,59	51,83	55,07	58,31	61,55	64,79	68,03	71,27	74,51	77,75	80,99	84,23	
1,9	3,61	7,22	10,83	14,44	18,04	21,65	25,26	28,87	32,48	36,09	39,70	43,31	46,92	50,53	54,14	57,75	61,36	64,97	68,58	72,19	75,80	79,41	83,02	86,63	90,24	93,85	
2,0	4,00	8,00	12,00	16,00	19,99	23,99	27,99	31,99	35,99	39,99	43,99	47,99	51,99	55,99	59,99	63,99	67,99	71,99	75,99	79,99	83,99	87,99	91,99	95,99	99,99	103,99	
2,1	4,41	8,82	13,23	17,63	22,04	26,45	30,86	35,27	39,68	44,09	48,50	52,91	57,32	61,73	66,14	70,55	74,96	79,37	83,78	88,19	92,60	97,01	101,42	105,83	110,24	114,65	
2,2	4,84	9,68	14,52	19,35	24,19	29,03	33,87	38,71	43,55	48,39	53,23	58,07	62,91	67,75	72,59	77,43	82,27	87,11	91,95	96,79	101,63	106,47	111,31	116,15	120,99	125,83	
2,3	5,29	10,58	15,87	21,15	26,44	31,73	37,02	42,31	47,60	52,89	58,18	63,47	68,76	74,05	79,34	84,63	89,92	95,21	100,50	105,79	111,08	116,37	121,66	126,95	132,24	137,53	
2,4	5,76	11,52	17,27	23,03	28,79	34,55	40,31	46,07	51,82	57,58	63,34	69,10	74,86	80,62	86,38	92,14	97,90	103,66	109,42	115,18	120,94	126,70	132,46	138,22	143,98	149,74	
2,5	6,25	12,50	18,74	24,99	31,24	37,49	43,74	49,99	56,23	62,48	68,73	74,98	81,23	87,48	93,73	99,98	106,23	112,48	118,73	124,98	131,23	137,48	143,73	149,98	156,23	162,48	
2,6	6,76	13,52	20,27	27,03	33,79	40,55	47,31	54,06	60,82	67,58	74,34	81,10	87,86	94,62	101,38	108,14	114,90	121,66	128,42	135,18	141,94	148,70	155,46	162,22	168,98	175,74	
2,7	7,29	14,58	21,86	29,15	36,44	43,73	51,01	58,30	65,59	72,88	80,17	87,46	94,75	102,04	109,33	116,62	123,91	131,20	138,49	145,78	153,07	160,36	167,65	174,94	182,23	189,52	
2,8	7,84	15,68	23,51	31,35	39,19	47,03	54,86	62,70	70,54	78,38	86,22	94,06	101,90	109,74	117,58	125,42	133,26	141,10	148,94	156,78	164,62	172,46	180,30	188,14	195,98	203,82	
2,9	8,41	16,81	25,22	33,63	42,04	50,44	58,85	67,26	75,67	84,08	92,49	100,90	109,31	117,72	126,13	134,54	142,95	151,36	159,77	168,18	176,59	185,00	193,41	201,82	210,23	218,64	
3,0	9,00	17,99	26,99	35,99	44,99	53,99	62,99	71,99	80,99	89,99	98,99	107,99	116,99	125,99	134,99	143,99	152,99	161,99	170,99	179,99	188,99	197,99	206,99	215,99	224,99	233,99	242,99
3,1	9,61	19,21	28,82	38,43	48,04	57,65	67,26	76,87	86,48	96,09	105,70	115,31	124,92	134,53	144,14	153,75	163,36	172,97	182,58	192,19	201,80	211,41	221,02	230,63	240,24	249,85	
3,2	10,24	20,47	30,71	40,95	51,18	61,42	71,66	81,90	92,14	102,38	112,62	122,86	133,10	143,34	153,58	163,82	174,06	184,30	194,54	204,78	215,02	225,26	235,50	245,74	255,98	266,22	
3,3	10,89	21,78	32,67	43,56	54,45	65,34	76,23	87,12	98,01	108,90	119,79	130,68	141,57	152,46	163,35	174,24	185,13	196,02	206,91	217,80	228,69	239,58	250,47	261,36	272,25	283,14	
3,4	11,56	23,11	34,67	46,23	57,78	69,34	80,89	92,45	104,01	115,57	127,13	138,69	150,25	161,81	173,37	184,93	196,49	208,05	219,61	231,17	242,73	254,29	265,85	277,41	288,97	300,53	
3,5	12,25	24,50	37,06	49,62	62,18	74,74	87,30	99,86	112,42	124,98	137,54	150,10	162,66	175,22	187,78	200,34	212,90	225,46	238,02	250,58	263,14	275,70	288,26	300,82	313,38	325,94	
3,6	12,96	25,91	38,87	51,82	64,78	77,74	90,69	103,65	116,61	129,57	142,53	155,49	168,45	181,41	194,37	207,33	220,29	233,25	246,21	259,17	272,13	285,09	298,05	311,01	323,97	336,93	
3,7	13,69	27,38	41,33	55,28	69,23	83,18	97,13	111,08	125,03	138,98	152,93	166,88	180,83	194,78	208,73	222,68	236,63	250,58	264,53	278,48	292,43	306,38	320,33	334,28	348,23	362,18	
3,8	14,44	28,87	43,31	57,26	71,21	85,16	99,11	113,06	127,01	140,96	154,91	168,86	182,81	196,76	210,71	224,66	238,61	252,56	266,51	280,46	294,41	308,36	322,31	336,26	350,21	364,16	
3,9	15,21	30,42	45,63	60,58	75,53	90,48	105,43	120,38	135,33	150,28	165,23	180,18	195,13	210,08	225,03	240,00	254,95	269,90	284,85	299,80	314,75	329,70	344,65	359,60	374,55	389,50	
4,0	16,00	31,99	47,99	63,99	79,99	95,99	111,99	127,99	143,99	159,99	175,99	191,99	207,99	223,99	239,99	255,99	271,99	287,99	303,99	319,99							

Tab. 7

Stainless steel pipes for gas.  
Pressure drops  $Z$  as a function of speed  $v$  and addition of  
resistance values  $\Sigma \xi$  at 10 °C temperature.

$\Sigma \xi$ v(m/s)	Pressure drop $Z$ (mbar) due to minor losses																										
	0,3	0,5	1,0	1,5	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0	7,5	8,0	8,5	9,0	9,5	10,0	10,5	11,0	11,5	12,0	13,0	
1,0	0,0009	0,002	0,003	0,005	0,006	0,008	0,009	0,011	0,012	0,014	0,015	0,017	0,018	0,020	0,021	0,023	0,024	0,026	0,028	0,029	0,031	0,032	0,034	0,035	0,037	0,040	0,040
1,1	0,0011	0,002	0,004	0,006	0,007	0,009	0,011	0,013	0,015	0,017	0,019	0,020	0,022	0,024	0,026	0,028	0,030	0,031	0,033	0,035	0,037	0,039	0,041	0,043	0,044	0,048	0,048
1,2	0,0013	0,002	0,004	0,007	0,009	0,011	0,013	0,016	0,018	0,021	0,023	0,026	0,028	0,031	0,034	0,036	0,039	0,041	0,044	0,047	0,049	0,052	0,054	0,057	0,059	0,062	0,067
1,3	0,0016	0,003	0,005	0,008	0,010	0,013	0,016	0,021	0,023	0,026	0,028	0,031	0,034	0,038	0,041	0,045	0,048	0,052	0,055	0,059	0,062	0,066	0,070	0,074	0,079	0,083	0,090
1,4	0,0018	0,003	0,006	0,009	0,012	0,015	0,018	0,021	0,024	0,028	0,030	0,033	0,036	0,040	0,044	0,048	0,052	0,056	0,060	0,064	0,068	0,072	0,077	0,082	0,087	0,092	0,102
1,5	0,0021	0,003	0,007	0,010	0,014	0,017	0,021	0,024	0,028	0,031	0,034	0,038	0,041	0,045	0,050	0,054	0,058	0,063	0,067	0,071	0,074	0,078	0,082	0,086	0,090	0,094	0,102
1,7	0,0027	0,004	0,009	0,013	0,018	0,022	0,027	0,031	0,035	0,040	0,044	0,049	0,053	0,057	0,062	0,066	0,071	0,075	0,080	0,084	0,088	0,093	0,097	0,101	0,105	0,111	0,115
1,8	0,0030	0,005	0,010	0,015	0,020	0,025	0,030	0,035	0,040	0,045	0,050	0,055	0,060	0,065	0,070	0,074	0,079	0,084	0,089	0,094	0,099	0,104	0,109	0,114	0,119	0,129	0,144
1,9	0,0033	0,006	0,011	0,017	0,022	0,028	0,033	0,039	0,044	0,050	0,055	0,061	0,066	0,072	0,077	0,083	0,088	0,094	0,099	0,105	0,110	0,116	0,122	0,127	0,133	0,144	0,159
2,0	0,0037	0,006	0,012	0,018	0,024	0,030	0,036	0,042	0,048	0,054	0,061	0,067	0,073	0,080	0,086	0,092	0,098	0,104	0,110	0,116	0,122	0,128	0,135	0,141	0,147	0,159	0,175
2,1	0,0040	0,007	0,013	0,020	0,026	0,035	0,044	0,053	0,062	0,071	0,079	0,088	0,097	0,106	0,115	0,123	0,131	0,140	0,149	0,158	0,167	0,176	0,185	0,194	0,203	0,212	0,229
2,2	0,0049	0,008	0,016	0,024	0,032	0,040	0,049	0,057	0,065	0,073	0,081	0,089	0,097	0,105	0,113	0,121	0,129	0,138	0,146	0,154	0,162	0,170	0,178	0,186	0,194	0,210	0,210
2,3	0,0053	0,009	0,018	0,026	0,035	0,044	0,053	0,062	0,071	0,079	0,088	0,097	0,106	0,115	0,123	0,132	0,141	0,150	0,159	0,167	0,176	0,185	0,194	0,203	0,212	0,229	0,249
2,4	0,0057	0,010	0,019	0,029	0,038	0,048	0,057	0,067	0,077	0,086	0,096	0,105	0,115	0,124	0,134	0,143	0,153	0,163	0,172	0,182	0,191	0,201	0,210	0,220	0,230	0,249	0,269
2,5	0,0062	0,011	0,022	0,031	0,040	0,050	0,060	0,070	0,080	0,090	0,100	0,110	0,120	0,130	0,140	0,150	0,160	0,170	0,180	0,190	0,200	0,210	0,220	0,230	0,240	0,250	0,269
2,6	0,0067	0,012	0,024	0,033	0,043	0,053	0,063	0,073	0,083	0,093	0,103	0,113	0,123	0,133	0,143	0,153	0,163	0,173	0,183	0,193	0,203	0,213	0,223	0,233	0,243	0,253	0,269
2,7	0,0072	0,013	0,026	0,035	0,045	0,055	0,065	0,075	0,085	0,095	0,105	0,115	0,125	0,135	0,145	0,155	0,165	0,175	0,185	0,195	0,205	0,215	0,225	0,235	0,245	0,255	0,269
2,8	0,0077	0,014	0,028	0,037	0,047	0,057	0,067	0,077	0,087	0,097	0,107	0,117	0,127	0,137	0,147	0,157	0,167	0,177	0,187	0,197	0,207	0,217	0,227	0,237	0,247	0,257	0,269
2,9	0,0083	0,015	0,030	0,039	0,049	0,059	0,069	0,079	0,089	0,099	0,109	0,119	0,129	0,139	0,149	0,159	0,169	0,179	0,189	0,199	0,209	0,219	0,229	0,239	0,249	0,259	0,269
3,0	0,0088	0,016	0,032	0,041	0,051	0,061	0,071	0,081	0,091	0,101	0,111	0,121	0,131	0,141	0,151	0,161	0,171	0,181	0,191	0,201	0,211	0,221	0,231	0,241	0,251	0,269	0,289
3,1	0,0094	0,017	0,034	0,043	0,053	0,063	0,073	0,083	0,093	0,103	0,113	0,123	0,133	0,143	0,153	0,163	0,173	0,183	0,193	0,203	0,213	0,223	0,233	0,243	0,253	0,269	0,289
3,2	0,0100	0,018	0,036	0,045	0,055	0,065	0,075	0,085	0,095	0,105	0,115	0,125	0,135	0,145	0,155	0,165	0,175	0,185	0,195	0,205	0,215	0,225	0,235	0,245	0,255	0,269	0,289
3,3	0,0106	0,019	0,038	0,047	0,057	0,067	0,077	0,087	0,097	0,107	0,117	0,127	0,137	0,147	0,157	0,167	0,177	0,187	0,197	0,207	0,217	0,227	0,237	0,247	0,257	0,269	0,289
3,4	0,0112	0,020	0,040	0,049	0,059	0,069	0,079	0,089	0,099	0,109	0,119	0,129	0,139	0,149	0,159	0,169	0,179	0,189	0,199	0,209	0,219	0,229	0,239	0,249	0,259	0,269	0,289
3,5	0,0117	0,021	0,042	0,051	0,061	0,071	0,081	0,091	0,101	0,111	0,121	0,131	0,141	0,151	0,161	0,171	0,181	0,191	0,201	0,211	0,221	0,231	0,241	0,251	0,269	0,289	0,309
3,6	0,0123	0,022	0,044	0,053	0,063	0,073	0,083	0,093	0,103	0,113	0,123	0,133	0,143	0,153	0,163	0,173	0,183	0,193	0,203	0,213	0,223	0,233	0,243	0,253	0,269	0,289	0,309
3,7	0,0129	0,024	0,048	0,057	0,067	0,077	0,087	0,097	0,107	0,117	0,127	0,137	0,147	0,157	0,167	0,177	0,187	0,197	0,207	0,217	0,227	0,237	0,247	0,257	0,269	0,289	0,309
3,8	0,0135	0,025	0,050	0,059	0,069	0,079	0,089	0,099	0,109	0,119	0,129	0,139	0,149	0,159	0,169	0,179	0,189	0,199	0,209	0,219	0,229	0,239	0,249	0,259	0,269	0,289	0,309
3,9	0,0141	0,026	0,052	0,061	0,071	0,081	0,091	0,101	0,111	0,121	0,131	0,141	0,151	0,161	0,171	0,181	0,191	0,201	0,211	0,221	0,231	0,241	0,251	0,269	0,289	0,309	0,329
4,0	0,0147	0,028	0,054	0,063	0,073	0,083	0,093	0,103	0,113	0,123	0,133	0,143	0,153	0,163	0,173	0,183	0,193	0,203	0,213	0,223	0,233	0,243	0,253	0,269	0,289	0,309	0,329
4,1	0,0154	0,029	0,056	0,065	0,075	0,085	0,095	0,105	0,115	0,125	0,135	0,145	0,155	0,165	0,175	0,185	0,195	0,205	0,215	0,225	0,235	0,245	0,255	0,269	0,289	0,309	0,329
4,2	0,0162	0,030	0,060	0,069	0,079	0,089	0,099	0,109	0,119	0,129	0,139	0,149	0,159	0,169	0,179	0,189	0,199	0,209	0,219	0,229	0,239	0,249	0,259	0,269	0,289	0,309	0,329
4,3	0,0170	0,032	0,064	0,073	0,083	0,093	0,103	0,113	0,123	0,133	0,143	0,153	0,163	0,173	0,183	0,193	0,203	0,213	0,223	0,233	0,243	0,253	0,269	0,289	0,309	0,329	0,349
4,4	0,0178	0,034	0,068	0,077	0,087	0,097	0,107	0,117	0,127	0,137	0,147	0,157	0,167	0,177	0,187	0,197	0,207	0,217	0,227	0,237	0,247	0,257	0,269	0,289	0,309	0,329	0,349
4,5	0,0186	0,036	0,072	0,081	0,091	0,101	0,111	0,121	0,131	0,141	0,151	0,161	0,171	0,181	0,191	0,201	0,211	0,221	0,231	0,241	0,251	0,269	0,289	0,309	0,329	0,349	0,369
4,6	0,0194	0,038	0,076	0,085	0,095	0,105	0,115	0,125	0,135	0,145	0,155	0,165	0,175	0,185	0,195	0,205	0,215	0,225	0,235	0,245	0,255	0,269	0,289	0,309	0,329	0,349	0,369
4,7	0,0203	0,040	0,080	0,089	0,099	0,109	0,119	0,129	0,139	0,149	0,159	0,169	0,179	0,189	0,199	0,209	0,219	0,229	0,239	0,249	0,259	0,269	0,289	0,309	0,329	0,349	0,369
4,8	0,0212	0,042	0,084	0,093	0,103	0,113	0,123	0,133	0,143	0,153	0,163	0,173	0,183	0,193	0,203	0,213	0,223	0,233	0,243	0,253	0,269	0,289	0,309	0,329	0,349	0,369	0,389
4,9	0,0220	0,044	0,088	0,097	0,107	0,117	0,127	0,137	0,147	0,157	0,167	0,177	0,187	0,197	0,207	0,217	0,227	0,237	0,247	0,257	0,269	0,289	0,309	0,329	0,349	0,369	0,389
5,0	0,0230	0,046	0,092	0,101	0,111	0,121	0,131	0,141	0,151	0,161	0,171	0,181	0,191	0,201	0,211	0,221	0,231	0,241	0,251	0,269	0,289	0,309	0,329	0,349	0,369	0,389	0,409

Tab. 8

Carbon steel pipes for heating.  
Pressure drops  $Z$  as a function of speed  $v$  and addition of  
resistance values  $\Sigma \xi$  at 80 °C water temperature.

$\Sigma \xi$ v(m/s)	Pressure drop $Z$ (mbar) due to minor losses																								
	0,2	0,4	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	2,5	3,0	3,5	4,0	4,5	5,0	5,5	6,0	6,5	7,0	7,5	8,0	8,5	9,0	9,5
0,10	0																								





**1. CUTTING:** Cut the pipe using burr free approved cutters. Do not use oxy-acetylene or abrasive cut off wheels. Pipes must be cut at right angles to their axis, using a pipe cutter or fine-tooth saw, taking into account the depth of insertion into the fitting.



**2. DEBURRING:** All pipe cuts must be carefully deburred, both inside and outside, using a manual or electric deburring tool. Any cutting residue (swarf) must be removed to preclude damage to the O-ring when the pipe is inserted into the fitting, avoiding possible leaks.



**3. WITNESS MARK INSERTION DEPTH:** To ensure a correctly inserted joint the pipe must be marked with a fine-point felt -tip pen where it meets the fitting using the Europress depth gauge so that full insertion can be verified.



**1. CUTTING:** As per previous page

**2. DEBURRING:** All pipe cuts must be carefully deburred, both inside and outside, using a manual or electric deburring tool. Any cutting residue (swarf) must be removed to preclude damage to the O-ring when the pipe is inserted into the fitting, avoiding possible leaks.



**3. WITNESS MARK INSERTION DEPTH:** To ensure a correctly inserted joint, the pipe must be marked with a fine-point felt-tip pen. 42 & 54 Use the Europress depth gauge.

Large sizes use rule (pictured)  
76.1 mark at 55mm  
88.9 mark at 63mm  
108 mark at 78mm  
139.7 mark at 97mm  
168.3 mark at 117mm



**4. ASSEMBLE FITTING ON TUBE:** Before assembling the fittings, the positioning of the o-rings must be checked and, if necessary, lubricate O-ring with water or talc to ease the insertion of the pipe. Never use oils, greases, glues or other similar substances. The pipe is inserted in the fitting with a slight rotating motion until it hits the stop.

**Check pipe is fully inserted to witness mark**



**4. ASSEMBLE FITTING ON TUBE:** Before assembling the fittings, the positioning of the O-rings must be checked and, if necessary, lubricate O-ring with water or talc to ease the insertion of the pipe. Never use oils, greases, glues or other similar substances. The pipe is inserted in the fitting with a slight rotating motion until it hits the stop.

**Check pipe is fully inserted to witness mark**



**5. PRESS TOOL & JAW:** The pressing tools must be equipped with M-shaped profile jaw attachments or pressing jaw corresponding to the diameter of the fitting to be pressed. Retract the lock pin, position the jaws into the tool head and ensure the lock pin is fully engaged.



**6. POSITION PRESS JAW:** Open the jaws by squeezing the two ends together, then position jaws over the fitting so that the internal channel of the jaws form a perfect fit round the toroidal seat of the fitting. Release the jaws and check for alignment.



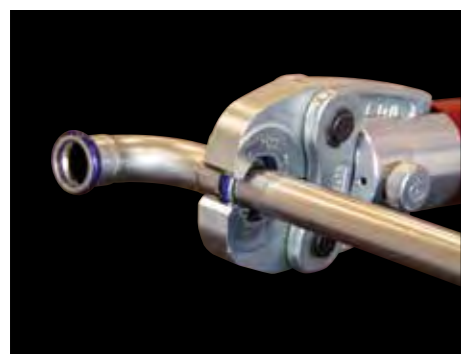
**5. ATTACH PRESS COLLAR:** The pressing collar must be M- shaped profile corresponding to the diameter of the fitting to be pressed. Retract the lock pin, open the jaws and position the jaws around the fitting.



**6. LOCK COLLAR** Ensure that the internal channel of the jaws form a perfect fit round the O-ring seat of the fitting. Ensure the lock pin is fully engaged.



**7. ATTACH ADAPTOR** Squeeze the back of the adaptor arms together and hook onto the pressing collar

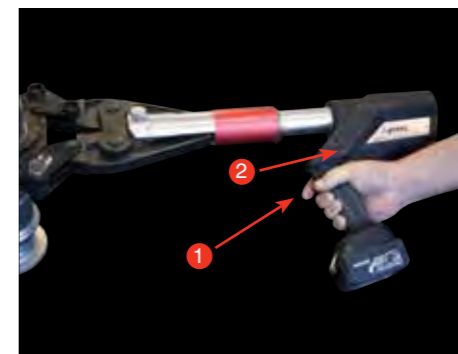


**7. PRESS JOINT:** Initiate the press cycle by squeezing the trigger 1 - hold until press cycle is completed. Do not allow interruption to the press cycle. If the LED light 2 comes on or warning beep sounds, the joint is NOT approved. If the hydraulic ram stops mid-cycle the automatic reset function can be manually overridden by depressing the reset button 3

**Check L.E.D. light after each press. If it comes on, battery must be recharged or changed before attempting the next press. see trouble-shooting guide.**



**8. CONNECT PRESS TOOL** Retract the lock pin, engage the adaptor and make sure lock pin is fully engaged.



**Check witness mark for insertion and alignment before initialising press cycle.**

**9. PRESS JOINT.** Initiate the press cycle by squeezing the trigger 1 hold until press cycle is completed. Do not allow interruption to the press cycle. If the LED light comes on or warning beep sounds, the joint is NOT approved. If the hydraulic ram stops mid-cycle the automatic reset function can be manually overridden by depressing the reset button- 2 Any tool malfunction check with our Technical dept. **Do not continue using tool without approval**

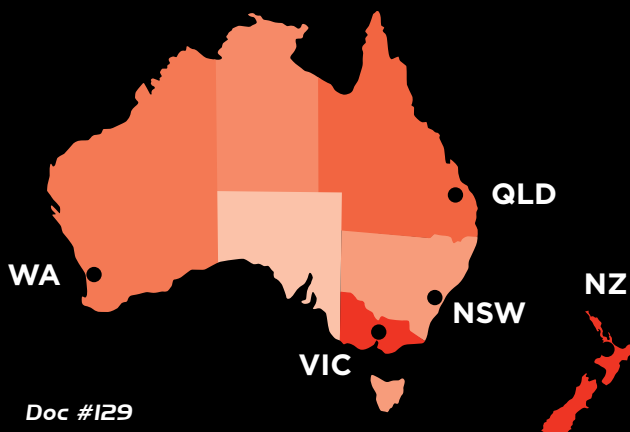


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