



BRANDS

NEW ZEALAND'S LEADING SUPPLIER OF
QUALITY PIPING & PLUMBING PRODUCTS

**STAINLESS
STEEL**

STAINLESS STEEL
TUBE & PRESS FIT
SYSTEM FOR
WATER, GAS
& INDUSTRY

 **KEMBLA**

KemPress®

DESIGN & INSTALLATION GUIDE

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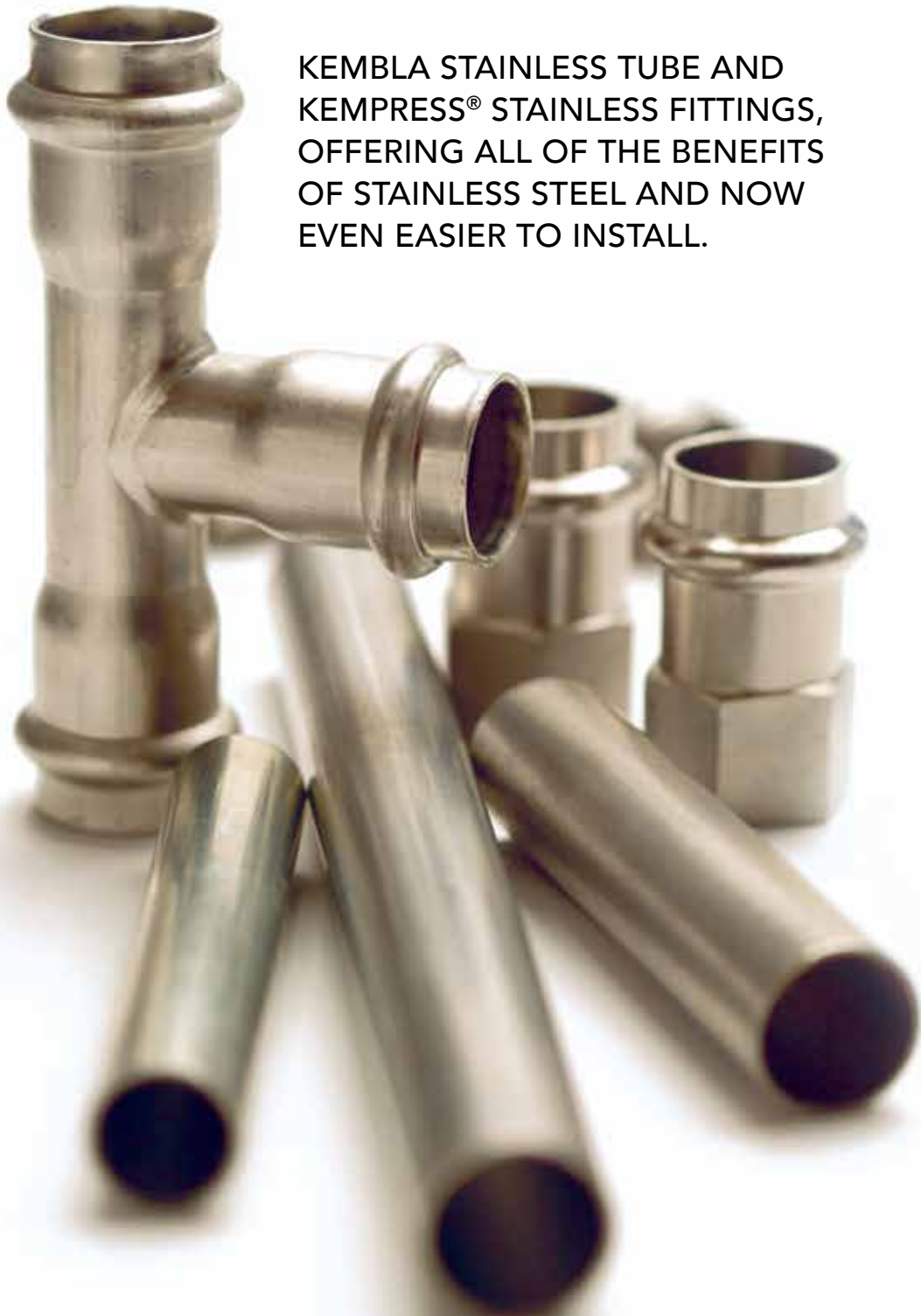
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SECTION 1

INTRODUCTION



KEMBLA STAINLESS TUBE AND
KEMPRESS® STAINLESS FITTINGS,
OFFERING ALL OF THE BENEFITS
OF STAINLESS STEEL AND NOW
EVEN EASIER TO INSTALL.

THE HIGHEST QUALITY STAINLESS STEEL PRESS-FIT TECHNOLOGY OFFERING, EASE OF USE AND IMPROVED INSTALLATION QUALITY.

MM Kembla® has combined the experience and knowledge of over 100 years of Australian metal tube manufacturing with press-fit technology and German engineering to produce the KemPress® Stainless Steel press-fit connection system

With a warranty of 25 years for potable water and fuel gas applications, and a design life of over 50 years, KemPress® Stainless Steel offers you peace of mind and the simplicity that you want.

Kembla Stainless Steel Tube and KemPress® Stainless press fittings, have been optimised for combined use. When you need the highest quality stainless steel press-fit system, use Kembla Stainless steel tube, KemPress® Stainless fittings and the KemPress® press tools. Our press tools are of the highest quality, are the lightest on the market and have the longest intervals between servicing.





WHY USE KEMPRESS STAINLESS STEEL?

The advantages of installing KemPress Stainless Steel tube and fittings include:

Fast and Easy to use

- Considerably faster than traditional jointing methods
- No need to drain water out of the system
- No waiting for adhesives to set

Safe, Heat-free, Flame-free connections

- No hot works permit required
- Ideal for retrofit projects

High Quality 316L stainless steel tube

- Low carbon (<0.03%) and a minimum 2.3% Molybdenum content ensures even higher corrosion resistance
- Sizes 15 – 108mm
- Compliant with AS 5200.053
- Watermark Approval # 23151

High Quality 316L stainless steel press fittings

- Compliant with AS3688
- 316L, material EN 1.4404 (press fittings)
- 316Ti, material EN 1.4571 (threaded parts)
- 316, material EN 1.4408 (precision cast parts)
- Watermark Approval # 23087 (EPDM and FKM O-rings)

Push and Stay and Leak Path Features

- Fitting is tight enough to complete the rough-in before securing placement by pressing for easier installation
- Leak Path ensures efficient checking of joint integrity, joints will leak if not pressed (Standard EPDM O-ring only)

High quality, lightweight KemPress® tools

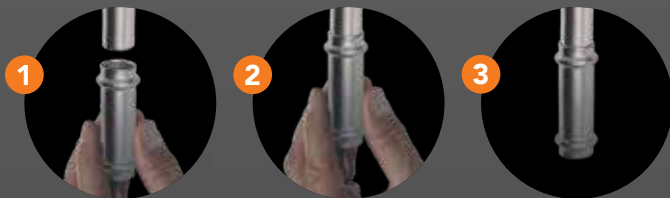
- Slim lightweight and ergonomic design
- One hand operation. Once the jaws are inserted the weight is balanced
- Smart Electronic Controls and Bluetooth technology for use with the Novocheck App
- Longest interval between servicing
- Loan tool provided while servicing
- Small tool (KPS2) handles tube up to DN32
- Large tool (KPL3) handles tube up to DN100
- Brushless Motor Technology for more presses per battery charge
- Press area illumination
- 180° Rotatable head on KPS2 small tool.

KemPress Warranty

- With a warranty of 25 years, and a design life of over 50 years, KemPress® offers you peace of mind.
- Backed by MM Kembla's reputation for high quality products, service and customer care.

KEMPRESS STAINLESS STEEL FEATURES

UNIQUE PUSH & STAY



Push & Stay

KemPress® Stainless press fittings are designed to provide a tight fit when pushed together to allow the rough-in to be completed prior to pressing. This ensures you have the right design and tube placement and allows you to make adjustments, if required, prior to pressing. This is especially beneficial for vertical installations.

VISUAL IDENTIFICATION

Press Identification

The objective of the press process is to deliver a permanent connection while achieving the required pullout strength according to AS3688. The KemPress® process presses the lip of the fitting and compresses the O-ring at the same time.

BLUETOOTH KEMPRESS TOOLS

Manage on-site tool performance and calibration.

- KPS2 and KPL3 tools are Bluetooth
- Access live diagnostic data of all presses via the Novocheck App
- Generate site reports showing press completion and data logs of press performance
- Compare press completion with number of presses required on a section of work.



UNPRESSED FITTING ID

Leak Path

KemPress® Stainless standard fittings, with EPDM O-rings, also feature a built-in leak path so they visibly leak prior to pressing, making the process of checking all joints are pressed and sealed more efficient.

Note: Due to potential movement between test fitting and pressing, it is important to check that you have full engagement of your fittings on the tube prior to pressing. See Section 3 "Installation Guidelines" for further details.

UNIVERSAL PROFILE

Press Profile

KemPress fittings up to DN54 have been designed with a unique universal profile, to ensure no matter what press tool you are using, your fitting warranty remains intact.

The unique SA press profile of KemPress fittings means you can use any press tool with jaw profiles V, SA or M suitable for use on AS3688 size fittings to complete your press connection. Meaning you don't need to purchase a new press tool to begin using KemPress fittings or worry about using the wrong press tool across job sites.



SECTION 2
DESIGN
CONSIDERATIONS



2.1 **KEMBLA STAINLESS
STEEL TUBE**

Kembla Stainless tube is 316L grade (EN 1.4404) complying with DIN EN 10088, fabricated according to DIN EN 10312 and DVGW - W 541 and is supplied as straight 6m lengths with outside diameters in the range 15mm – 108mm. It is compliant with AS 5200.053 and has Watermark Approval #23151. Kembla Stainless tubes combine low carbon, at less than 0.03%, with a minimum molybdenum content of 2.3% for improved corrosion resistance.

Low carbon, austenitic stainless steel is roll formed and then longitudinally plasma-inert gas-welded to precisely form the tubes. Kembla Stainless tubes are bright annealed and solution heat-treated, resulting in an attractive, hygienic and highly durable product.

AS 5200.053



23151



Table 1: Kembla Stainless Tube Specifications

Nominal Size	Outside Diameter mm	Wall Thickness mm	Dry Weight kg/m	Wet Weight, filled with water kg/m	Volume l/m	Tube Length mm	6m Tube Mass kg
DN15	15	1.0	0.351	0.484	0.133	6000	2.11
DN20	22	1.2	0.625	0.928	0.302	6000	3.75
DN25	28	1.2	0.805	1.321	0.515	6000	4.83
DN32	35	1.5	1.258	2.064	0.804	6000	7.55
DN40	42	1.5	1.521	2.718	1.195	6000	9.13
DN50	54	1.5	1.972	4.017	2.043	6000	11.83
DN65	76.1	2.0	3.711	7.798	4.083	6000	22.27
DN100	108	2.0	5.308	13.810	8.495	6000	31.85

For designers familiar with designing with copper, Table 2 provides a quick reference comparing bore size and safe working pressures for Kembla Type B copper tube with KemPress® Copper press fittings and the KemPress® Stainless system.

Table 2: Comparison of Kembla Copper Type B KemPress® vs. Kembla Stainless KemPress® - Potable Water

Kembla Copper Type B Tube with KemPress® Copper Fittings							Kembla Stainless Tube and KemPress® Stainless Fittings			
Nom Size	OD mm	WT mm	Bore mm	Tube Only SWP 50°C	KemPress® SWP# 50°C	KemPress® SWP# 120°C with EPDM Seal	OD mm	WT mm	Bore mm	SWP# up to 120°C with EPDM Seal
DN12	12.7	0.91	10.88	5290	1600	1600				
							15	1.00	13.00	4000#
DN18*	15.88	1.02	13.84	4810						
DN20	19.05	1.02	17.01	3970	1600	1600				
							22	1.20	19.60	4000#
DN25	25.4	1.22	22.96	3500	1600	1600				
							28	1.20	25.60	2500#
DN32	31.75	1.22	29.31	2780	1600	1600				
							35	1.50	32.00	2500#
DN40	38.1	1.22	35.66	2300	1600	1600				
							42	1.50	39.00	1600#
DN50	50.8	1.22	48.36	1710	1600	1370				
							54	1.50	51.00	1600#
DN65	63.5	1.22	61.06	1370	1370	1100				
DN80*	76.2	1.63	72.94	1520			76.1	2.00	72.10	1600#
DN90*	88.9	1.63	85.64	1300						
DN100*	101.6	1.63	98.34	1200						
							108	2.00	104.00	1600#

* Sizes not available in KemPress® Copper at time of publication # Higher pressures may be approved by MM Kembla and may require the use of high pressure pressing tools and special jaws and slings. Please contact MM Kembla for individual project assessment.

**2.2) KEMPRESS®
 STAINLESS FITTINGS**

KemPress® Stainless fittings are manufactured and quality controlled to AS3688, with 316L (material EN1.4404) for parts made from tube, 316Ti (material EN1.4571) for threaded fittings and 316 (material 1.4408) for precision cast fittings, all having Watermark Approval # 23087 for Standard (EPDM) and Industry (FKM) fittings.

All KemPress® fittings are optimally designed to ensure the most effective joint formation, achieving or exceeding the hydraulic and structural requirements of standards and are fully supported by the MM Kembla warranty of up to 25 years. KemPress® Stainless fittings up to and including 54mm have a leading lip, whereas, the 76.1 mm and 108 mm press fittings do not.

AS 3688



23087



KemPress® Stainless fittings up to and including 54 mm have a leading lip prior to the O-ring.



KemPress® Stainless fittings 76.1 mm and 108 mm do not have a leading lip prior to the O-ring.

**2.3) KEMPRESS®
 STAINLESS O-RINGS**

KemPress® Stainless press-fit fittings are available with three different O-rings depending on the application. Each type of O-ring is made of a different material, black coloured EPDM for Standard fittings, red coloured FKM for Industry fittings and yellow coloured HNBR for Gas fittings. Please reference the KemPress® Stainless Application Guide, available from MM Kembla, to determine the most appropriate fitting type for the application. Fittings without sealing elements, such as bends with plain tube ends and threaded adaptors with plain tube ends, may be used in combination with any of the fittings with elastomeric seals.

Industry press fittings are clearly marked on the fittings and also on the packaging with a distinctive red colour and the letters HT (high temperature). Gas press fittings are clearly marked on the fittings and also on the packaging with a distinctive yellow colour and the word GAS.

It is essential that the O-rings are correctly positioned in the press fitting O-ring recess and not contaminated or damaged by foreign material such as stainless steel swarf, or sharp metal at the tube ends following cutting. The O-rings are pre-lubricated and are ready to use. If additional lubricant is required it is recommended to use a small amount of silicone grease, ensuring it is PTFE-free.



KemPress® Stainless Standard O-Rings

Standard press fittings utilise a black EPDM (Ethylene Propylene Diene Monomer) O-ring. EPDM possesses excellent resistance to ozone, sunlight and weathering, has very good flexibility at low temperature and good chemical resistance, such as to many dilute acids and alkalis and polar solvents.

This O-ring is suitable for hot and cold potable water applications and some industrial applications. It is not suitable for aromatic hydrocarbons, di-ester based lubricants, halogenated solvents or petroleum based oils and greases.

For applications with temperatures exceeding 120°C and/or media other than potable water, please reference the KemPress® Stainless Application Guide, available from MM Kembla, to determine a suitable combination of tube and O-ring. Please contact MM Kembla for guidance if in doubt.



KemPress® Stainless Industry O-Rings

Industry press fittings utilise a FKM (Fluorocarbon) O-Ring. FKM has excellent resistance to high temperatures up to 200°C (depending on the medium), ozone, weather, oxygen, mineral oil, fuels, hydraulic fluids, aromatics and many organic solvents and chemicals.

It is ideal for petroleum products, fuels including those blended with ethanol or methanol, diesel, biodiesel, mineral oils and greases, silicone oils and greases, high vacuum, strong acids, ozone, weather and very high temperatures.

It isn't suitable for ketones, low molecular weight organic acids (e.g. formic and acetic), super heated steam, low molecular weight esters and ethers or phosphate based hydraulic fluids.

Industry fittings have a red coloured O-ring and are clearly marked with distinctive red HT symbol.

Please consult the KemPress® Stainless Application Guide to determine a suitable combination of tube and O-ring and contact MM Kembla for further guidance if in doubt.

KemPress® Stainless Gas O-Rings

Gas press fittings utilise a HNBR (Hydrogenated Nitrile Butadiene Rubber) O-ring sealing element. HNBR, compared to standard Nitrile, possesses superior mechanical properties and improved resistance to heat, ozone and chemicals.

HNBR has been used for decades in automotive and industrial applications. It is well suited to propane, butane and natural gas (methane). It is not suitable for drinking water.

Gas press fittings have a yellow O-ring and are clearly marked with a distinctive yellow colour and the word GAS.

Whilst fuel gas standards call for working temperatures of up to 70°C, the KemPress® Stainless HNBR gas O-ring is certified for operating temperatures up to 100°C.

Please reference the KemPress® Stainless Application Guide, available from MM Kembla, to determine a suitable combination of tube and O-ring and contact MM Kembla for further guidance if in doubt



Table 3: KemPress® Stainless O-Ring Specifications

Colour Code	Black	Red	Yellow
Fitting Type	Standard	Industry	Gas
Material Code	EPDM	FKM	HNBR
Material	Ethylene Propylene Diene Monomer	Fluorocarbon	Hydrogenated Nitrile Butadiene Rubber
Maximum Continuous Temperature Range °C	-30°C up to 120°C	-20°C up to 200°C (depending on the medium)	-20°C up to 100°C
Peak Short Term Max. Temp °C	150°C	280°C	100°C

2.4 DESIGN PRESSURES

Table 4: KemPress® Stainless Design Pressures Using Standard Tools, Jaws and Slings

Application	Pipe External Diameter	Safe Working Pressure
Water and Aqueous Solutions	d ≤ 22mm	40 bar
	d = 28-35mm	25 bar
	d = 42-108mm	16 bar
Flammable/Fuel Gases	d ≤ 108mm	5 bar
Technical Gases & Compressed Air (Non-Toxic, Non-Flammable)	d ≤ 108mm	16 bar
Fire Sprinkler Systems*	d = 22-76.1mm	16 bar (EPDM & FKM for VdS) 12 bar (EPDM & FKM for FM)
	d = 108 mm	12.5 bar (EPDM only for VdS) 12 bar (EPDM & FKM for FM)

* For further information please refer to "Fire Systems" in Section 2.11 of this document

For applications other than flammable gases and technical gases, e.g. water and compressed air, pressures higher than those shown in Table 4 may be approved by MM Kembla. Depending on the application variables, including the medium being conveyed, pressures and temperatures, the use of high pressure pressing tools and special jaws and slings may be required to achieve these higher pressures. Please contact MM Kembla for project assessment and warranty information.

Vacuum Applications

KemPress® Stainless has been tested and approved to operate safely at up to -0.95 bar for vacuum applications.

2.5 SYSTEM PRESSURE LOSSES

System pressure losses are calculated by taking into consideration tube friction pressure losses and individual fittings pressure losses.

2.5.1 Kembla Stainless Tube Friction Pressure Losses

The friction pressure losses "R" (Pa/metre) and the flow velocity "v" (metres per second) depend on the flow rate "V" (litres per second) and the drinking water temperature "θ" (°C) for the Kembla Stainless tube. The average tube roughness of Kembla Stainless tube is K = 0.0015 mm.

The following tables provide estimates of friction pressure losses for Kembla Stainless tube with potable water at 10°C and at 60°C.

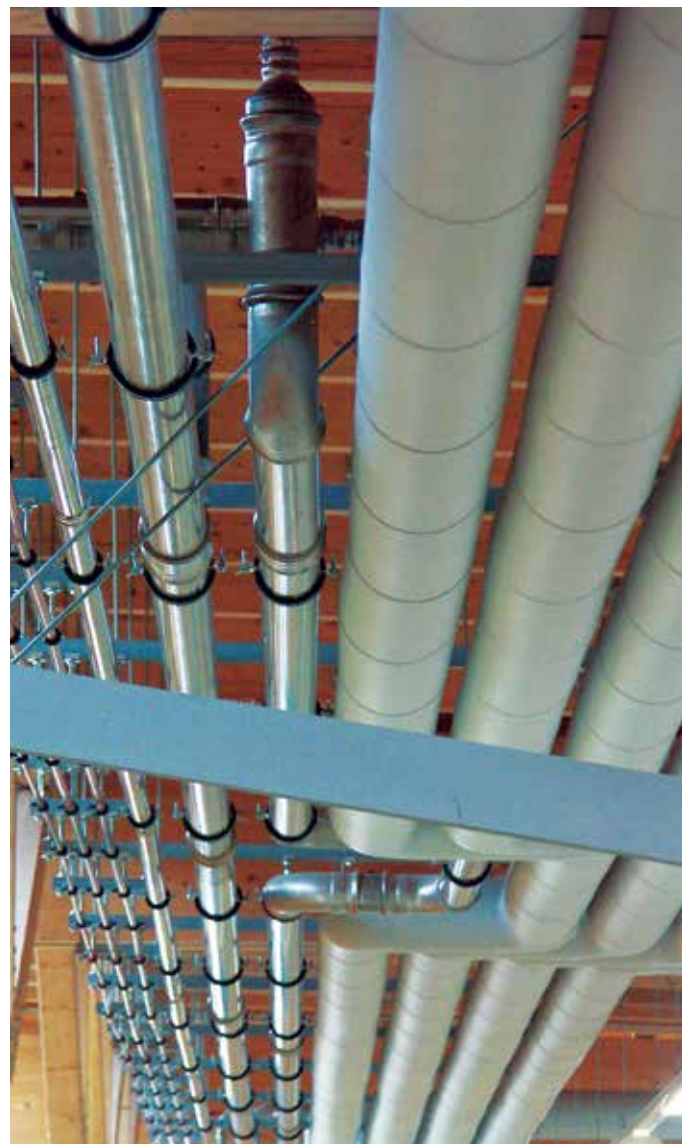


Table 5A: Kembla Stainless Tube Friction Pressure Loss at 10°C

OD x WT (mm)	15 x 1		22 x 1.2	
Bore (mm)	13.0		19.6	
Volume (l/m)	0.13		0.30	
V (l/s)	R (Pa/m)	v (m/s)	R (Pa/m)	v (m/s)
0.07	397.2	0.53	57.4	0.23
0.08	499.6	0.60	72.1	0.27
0.09	612.1	0.68	88.1	0.30
0.10	734.2	0.75	105.5	0.33
0.12	1006.9	0.90	144.3	0.40
0.14	1316.3	1.05	188.2	0.46
0.16	1661.2	1.21	237.1	0.53
0.18	2040.8	1.36	290.7	0.60
0.20	2454.2	1.51	349.0	0.66
0.22	2900.7	1.66	412.0	0.73
0.24	3379.8	1.81	479.4	0.80
0.26	3891.0	1.96	551.2	0.86
0.28	4433.8	2.11	627.4	0.93
0.30	5007.7	2.26	707.9	0.99
0.32	5612.4	2.41	792.6	1.06
0.34	6247.6	2.56	881.5	1.13
0.36	6912.9	2.71	974.5	1.19
0.38	7608.1	2.86	1071.6	1.26
0.40	8332.7	3.01	1172.7	1.33
0.42	9086.7	3.16	1277.9	1.39
0.44	9869.8	3.31	1387.0	1.46
0.46	10681.7	3.47	1500.0	1.52
0.48	11522.3	3.62	1617.0	1.59
0.50	12391.3	3.77	1737.8	1.66
0.52	13288.6	3.92	1862.5	1.72
0.54	14214.0	4.07	1990.9	1.79
0.56	15167.3	4.22	2123.2	1.86
0.58	16148.3	4.37	2259.2	1.92
0.60	17157.0	4.52	2399.0	1.99
0.62	18193.2	4.67	2542.5	2.05
0.64	19256.6	4.82	2689.7	2.12
0.66	20347.4	4.97	2840.6	2.19
0.68	21465.1	5.12	2995.1	2.25
0.70			3153.3	2.32
0.75			3564.6	2.49
0.80			3998.2	2.65
0.85			4454.0	2.82
0.90			4931.7	2.98
0.95			5431.1	3.15
1.00			5952.0	3.31
1.05			6494.3	3.48
1.10			7057.8	3.65
1.15			7642.3	3.81
1.20			8247.6	3.98
1.30			9520.5	4.31
1.40			10875.4	4.64
1.50			12311.5	4.97



Table 5B: Kembla Stainless Tube Friction Pressure Loss at 10°C

OD x WT (mm)	28 x 1.2		35 x 1.5		42 x 1.5		54 x 1.5	
Bore (mm)	25.6		32.0		39.0		51.0	
Volume (l/m)	0.51		0.80		1.19		2.04	
V (l/s)	R (Pa/m)	v (m/s)	R (Pa/m)	v (m/s)	R (Pa/m)	v (m/s)	R (Pa/m)	v (m/s)
0.25	145.0	0.49	50.4	0.31	19.8	0.21	5.59	0.12
0.30	199.1	0.58	69.1	0.37	27.1	0.25	7.64	0.15
0.35	260.5	0.68	90.4	0.44	35.4	0.29	9.95	0.17
0.40	329.0	0.78	114.0	0.50	44.6	0.33	12.53	0.20
0.45	404.4	0.87	140.0	0.56	54.8	0.38	15.36	0.22
0.50	486.5	0.97	168.3	0.62	65.8	0.42	18.44	0.24
0.55	575.2	1.07	198.9	0.68	77.7	0.46	21.76	0.27
0.60	670.5	1.17	231.6	0.75	90.4	0.50	25.31	0.29
0.65	772.1	1.26	266.6	0.81	104.0	0.54	29.10	0.32
0.70	880.1	1.36	303.7	0.87	118.4	0.59	33.11	0.34
0.75	994.2	1.46	342.9	0.93	133.7	0.63	37.35	0.37
0.80	1114.5	1.55	384.2	0.99	149.7	0.67	41.81	0.39
0.85	1240.8	1.65	427.6	1.06	166.6	0.71	46.49	0.42
0.90	1373.1	1.75	473.0	1.12	184.2	0.75	51.38	0.44
0.95	1511.4	1.85	520.4	1.18	202.6	0.80	56.49	0.47
1.00	1655.5	1.94	569.8	1.24	221.8	0.84	61.81	0.49
1.25	2462.7	2.43	846.3	1.55	328.9	1.05	91.50	0.61
1.50	3410.2	2.91	1170.3	1.87	454.3	1.26	126.21	0.73
1.75	4494.0	3.40	1540.3	2.18	597.4	1.46	165.76	0.86
2.00	5710.8	3.89	1955.3	2.49	757.6	1.67	210.01	0.98
2.25	7057.7	4.37	2414.1	2.80	934.7	1.88	258.84	1.10
2.50	8532.7	4.86	2916.0	3.11	1128.3	2.09	312.17	1.22
2.75	10133.6	5.34	3460.3	3.42	1338.0	2.30	369.92	1.35
3.00			4046.3	3.73	1563.6	2.51	431.99	1.47
3.25			4673.5	4.04	1805.0	2.72	498.34	1.59
3.50			5341.4	4.35	2061.9	2.93	568.90	1.71
3.75			6049.5	4.66	2334.1	3.14	643.63	1.84
4.00			6797.6	4.97	2621.4	3.35	722.46	1.96
4.25			7585.1	5.28	2923.8	3.56	805.37	2.08
4.50					3241.0	3.77	892.31	2.20
4.75					3573.0	3.98	983.24	2.33
5.00					3919.7	4.19	1078.12	2.45
5.25					4280.8	4.39	1176.94	2.57
5.50					4656.4	4.60	1279.64	2.69
5.75					5046.3	4.81	1386.22	2.81
6.00					5450.5	5.02	1496.64	2.94
6.25					5868.8	5.23	1610.87	3.06
6.50							1728.89	3.18
6.75							1850.69	3.30
7.00							1976.23	3.43
7.25							2105.50	3.55
7.50							2238.48	3.67
8.00							2515.48	3.92
8.50							2807.12	4.16
9.00							3113.24	4.41
9.50							3433.75	4.65
10.00							3768.53	4.90

Table 5C: Kembla Stainless Tube Friction Pressure Loss at 10°C

OD x WT (mm)	76.1 x 2		108 x 2	
Bore (mm)	72.1		104.0	
Volume (l/m)	4.08		8.49	
V (l/s)	R (Pa/m)	v (m/s)	R (Pa/m)	v (m/s)
1.50	24.3	0.37	4.25	0.18
1.75	31.8	0.43	5.57	0.21
2.00	40.2	0.49	7.04	0.24
2.25	49.5	0.55	8.65	0.26
2.50	59.7	0.61	10.41	0.29
2.75	70.7	0.67	12.32	0.32
3.00	82.5	0.73	14.36	0.35
3.50	108.4	0.86	18.85	0.41
4.00	137.5	0.98	23.88	0.47
4.50	169.7	1.10	29.42	0.53
5.00	204.8	1.22	35.48	0.59
5.50	242.8	1.35	42.03	0.65
6.00	283.7	1.47	49.07	0.71
6.50	327.5	1.59	56.60	0.77
7.00	374.0	1.71	64.60	0.82
7.50	423.4	1.84	73.07	0.88
8.00	475.4	1.96	82.00	0.94
8.50	530.2	2.08	91.39	1.00
9.00	587.6	2.20	101.24	1.06
9.50	647.8	2.33	111.53	1.12
10.00	710.5	2.45	122.27	1.18
11.00	843.8	2.69	145.07	1.29
12.00	987.4	2.94	169.61	1.41
13.00	1141.2	3.18	195.87	1.53
14.00	1305.0	3.43	223.81	1.65
15.00	1478.8	3.67	253.43	1.77
16.00	1662.4	3.92	284.70	1.88
17.00	1855.7	4.16	317.60	2.00
18.00	2058.7	4.41	352.12	2.12
19.00	2271.3	4.65	388.26	2.24
20.00	2493.4	4.90	425.98	2.35
21.00	2725.0	5.14	465.28	2.47
22.00	2966.0	5.39	506.15	2.59
23.00			548.58	2.71
24.00			592.56	2.83
25.00			638.08	2.94
26.00			685.12	3.06
27.00			733.68	3.18
28.00			783.76	3.30
29.00			835.34	3.41
30.00			888.41	3.53
32.00			999.02	3.77
34.00			1115.53	4.00
36.00			1237.89	4.24
38.00			1366.05	4.47
40.00			1499.98	4.71
42.50			1675.44	5.00



Table 6A: Kembla Stainless Tube Friction Pressure Loss at 60°C

OD x WT (mm)	15 x 1		22 x 1.2	
Bore (mm)	13.0		19.6	
Volume (l/m)	0.13		0.30	
V (l/s)	R (Pa/m)	v (m/s)	R (Pa/m)	v (m/s)
0.07	298.1	0.53	42.4	0.23
0.08	376.7	0.60	53.5	0.27
0.09	463.3	0.68	65.7	0.30
0.10	557.8	0.75	78.9	0.33
0.12	769.7	0.90	108.6	0.40
0.14	1011.3	1.05	142.4	0.46
0.16	1281.9	1.21	180.1	0.53
0.18	1580.9	1.36	221.7	0.60
0.20	1907.7	1.51	267.1	0.66
0.22	2261.8	1.66	316.2	0.73
0.24	2643.0	1.81	368.9	0.80
0.26	3050.7	1.96	425.3	0.86
0.28	3484.8	2.11	485.2	0.93
0.30	3944.9	2.26	548.6	0.99
0.32	4430.8	2.41	615.4	1.06
0.34	4942.2	2.56	685.7	1.13
0.36	5479.0	2.71	759.3	1.19
0.38	6041.0	2.86	836.4	1.26
0.40	6627.9	3.01	916.7	1.33
0.42	7239.7	3.16	1000.4	1.39
0.44	7876.2	3.31	1087.4	1.46
0.46	8537.2	3.47	1177.6	1.52
0.48	9222.7	3.62	1271.0	1.59
0.50	9932.4	3.77	1367.7	1.66
0.52	10666.3	3.92	1467.5	1.72
0.54	11424.3	4.07	1570.6	1.79
0.56	12206.3	4.22	1676.8	1.86
0.58	13012.1	4.37	1786.1	1.92
0.60	13841.8	4.52	1898.6	1.99
0.62	14695.2	4.67	2014.2	2.05
0.64	15572.1	4.82	2132.9	2.12
0.66	16472.7	4.97	2254.6	2.19
0.68	17396.7	5.12	2379.5	2.25
0.70			2507.4	2.32
0.75			2840.5	2.49
0.80			3192.4	2.65
0.85			3563.1	2.82
0.90			3952.4	2.98
0.95			4360.1	3.15
1.00			4786.2	3.31
1.05			5230.5	3.48
1.10			5692.9	3.65
1.15			6173.3	3.81
1.20			6671.6	3.98
1.30			7721.8	4.31
1.40			8842.8	4.64
1.50			10034.0	4.97


Table 6B: Kembla Stainless Tube Friction Pressure Loss at 60°C

OD x WT (mm)	28 x 1.2		35 x 1.5		42 x 1.5		54 x 1.5	
Bore (mm)	25.6		32.0		39.0		51.0	
Volume (l/m)	0.51		0.80		1.19		2.04	
V (l/s)	R (Pa/m)	v (m/s)	R (Pa/m)	v (m/s)	R (Pa/m)	v (m/s)	R (Pa/m)	v (m/s)
0.25	110.7	0.49	38.2	0.31	14.9	0.21	4.17	0.12
0.30	152.8	0.58	52.7	0.37	20.5	0.25	5.73	0.15
0.35	200.9	0.68	69.2	0.44	26.9	0.29	7.51	0.17
0.40	254.7	0.78	87.6	0.50	34.1	0.33	9.49	0.20
0.45	314.2	0.87	108.0	0.56	42.0	0.38	11.68	0.22
0.50	379.2	0.97	130.2	0.62	50.6	0.42	14.06	0.24
0.55	449.6	1.07	154.3	0.68	59.9	0.46	16.63	0.27
0.60	525.3	1.17	180.1	0.75	69.9	0.50	19.40	0.29
0.65	606.4	1.26	207.8	0.81	80.6	0.54	22.35	0.32
0.70	692.6	1.36	237.2	0.87	91.9	0.59	25.49	0.34
0.75	784.0	1.46	268.3	0.93	104.0	0.63	28.81	0.37
0.80	880.5	1.55	301.2	0.99	116.6	0.67	32.30	0.39
0.85	982.0	1.65	335.8	1.06	130.0	0.71	35.98	0.42
0.90	1088.5	1.75	372.0	1.12	143.9	0.75	39.83	0.44
0.95	1200.0	1.85	409.9	1.18	158.6	0.80	43.85	0.47
1.00	1316.4	1.94	449.5	1.24	173.8	0.84	48.05	0.49
1.25	1971.1	2.43	671.7	1.55	259.3	1.05	71.55	0.61
1.50	2744.4	2.91	933.6	1.87	359.9	1.26	99.16	0.73
1.75	3633.7	3.40	1234.1	2.18	475.2	1.46	130.75	0.86
2.00	4636.7	3.89	1572.5	2.49	604.9	1.67	166.22	0.98
2.25	5751.8	4.37	1948.1	2.80	748.6	1.88	205.50	1.10
2.50	6977.6	4.86	2360.3	3.11	906.2	2.09	248.50	1.22
2.75	8313.0	5.34	2808.8	3.42	1077.5	2.30	295.18	1.35
3.00			3293.0	3.73	1262.3	2.51	345.48	1.47
3.25			3812.7	4.04	1460.3	2.72	399.36	1.59
3.50			4367.5	4.35	1671.6	2.93	456.77	1.71
3.75			4957.2	4.66	1896.0	3.14	517.69	1.84
4.00			5581.6	4.97	2133.4	3.35	582.07	1.96
4.25			6240.3	5.28	2383.6	3.56	649.89	2.08
4.50					2646.7	3.77	721.11	2.20
4.75					2922.4	3.98	795.72	2.33
5.00					3210.8	4.19	873.69	2.45
5.25					3511.8	4.39	955.00	2.57
5.50					3825.3	4.60	1039.63	2.69
5.75					4151.2	4.81	1127.56	2.81
6.00					4489.6	5.02	1218.77	2.94
6.25					4840.3	5.23	1313.24	3.06
6.50							1410.97	3.18
6.75							1511.93	3.30
7.00							1616.11	3.43
7.25							1723.50	3.55
7.50							1834.08	3.67
8.00							2064.79	3.92
8.50							2308.15	4.16
9.00							2564.07	4.41
9.50							2832.49	4.65
10.00							3113.33	4.90

Table 6C: Kembla Stainless Tube Friction Pressure Loss at 10°C

OD x WT (mm)	76.1 x 2		108 x 2	
Bore (mm)	72.1		104.0	
Volume (l/m)	4.08		8.49	
V (l/s)	R (Pa/m)	v (m/s)	R (Pa/m)	v (m/s)
1.50	18.9	0.37	3.28	0.18
1.75	24.8	0.43	4.31	0.21
2.00	31.5	0.49	5.46	0.24
2.25	38.9	0.55	6.73	0.26
2.50	47.0	0.61	8.12	0.29
2.75	55.8	0.67	9.63	0.32
3.00	65.3	0.73	11.25	0.35
3.50	86.1	0.86	14.83	0.41
4.00	109.6	0.98	18.84	0.47
4.50	135.6	1.10	23.29	0.53
5.00	164.1	1.22	28.14	0.59
5.50	195.0	1.35	33.42	0.65
6.00	228.4	1.47	39.09	0.71
6.50	264.1	1.59	45.17	0.77
7.00	302.2	1.71	51.64	0.82
7.50	342.6	1.84	58.50	0.88
8.00	385.3	1.96	65.75	0.94
8.50	430.4	2.08	73.38	1.00
9.00	477.7	2.20	81.39	1.06
9.50	527.2	2.33	89.78	1.12
10.00	579.0	2.45	98.54	1.18
11.00	689.3	2.69	117.17	1.29
12.00	808.4	2.94	137.26	1.41
13.00	936.2	3.18	158.79	1.53
14.00	1072.7	3.43	181.75	1.65
15.00	1217.7	3.67	206.13	1.77
16.00	1371.3	3.92	231.90	1.88
17.00	1533.3	4.16	259.07	2.00
18.00	1703.7	4.41	287.61	2.12
19.00	1882.5	4.65	317.52	2.24
20.00	2069.5	4.90	348.79	2.35
21.00	2264.8	5.14	381.41	2.47
22.00	2468.4	5.39	415.37	2.59
23.00			450.67	2.71
24.00			487.29	2.83
25.00			525.24	2.94
26.00			564.50	3.06
27.00			605.07	3.18
28.00			646.94	3.30
29.00			690.11	3.41
30.00			734.58	3.53
32.00			827.37	3.77
34.00			925.28	4.00
36.00			1028.28	4.24
38.00			1136.34	4.47
40.00			1249.43	4.71
42.50			1397.83	5.00

KemPress® Stainless Fittings Pressure Losses

Pressure loss coefficients for fittings can be found in the table below. Note: Values have been measured in laboratory testing for sizes 15mm – 54mm inclusive. Values for 76.1mm and 108mm are estimated.

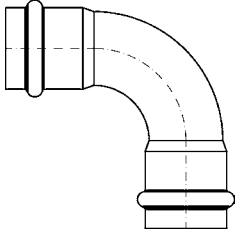
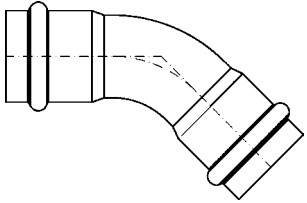
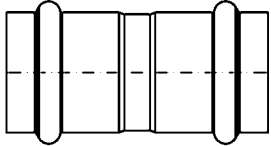
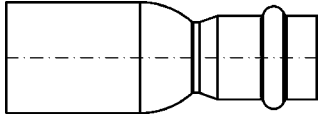
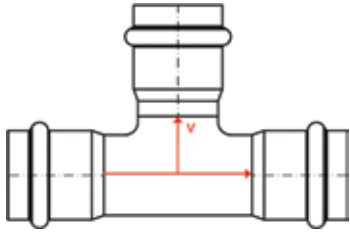
Table 7A: Individual KemPress® Stainless Fittings Pressure Loss Coefficients			
Fitting	Outside Diameter mm	Loss Coefficient ζ^{**}	Diagram
90° Bend	15	0.86	
	22	0.48	
	28	0.27	
	35	0.21	
	42	0.19	
	54	0.13	
	76.1	0.30	
	108	0.30	
45° Bend	15	0.45	
	22	0.39	
	28	0.34	
	35	0.37	
	42	0.33	
	54	0.29	
	76.1	0.40	
	108	0.40	
Coupling	15	0.11	
	22	0.20	
	28	0.02	
	35	0.04	
	42	0.07	
	54	0.09	
	76.1	0.10	
	108	0.10	
Reducer	22 x ...	0.40	
	28 x ...	0.46	
	35 x ...	0.59	
	42 x ...	0.51	
	53 x ...	0.48	
	76.1 x ...	0.40	
	108 x ...	0.40	
Equal T-piece flow through with flow separation	15	0.51	
	22	0.25	
	28	0.06	
	35	0.17	
	42	0.14	
	54	0.15	
	76.1	0.30	
	108	0.30	

Table 7B: Individual KemPress® Stainless Fittings Pressure Loss Coefficients

Fitting	Outside Diameter mm	Loss Coefficient ζ^{**}	
T-piece with flow separation	15	0.86	
	22	0.48	
	28	0.27	
	35	0.21	
	42	0.19	
	54	0.13	
	76.1	0.30	
	108	0.30	
Reducing T-piece flow through with flow separation	22 x 15 x 22	1.07	
	28 x 15 x 28	1.20	
	28 x 22 x 28	1.30	
	35 x 15 x 35	1.48	
	35 x 22 x 35	1.41	
	35 x 28 x 35	1.37	
	54 x 22 x 54	1.32	
	54 x 28 x 54	1.24	
	54 x 35 x 54	1.16	
	54 x 42 x 54	1.08	
	76.1 x ... x 76.1	1.30	
	108 x ... x 108	1.30	
Equal T-piece counter flow with flow separation	15	1.18	
	22	1.09	
	28	0.93	
	35	0.85	
	42	0.74	
	54	0.71	
	76.1	1.30	
	108	1.30	
Equal T-piece counter flow with flow unification	22 x ...	3.00	
	28 x ...	3.00	
	35 x ...	3.00	
	42 x ...	3.00	
	53 x ...	3.00	
	76.1 x ...	3.00	
	108 x ...	3.00	
	Expansion Compensator	15	
22		2.00	
28		2.00	
35		2.00	
42		2.00	
54		2.00	
76.1		2.00	
108		2.00	



Pressure loss “Z” (Pa) attributable to individual fittings depend on the flow velocity “v” (metres per second) and the loss coefficients “Σζ” and the drinking water temperature for the system fittings. The following tables show values for 10°C and 60°C.

Table 8A: KemPress® Stainless Fittings Pressure Loss at 10°C

Σζ	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
v (m/s)	Z (Pa)									
0.20	10.00	19.99	29.99	39.99	49.99	59.98	69.98	79.98	89.97	99.97
0.30	22.49	44.99	67.48	89.97	112.47	134.96	157.46	179.95	202.44	224.94
0.40	39.99	79.98	119.97	159.96	199.94	239.93	279.92	319.91	359.90	399.89
0.50	62.48	124.97	187.45	249.93	312.41	374.90	437.38	499.86	562.34	624.83
0.60	89.97	179.95	269.92	359.90	449.87	539.85	629.82	719.80	809.77	899.75
0.70	122.47	244.93	367.40	489.86	612.33	734.79	857.26	979.73	1102.19	1224.66
0.80	159.96	319.91	479.87	639.82	799.78	959.73	1119.69	1279.64	1439.60	1599.55
0.90	202.44	404.89	607.33	809.77	1012.22	1214.66	1417.10	1619.55	1821.99	2024.43
1.00	249.93	499.86	749.79	999.72	1249.65	1499.58	1749.51	1999.44	2249.37	2499.30
1.05	275.55	551.10	826.64	1102.19	1377.74	1653.29	1928.84	2204.38	2479.93	2755.48
1.10	302.42	604.83	907.25	1209.66	1512.08	1814.49	2116.91	2419.32	2721.74	3024.16
1.15	330.53	661.07	991.60	1322.13	1652.66	1983.20	2313.73	2644.26	2974.79	3305.33
1.20	359.90	719.80	1079.70	1439.60	1799.50	2159.40	2519.30	2879.20	3239.10	3598.99
1.25	390.52	781.03	1171.55	1562.06	1952.58	2343.10	2733.61	3124.13	3514.64	3905.16
1.30	422.38	844.76	1267.15	1689.53	2111.91	2534.29	2956.67	3379.06	3801.44	4223.82
1.35	455.50	911.00	1366.49	1821.99	2277.49	2732.99	3188.48	3643.98	4099.48	4554.98
1.40	489.86	979.73	1469.59	1959.45	2449.32	2939.18	3429.04	3918.91	4408.77	4898.63
1.45	525.48	1050.96	1576.43	2101.91	2627.39	3152.87	3678.35	4203.83	4729.30	5254.78
1.50	562.34	1124.69	1687.03	2249.37	2811.71	3374.06	3936.40	4498.74	5061.09	5623.43
1.55	600.46	1200.91	1801.37	2401.83	3002.29	3602.74	4203.20	4803.66	5404.12	6004.57
1.60	639.82	1279.64	1919.46	2559.29	3199.11	3838.93	4478.75	5118.57	5758.39	6398.21
1.70	722.30	1444.60	2166.89	2889.19	3611.49	4333.79	5056.09	5778.39	6500.68	7222.98
1.80	809.77	1619.55	2429.32	3239.10	4048.87	4858.64	5668.42	6478.19	7287.96	8097.74
1.90	902.25	1804.50	2706.74	3608.99	4511.24	5413.49	6315.74	7217.98	8120.23	9022.48
2.00	999.72	1999.44	2999.16	3998.88	4998.60	5998.32	6998.05	7997.77	8997.49	9997.21
2.10	1102.19	2204.38	3306.58	4408.77	5510.96	6613.15	7715.35	8817.54	9919.73	11021.92
2.20	1209.66	2419.32	3628.99	4838.65	6048.31	7257.97	8467.63	9677.30	10886.96	12096.62
2.30	1322.13	2644.26	3966.39	5288.52	6610.65	7932.78	9254.92	10577.05	11899.18	13221.31
2.40	1439.60	2879.20	4318.79	5758.39	7197.99	8637.59	10077.19	11516.78	12956.38	14395.98
2.50	1562.06	3124.13	4686.19	6248.25	7810.32	9372.38	10934.45	12496.51	14058.57	15620.64
2.60	1689.53	3379.06	5068.58	6758.11	8447.64	10137.17	11826.70	13516.22	15205.75	16895.28
2.70	1821.99	3643.98	5465.97	7287.96	9109.96	10931.95	12753.94	14575.93	16397.92	18219.91
2.80	1959.45	3918.91	5878.36	7837.81	9797.26	11756.72	13716.17	15675.62	17635.07	19594.53
2.90	2101.91	4203.83	6305.74	8407.65	10509.56	12611.48	14713.39	16815.30	18917.22	21019.13
3.00	2249.37	4498.74	6748.12	8997.49	11246.86	13496.23	15745.60	17994.97	20244.35	22493.72
3.10	2401.83	4803.66	7205.49	9607.32	12009.15	14410.97	16812.80	19214.63	21616.46	24018.29
3.20	2559.29	5118.57	7677.86	10237.14	12796.43	15355.71	17915.00	20474.28	23033.57	25592.85
3.30	2721.74	5443.48	8165.22	10886.96	13608.70	16330.44	19052.18	21773.92	24495.66	27217.40
3.40	2889.19	5778.39	8667.58	11556.77	14445.97	17335.16	20224.35	23113.54	26002.74	28891.93
3.50	3061.64	6123.29	9184.93	12246.58	15308.22	18369.87	21431.51	24493.16	27554.80	30616.45
3.60	3239.10	6478.19	9717.29	12956.38	16195.48	19434.57	22673.67	25912.76	29151.86	32390.95
3.70	3421.54	6843.09	10264.63	13686.18	17107.72	20529.27	23950.81	27372.35	30793.90	34215.44
3.80	3608.99	7217.98	10826.98	14435.97	18044.96	21653.95	25262.94	28871.94	32480.93	36089.92
3.90	3801.44	7602.88	11404.31	15205.75	19007.19	22808.63	26610.07	30411.51	34212.94	38014.38
4.00	3998.88	7997.77	11996.65	15995.53	19994.42	23993.30	27992.18	31991.06	35989.95	39988.83
4.10	4201.33	8402.65	12603.98	16805.31	21006.63	25207.96	29409.29	33610.61	37811.94	42013.27
4.20	4408.77	8817.54	13226.31	17635.07	22043.84	26452.61	30861.38	35270.15	39678.92	44087.69
4.30	4621.21	9242.42	13863.63	18484.84	23106.05	27727.26	32348.46	36969.67	41590.88	46212.09
4.40	4838.65	9677.30	14515.95	19354.59	24193.24	29031.89	33870.54	38709.19	43547.84	48386.49
4.50	5061.09	10122.17	15183.26	20244.35	25305.43	30366.52	35427.60	40488.69	45549.78	50610.86
4.60	5288.52	10577.05	15865.57	21154.09	26442.61	31731.14	37019.66	42308.18	47596.71	52885.23
4.70	5520.96	11041.92	16562.87	22083.83	27604.79	33125.75	38646.71	44167.66	49688.62	55209.58
4.80	5758.39	11516.78	17275.17	23033.57	28791.96	34550.35	40308.74	46067.13	51825.52	57583.92
5.00	6248.25	12496.51	18744.76	24993.02	31241.27	37489.53	43737.78	49986.04	56234.29	62482.55



Table 8B: KemPress® Stainless Fittings Pressure Loss at 10°C

Σζ	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
v (m/s)	Z (Pa)									
0.20	10.00	19.99	29.99	39.99	49.99	59.98	69.98	79.98	89.97	99.97
0.30	22.49	44.99	67.48	89.97	112.47	134.96	157.46	179.95	202.44	224.94
0.40	39.99	79.98	119.97	159.96	199.94	239.93	279.92	319.91	359.90	399.89
0.50	62.48	124.97	187.45	249.93	312.41	374.90	437.38	499.86	562.34	624.83
0.60	89.97	179.95	269.92	359.90	449.87	539.85	629.82	719.80	809.77	899.75
0.70	122.47	244.93	367.40	489.86	612.33	734.79	857.26	979.73	1102.19	1224.66
0.80	159.96	319.91	479.87	639.82	799.78	959.73	1119.69	1279.64	1439.60	1599.55
0.90	202.44	404.89	607.33	809.77	1012.22	1214.66	1417.10	1619.55	1821.99	2024.43
1.00	249.93	499.86	749.79	999.72	1249.65	1499.58	1749.51	1999.44	2249.37	2499.30
1.05	275.55	551.10	826.64	1102.19	1377.74	1653.29	1928.84	2204.38	2479.93	2755.48
1.10	302.42	604.83	907.25	1209.66	1512.08	1814.49	2116.91	2419.32	2721.74	3024.16
1.15	330.53	661.07	991.60	1322.13	1652.66	1983.20	2313.73	2644.26	2974.79	3305.33
1.20	359.90	719.80	1079.70	1439.60	1799.50	2159.40	2519.30	2879.20	3239.10	3598.99
1.25	390.52	781.03	1171.55	1562.06	1952.58	2343.10	2733.61	3124.13	3514.64	3905.16
1.30	422.38	844.76	1267.15	1689.53	2111.91	2534.29	2956.67	3379.06	3801.44	4223.82
1.35	455.50	911.00	1366.49	1821.99	2277.49	2732.99	3188.48	3643.98	4099.48	4554.98
1.40	489.86	979.73	1469.59	1959.45	2449.32	2939.18	3429.04	3918.91	4408.77	4898.63
1.45	525.48	1050.96	1576.43	2101.91	2627.39	3152.87	3678.35	4203.83	4729.30	5254.78
1.50	562.34	1124.69	1687.03	2249.37	2811.71	3374.06	3936.40	4498.74	5061.09	5623.43
1.55	600.46	1200.91	1801.37	2401.83	3002.29	3602.74	4203.20	4803.66	5404.12	6004.57
1.60	639.82	1279.64	1919.46	2559.29	3199.11	3838.93	4478.75	5118.57	5758.39	6398.21
1.70	722.30	1444.60	2166.89	2889.19	3611.49	4333.79	5056.09	5778.39	6500.68	7222.98
1.80	809.77	1619.55	2429.32	3239.10	4048.87	4858.64	5668.42	6478.19	7287.96	8097.74
1.90	902.25	1804.50	2706.74	3608.99	4511.24	5413.49	6315.74	7217.98	8120.23	9022.48
2.00	999.72	1999.44	2999.16	3998.88	4998.60	5998.32	6998.05	7997.77	8997.49	9997.21
2.10	1102.19	2204.38	3306.58	4408.77	5510.96	6613.15	7715.35	8817.54	9919.73	11021.92
2.20	1209.66	2419.32	3628.99	4838.65	6048.31	7257.97	8467.63	9677.30	10886.96	12096.62
2.30	1322.13	2644.26	3966.39	5288.52	6610.65	7932.78	9254.92	10577.05	11899.18	13221.31
2.40	1439.60	2879.20	4318.79	5758.39	7197.99	8637.59	10077.19	11516.78	12956.38	14395.98
2.50	1562.06	3124.13	4686.19	6248.25	7810.32	9372.38	10934.45	12496.51	14058.57	15620.64
2.60	1689.53	3379.06	5068.58	6758.11	8447.64	10137.17	11826.70	13516.22	15205.75	16895.28
2.70	1821.99	3643.98	5465.97	7287.96	9109.96	10931.95	12753.94	14575.93	16397.92	18219.91
2.80	1959.45	3918.91	5878.36	7837.81	9797.26	11756.72	13716.17	15675.62	17635.07	19594.53
2.90	2101.91	4203.83	6305.74	8407.65	10509.56	12611.48	14713.39	16815.30	18917.22	21019.13
3.00	2249.37	4498.74	6748.12	8997.49	11246.86	13496.23	15745.60	17994.97	20244.35	22493.72
3.10	2401.83	4803.66	7205.49	9607.32	12009.15	14410.97	16812.80	19214.63	21616.46	24018.29
3.20	2559.29	5118.57	7677.86	10237.14	12796.43	15355.71	17915.00	20474.28	23033.57	25592.85
3.30	2721.74	5443.48	8165.22	10886.96	13608.70	16330.44	19052.18	21773.92	24495.66	27217.40
3.40	2889.19	5778.39	8667.58	11556.77	14445.97	17335.16	20224.35	23113.54	26002.74	28891.93
3.50	3061.64	6123.29	9184.93	12246.58	15308.22	18369.87	21431.51	24493.16	27554.80	30616.45
3.60	3239.10	6478.19	9717.29	12956.38	16195.48	19434.57	22673.67	25912.76	29151.86	32390.95
3.70	3421.54	6843.09	10264.63	13686.18	17107.72	20529.27	23950.81	27372.35	30793.90	34215.44
3.80	3608.99	7217.98	10826.98	14435.97	18044.96	21653.95	25262.94	28871.94	32480.93	36089.92
3.90	3801.44	7602.88	11404.31	15205.75	19007.19	22808.63	26610.07	30411.51	34212.94	38014.38
4.00	3998.88	7997.77	11996.65	15995.53	19994.42	23993.30	27992.18	31991.06	35989.95	39988.83
4.10	4201.33	8402.65	12603.98	16805.31	21006.63	25207.96	29409.29	33610.61	37811.94	42013.27
4.20	4408.77	8817.54	13226.31	17635.07	22043.84	26452.61	30861.38	35270.15	39678.92	44087.69
4.30	4621.21	9242.42	13863.63	18484.84	23106.05	27727.26	32348.46	36969.67	41590.88	46212.09
4.40	4838.65	9677.30	14515.95	19354.59	24193.24	29031.89	33870.54	38709.19	43547.84	48386.49
4.50	5061.09	10122.17	15183.26	20244.35	25305.43	30366.52	35427.60	40488.69	45549.78	50610.86
4.60	5288.52	10577.05	15865.57	21154.09	26442.61	31731.14	37019.66	42308.18	47596.71	52885.23
4.70	5520.96	11041.92	16562.87	22083.83	27604.79	33125.75	38646.71	44167.66	49688.62	55209.58
4.80	5758.39	11516.78	17275.17	23033.57	28791.96	34550.35	40308.74	46067.13	51825.52	57583.92
5.00	68730.80	74979.06	81227.31	87475.57	93723.82	99972.08	106220.3	112468.6	118716.8	124965.1


Table 9A: KemPress® Stainless Fittings Pressure Loss at 60°C

$\Sigma\zeta$	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
v (m/s)	Z (Pa)									
0.20	9.83	19.66	29.50	39.33	49.16	58.99	68.82	78.66	88.49	98.32
0.30	22.12	44.24	66.37	88.49	110.61	132.73	154.85	176.97	199.10	221.22
0.40	39.33	78.66	117.98	157.31	196.64	235.97	275.29	314.62	353.95	393.28
0.50	61.45	122.90	184.35	245.80	307.25	368.70	430.15	491.60	553.05	614.50
0.60	88.49	176.97	265.46	353.95	442.44	530.92	619.41	707.90	796.39	884.87
0.70	120.44	240.88	361.32	481.76	602.21	722.65	843.09	963.53	1083.97	1204.41
0.80	157.31	314.62	471.93	629.24	786.55	943.87	1101.18	1258.49	1415.80	1573.11
0.90	199.10	398.19	597.29	796.39	995.48	1194.58	1393.68	1592.77	1791.87	1990.97
1.00	245.80	491.60	737.39	983.19	1228.99	1474.79	1720.59	1966.39	2212.18	2457.98
1.05	270.99	541.99	812.98	1083.97	1354.96	1625.96	1896.95	2167.94	2438.93	2709.93
1.10	297.42	594.83	892.25	1189.66	1487.08	1784.50	2081.91	2379.33	2676.74	2974.16
1.15	325.07	650.14	975.20	1300.27	1625.34	1950.41	2275.48	2600.55	2925.61	3250.68
1.20	353.95	707.90	1061.85	1415.80	1769.75	2123.70	2477.65	2831.60	3185.55	3539.50
1.25	384.06	768.12	1152.18	1536.24	1920.30	2304.36	2688.42	3072.48	3456.54	3840.60
1.30	415.40	830.80	1246.20	1661.60	2077.00	2492.40	2907.79	3323.19	3738.59	4153.99
1.35	447.97	895.93	1343.90	1791.87	2239.84	2687.80	3135.77	3583.74	4031.71	4479.67
1.40	481.76	963.53	1445.29	1927.06	2408.82	2890.59	3372.35	3854.12	4335.88	4817.65
1.45	516.79	1033.58	1550.37	2067.16	2583.95	3100.75	3617.54	4134.33	4651.12	5167.91
1.50	553.05	1106.09	1659.14	2212.18	2765.23	3318.28	3871.32	4424.37	4977.42	5530.46
1.55	590.53	1181.06	1771.59	2362.12	2952.65	3543.18	4133.71	4724.24	5314.77	5905.30
1.60	629.24	1258.49	1887.73	2516.97	3146.22	3775.46	4404.71	5033.95	5663.19	6292.44
1.70	710.36	1420.71	2131.07	2841.43	3551.79	4262.14	4972.50	5682.86	6393.21	7103.57
1.80	796.39	1592.77	2389.16	3185.55	3981.93	4778.32	5574.71	6371.09	7167.48	7963.87
1.90	887.33	1774.66	2662.00	3549.33	4436.66	5323.99	6211.32	7098.66	7985.99	8873.32
2.00	983.19	1966.39	2949.58	3932.77	4915.97	5899.16	6882.35	7865.55	8848.74	9831.93
2.10	1083.97	2167.94	3251.91	4335.88	5419.85	6503.82	7587.79	8671.77	9755.74	10839.71
2.20	1189.66	2379.33	3568.99	4758.66	5948.32	7137.98	8327.65	9517.31	10706.98	11896.64
2.30	1300.27	2600.55	3900.82	5201.09	6501.37	7801.64	9101.91	10402.19	11702.46	13002.73
2.40	1415.80	2831.60	4247.40	5663.19	7078.99	8494.79	9910.59	11326.39	12742.19	14157.98
2.50	1536.24	3072.48	4608.72	6144.96	7681.20	9217.44	10753.68	12289.92	13826.16	15362.40
2.60	1661.60	3323.19	4984.79	6646.39	8307.98	9969.58	11631.18	13292.77	14954.37	16615.97
2.70	1791.87	3583.74	5375.61	7167.48	8959.35	10751.22	12543.09	14334.96	16126.83	17918.70
2.80	1927.06	3854.12	5781.18	7708.24	9635.29	11562.35	13489.41	15416.47	17343.53	19270.59
2.90	2067.16	4134.33	6201.49	8268.66	10335.82	12402.98	14470.15	16537.31	18604.48	20671.64
3.00	2212.18	4424.37	6636.55	8848.74	11060.92	13273.11	15485.29	17697.48	19909.66	22121.85
3.10	2362.12	4724.24	7086.37	9448.49	11810.61	14172.73	16534.85	18896.98	21259.10	23621.22
3.20	2516.97	5033.95	7550.92	10067.90	12584.87	15101.85	17618.82	20135.80	22652.77	25169.75
3.30	2676.74	5353.49	8030.23	10706.98	13383.72	16060.46	18737.21	21413.95	24090.69	26767.44
3.40	2841.43	5682.86	8524.29	11365.71	14207.14	17048.57	19890.00	22731.43	25572.86	28414.29
3.50	3011.03	6022.06	9033.09	12044.12	15055.15	18066.18	21077.21	24088.24	27099.27	30110.30
3.60	3185.55	6371.09	9556.64	12742.19	15927.73	19113.28	22298.82	25484.37	28669.92	31855.46
3.70	3364.98	6729.96	10094.94	13459.92	16824.90	20189.87	23554.85	26919.83	30284.81	33649.79
3.80	3549.33	7098.66	10647.98	14197.31	17746.64	21295.97	24845.30	28394.62	31943.95	35493.28
3.90	3738.59	7477.19	11215.78	14954.37	18692.96	22431.56	26170.15	29908.74	33647.33	37385.93
4.00	3932.77	7865.55	11798.32	15731.09	19663.87	23596.64	27529.41	31462.19	35394.96	39327.73
4.10	4131.87	8263.74	12395.61	16527.48	20659.35	24791.22	28923.09	33054.96	37186.83	41318.70
4.20	4335.88	8671.77	13007.65	17343.53	21679.41	26015.30	30351.18	34687.06	39022.94	43358.83
4.30	4544.81	9089.62	13634.43	18179.24	22724.06	27268.87	31813.68	36358.49	40903.30	45448.11
4.40	4758.66	9517.31	14275.97	19034.62	23793.28	28551.93	33310.59	38069.25	42827.90	47586.56
4.50	4977.42	9954.83	14932.25	19909.66	24887.08	29864.50	34841.91	39819.33	44796.75	49774.16
4.60	5201.09	10402.19	15603.28	20804.37	26005.46	31206.56	36407.65	41608.74	46809.83	52010.93
4.70	5429.69	10859.37	16289.06	21718.74	27148.43	32578.11	38007.80	43437.48	48867.17	54296.85
4.80	5663.19	11326.39	16989.58	22652.77	28315.97	33979.16	39642.35	45305.55	50968.74	56631.93
5.00	6144.96	12289.92	18434.87	24579.83	30724.79	36869.75	43014.71	49159.67	55304.62	61449.58



Table 9B: KemPress® Stainless Fittings Pressure Loss at 60°C

$\Sigma \zeta$	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
v (m/s)	Z (Pa)									
0.20	108.15	117.98	127.82	137.65	147.48	157.31	167.14	176.97	186.81	196.64
0.30	243.34	265.46	287.58	309.71	331.83	353.95	376.07	398.19	420.32	442.44
0.40	432.61	471.93	511.26	550.59	589.92	629.24	668.57	707.90	747.23	786.55
0.50	675.95	737.39	798.84	860.29	921.74	983.19	1044.64	1106.09	1167.54	1228.99
0.60	973.36	1061.85	1150.34	1238.82	1327.31	1415.80	1504.29	1592.77	1681.26	1769.75
0.70	1324.85	1445.29	1565.74	1686.18	1806.62	1927.06	2047.50	2167.94	2288.38	2408.82
0.80	1730.42	1887.73	2045.04	2202.35	2359.66	2516.97	2674.29	2831.60	2988.91	3146.22
0.90	2190.06	2389.16	2588.26	2787.35	2986.45	3185.55	3384.64	3583.74	3782.84	3981.93
1.00	2703.78	2949.58	3195.38	3441.18	3686.97	3932.77	4178.57	4424.37	4670.17	4915.97
1.05	2980.92	3251.91	3522.90	3793.90	4064.89	4335.88	4606.88	4877.87	5148.86	5419.85
1.10	3271.58	3568.99	3866.41	4163.82	4461.24	4758.66	5056.07	5353.49	5650.90	5948.32
1.15	3575.75	3900.82	4225.89	4550.96	4876.02	5201.09	5526.16	5851.23	6176.30	6501.37
1.20	3893.45	4247.40	4601.34	4955.29	5309.24	5663.19	6017.14	6371.09	6725.04	7078.99
1.25	4224.66	4608.72	4992.78	5376.84	5760.90	6144.96	6529.02	6913.08	7297.14	7681.20
1.30	4569.39	4984.79	5400.19	5815.59	6230.99	6646.39	7061.79	7477.19	7892.58	8307.98
1.35	4927.64	5375.61	5823.58	6271.54	6719.51	7167.48	7615.45	8063.41	8511.38	8959.35
1.40	5299.41	5781.18	6262.94	6744.71	7226.47	7708.24	8190.00	8671.77	9153.53	9635.29
1.45	5684.70	6201.49	6718.28	7235.07	7751.86	8268.66	8785.45	9302.24	9819.03	10335.82
1.50	6083.51	6636.55	7189.60	7742.65	8295.69	8848.74	9401.79	9954.83	10507.88	11060.92
1.55	6495.84	7086.37	7676.90	8267.43	8857.96	9448.49	10039.02	10629.55	11220.08	11810.61
1.60	6921.68	7550.92	8180.17	8809.41	9438.66	10067.90	10697.14	11326.39	11955.63	12584.87
1.70	7813.93	8524.29	9234.64	9945.00	10655.36	11365.71	12076.07	12786.43	13496.79	14207.14
1.80	8760.25	9556.64	10353.03	11149.41	11945.80	12742.19	13538.57	14334.96	15131.35	15927.73
1.90	9760.65	10647.98	11535.32	12422.65	13309.98	14197.31	15084.64	15971.98	16859.31	17746.64
2.00	10815.13	11798.32	12781.51	13764.71	14747.90	15731.09	16714.29	17697.48	18680.67	19663.87
2.10	11923.68	13007.65	14091.62	15175.59	16259.56	17343.53	18427.50	19511.47	20595.44	21679.41
2.20	13086.30	14275.97	15465.63	16655.29	17844.96	19034.62	20224.29	21413.95	22603.61	23793.28
2.30	14303.00	15603.28	16903.55	18203.82	19504.10	20804.37	22104.64	23404.92	24705.19	26005.46
2.40	15573.78	16989.58	18405.38	19821.18	21236.98	22652.77	24068.57	25484.37	26900.17	28315.97
2.50	16898.64	18434.87	19971.11	21507.35	23043.59	24579.83	26116.07	27652.31	29188.55	30724.79
2.60	18277.56	19939.16	21600.76	23262.35	24923.95	26585.55	28247.14	29908.74	31570.34	33231.93
2.70	19710.57	21502.44	23294.31	25086.18	26878.05	28669.92	30461.79	32253.66	34045.53	35837.40
2.80	21197.65	23124.71	25051.77	26978.82	28905.88	30832.94	32760.00	34687.06	36614.12	38541.18
2.90	22738.80	24805.97	26873.13	28940.30	31007.46	33074.62	35141.79	37208.95	39276.11	41343.28
3.00	24334.03	26546.22	28758.40	30970.59	33182.77	35394.96	37607.14	39819.33	42031.51	44243.70
3.10	25983.34	28345.46	30707.59	33069.71	35431.83	37793.95	40156.07	42518.19	44880.32	47242.44
3.20	27686.72	30203.70	32720.67	35237.65	37754.62	40271.60	42788.57	45305.55	47822.52	50339.50
3.30	29444.18	32120.93	34797.67	37474.41	40151.16	42827.90	45504.64	48181.39	50858.13	53534.88
3.40	31255.72	34097.14	36938.57	39780.00	42621.43	45462.86	48304.29	51145.72	53987.14	56828.57
3.50	33121.32	36132.35	39143.38	42154.41	45165.44	48176.47	51187.50	54198.53	57209.56	60220.59
3.60	35041.01	38226.56	41412.10	44597.65	47783.20	50968.74	54154.29	57339.83	60525.38	63710.93
3.70	37014.77	40379.75	43744.73	47109.71	50474.69	53839.67	57204.65	60569.62	63934.60	67299.58
3.80	39042.61	42591.93	46141.26	49690.59	53239.92	56789.25	60338.57	63887.90	67437.23	70986.56
3.90	41124.52	44863.11	48601.70	52340.30	56078.89	59817.48	63556.07	67294.67	71033.26	74771.85
4.00	43260.51	47193.28	51126.05	55058.83	58991.60	62924.37	66857.15	70789.92	74722.69	78655.47
4.10	45450.57	49582.44	53714.31	57846.18	61978.05	66109.92	70241.79	74373.66	78505.53	82637.40
4.20	47694.71	52030.59	56366.47	60702.36	65038.24	69374.12	73710.00	78045.89	82381.77	86717.65
4.30	49992.92	54537.73	59082.54	63627.36	68172.17	72716.98	77261.79	81806.60	86351.41	90896.22
4.40	52345.21	57103.87	61862.52	66621.18	71379.83	76138.49	80897.15	85655.80	90414.46	95173.11
4.50	54751.58	59728.99	64706.41	69683.83	74661.24	79638.66	84616.07	89593.49	94570.91	99548.32
4.60	57212.02	62413.11	67614.20	72815.30	78016.39	83217.48	88418.57	93619.67	98820.76	104021.9
4.70	59726.54	65156.22	70585.91	76015.59	81445.28	86874.96	92304.65	97734.33	103164.0	108593.7
4.80	62295.13	67958.32	73621.52	79284.71	84947.90	90611.10	96274.29	101937.5	107600.7	113263.9
5.00	67594.54	73739.50	79884.46	86029.42	92174.37	98319.33	104464.3	110609.3	116754.2	122899.2

2.6) RECOMMENDED WATER VELOCITIES

Reference should be made to relevant national standards and codes, including AS/NZS 3500, regarding allowable maximum design velocities.



Illustration 1: Axial compensator with KemPress® sockets

2.7) THERMAL EXPANSION/ MOVEMENT

Tube lines conveying hot, cold, or media of varying temperature and lines which are exposed to a high level of heat radiation (e.g. solar radiation etc.), expand and contract, generating thermal movement of the system.

If the lines are constrained and subject to thermal movement, damage can result (mostly in the form of fatigue failures). It is especially important to avoid stress concentrations between fixed points, typically found at valves and other fittings.

In order to maximise the design life of the system and reduce repair and maintenance costs, sufficient space for thermal movement must be allowed for in the system.

To achieve this, the design of the tube network can frequently be exploited. Incorporating expansion loops, offsets and horseshoe expansion links (see Illustration 6) into the system are cost-effective ways to accommodate thermal expansion

and contraction. The basic principle is that sufficient movement potential must always be available between two fixed points. If the line routing does not enable sufficient compensation for thermal movement, installation of special component parts, such as axial compensators may be considered. These are available from MM Kembla, see Illustration 1. To enable regular maintenance inspections the installation location should be visible and easily accessible for these items.

For concealed installations, unobstructed thermal expansion is to be accommodated by surrounding the lines with inert, chloride-free, non-restrictive material of sufficient thickness. In particular, ceiling penetrations are to be cushioned carefully, ensuring that a fixed point has not been created (see Illustrations 2 - 4)

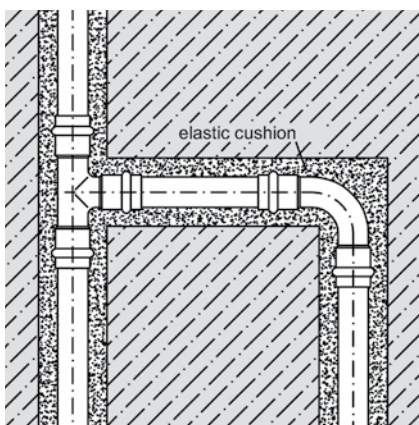


Illustration 2: Tubes under plaster

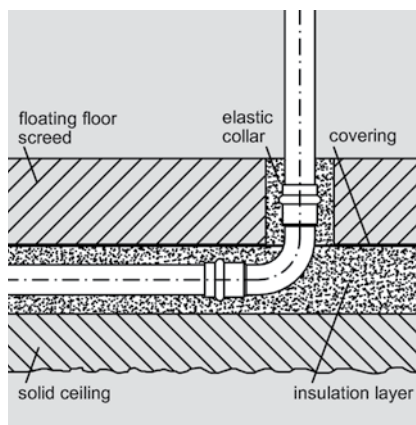


Illustration 3: Tubes under composition floor (in thermal and footfall acoustic insulation)

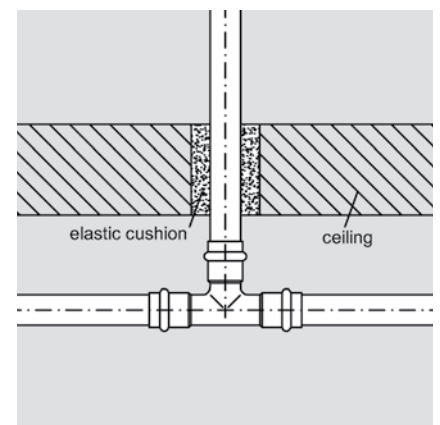


Illustration 4: Tubes in ceiling penetrations

Linear Expansion Formula

Table 10 below is based on potable water, for other media expansion may be different e.g. diesel oil. For other media please check with MM Kembla.

$\Delta L = (L) (\alpha) (\Delta T)$

ΔL = Tube Length Change in mm

L = Pipeline/Tube Length (mm)

α = Linear Thermal Expansion Coefficient (16.5×10^{-6} per °C change, for stainless steel from +20°C to +200°C)

ΔT = Maximum Temperature Difference, calculated by Maximum Tube Wall Temperature °C – Minimum Tube Wall Temperature °C, considering changes in ambient temperature, exposure to other heat sources e.g. solar radiation, and temperature changes in the media within the tube system.

For example, there will be approximately 1mm/metre of expansion at a 60°C temperature differential where water is the medium.

Table 10: Thermal expansion “ ΔL ” of Kembla Stainless systems [mm] for water

Tube Length L (m)	Temperature Differential ΔT °C						
	10	20	30	40	50	60	70
1	0.17	0.33	0.50	0.66	0.83	0.99	1.16
2	0.33	0.66	0.99	1.32	1.65	1.98	2.31
3	0.50	0.99	1.49	1.98	2.48	2.97	3.47
4	0.66	1.32	1.98	2.64	3.30	3.96	4.62
5	0.83	1.65	2.48	3.30	4.13	4.95	5.72
6	1.00	1.98	2.97	3.96	4.95	5.94	6.93
7	1.16	2.31	3.47	4.62	5.78	6.93	8.09
8	1.33	2.64	3.96	5.28	6.60	7.92	9.24
9	1.49	2.97	4.46	5.94	7.43	8.91	10.40
10	1.66	3.30	4.95	6.60	8.25	9.90	11.55



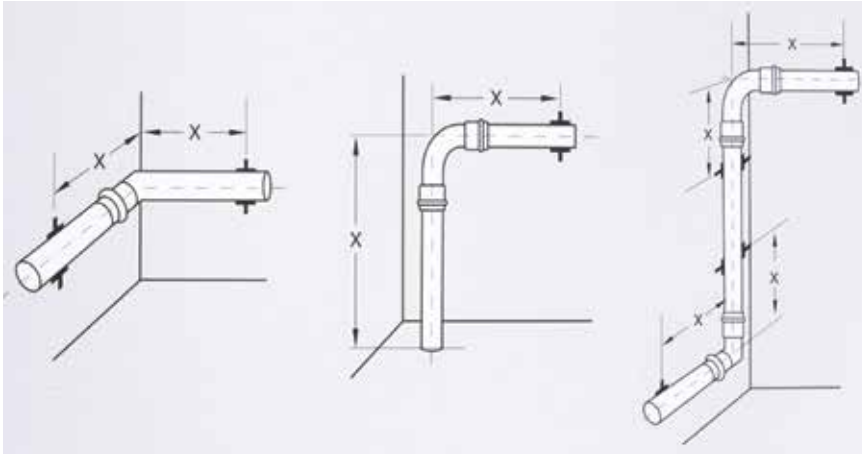


Illustration 5: Minimum spacing "X" of sliding brackets to allow for thermal expansion (see Table 11)

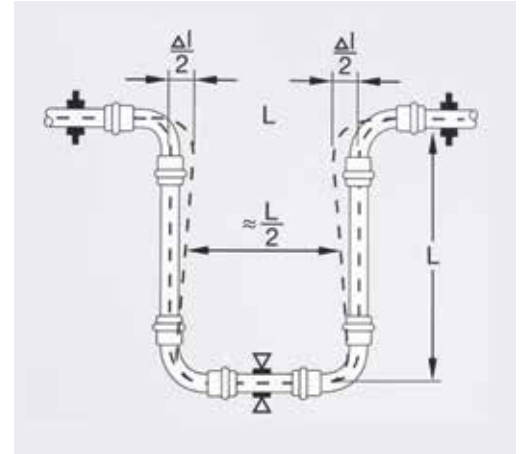


Illustration 6: Minimum length of leg "L" of a U-bend, used as an expansion compensating element, to accommodate thermal expansion (see Table 12)

Table 11: Minimum distance "X" to sliding supports (m) to allow for thermal expansion (see Illustration 5)

Tube Diameter d (mm)	Temperature Differential ΔL						
	10mm	20mm	30mm	40mm	50mm	60mm	70mm
15	0.57	0.80	0.98	1.13	1.27	1.39	1.50
22	0.69	0.97	1.19	1.37	1.54	1.68	1.82
28	0.77	1.10	1.34	1.55	1.73	1.90	2.05
35	0.87	1.22	1.50	1.73	1.94	2.12	2.29
42	0.95	1.35	1.64	1.90	2.12	2.32	2.51
54	1.08	1.52	1.86	2.15	2.41	2.63	2.85
76.1	1.28	1.81	2.21	2.55	2.86	3.13	3.38
108	1.52	2.15	2.63	3.04	3.40	3.73	4.02

Table 12: Minimum side length "L" of a U-bend expansion element for thermal expansion absorption (m) (see Illustration 6)

Tube Diameter d (mm)	Temperature Differential ΔL						
	10mm	20mm	30mm	40mm	50mm	60mm	70mm
15	0.33	0.46	0.57	0.65	0.73	0.80	0.87
22	0.40	0.56	0.69	0.79	0.89	0.97	1.05
28	0.45	0.63	0.77	0.89	1.00	1.10	1.18
35	0.50	0.71	0.87	1.00	1.12	1.22	1.32
42	0.55	0.77	0.95	1.10	1.22	1.34	1.45
54	0.62	0.88	1.08	1.24	1.39	1.52	1.64
76.1	0.74	1.04	1.28	1.47	1.65	1.81	1.95
108	0.88	1.24	1.52	1.76	1.96	2.15	2.32

2.8 INSULATION – ACOUSTIC AND THERMAL

Any lagging or insulation materials applied to the stainless steel tubes must not have a water soluble chloride ion content exceeding 0.05% by weight. Failure to ensure this may result in corrosion and a shortened life of the installed system.

XLPE Insulation with a water soluble chloride content level at 0.05% or below is the recommended material when installing KemPress Stainless Steel.

Acoustic Insulation

Acoustic insulation is to be implemented according to standards and codes, including the National Construction Code in Australia.

Tubes, including fittings, in isolation generate no noise, but supports that are poorly constructed or poorly sized can generate flow noise that will be transmitted on the tube work.

Tubes should always be acoustically insulated against structure borne noise in wall break-through penetrations, or on installation walls using clamps with acoustic insulation, or they should be laid in utility shafts.

Thermal Insulation

Thermal insulation of tubes is to be implemented according to standards and codes, including the National Construction Code in Australia. Additionally, the following design considerations should be observed.

Tube lines for cold drinking water are to be laid so that the drinking water quality is not impaired by the heat influence of the environment. A sufficient separation distance to heat sources is to be maintained (hot water and heating lines, flues etc.), so that the lines are not influenced by these heat sources. If this is not possible, the cold water lines must be insulated against unwanted heating.

In refrigeration systems, cooling water tubes are frequently operated with temperatures from 4°C to 6°C. To decrease energy losses and to avoid unwanted water condensate (undershooting of the dew-point temperature of the ambient air), these lines must be water-blocking thermally-insulated. These requirements apply not only for newly built systems, but also for those laid during renovation in existing buildings.



2.9 ELECTRICAL SAFETY – EQUIPOTENTIAL BONDING

Stainless steel tubes form, with their corresponding fittings (including press fittings), a continuous electrically conducting connection and equipotential bonding must be addressed in accordance with relevant codes and standards.

2.10 TRACE HEATING SYSTEMS

In order to avoid unacceptable increases of pressure, shut off lines which do not possess their own safety systems must not be heated. In connection with electrical trace heating, it is absolutely necessary that relevant standards are followed.

In case of stainless steel lines which are equipped with electrical trace heating, it is to be ensured that the tube inside-wall temperature does not exceed 60°C for a long period.

Short-term temperatures of approx. 70°C are permissible for the purpose of thermal disinfection.

2.11 TYPICAL APPLICATION DESIGN INFORMATION

To ensure the correct use of Kembla Stainless and KemPress® Stainless fittings, please confirm with MM Kembla that the tube and proposed O-ring seal materials are suitable for the application. Some typical applications are listed below and for other applications please reference the KemPress® Stainless Application Guide, available from MM Kembla, or contact MM Kembla.

Potable Water

Kembla Stainless tube and KemPress® Stainless fittings are suitable for all potable water applications, having Watermark approval for the Standard EPDM (black) and FKM (red) O-ring seals.

Treated and Process Water

Kembla Stainless tube and KemPress® Stainless fittings are suitable for softened and demineralised water, including desalinated water treated via reverse osmosis.

Fire Systems

Kembla Stainless tube and KemPress® Stainless fittings have FM and VdS approval for use in fire sprinkler systems. The approvals are based on a tested system comprising of Kembla Stainless tube, KemPress® Stainless fittings with specific EPDM or FKM O-rings, the use of nominated press tools, jaws and high pressure slings and installation standards. These configurations and installation methods are critical in order to achieve the requirements of the approvals. A summary of the approved pressures and applications can be found in Table 13.



FM Approval

The KemPress® Stainless system has FM approvals in the size range 22 – 108 mm, using the standard black-coloured EPDM O-ring seals

for wet systems only and the red-coloured Industry FKM O-ring seals for wet and dry systems, to 12 bar for all sizes. To comply with FM approvals, special jaws must be used for 22mm size and special high pressure (HP) slings must be used for sizes 28mm – 108mm inclusive. KemPress® tools KPS2 or KPL3 must be used for sizes d = 22 – 54 mm and the KPXL2 or NovoPress model ACO401 for sizes d = 76.1 and 108 mm. Please contact MM Brands for further information.

KemPress® Stainless is approved for use in sprinkler systems when joined to the sprinkler trunk pipe work by an FM Approved “Transition Fitting” and for use as valve trim, gauge connections, or other auxiliary piping in sizes below 35 mm nominal size.



VdS Approval

The KemPress® Stainless system has VdS approvals, using the standard black-coloured EPDM O-ring seals for wet systems only and

the red-coloured Industry FKM O-ring seals for wet and dry systems. To comply with VdS approvals, special jaws must be used for 22mm size and special high pressure (HP) slings must be used for sizes 28mm – 108mm inclusive. KemPress® tools KPS2 or KPL3 must be used for sizes d = 22 – 54 mm and the KPXL2 or NovoPress model ACO401 for sizes d = 76.1 and 108 mm. Please contact MM Brands for further information.

The use is limited to the protection of LH, OH1 - OH3 and select OH4 fire hazard classes (exhibition halls, cinemas, theatres and concert halls) and is also limited to the connection of the system components among each other.

The connection of other non-system components is only admissible via detachable metal connections.

The mounting and installation instruction of the manufacturer and their specifications of the press techniques have to be observed during use. The admissible clamp clearances for copper pipes according to VdS CEA 4001 do apply.

It is not allowed to insert additives in the extinguishing water. Exceptions are anti-corrosive agents according to manufacturer release and previous agreement with VdS.

The Standard fittings with EPDM (black) O-ring may be used only as branch and distribution pipe in wet systems behind the alarm valve station, with sizes 22 – 76.1 mm approved to 16 bar and size 108 mm to 12.5 bar, according to VdS guideline – design and installation of sprinkler systems – VdS CEA 4001. The use is limited to the connection of the system components among each other. The connection of other non-system components is only admissible via detachable metal connections.

The Industry fittings with FKM (red) O-ring may be used only as branch and distribution pipe in wet and dry systems behind the alarm valve station, with fittings in sizes 22 – 76.1 mm approved to 16 bar, according to VdS guideline – design and installation for sprinkler systems – VdS CEA 4001.

Compressed Air Systems

The Kembla Stainless tube and KemPress® Stainless fittings system is suitable for compressed air installations where working pressure is 16 bar. Compressed air may contain oil and as such it is recommended to only use the KemPress® Stainless Industry fittings incorporating the FKM (red) O-rings.

Gas Supply (Fuel Gas)

The Kembla Stainless tube and KemPress® Stainless fittings system is suitable for fuel gases such as propane, butane and natural gas (methane), where maximum working pressure is 5 bar. Gas installation should be tested in accordance with the requirements specified in relevant standards including AS/NZS5601. The KemPress® Stainless Gas fittings, incorporating the HNBR (yellow) O-rings, must be used.

Table 13: FM and VdS Fire Sprinkler System Approvals and Requirements for Kembla Stainless Tube and KemPress® Stainless Fittings

OD	FM Approval		VdS Approval		Mandatory Tools, Jaw & Slings	
	Standard EPDM O-ring Wet Systems Only	Industry FKM O-ring Wet & Dry Systems	Standard EPDM O-ring Wet Systems Only	Industry FKM O-ring Wet & Dry Systems	Press Tool	Jaw/Slings
22mm	12 bar	12 bar	16 bar	16 bar	KPS2, KPL3 & KPXL2	Sanha SA Profile Jaw
28mm	12 bar	12 bar	16 bar	16 bar	KPS2, KPL3 & KPXL2	NovoPress M-Profile HP Sling
35mm	12 bar	12 bar	16 bar	16 bar	KPS2, KPL3 & KPXL2	NovoPress M-Profile HP Sling
42mm	12 bar	12 bar	16 bar	16 bar	KPL3 & KPXL2	NovoPress M-Profile HP Sling
54mm	12 bar	12 bar	16 bar	16 bar	KPL3 & KPXL2	NovoPress M-Profile HP Sling
76.1mm	12 bar	12 bar	16 bar	16 bar	KPXL2 & NovoPress ACO401	NovoPress M-Profile HP Sling
108mm	12 bar	12 bar	12.5 bar	N/A	KPXL2 & NovoPress ACO401	NovoPress M-Profile HP Sling

2.12 CORROSION RESISTANCE

Internal Corrosion

Stainless steel forms a passive layer (chromic oxide layer for the most part) on contact with oxygen and/or oxygenated water (e.g. drinking water). This passive layer prevents corrosion and ensures high levels of water quality, hygiene and durability.

Chloride levels in excess of those considered acceptable may result in a break-down of the passive layer and allow corrosion, with the three main types being pitting corrosion, crevice corrosion and stress corrosion cracking. The accepted view is that crevice corrosion of grade 316 stainless steel is rare where chloride concentrations are below 1000 ppm (Corrosion of Stainless Steels in Supply (Drinking) and Waste (Sewage) Water Systems, Stainless Steel Advisory Service Information Sheet 4.92, March 2001).

It should also be noted that pitting and crevice corrosion increases with temperature, although for potable water the typical temperatures and chloride levels should not be a problem. NHMRC/ARMCANZ Australian & NZ Drinking Water Guidelines give a guideline maximum value of 250 ppm for chlorides in drinking water. Bore water may have elevated chloride levels and care should be taken to ensure the levels are within the acceptable range.

For sterilisation processes, free chlorine at concentrations of up to 25 ppm, for a period of up to 24 hours can be tolerated, providing the lines are thoroughly flushed with fresh water and residual chlorine is limited to <1ppm.

Stainless steel may become sensitised from exposure to excessive heat e.g. during the welding, cutting with fast running saws/cutting discs and this shall be avoided. Hot bending of stainless steel tubes is not allowed.

External Corrosion

The KemPress® Stainless system should not be installed in locations where it will be exposed to high levels of chlorides. If this is unavoidable, precautions should be implemented to minimise the risk of corrosion, including application of watertight tapes and coatings.

Thermal insulation is to be kept permanently dry in order to retain its insulation effect and materials must not exceed a mass content of 0.05% of water-soluble chloride ions.

Connecting to Other Materials

Stainless steel and carbon steel must not be connected directly with each other. Where there is a requirement to connect stainless steel tube with carbon steel, a non-ferrous metal spacer of at least 50 mm length, or tube diameter, whichever is greater, shall be installed. This may be achieved through the installation of a non-ferrous metal valve (brass or red brass) between the stainless steel and carbon steel materials.

In case of the installation of stainless steel with copper materials it is recommended to use brass or red bronze connector of at least 50 mm length. Note: the OD's are not

matching from Kembla stainless to Kembla Copper tube and that adaptors are required to interconnect the materials.

In closed systems e.g. heating and coolant systems with no-oxygen, interconnection with other metallic pipe systems is not a problem.

2.13 FIRE RESISTANCE AND PROTECTION

Kembla Stainless tube and KemPress® Stainless fittings are non-flammable and will not contribute to fire propagation.

Fire protection is to be implemented according to the respective national standards and building codes. Any materials applied to the KemPress® Stainless system for the purpose of achieving fire ratings at penetrations must be chloride-free.

2.14 STANDARDS AND COMPLIANCE

Kembla Stainless tube is 316L grade stainless steel (material EN 1.4404) complying with DIN EN 10088, fabricated according to DIN EN 10312 and DVGW - W 541 and is supplied as straight 6 m lengths with outside diameters in the range 15mm – 108mm. It is compliant with AS 5200.053 and has Watermark Approval # 23151.



KemPress® Stainless fittings are manufactured and quality controlled to AS3688, with 316L grade stainless steel (material EN1.4404) for parts made from tube, 316Ti (material EN1.4571) for threaded fittings and 316 (material 1.4408) for precision cast fittings. Watermark Approval # 23087 for Standard (EPDM) and Industry (FKM) fittings.





2.15 DESIGN QUICK REFERENCE GUIDE

Table 14: Quick reference guide to Kembla Stainless tube and KemPress® Stainless fittings

Field of Application	Dim./Nominal Pressure	Seals	Tools
KemPress® Stainless Standard			
<ul style="list-style-type: none"> - Drinking water - Processed water - Heating system - Cooling water - Condensate - Utility and rain water 	d = 15-22mm PN 40 d = 28-35mm PN 25 d = 42-108mm PN 16	EPDM Colour: black Max. continuous temp.: -30°C up to 120°C (short time up to 150°C) Requirements according to KTW satisfied	d =15-28mm KemPress® KPS2 d =15-54mm KemPress® KPL3 d =15-108mm KemPress® KPXL2 (see Section 6 for specifications)
KemPress® Stainless Industry			
<ul style="list-style-type: none"> - Compressed air - Solar thermal power - Cooling water - Bulk goods - Applications in industry 	d = 15-22mm PN 40 d = 28-35mm PN 25 d = 42-108mm PN 16 	FKM Colour: red Max. continuous temp.: -20°C to 200°C (depending on the medium) Solar thermal power up to 200°C (short time up to 280°C) Resistant against oils and water glycol mixture	d =15-28mm KemPress® KPS2 d =15-54mm KemPress® KPL3 d =15-108mm KemPress® KPXL2 (see Section 6 for specifications)
KemPress® Stainless Gas			
<ul style="list-style-type: none"> - Flammable/fuel gases according to DVGW G260 and G262 	d = 15-108 mm PN 5 / GT 5 Underground laying not allowed 	HNBR Colour: yellow Max. continuous temp.: -20°C to 100°C Requirements according to DVGW VP 614 satisfied	d =15-28mm KemPress® KPS2 d =15-54mm KemPress® KPL3 d =15-108mm KemPress® KPXL2 (see Section 6 for specifications)
Materials: Fittings from tube: Threaded fittings: Stainless steel parts: Tubes: Tube inside surface:	Material No.: 1.4404 (316L) according to EN 10088 Material No.: 1.4571 (316Ti) according to EN 10088 Material No.: 1.4408 according to EN 10283 Material No.: 1.4404 (316L) according to EN 10088 Tube dimensions according to EN 10312 and DVGW-GW 541 bright-annealed and solution-heat-treated, strength limited in upper values according to EN 10312 Free of harmful component parts and according to the special requirements of GW DVGW-Code of Practice 541		

SECTION 3
**INSTALLATION
GUIDELINES**

MM BRANDS STAINLESS AND KEMPRESS® STAINLESS FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH LOCAL COUNTRY CODES AND STANDARDS INCLUDING THE NATIONAL CONSTRUCTION CODE IN AUSTRALIA AND AS/NZS 3500.

3.1 HANDLING AND STORAGE OF KEMBLA STAINLESS TUBES AND KEMPRESS® STAINLESS FITTINGS

In the storage and transport of tubes and fittings, damage and contamination, including physical damage from building site activity, swarf, other building materials, soil and stormwater must be avoided. It is recommended to transport and store the tubes carefully, preferably on squared timbers and ensuring no risk of damage from heavy objects falling or resting on them. The tubes and fittings shall be stored dry and not placed directly on the ground. Fittings are to be taken from the original packaging only directly prior to installation.

3.2 TUBE CUTTING AND DE-BURRING

It is recommended to use a tube cutter to cut Kembla Stainless tubes to ensure a clean and right angled cut.

Note: The tube cutter shall not have been used for cutting carbon steel/ferrous metals. Failure to ensure this may result in a corrosion failure point.

If electrically driven saws are used for cutting Kembla Stainless tubes, the cutting speed needs to be carefully controlled to ensure no sensitization of the material occurs. Experience indicates that even a straw-yellow discoloration of the stainless steel can indicate a sensitization of the material. If annealing colours appear, the affected sections must be eliminated and the remaining stainless steel tube surfaces shall be carefully checked both inside and out.

Purpose designed planetary saws, for cutting stainless steel tubes, are ideal for cutting higher volumes of tubes and larger sizes, as they simultaneously de-burr as they cut.

The utilization of high speed cutting disks, angle grinders or flame cutters is not allowed for cutting stainless steel tubes.

Caution: After cutting, the tube ends are to be carefully de-burred inside and outside using a tube de-burring tool or suitable hand file.

3.3 BENDING STAINLESS STEEL TUBES

Hot bending of stainless steel tubes is not allowed as it will adversely affect the composition of the stainless steel, compromising performance.

Kembla Stainless tubes up to and including dimension 28 mm must be cold bent with suitable bending tools. Larger size tubes are not to be bent.

A bending radius, measured in the neutral axis of the bend, of at least $R = 3.5D$ is to be maintained, where R is the radius and D is the tube diameter.

It is to be ensured that, after bending, a sufficiently long, straight cylindrical tube piece is available for further processing.



3.4) INSERTION DEPTHS AND DISTANCES OF FITTINGS

There are minimum tube insertion depths and minimum spacing requirements between two press fittings and from wall/floor penetrations to press fittings. These minimum

distances are required to ensure proper use of the pressing tools and to facilitate correct formation of the joints. Please refer to the following drawings and tables.

Table 16: Minimum spacing between fittings and from fittings to walls

Tube OD mm	Insertion Depth mm (e)	Minimum Spacing in mm (see Illustrations 7 - 10)			
		A min	L min	B min	C min
15	24	10	58	60	84
22	28	10	66	60	88
28	28	10	66	60	88
35	30	10	70	60	90
42	38	20	96	60	98
54	43	20	106	60	103
76.1	50	30	130	60	110
108	69	30	168	60	129

For Tube Sizes $d \leq 54$ mm

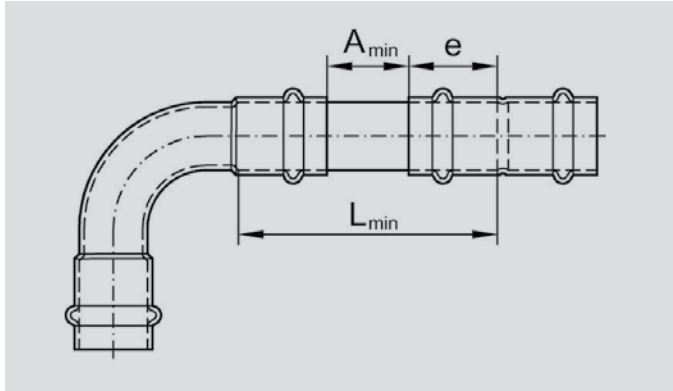


Illustration 7: Minimum spacing between two press fittings (A), minimum insertion depth (e) and minimum tube length (L) for sizes $d \leq 54$ mm (see Table 16)

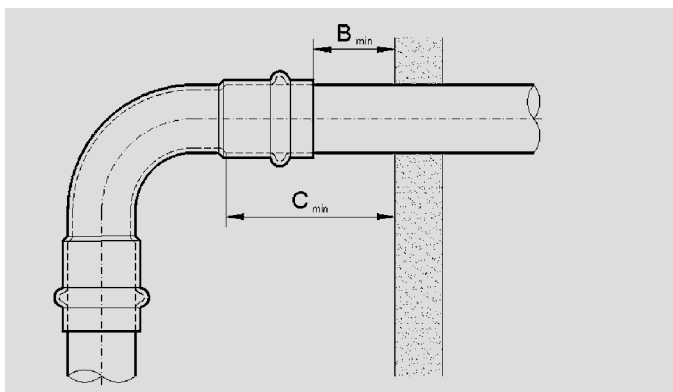


Illustration 8: Minimum distance from wall/floor to front of press fitting (B) and socket end from wall (C) for sizes $d \leq 54$ mm (see Table 16)

For Tube Sizes $d = 76.1$ mm and 108 mm

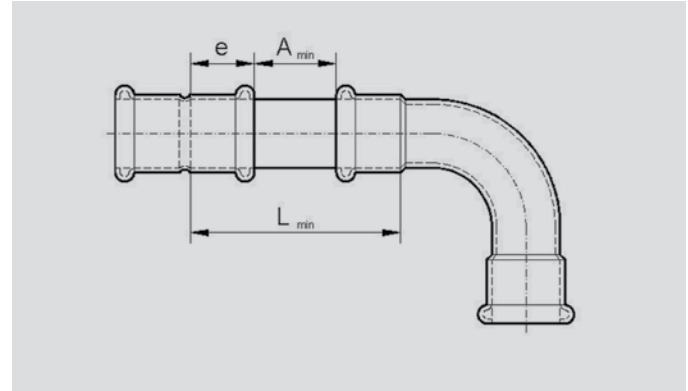


Illustration 9: Minimum spacing between two press fittings (A), minimum insertion depth (e) and minimum tube length (L) for sizes $d > 54$ mm (see Table 16)

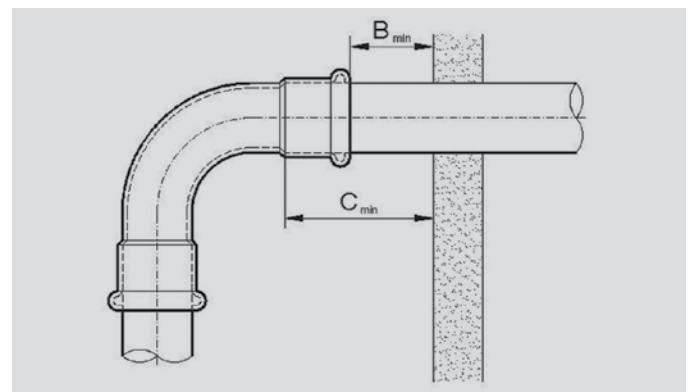


Illustration 10: Minimum distance from wall/floor to front of press fitting (B) and socket end from wall (C) for sizes $d > 54$ mm (see Table 16)

3.5 PRESS TOOL SPACE REQUIREMENTS

Table 17 and Illustration 11 below provide information regarding the required space to safely and effectively

complete press cycles with KemPress® tools using either jaws and slings.

Table 17: KemPress® Tool Space requirements relative to walls and other tubes. (see illustration 11)

Tube Size OD mm	A mm	B mm	C mm	D mm	E mm	F mm
15 Jaw	20	56	32	40	80	155
22 Jaw	25	65	32	50	82	175
28 Jaw & HP Sling	25	75	32	54	82	182
35 Jaw	30	83	32	65	85	205
35 HP Sling	75	95	75	75	95	205
42 Sling & HP Sling	75	140	85	110	155	375
54 Sling & HP Sling	85	150	90	110	155	375
76.1 Sling & HP Sling	115	220	120	200	220	650
108 Sling & HP Sling	150	255	150	200	255	650

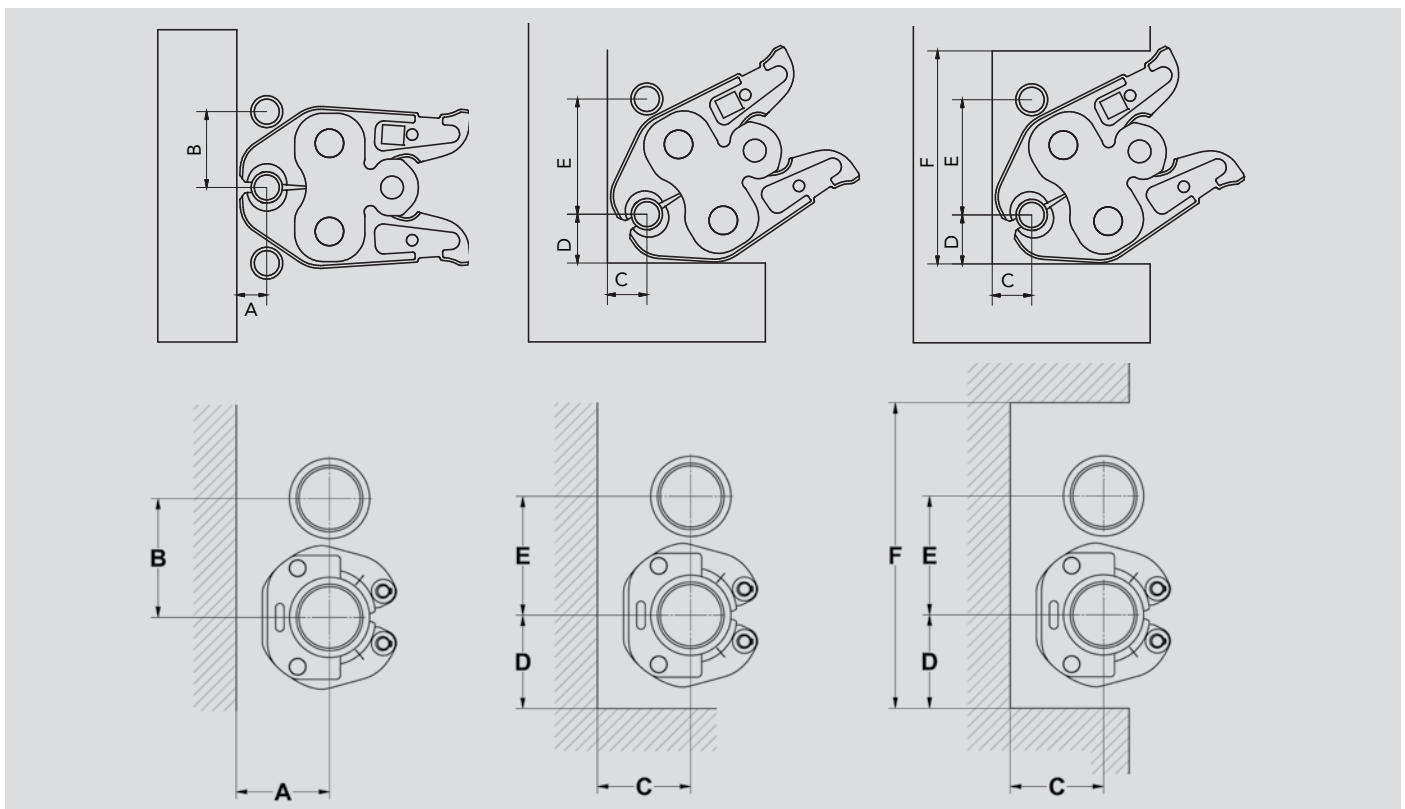


Illustration 11: KemPress® jaw/sling space requirements relative to walls and other tubes. Tubes assumed as equal size.

3.6 THREADED FITTINGS

KemPress® Stainless threaded fittings incorporate BSP R external taper (male), BSP Rp internal parallel (female), according to EN 10226, for connecting threads and G thread according to EN/ISO 228 for fastening screw threads.

Only chloride-free sealant may be used to seal stainless steel threaded components. Do not use PTFE sealing tapes that

contain chloride ions as they can lead to corrosion in stainless steel tubes and fittings.

It is recommended to use a permanently elastic thread sealing compound, suitable for the end use application, which is free from chloride ions.

3.7) COUPLING OF TUBES TO KEMPRESS® STAINLESS FITTINGS

The procedure for coupling Kembla Stainless tube and KemPress® Stainless fittings is shown below. Please note that for high pressure applications a special press tool, jaw and HP slings may be required (subject to confirmation of suitability from MM Kembla).

The tube ends must be clean for the creation of trouble-free press connections. The tube exterior surfaces shall have no scratches or grooves in the section of tube end being inserted into a socket for press fitting.

FOR KEMBLA STAINLESS TUBES WITH AN OUTSIDE DIAMETER UP TO & INCLUDING D = 35 MM

STEP 1

Cut tubes as required with a pipe cutter, squarely at a right angle.

Note: The cutter blade shall not have been used for other ferrous metals. Failure to ensure this may result in a corrosion failure point.

ALTERNATIVE

Cut tubes with a fine toothed hand saw at a right angle.

Note: The saw shall not have been used for other ferrous metals. Failure to ensure this may result in a corrosion failure point.



STEP 2

Always de-burr tubes carefully and thoroughly with a suitable de-burring tool inside and outside. Failure to do so may result in leaks from damaging O-rings, compromising joint integrity, as well as the risk of increasing turbidity and facilitating corrosion near joints

Note: The equipment used to de-burr shall not have been used for other ferrous metals. Failure to ensure this may result in a corrosion failure point.



STEP 3

Mark the insertion depth on the tube, or male plain end of fitting, with felt tipped pen and template. The marker must be water-proof. Refer to Table 16 in Section 3.7 Minimum Insertion Depth (e) in mm.



FOR KEMBLA STAINLESS TUBES WITH AN OUTSIDE DIAMETER UP TO & INCLUDING D = 35 MM

STEP 4

Check KemPress® Stainless fittings for correct seating of the O-ring, that it is free of dirt and that it is not damaged. Insert tube into the fitting up to the stop, using slight rotation. The fitting outer edge must line up with the mark.



STEP 5

Select press jaw according to the fitting dimension, checking to make sure the jaw surface is clean and in good condition.

Attach the press jaw to the press machine. Close the retention/locking bolts as required.



STEP 6

Ensure the fitting has not moved and that the outer edge still lines up with the marking. Open the press jaw and place

at right angles on to the KemPress® Stainless fitting such that the bead of the fitting is inserted into the groove of the press jaw.



STEP 7

Initiate the pressing procedure by pressing the start button for approximately 3 seconds. The pressing procedure will run automatically and should not be interrupted prematurely. This ensures a permanent joint that is sealed and has the required tensional and axial force locking properties. After completing the pressing process, the pressing tool

can be removed from the pressed connection by opening the press jaw. For safety, the pressing process can be stopped by pressing the emergency stop button. Once the emergency button has been activated, the tool will need to be reset. The affected fitting and tube section should be discarded and new components used.



FOR KEMBLA STAINLESS TUBES WITH AN OUTSIDE DIAMETER D=42MM AND D=54MM

For the dimensions 42 and 54 mm, the use of the KemPress® KPL3, KPXL2 or other approved press tool (see Section 6.0 Recommended pressing tools) is required. KemPress® tools require adaptor jaw ZB203 for these sizes. For high pressure applications a special press tool and HP slings may be required (subject to confirmation of suitability from MM Kembla).

The installation is the same as described above for the steps 1 to 4 of "For Kembla Stainless tubes with an outside diameter up to and including d = 35 mm", then the procedure is continued with the dimensions 42 mm and 54 mm with the operation steps 5 to 9 below.

STEP 5

Select the appropriate press sling and check that it is clean and that the surface is smooth. In order to ensure correct operation of the pressing slings, the sliding segments must be free to move/slide

The sliding segments are tensioned by springs, holding them in the correct starting position. Please ensure that the marking lines on the inner and outer rings form a line for the correct starting position. If the segments

are not freely moving, clean and lubricate with light machine oil or have them serviced by an approved MM Brands KemPress® service agent.



STEP 6

Place the sling around the KemPress® Stainless fitting such that the bead of the fitting is inserted into the groove of the press sling. Close press sling. Make certain that the pressing sling fits tightly into the fitting. Afterwards position the pressing sling by rotating it so that the pressing machine can be correctly attached.



FOR KEMBLA STAINLESS TUBES WITH AN OUTSIDE DIAMETER D=42MM AND D=54MM

STEP 7

Select adaptor jaw ZB203 for the dimension for the dimensions 42 mm and 54 mm. Insert the adaptor jaw into the press tool and close the locking bolts.



STEP 8

Open the adaptor jaw by depressing the jaw levers and attach to the press sling so that the claws of the adaptor jaw grip around the pins of the press sling.

Check whether fittings outer edge lines up with the marker of the insertion depth then start the pressing procedure by pressing the start button.

The pressing procedure should not be interrupted prematurely. Following this procedure ensures a permanently sealed connection always results.

For safety, the pressing process can be stopped by pressing the emergency stop button. Once the emergency button has been activated, the tool will need to be reset. The affected fitting and tube section should be discarded and new components used.



STEP 9

Loosen the press sling by pulling apart.



FOR KEMBLA STAINLESS TUBES WITH AN OUTSIDE DIAMETER D=76.1MM & D=108MM

For the dimensions 76.1 and 108 mm, the use of the KemPress® KPXL2 or other approved press tool (see 6.0 Recommended pressing tools) is required. For high pressure applications a special press tool and HP slings may be required (subject to confirmation of suitability from MM Kembla).

For the 76.1 mm size, it is recommended to use the KemPress® 76.1 mm press sling and Adaptor Jaw ZB221.

For the 108 mm size, it is recommended to use the KemPress® 108 mm press sling and Adaptor jaw ZB221 for the first pressing, followed by the 108 mm press sling and Adaptor Jaw ZB222 for the second pressing.

The installation is the same as described above for the steps 1 to 4 of "For Kembla Stainless tubes with an outside diameter up to and including d = 35 mm", then the procedure is continued with the dimensions 42 mm and 54 mm with the operation steps 5 to 9 below.

FOR KEMBLA STAINLESS TUBES WITH AN OUTSIDE DIAMETER D=76.1MM

STEP 5

Select the 76.1 mm press sling and check that it is clean and that the surface is smooth. In order to ensure correct operation of the pressing slings, the sliding segments must be free to move/slide. The sliding segments are tensioned by springs, holding them in the correct starting position.

Please ensure that the marking lines on the inner and outer rings form a line for the correct starting position. If the segments are not freely moving, clean and lubricate with light machine oil or have them serviced by an approved MM Brands KemPress® service agent.



STEP 6

Place the sling around the KemPress® Stainless fitting such that the bead of the fitting is inserted into the slot of the press sling. Close press sling. Make certain that the pressing sling fits tightly into the fitting. Afterwards position the pressing sling by rotating it so that the pressing machine can be correctly attached.



FOR KEMBLA STAINLESS TUBES WITH AN OUTSIDE DIAMETER D=76.1MM & D=108MM

STEP 7

Select adaptor jaw ZB221 for the dimension for the dimensions 76.1 mm. Insert the adaptor jaw into the press tool and close the locking bolts.



STEP 8

Open the adaptor jaw by depressing the jaw levers and attach to the press sling so that the claws of the adaptor jaw grip around the pins of the press sling.

Check whether fittings outer edge lines up with the marker of the insertion depth then start the pressing procedure by pressing the start button.

The pressing procedure should not be interrupted prematurely. Following this procedure ensures a permanently sealed connection always results.

For safety, the pressing process can be stopped by pressing the emergency stop button. Once the emergency button has been activated, the tool will need to be reset. The affected fitting and tube section should be discarded and new components used.



STEP 9

Loosen the press sling by pulling apart.



FOR KEMBLA STAINLESS TUBES WITH AN OUTSIDE DIAMETER D=76.1MM & D=108MM

FOR KEMBLA STAINLESS TUBES WITH AN OUTSIDE DIAMETER D = 108MM
 (Note: requires two pressings with different adaptor jaws for the same 108 mm sling)

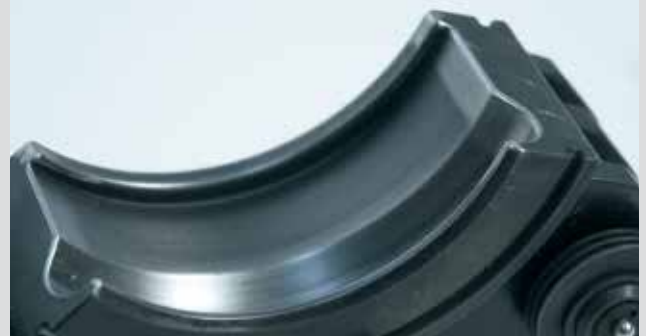
STEP 5

Select the 108mm press sling and check that it is clean and that the surface is smooth. In order to ensure correct operation of the pressing slings, the sliding segments must be free to move/slide.

The sliding segments are tensioned by springs, holding them in the correct starting position.

Please ensure that the marking lines on the inner and outer rings form a line for the correct starting position.

If the segments are not freely moving, clean and lubricate with light machine oil or have them serviced by an approved KemPress® service agent.



STEP 6

Place the sling around the KemPress® Stainless fitting such that the bead of the fitting is inserted into the slot of the press sling.

Close press sling and secure the fastening latch. Make certain that the pressing sling fits tightly into the fitting.

Afterwards position the pressing sling by rotating it so that the pressing machine can be correctly attached.



STEP 7

Select adaptor jaw ZB221 for the dimension for the dimensions 108 mm first press. Insert the adaptor jaw into the press tool and close the locking bolts



FOR KEMBLA STAINLESS TUBES WITH AN OUTSIDE DIAMETER D=76.1MM & D=108MM

STEP 8

Open the adaptor jaw by depressing the jaw levers and attach to the press sling so that the claws of the adaptor jaw grip around the pins of the press sling.

Check whether fittings outer edge lines up with the marker of the insertion depth then start the pressing procedure by pressing the start button. The pressing procedure should not be interrupted prematurely.

Following this procedure ensures a permanently sealed connection always results. After completing the

pressing process, the pressing tool can be removed from the press sling by opening the intermediate jaw. Then carry out step 7 to 9 using the intermediate jaw ZB222 to complete the second stage of pressing in order to close the press sling completely.

For safety, the pressing process can be stopped by pressing the emergency stop button. Once the emergency button has been activated, the tool will need to be reset. The affected fitting and tube section should be discarded and new components used.



STEP 9

Loosen the press sling by releasing the fastening latch and then pull apart.



3.8) TUBE FIXING AND SUPPORT

Please refer to the relevant national standards and/or codes, such as AS/NZS 3500, to determine the requirements for tube fixing and support.

Tubes are to be connected directly to the building by means of standard brackets, clips and hangers and must not be attached to other lines. In order to fulfil acoustic protection requirements, clamps with appropriate elastomeric inserts are to be employed.

Clamps are always to be attached on the tube only, not on the fittings. With regard to placement of clips on the tubes, in particular in the area of branches (bends, T-joints etc.), please reference Section 2.7 in this guide regarding thermal movement.

3.9) PRESSURE TESTING, FLUSHING AND DISINFECTING INSTALLED SYSTEMS

Pressure testing, flushing and commissioning of installed tubes and fittings shall be carried out in Australia and New Zealand in accordance with standards and codes, including AS/NZS 3500.

It is important to ensure that the system remains full following a water pressure test, systems that are drained or partially drained will have increased risk of pitting corrosion. Intensive flushing with clear drinking water shall be carried out directly after any chemical disinfection. No remains of disinfection agents may be measured in the drinking water at the tapping points and respectively the tapping measured values may not be higher than potable water standards. Failure to do so will increase the risk of corrosion.

The thermal disinfection of stainless steel lines can be carried out at high temperatures. The temperature is limited to 120°C in case of standard KemPress® Stainless fittings because of the EPDM O-rings. However, there is no restriction on the disinfection duration.

SECTION 4
WARRANTIES



WARRANTY

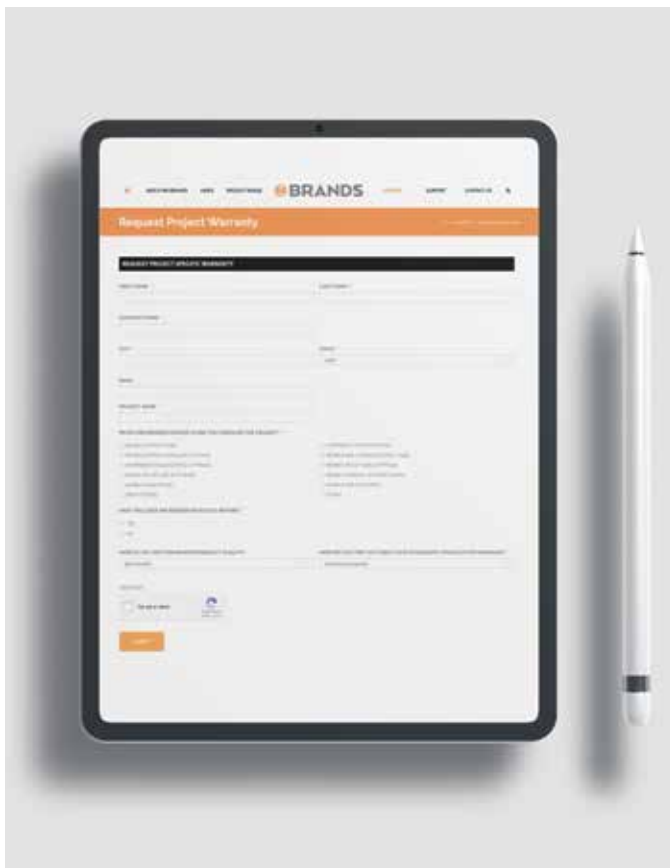
Tool Warranty

The KemPress® tool, jaws, adaptor jaws and collars are guaranteed to work for a minimum of 3 years from date of purchase. The warranty covers the repair of any damage or malfunction to the tool that is the cause of defective materials or parts. It will not cover damage caused by improper use, inadequate maintenance or mishandling of the tool (for example, major impact caused by dropping the tool or water damage).

The KemPress® 12V & 18V Li-ion batteries and battery chargers are covered by a limited 12 month warranty.

The following faults are not covered by the warranty (for examples of how MM Kembla can detect these faults, please contact customer service):

1. Tool damaged by dropping
2. Water damage
3. Heavily affected by dirt
4. Unauthorized opening
5. Inappropriate handling
6. Continuous operation
7. Operation without jaws and fitting
8. Inserting the battery by force



Fittings and Stainless Steel Tube Warranty

For full details of the MM Kembla warranty please see <http://www.kembla.com.au/support/trading-terms> and download the Standard Conditions of Sale for Goods.

There are three elements to a Press-fit system. The stainless steel tube, the fittings and the press tool. MM Kembla has tested Kembla stainless steel tube, KemPress® fittings and the KemPress® tools in accordance with the relevant standards and guarantees. When installed by a licensed plumber in accordance with the Design and Installation Guide (located on our website) the tube and fittings will be fit for their intended purpose for a period of not less than 25 years.

This means that the system is designed not to leak for a minimum of 50 years and guaranteed not to leak for 25 years.

When using stainless steel tube compliant to AS 5200.053 other than Kembla stainless steel tube, MM Kembla will provide the same warranty as above for the same period as the warranty of the stainless steel tube to a maximum of 25 years. If the stainless steel tube warranty is 10 years, then the Kembla warranty for the KemPress® fittings is 10 years.

When using Kembla stainless steel tube with other press-fit fittings, Kembla will provide a warranty for the stainless steel tube only. The fittings manufacturer must provide the warranty for the fittings.

The below list of press tools sold in Australia & NZ (up to September 2022) with AS3688 size press jaws and collars have been tested for use on our KemPress fittings. This guarantee covers licensed plumbers using these tools on our fittings. The warranty does not cover faults arising from incorrect installations and faults arising from competitor fittings used on the same installation.

TOOLS COMPATIBLE WITH KEMPRESS FITTINGS

KemPress® KPS2, KPL3 & KPXL2

Viega Picco & Picco 6 Plus, Pressgun 4B, 5, 6 & Picco 6 Plus

Novopress ACO102, ACO153BT, ACO202, ACO202XL, ACO203, ECO202 & ECO203

Ridgid RP 210-B & RP 340

Milwaukee M12 & M18 Force Logic

Rothenberger Compact and ROMAX 3000 & 4000

CAUTION: Product data, design details, performance figures, advice and other information given herein (the "Information") is provided only as a guide to available information. MM Kembla does not accept any liability whatsoever (including arising from negligence) for the accuracy of the Information and for injuries, expense or loss, which may arise as a result of the use of the Information by the recipient.

For further information: Refer to the current edition of The Plumbers Handbook available through your MM Brands representative or contact Customer Service: 0800 536 252

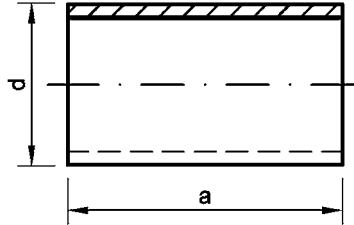
SECTION 5

PRODUCT RANGE

STAINLESS STEEL TUBE
STAINLESS STEEL FITTINGS

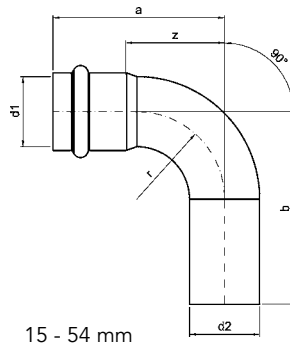


KEMBLA STAINLESS TUBES IN 6 M LENGTHS, AISI 316L

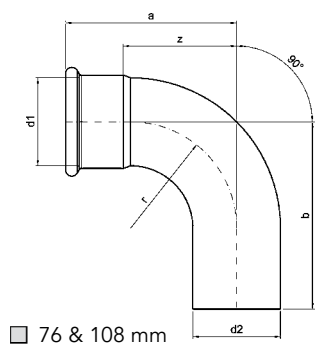


Product Code	OD (d) mm	Wall Thickness mm	Dry Weight kg/m	Wet Weight, filled with water kg/m	Volume l/m	Tube Length (a)mm	6m Tube Mass kg
42000	15	1.0	0.351	0.484	0.133	6000	2.106
42001	22	1.2	0.625	0.928	0.302	6000	3.750
42002	28	1.2	0.805	1.321	0.515	6000	4.830
42003	35	1.5	1.258	2.064	0.804	6000	7.548
42004	42	1.5	1.521	2.718	1.195	6000	9.126
42005	54	1.5	1.972	4.017	2.043	6000	11.832
42006	76.1	2.0	3.711	7.798	4.083	6000	22.266
42007	108	2.0	5.308	13.810	8.495	6000	31.848

KEMPRESS® STAINLESS BEND 90° FEMALE/MALE



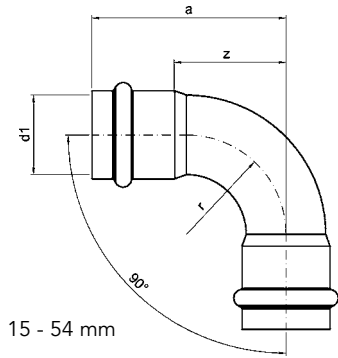
15 - 54 mm



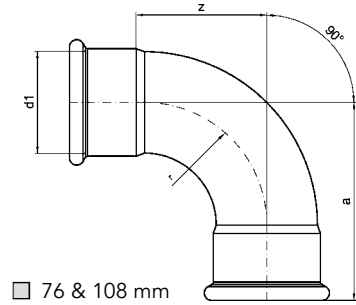
76 & 108 mm

Standard	Industry	Gas	Dimension d1 x d2	a	b	z
95450	95460	95470	15	48	60	22
95451	95461	95471	22	63	72	34
95452	95462	95472	28	68	77	39
95453	95463	95473	35	87	93	56
95454	95464	95474	42	103	113	64
95455	95465	95475	54	125	131	80
95456	95466	95476	76	143	162	92
95457	95467	95477	108	210	231	131

KEMPRESS® STAINLESS BEND 90° FEMALE/FEMALE



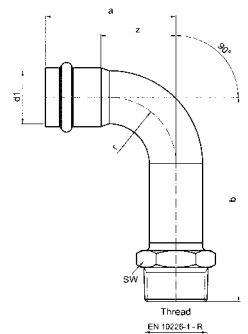
15 - 54 mm



□ 76 & 108 mm

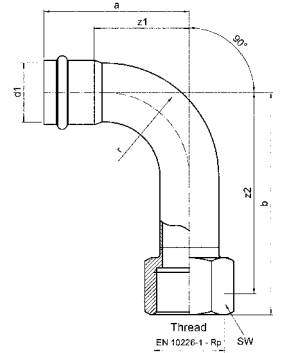
Standard	Industry	Gas	Dimension d1 x d2	a	z
95500	95510	95520	15	48	22
95501	95511	95521	22	63	34
95502	95512	95522	28	68	39
95503	95513	95523	35	87	56
95504	95514	95524	42	103	64
95505	95515	95525	54	125	80
95506	95516	95526	76	143	92
95507	95517	95527	108	201	131

KEMPRESS® STAINLESS BEND 90° MALE BSPT/R THREAD



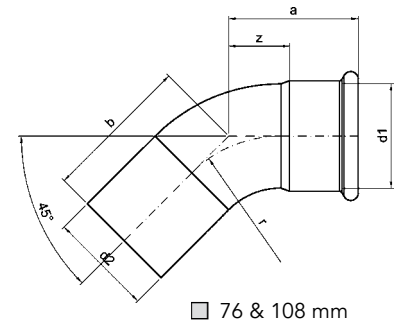
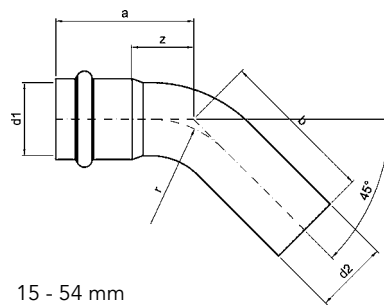
Standard	Industry	Gas	Dimension d1 x R	a	b	Z	SW
95600	95610	95620	15 x 1/2	48	84	22	22
95601	95611	95621	22 x 3/4	63	100	34	30
95602	95612	95622	28 x 1	68	108	39	36
95603	95613	95623	35 x 1 1/4	87	128	56	46
95604	95614	95624	42 x 1 1/2	103	149	64	55
95605	95615	95625	54 x 2	125	173	80	65

KEMPRESS® STAINLESS BEND 90° FEMALE BSPP/RP THREAD



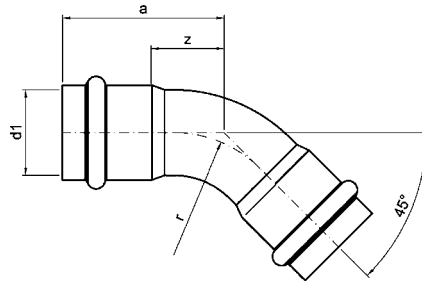
Standard	Industry	Gas	Dimension d1 x Rp	a	b	Z1	Z2	SW
95550	95560	95570	15 x 1/2	48	91	22	77	24
95551	95561	95571	22 x 3/4	63	105	34	90	32
95552	95562	95572	28 x 1	69	113	39	96	38
95553	95563	95573	35 x 1 1/4	87	133	56	113	46

KEMPRESS® STAINLESS BEND 45° FEMALE/MALE

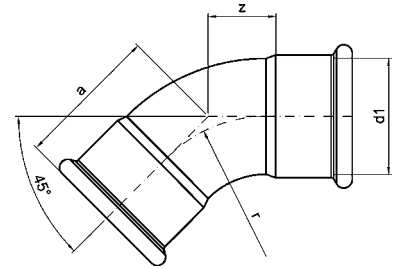


Standard	Industry	Gas	Dimension d1	a	b	z
95650	95660	95670	15	37	47	12
95651	95661	95671	22	48	56	19
95652	95662	95672	28	53	60	24
95653	95663	95673	35	58	64	27
95654	95664	95674	42	68	79	30
95655	95665	95675	54	83	89	38
95656	95666	95676	76	89	108	38
95657	95667	95677	108	124	150	54

KEMPRESS® STAINLESS BEND 45° FEMALE/FEMALE



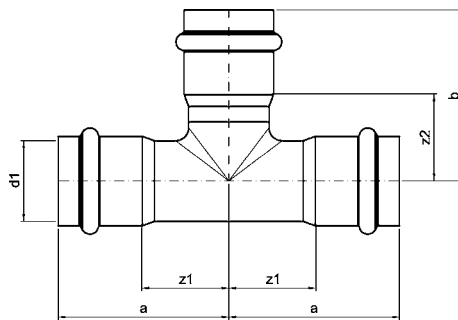
15 - 54 mm



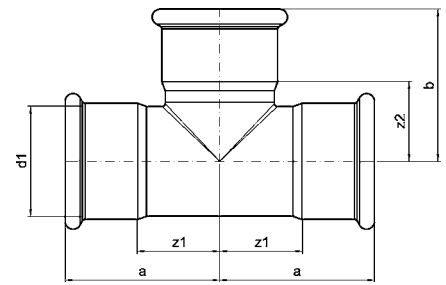
□ 76 & 108 mm

Standard	Industry	Gas	Dimension d1	a	z
95700	95710	95720	15	37	12
95701	95711	95721	22	48	19
95702	95712	95722	28	53	24
95703	95713	95723	35	58	27
95704	95714	95724	42	68	29
95705	95715	95725	54	83	38
95706	95716	95726	76	89	38
95707	95717	95727	108	124	54

KEMPRESS® STAINLESS EQUAL TEE



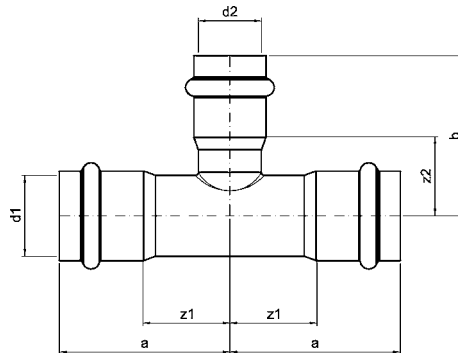
15 - 54 mm



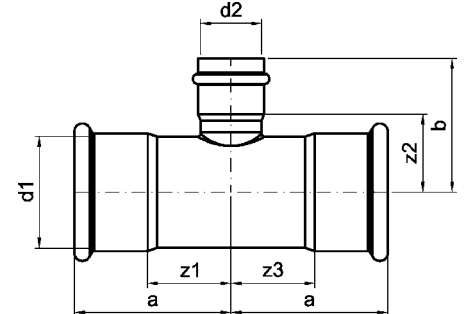
□ 76 & 108 mm

Standard	Industry	Gas	Dimension d1 x d2 x d3	a	b	z1	z2	z3
96250	96260	96270	15	48	46	22	21	22
96251	96261	96271	22	54	53	26	25	26
96252	96262	96272	28	60	59	30	30	30
96253	96263	96273	35	65	65	35	35	35
96254	96264	96274	42	77	77	39	38	39
96255	96265	96275	54	89	90	45	46	45
96256	96266	96276	76	108	106	57	55	57
96257	96267	96277	108	144	144	74	74	74

KEMPRESS® STAINLESS REDUCING TEE



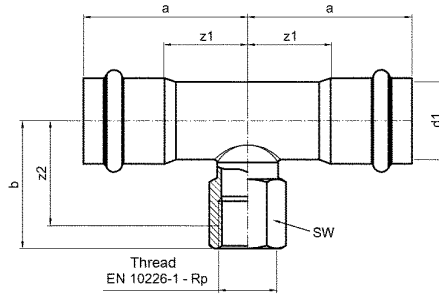
15 - 54 mm



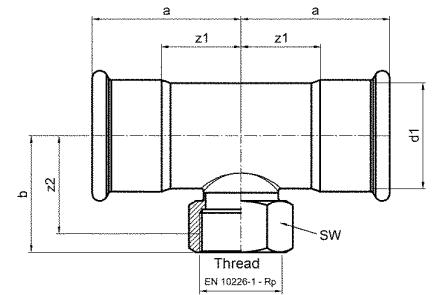
□ 76 & 108 mm

Standard	Industry	Gas	Dimension d1 x d2 x d3	a	b	z1	z2	z3
96300	96350	96400	22 x 15 x 22	44	44	15	18	15
96301	96351	96401	28 x 15 x 28	60	54	30	28	30
96302	96352	96402	28 x 22 x 28	60	53	30	27	30
96303	96353	96403	35 x 15 x 35	65	58	35	33	35
96304	96354	96404	35 x 22 x 35	65	59	35	31	35
96305	96355	96405	35 x 28 x 35	65	62	35	33	35
96306	96356	96406	42 x 22 x 42	77	63	39	34	39
96307	96357	96407	42 x 28 x 42	77	64	39	35	39
96308	96358	96408	42 x 35 x 42	77	67	39	37	39
96309	96359	96409	54 x 22 x 54	89	69	45	40	45
96310	96360	96410	54 x 28 x 54	89	70	45	41	45
96311	96361	96411	54 x 35 x 54	89	74	45	42	45
96312	96362	96412	54 x 42 x 54	89	81	45	42	45
96313	96363	N/A	76 x 22 x 76	108	83	57	55	57
96314	96364	N/A	76 x 28 x 76	108	85	57	56	57
96315	96365	N/A	76 x 35 x 76	108	87	57	57	57
96316	96366	N/A	76 x 42 x 76	108	95	57	57	57
96317	96367	96417	76 x 54 x 76	108	102	57	57	57
96318	96368	96418	108 x 22 x 108	144	99	74	70	74
96319	96369	N/A	108 x 28 x 108	144	101	74	72	74
96320	96370	96420	108 x 35 x 108	144	103	74	73	74
96321	96371	96421	108 x 42 x 108	144	111	74	73	74
96322	96372	96422	108 x 54 x 108	144	118	74	73	74
96323	96373	96423	108 x 76 x 108	144	122	74	71	74

KEMPRESS® STAINLESS FEMALE BSPP/RP THREADED T-JUNCTION



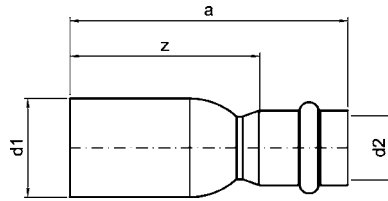
15 - 54 mm



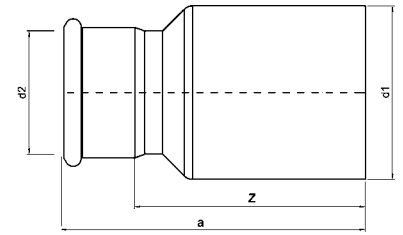
□ 76 & 108 mm

Standard	Industry	Gas	Dimension d1 x RP	a	b	z1	z2	SW
96450	96500	96550	15 x 1/2	48	45	22	32	24
96451	96501	96551	22 x 1/2	54	48	26	35	24
96452	96502	96552	22 x 3/4	54	50	26	35	32
96453	96503	96553	28 x 1/2	60	46	30	32	24
96454	96504	96554	28 x 3/4	60	54	30	39	32
96455	96505	96555	28 x 1	60	57	30	40	38
96456	96506	96556	35 x 1/2	65	49	35	36	24
96457	96507	96557	35 x 3/4	65	51	35	36	32
96458	96508	96558	35 x 1 1/4	65	65	35	45	46
96459	96509	96559	42 x 1/2	77	54	39	40	24
96460	96510	96560	42 x 3/4	77	56	39	41	32
96461	96511	96561	42 x 1 1/2	77	68	39	48	55
96462	96512	96562	54 x 1/2	89	60	45	46	24
96463	96513	96563	54 x 3/4	89	62	45	47	32
96464	96514	96564	54 x 2	89	80	45	56	65
96465	96515	96565	76.1 x 3/4	108	75	57	60	32
96466	96516	96566	76.1 x 2	108	85	57	61	65
96467	96517	96567	108 x 3/4	144	91	74	76	32
96468	96518	96568	108 x 2	144	101	74	77	65

KEMPRESS® STAINLESS REDUCER WITH TUBE END



15 - 54 mm

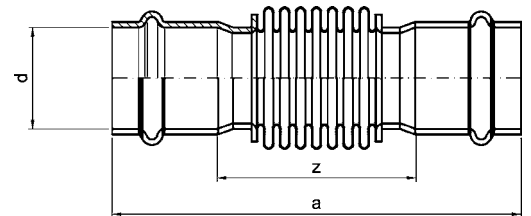


□ 76 & 108 mm

Standard	Industry	Gas	Dimension d1 x d2	a	z
95400	95414	95428	22 x 15	73	47
95401	95415	95429	28 x 15	78	52
95402	95416	95430	28 x 22	77	48
95403	95417	95431	35 x 22	84	55
95404	95418	95432	35 x 28	85	55
95405	95419	95433	42 x 22	95	66
95406	95420	95434	42 x 28	97	67
95407	95421	95435	42 x 35	95	64
95408	95422	95436	54 x 28	106	76
95409	95423	95437	54 x 35	106	75
95410	95424	95438	54 x 42	112	73
95411	95425	95439	76 x 54	141	96
95412	95426	95440	108 x 54	180	135
95413	95427	95441	108 x 76	181	130

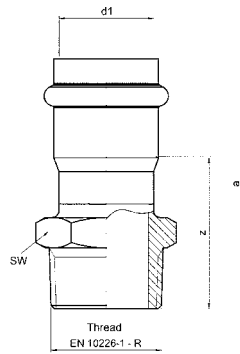
KEMPRESS® STAINLESS EXPANSION COMPENSATOR

Installation must be visible and easily accessible

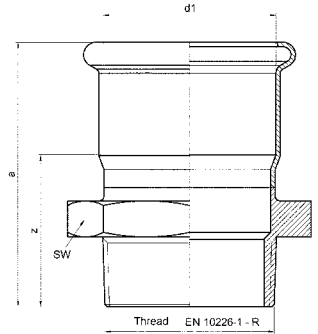


Standard	Industry	Gas	Dimension d	a	z	GDK
97000	N/A	N/A	15	106	45	10
97001	N/A	N/A	22	108	37	14
97002	N/A	N/A	28	113	42	12
97003	N/A	N/A	35	124	49	14
97004	N/A	N/A	42	146	53	16
97005	N/A	N/A	54	165	56	20
97006	N/A	N/A	76.1	201	76	24
97007	N/A	N/A	108	265	92	34

KEMPRESS® STAINLESS MALE BSPT/R THREAD ADAPTOR, FEMALE SOCKET



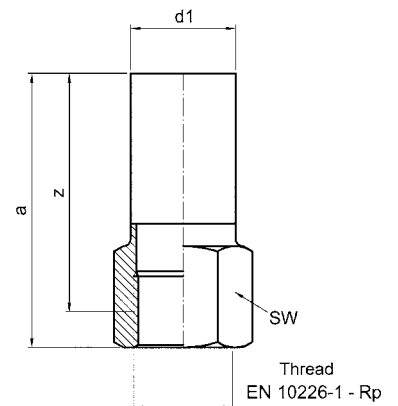
15 - 54 mm



□ 76 & 108 mm

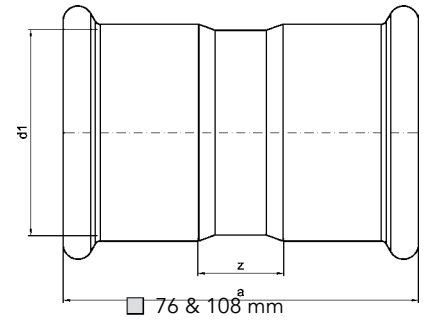
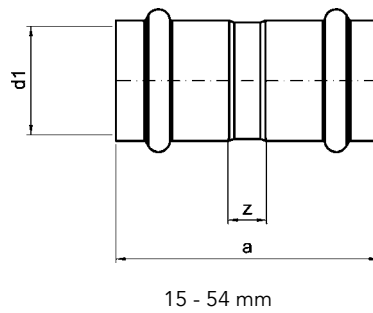
Standard	Industry	Gas	Dimension d1 x R	a	z	SW
96050	96063	96076	15 x 1/2	46	20	24
96051	96064	96077	15 x 3/4	63	37	30
96052	96065	96078	22 x 1/2	51	22	27
96053	96066	96079	22 x 3/4	51	22	30
96054	96067	96080	22 x 1	52	23	36
96055	96068	96081	28 x 3/4	72	42	30
96056	96069	96082	28 x 1	74	44	36
96057	96070	96083	35 x 1	80	49	36
96058	96071	96084	35 x 1 1/4	84	53	46
96059	96072	96085	42 x 1 1/2	94	55	55
96060	96073	96086	54 x 2	107	62	65
96061	96074	96087	76.1 x 2 1/2	117	65	100
96062	96075	96088	108 x 4	155	84	125

KEMPRESS® STAINLESS FEMALE BSP/RP THREAD ADAPTOR, TUBE END



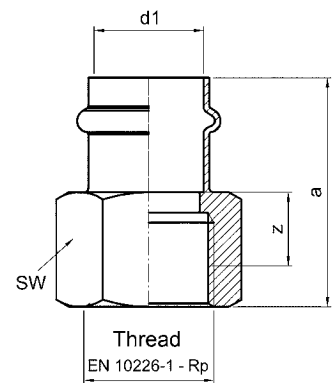
Standard	Industry	Gas	Dimension d1 x Rp	a	z	SW
	96200		15 x 1/2	66	53	24
	96201		22 x 1/2	71	58	24
	96202		22 x 3/4	73	58	32
	96203		28 x 3/4	78	63	32

KEMPRESS® STAINLESS COUPLING



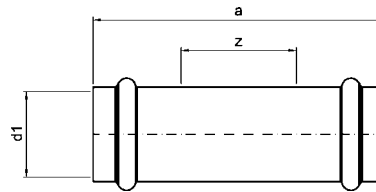
Standard	Industry	Gas	Dimension d1	a	z
95300	95310	95320	15	56	6
95301	95311	95321	22	76	20
95302	95312	95322	28	78	19
95303	95313	95323	35	78	17
95304	95314	95324	42	94	18
95305	95315	95325	54	106	18
95306	95316	95326	76	132	31
95307	95317	95327	108	170	31

KEMPRESS® STAINLESS FEMALE BSPP/RP THREAD ADAPTOR, FEMALE SOCKET

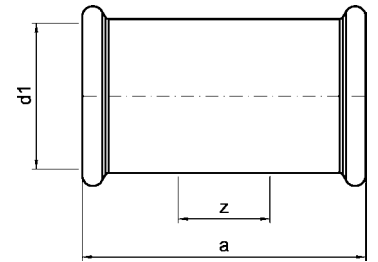


Standard	Industry	Gas	Dimension d1 x Rp	a	z	SW
96150	96160	96170	15 x 1/2	46	7	24
96151	96161	96171	15 x 3/4	49	9	30
96152	96162	96172	22 x 1/2	50	8	24
96153	96163	96173	22 x 3/4	52	9	30
96154	96164	96174	22 x 1	55	9	38
96155	96165	96175	28 x 3/4	76	32	32
96156	96166	96176	28 x 1	79	32	38
96157	96167	96177	35 x 1 1/4	89	39	46
96158	96168	96178	42 x 1 1/2	98	40	55
96159	96169	96179	54 x 2	107	39	65

KEMPRESS® STAINLESS SLIP COUPLING



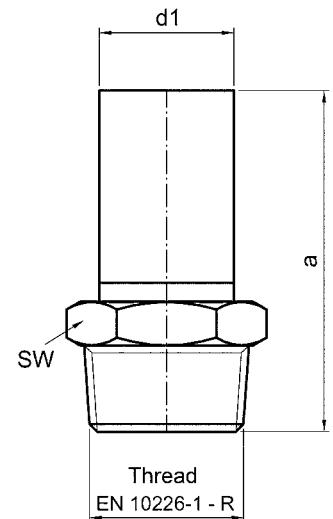
15 - 54 mm



□ 76 & 108 mm

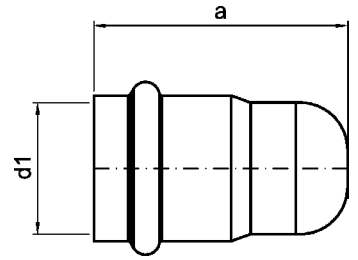
Standard	Industry	Gas	Dimension d1	a	z
95350	95360	95370	15	78	27
95351	95361	95371	22	84	27
95352	95362	95372	28	96	37
95353	95363	95373	35	98	37
95354	95364	95374	42	114	37
95355	95365	95375	54	131	42
95356	95366	95376	76	148	47
95357	95367	95377	108	210	71

KEMPRESS® STAINLESS MALE BSPT/R ADAPTOR, TUBE END



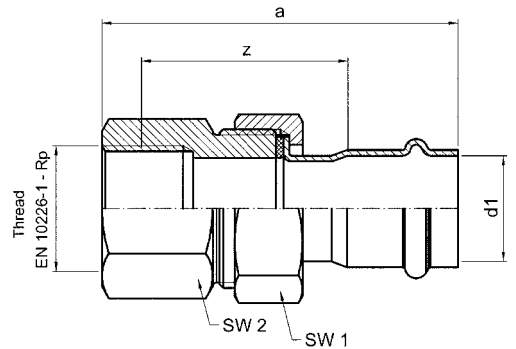
Standard	Industry	Gas	Dimension d1 x R	a	SW
	96100		15 x 1/2	59	22
	96101		22 x 1/2	64	24
	96102		22 x 3/4	68	30
	96103		28 x 1	76	36

KEMPRESS® STAINLESS END CAP WITH SOCKET



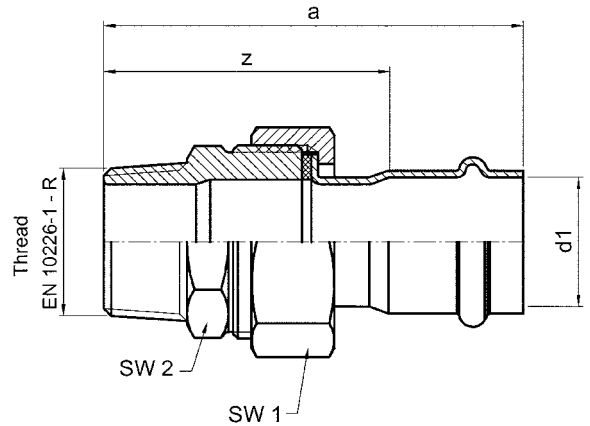
Standard	Industry	Gas	Dimension d1	a
96850	96860	96870	15	47
96851	96861	96871	22	51
96852	96862	96872	28	54
96853	96863	96873	35	57
96854	96864	96874	42	68
96855	96865	96875	54	82

KEMPRESS® STAINLESS FEMALE BSP/RP THREAD UNION, FEMALE SOCKET, STAINLESS STEEL NUT



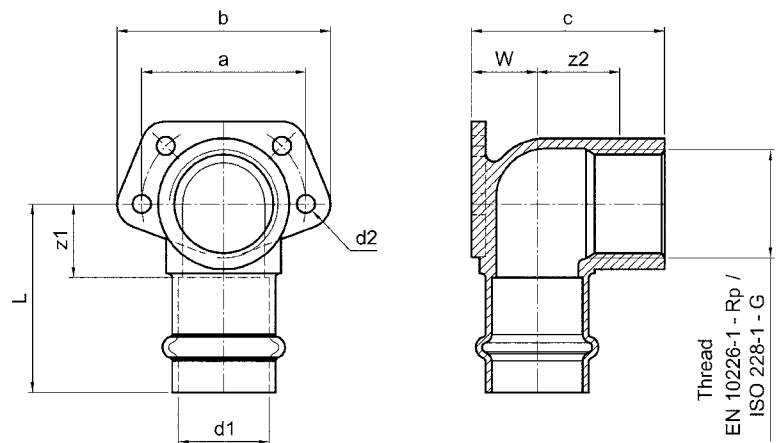
Standard	Industry	Gas	Dimension d1 x Rp	a	z	G	SW1	SW2
96700	96710	96720	15 x 1/2	93	53	27	24	96700
96701	96711	96721	15 x 3/4	94	53	32	30	96701
96702	96712	96722	22 x 3/4	104	60	38	32	96702
96703	96713	96723	22 x 1	107	60	38	38	96703
96704	96714	96724	28 x 3/4	114	69	50	32	96704
96705	96715	96725	28 x 1	118	71	40	41	96705
96706	96716	96726	35 x 1 1/4	113	62	55	46	96706
96707	96717	96727	42 x 1 1/2	115	57	58	55	96707
96708	96718	96728	54 x 2	126	57	75	70	96708

KEMPRESS® STAINLESS MALE BSPT/R THREAD UNION, FLAT SEALING, STAINLESS STEEL NUT



Standard	Industry	Gas	Dimension d1 x R	a	z	SW1	SW2
96750	96760	96770	15 x 1/2	90	63	30	27
96751	96761	96771	15 x 3/4	91	64	30	30
96752	96762	96772	22 x 3/4	101	71	38	36
96753	96763	96773	28 x 1	115	85	50	36
96754	96764	96774	35 x 11/4	124	92	55	46
96755	96765	96775	42 x 1 1/2	126	87	58	55
96756	96766	96776	54 x 2	138	93	75	70

KEMPRESS® STAINLESS FEMALE BSPP/RP THREAD BEND 90° WITH WALL MOUNT PLATE



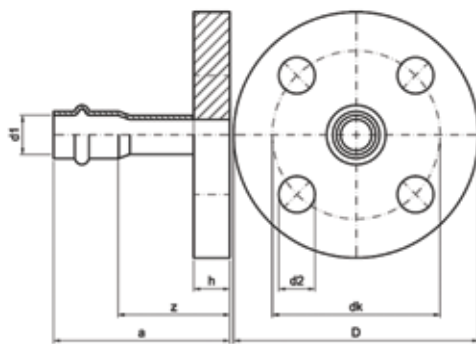
Standard	Industry	Gas	Dimension d1 x Rp	a	b	c	z1	z2	L	W	d2
96600	96610	96620	15 x 1/2	40	55	40	15	14	40	13	5
96601	96611	96621	22 x 3/4	46	55	47	18	16	46	16	5
96602	96612	N/A	28 x 1	55	70	58	22	21	51	20	5

KEMPRESS® STAINLESS SPACERS FOR FEMALE BSP BEND 90° WITH WALL MOUNT PLATE

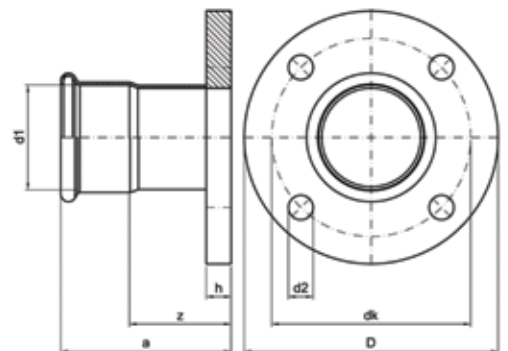


Standard	Industry	Gas	Dimension
	96650		18mm for 22 x 3/4
	96651		25mm for 15 x 1/2

KEMPRESS® STAINLESS ADAPTOR FLANGE WITH SOCKET END



15 - 54 mm



□ 76 & 108 mm

Standard	Industry	Gas	Dimension d1	a	z	h	dk	d2	D	Bolt Holes
96801	96811	96821	22 mm	69	40	14	75	14	105	4
96802	96812	96822	28 mm	75	45	16	85	14	115	4
96803	96813	96823	35 mm	78	47	16	100	18	140	4
96804	96814	96824	42 mm	87	48	16	110	18	150	4
96805	96815	96825	54 mm	100	55	18	125	18	165	4
96806	96816	96826	76.1 mm	124	73	18	145	18	185	4
96807	96817	96827	108 mm	162	92	20	180	18	220	8

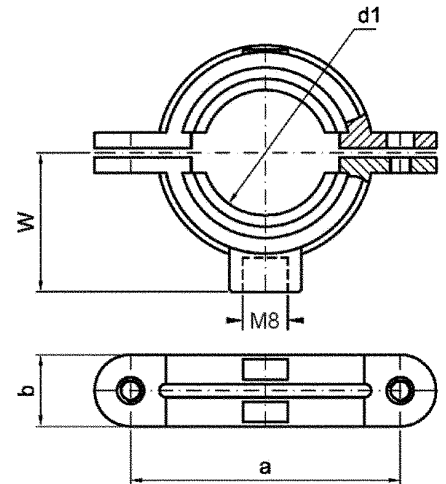
KEMPRESS® STAINLESS FLANGE SEALS



Adaptor flange sealing, asbestos free, suitable up to maximum 400°C, resistant against water, steam, fuel, depleted liquor, oils, gases (DVGW tested according to DIN 3535 part 6). Dimensions according to EN 1514-1, 2 mm thickness for flanges, PN 10/16 = EN 1092-1 and EN 1092-2

Standard	Industry	Gas	Dimension d
	97051		22 mm
	97052		28 mm
	97053		35 mm
	97054		42 mm
	97055		54 mm
	97056		76.1 mm
	97057		108 mm

KEMPRESS® STAINLESS PIPE CLAMPS WITH INSULATION



Standard	Industry	Gas	Dimension d1	a	b	w
	97100		15 mm	47	18	25
	97101		22 mm	54	18	28
	97102		28 mm	60	18	31
	97103		35 mm	67	18	35
	97104		42 mm	74	18	38
	97105		54 mm	86	18	44

SECTION 6

KEMPRESS TOOLS





PRESS TOOL

The KemPress® tools are the smartest, lightweight copper pressing tool on the market and its slim line design makes it easy to handle. It has been specifically designed and tested to work with KemPress® fittings.

There is a range of small, large and extra large tools that deliver different pressing forces.

The jaws have been designed specifically for each tool and are not interchangeable.

- Small tool (KPS2) designed for DN15, 22 & 28mm
- Large tool (KPL3) designed for DN15, 22, 28, 35, 42 & 54mm
- Large tool (KPXL2) designed for DN15 - 108mm.
- Lightest tools on the market
- One hand operation (Patent)
- Perfectly balanced with Jaws
- Longest Maintenance interval:
 KPS2 - Unlimited, service every 2 years
 KPL3 - Unlimited, service every 2 years
 KPXL2 - Unlimited, service every 2 years
- Smart electronic controls:
 Flashes if not pressed correctly
 Battery status indicator
- KPS2 tool is lighter, shorter, contains Brushless Motor Technology for more presses per battery charge and press area illumination
- Second battery included, rapid recharge 30 mins (KPS2 & KPL3) or 60 mins (KPXL2)
- Tool Service Program:
 Operated by MM Brands Service Agents
 Loan tool provided during service/repair

Key Features

- Equipped with Bluetooth technology so you can manage your tool and work via the Novocheck App on your smart phone or smart device
- Safe handling with slip-proof rubberised housing
- Signals if press not completed correctly - Immediately after the pressing cycle a green lights shows if the required pressing force was achieved, a red light if not
- Press cycle must be completed once it starts
- Electronic log book has bluetooth connectivity with the Novocheck App which allows for quick and precise analysis of errors for servicing and repair
- Electronic monitoring of the jaw locking bolt and visual error indicator
- When you reach the maximum number of presses before a service is required a warning light flashes. The machine will not close down enabling you to complete the job in hand
- Redundant switch-off
- Press area illumination
- 180° Rotatable head (KPS2)
- Latest generation tools have service interval of 2 years.

Tool Operation

Holding the tool securely, press and hold the start button for 2 seconds to begin the automatic press cycle (the green LED

will go out). Release the start button and continue to hold the tool securely. The green LED will light when the press cycle is complete. To cancel the automatic press cycle press and hold the release button on the side of the tool until the tool turns off.

If the red LED lights up, press the start button. If the tool does not run, call MM Brands for advice. If the red and green LEDs flash alternately, the tool is ready for a service, contact MM Brands Customer Service Centre.

The tool will turn off automatically after 30 minutes of no use. Turn the tool ON by quickly pressing and releasing the start button and open the jaws around the fitting.

Bluetooth Connectivity and Novocheck App

Next Generation KemPress Small 2.0 and KemPress Large 3.0 tools are equipped with Bluetooth technology so you can connect to your press tool from the your smart device via the NovoCheck App. This new feature as part of the risk minimising suite of KemGuard Technology features, allows you to perform the following via your smart device:

- Pre-start tool checks before you star your work to ensure you tool is ready for the job
- Analysis of tool performance and press performance that helps you to identify incomplete presses
- Usage diagnostics and next service reminders
- Changes to your tool settings
- Generation of logs and site reports showing complete and incomplete presses. Great for submission during handover of your work.
- Ability to monitor on-site activity and performance

Download the Novocheck App and connect with your KemPress® tool today!



Recommended Pressing Tools

MM Brands guarantees the leak tightness of the KemPress® Stainless pressed joints for standard potable water and gas applications, regardless of the manufacturer of the pressing tools, providing the pressing machines and pressing jaws and/or slings meet the following requirements:

- The pressing tools must be maintained and used according to the respective manufacturer's guidelines.
- KemPress® press tools and standard pressure jaws/slings are fully compliant as follows:
 - KPS2 for 15 mm – 28 mm inclusive
 - KPL3 for 15 mm – 54 mm inclusive
 - KPXL2 for 15 mm – 108 mm inclusive
- Compact pressing machines, such as KemPress® KPS2, for pressing sizes up to and including 28 mm, must exert a minimum pressing force of 24 kN
- Conventional and electronic pressing machines, such as KemPress® KPL3, for pressing sizes up to and including 54 mm, must exhibit a minimum pressing force of 30 kN



PRESS TOOL

- Conventional and electronic pressing machines, such as KemPress® KPXL2, for pressing sizes up to and including 108 mm, must exhibit a minimum pressing force of 32 kN
- High pressure applications are subject to approval by MM Brands and may require special press tools, jaws and slings.
- The correct EN size jaw/sling shall be used for the fitting
- With KemPress® Stainless fittings up to including 54 mm in diameter, pressing jaws and slings for press connections of the type M-MM must exhibit the original profiles SA, M or V
- With KemPress® Stainless fittings greater than 54 mm in diameter, pressing jaws and slings for press connections of the type M-MM must exhibit the original profiles M.
- MM Brands assembly instructions for the system must be observed at all times.

Tool Maintenance

KemPress® tool, jaws, adaptor jaws and collars are low maintenance, however, to ensure optimal performance and safety there are minimum precautions and maintenance procedures that need to be followed.

Carry out basic inspection of the pressing device and jaws prior to each use to ensure they are clean and free from debris and dirt. The pressing jaws should be visually inspected to ensure there are no cracks. If there are any cracks in the pressing jaws, do not use them, as there is risk of the jaws shattering and potential injury from flying fragments. It is recommended to always wear appropriate eye protection whenever using the pressing device.

When inspecting the pressing jaws, also ensure that there are no foreign material deposits and that the contours of the jaw surfaces are in order.

Failure to do this may result in damage to the jaws and/or the pressing device. Always remove the battery before performing regular cleaning and maintenance work. Regular application

of light machine oil to the moving parts of jaws, adaptor jaws and collars and general application of anti-corrosive spray is recommended to maintain serviceable condition and function.

The KemPress Small Tool 2.0 (KPS2), KemPress Large Tool 3.0 (KPL3) and KemPress Large Tool 2.0 (KPXL2) pressing device, jaws and batteries must be serviced at least every 2 years.

It is recommended to have the press tool, jaws, adaptor jaws and collars inspected by MM Brands Service Agents at least once per year. There are costs associated with the service work. Failure to have the required services carried out may affect the warranty.

Tool Service Program

The MM Brands tool service and repair program is easy, ensures minimal down time and provides known maximum costs for repairs. The key components of the program include:


- MM Brands - Customer Service: 0800 536 252
- Replacement tools available while your tool is being serviced/repared
- Convenient and easy process for lodging your tool for service/repair via MM Brands Service Agents, the place of purchase or via our express courier exchange program
- Maximum repair price guarantee: the cost won't exceed our maximum repair price and if the cost of repair is less, you only get charged that amount
- No fix, no charge
- Up to 12 months warranty on repairs
- MM Brands recommends an annual service of your tools jaws, adaptor jaws and collars


Any service or repair of the KemPress® pressing tool or jaws, requiring opening the device, or mechanical repairs, shall only be carried out by MM Brands or their authorised service agent. Failure to do so may void the warranty.



KEMPRESS COPPER TOOLING SPECIFICATIONS

Technical Data	Small Tool (KPS2)	Large Tool (KPL3)	Large Tool (KPL3)
Dimensions	DN15-DN32	DN15-DN54	DN15-DN108
Weight including battery	1.6 kg	2.8 kg	3.85 kg
Length	319 mm	387 mm	515 mm
Width	98 mm	75 mm	80 mm
Height	71 mm	111 mm	125 mm
Power Consumption	240 W	450 W	450 W
Piston Force (minimum press force)	24 kN	32 kN	32 kN
Piston Stroke	30 mm	40 mm	80 mm
Battery	12V/2.0 Ah Li-Ion	18V/3.0 Ah Li-Ion	18V/3.0 Ah Li-Ion
Charging Time	30 mins	30 mins	60 mins
Number of Presses Before Service	Unlimited, Service Every 2 Years	Unlimited, Service Every 2 Years	Unlimited, Service Every 2 Years
Noise Pressure at User's Ear	75.5 db(A)	75.5 db(A)	75.5 db(A)
Type of Protection	IP20	IP20	IP20

KEMPRESS STAINLESS STEEL TOOLS

ITEM	ITEM CODE	DESCRIPTION	INCLUDES
	97511	KEMPRESS KPS2 TOOL KIT DN15-28 Stainless Steel	KPS2 Battery Powered Hydraulic Press Tool
			KPS2 DN15 Jaw
			KPS2 DN22 Jaw
			KPS2 DN28 Jaw
			2 x 12V 2.0Ah Lithium-ion Batteries
			1 x 12V Battery Charger
			Carry Case

ITEM	ITEM CODE	DESCRIPTION	INCLUDES
	97514	KEMPRESS KPL3 TOOL KIT DN15-35 Stainless Steel	KPL3/KPXL2 Battery Powered Hydraulic Press Tool
			KPL3/KPXL2 DN15 Jaw
			KPL3/KPXL2 DN22 Jaw
	97515	KEMPRESS KPXL2 TOOL KIT DN15-35 Stainless Steel	KPL3/KPXL2 DN28 Jaw
			KPL3/KPXL2 DN35 Jaw
			2 x 12V 2.0Ah Lithium-ion Batteries
			1 x 12V Battery Charger
			Carry Case

ITEM	ITEM CODE	DESCRIPTION	INCLUDES
	97520	KEMPRESS DN42-54 COLLAR & ADAPTOR JAW KIT (Suitable for use with KPL3/KPXL2)	DN42 Collar
			DN54 Collar
			ZB203 Adaptor Jaw
			Carry Case
	97526	KEMPRESS DN76.1 COLLAR ONLY (Suitable for use with KPXL2)	DN 76.1 Collar Carry Case
	97527	KEMPRESS DN108 COLLAR ONLY (Suitable for use with KPXL2)	DN 108 Collar Carry Case
	97523	KEMPRESS DN76.1 – 108 ADAPTOR JAW KIT (Suitable for use with KPXL2)	ZB221 Adaptor Jaw
			ZB222 Adaptor Jaw
			Carry Case

KEMPRESS STAINLESS STEEL TOOLS

ITEM	ITEM CODE	DESCRIPTION	INCLUDES
	97600	KemPress KPS DN15 Jaw	DN15 Jaw for KPS2
	97601	KemPress KPS DN22 Jaw	DN22 Jaw for KPS2
	97602	KemPress KPS DN28 Jaw	DN28 Jaw for KPS2
	97650	KemPress KPL3 & KPXL2 DN15 Jaw	DN15 Jaw for KPL3/KPXL2
	97651	KemPress KPL3 & KPXL2 DN22 Jaw	DN22 Jaw for KPL3/KPXL2
	97652	KemPress KPL3 & KPXL2 DN28 Jaw	DN28 Jaw for KPL3/KPXL2
	97653	KemPress KPL3 & KPXL2 DN35 Jaw	DN35 Jaw for KPL3/KPXL2
	913782	KEMPRESS KPS2 TOOL KIT - NO JAWS	KPS2 Battery Powered Hydraulic Press Tool
			2 x 12V 2.0Ah Lithium-ion Batteries
			1 x 12V Battery Charger
			Carry Case
	913783	KEMPRESS KPL3 TOOL KIT - NO JAWS	KPL3 Battery Powered Hydraulic Press Tool
			2 x 12V 2.0Ah Lithium-ion Batteries
			1 x 12V Battery Charger
			Carry Case
	97641	KEMPRESS KPXL2 TOOL KIT - NO JAWS	KPXL2 Battery Powered Hydraulic Press Tool
			2 x 12V 2.0Ah Lithium-ion Batteries
			1 x 12V Battery Charger
			Carry Case
	913784	KemPress KPS2 12V Li-ion 2.0Ah Battery	KPS2 12V Li-ion 2.0Ah Battery
	913785	KemPress KPS2 12V Li-ion 3.0Ah Battery	KPS2 12V Li-ion 3.0Ah Battery
	913786	KemPress KPL3 18V Li-ion 2.0Ah Battery	KPL3 18V Li-ion 2.0Ah Battery
	913787	KemPress KPL3 18V Li-ion 3.0Ah Battery	KPL3 18V Li-ion 3.0Ah Battery
	913788	KemPress KPS2 12V Battery Charger 230V 50-60HZ	12V Battery Charger
	913789	KemPress KPL3 18V Battery Charger 230V 50-60HZ	18V Battery Charger
	913790	KPS2 Tool Kit Carry Case	KPS2 Carry Case
	913791	KPL3 Tool Kit Carry Case	KPL3 Carry Case

FREQUENTLY ASKED QUESTIONS

Q1: What standard of stainless steel tube are KemPress fittings compatible with?

A: KemPress fittings are suitable for use with Stainless Steel tubes compliant to AS 5200.053.

Q2: Why can't the Water (EPDM) O-ring be used for Gas and the Gas O-ring (HNBR) for water?

A: The O-rings are made from different materials for specific applications and are not suitable for the same applications. Using them for the wrong application can reduce the life of the installation or contaminate the pipeline supply.

Q3: Can the water O-ring be used for solar hot water heaters?

A: The water O-ring maximum temperature is 120 Deg. Usually the tube from the panel to the collector is 150-200 Deg. If the system exceeds 120 Deg then KemPress HT must be used.

Q4: What is the testing process for your "Un-Pressed Fitting ID" feature (or leak path)?

A: Unpressed fittings are able to be identified by pressurising the system at target pressures of 100kPa for water and 15kPa for air/gas. A leak or pressure drop should be evident. Final pressure testing of the system should be conducted in accordance with AS/NZS 3500 and/or AS/NZS 5601 once the low pressure leak testing has been completed.

It's also recommended that you employ a "visual inspection" check. It is obvious if the fitting has been pressed or not. Good practice has been to mark the fitting after pressing or inspection with a marker or paint to indicate all fittings have been pressed and inspected.

Q5: Can the fitting be pressed more than once?

A: No. Repeated pressing can incorrectly deform the fitting, affect the seal and create a leak.

Q6: What is the Maximum operating temperature of each O-ring:

EPDM (Water) -30°C to +120°C

HNBR (Gas) -20°C to +100°C

FKM (High temperature) -20°C to +200°C

Q7: Can KemPress be used for Refrigeration gases?

A: No, the fittings cannot handle the higher pressure. Maximum pressure is 1600kpa.

Q8: Can KemPress be used for Medical gases?

A: No, press fittings are not approved for use in the Australian Medical Gas Installation Standard AS2896. Only Silver brazing alloy (15% silver content) is to be used to connect copper tube and fittings for Medical Gas applications.

Q9: Do you have to use Kembla Stainless Steel tube with KemPress fittings?

A: It is recommended for a One Brand, One System warranty. In case where this is not viable please contact MM Brands - Customer Service: 0800 536 252 for further assistance.

Q10: Can KemPress be installed underground?

A: Yes exactly the same as brazed copper fittings. If the environment is aggressive then it needs to be lagged or wrapped in tape. Refer to the requirements of AS/NZS 3500 regarding location of fitting installations under concrete slabs.

Q11: Is de-burring the copper tube essential?

A: It is essential. Failing to De-bur can result in leaking pipes and void the warranty.

Q12: Can you press fittings directly against each other?

A: No. Minimum distance is 10mm for 15-35 and 20mm for 42 & 54mm, and 30mm for 76.1-108.

Q13: Once pressed, the tube shape looks to have changed. Is that normal?

A: Yes, the compression of the fitting onto the tube enables the connection to be permanent. There is no change in performance for water flow and friction loss.

Q14: What do the LED lights mean on my tool:

LED DISPLAY	STATUS/CAUSE	MEASURE
All LEDs off	The device is switched off	Briefly press the start button (1)
Green LED (2) lights up	On standby	
Green LED (2) off (press operation in progress).	Automatic press cycle is on, device ends the press operation automatically	
Green LED (2) flashes.	Insufficient battery charge.	Charge or replace battery.
Green LED (4).	Battery charge display.	
Red LED (3) lights up.	Device fault.	Press the start button (1) If this is unsuccessful, the press device is defective. Send the device to a specialist workshop. Note: The pressing operation may not have been completed; please check and repeat if required.
Red and Green LED (2) flash alternately.	Service interval reached.	Take the press device to be serviced.

Q15: Can I use KemPress for Gas coming off the main supply line?

A: Gas coming off main lines is in a liquid state and at very high pressures, which can exceed the O-safe working pressure capability of 1600kpa. For industrial use check the pressure rating (and other state requirements for high-pressure gas installations) and if the pressure is > 1600kpa then No.

For domestic supply, the liquid gas evaporates into low-pressure gas through a regulator to below 200kpa (which is well under 1600kpa).



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