

Applications

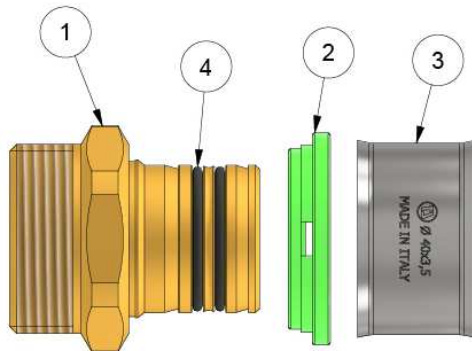
The **te-sa** Press Series 40 50 63 CR press fittings have been designed for joints with large diameter multilayer pipes, characterized by high flow rates, in the main distribution lines of hot and cold water for drinking use and in heating or conditioning.

The brass alloy used is of the type with low lead content with corrosion resistance, characteristics that make these fittings reliable even in the case of aggressive water while guaranteeing at the same time an extremely low release of lead into the water, below the values provided for by the relevant European regulations. The high-quality standards achieved through various controls adopted during production and the wide range of configurations available, allow even complex installations to be created with ease and reduction of installation times. This series of fittings has been developed with a pressing profile conformation that allows the use of most pressing machines on the market equipped with "TH" profile tongs.

A construction peculiarity of the **te-sa** press fittings is given by the transparent windows present on the plastic ring which keeps the stainless-steel bush in position. These windows allow you to see if the tube has reached the correct insertion position before crimping. The second function of the plastic ring is to avoid contact between the brass fitting and the aluminum layer of the multilayer pipe. This electrical insulation prevents corrosion phenomena due to electrolytic effects that can arise in rare and unfortunate situations. Two O-rings are positioned on the fittings which increase the safety of the fittings themselves.

All **te-sa** Press Series 40 50 63 CR fittings are produced entirely in Italy.

Components, Materials and Technical data



- 1) Fitting body made of CR brass alloy
- 2) Plastic ring made of POK
- 3) Stainless Steel AISI 304 sleeve
- 4) Double sealing O-ring made of EPDM-PX

The body of the fitting **(1)** is made of corrosion-resistant low lead content brass alloy suitable for use in applications involving drinking water and compliant with the requirements of the "4MS Common Composition List" and the "UBA HCACL List". To improve the corrosion resistance characteristics, the forged fittings are subjected to an oven solubilization heat treatment to eliminate the residual β phase. All the forged fittings and those obtained directly from the brass bar are subjected to heat treatment in the oven after the turning processes to eliminate residual tensions with a consequent increase in mechanical resistance. The hydraulic seal is guaranteed by the presence of two O-rings **(4)** in EPDM PEROXIDE compound. The position of the gaskets is specifically designed to be able to press the fitting with the most commonly used type of tongs. The stainless-steel bush **(3)**, in addition to the factory logo, also shows the size of the fitting for immediate dimensional recognition. The plastic ring **(2)**, in addition to keeping the fitting assembled, creates a physical separation between the material of the fitting and the aluminum of the multilayer pipe, preventing possible galvanic corrosion phenomena generated by the contact of the two different metals.

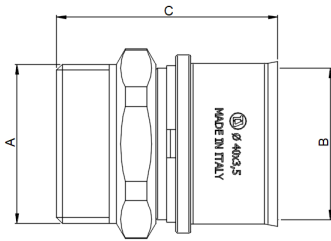
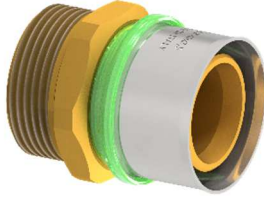
- Bodies directly machined from rods made of brass alloy UNI-EN 12164:2016 CW625N
- Forged bodies made of brass alloy UNI-EN 12165:2016 CW625N
- Seals O-ring made of compound EPDM-PX 70SH
- Pipe sleeve made of Stainless Steel AISI 304 – EN 1.4301
- Insulation plastic ring made of Polyketone (POK resin)
- Press Fitting suitable to be used in the distribution of cold and hot drinking water, heating system also with glycol solutions at maximum percentage of 30%, compressed air distribution systems.
- Maximum Operating Pressure 10 bar
- Maximum Test Pressure at room temperature 16 bar
- Maximum Operating Temperature 95°C
- Maximum peak Temperature 110°C for 1 hour
- Fittings available for pipes measuring 40x3.5 – 50x4 – 63x4.5

(In a system application maximum pressure and temperature depend on the characteristics of the pipe)

Range Available

Art. 800

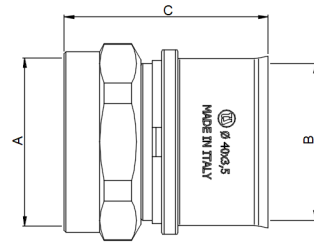
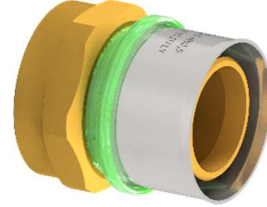
Male straight fitting



Art.	A	B	C
800-07-400	1-1/4"	Ø40x3,5	59
800-08-500	1-1/2"	Ø50x4	75
800-09-630	2"	Ø63x4,5	81

Art. 801

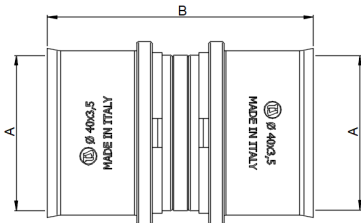
Female straight fitting



Art.	A	B	C
801-07-400	1-1/4"	Ø40x3,5	52
801-08-500	1-1/2"	Ø50x4	69
801-09-630	2"	Ø63x4,5	75

Art. 802

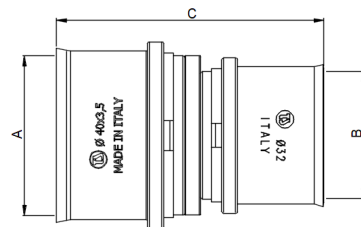
Double straight fitting



Art.	A	B
802-400-400	Ø40x3,5	69
802-500-500	Ø50x4	89
802-630-630	Ø63x4,5	93

Art. 803

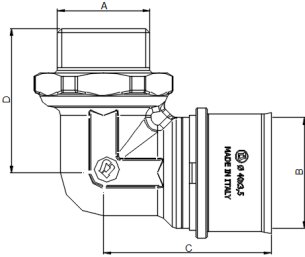
Reduced straight fitting



Art.	A	B	C
803-400-320	Ø40x3,5	Ø32x3	67
803-500-320	Ø50x4	Ø32x3	78
803-500-400	Ø50x4	Ø40x3,5	79
803-630-400	Ø63x4,5	Ø40x3,5	81
803-630-500	Ø63x4,5	Ø50x4	91

Art. 810

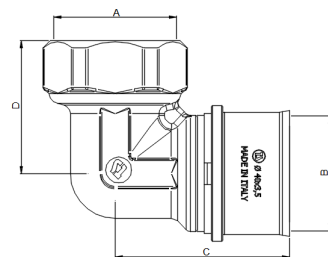
90° Male elbow fitting



Art.	A	B	C	D
810-06-400	1"	Ø40x3,5	60	52
810-07-400	1-1/4"	Ø40x3,5	60	52
810-08-500	1-1/2"	Ø50x4	75	61
810-09-630	2"	Ø63x4,5	83	80

Art. 811

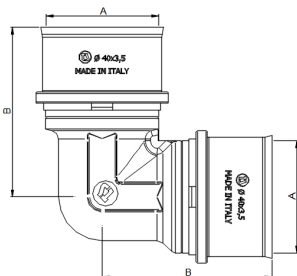
90° Female elbow fitting



Art.	A	B	C	D
811-07-400	1-1/4"	Ø40x3,5	60	46
811-08-500	1-1/2"	Ø50x4	75	61
811-09-630	2"	Ø63x4,5	83	69

Art. 812

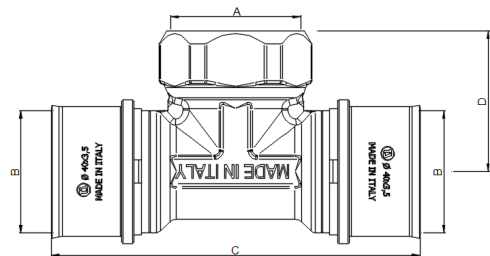
90° Elbow fitting



Art.	A	B
812-400-400	Ø40x3,5	60
812-500-500	Ø50x4	75
812-630-630	Ø63x4,5	83

Art. 821

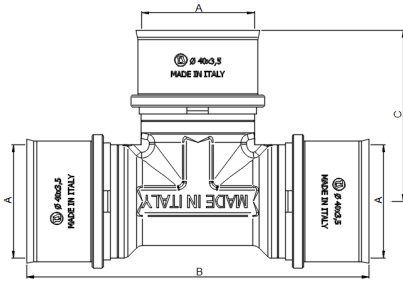
Female Tee fitting



Art.	A	B	C	D
821-400-06-400	1"	Ø40x3,5	121	46
821-400-07-400	1-1/4"	Ø40x3,5	121	46
821-500-06-500	1"	Ø50x4	152	53
821-500-07-500	1-1/4"	Ø50x4	152	53
821-630-06-630	1"	Ø63x4,5	173	60

Art. 822

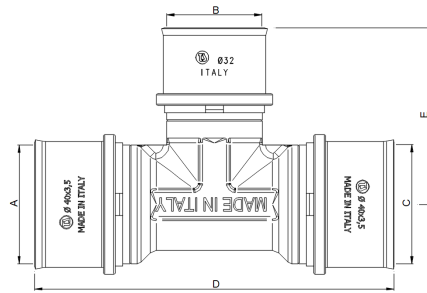
Tee fitting equal



Art.	A	B	C
822-400-400-400	Ø40x3,5	121	60
822-500-500-500	Ø50x4	152	76
822-630-630-630	Ø63x4,5	173	86

Art. 823

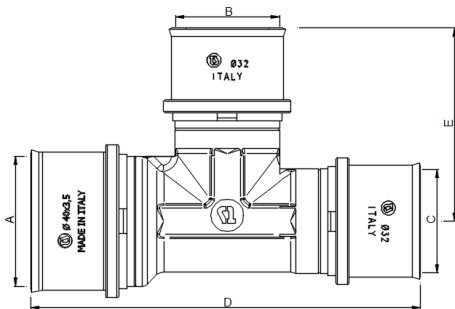
Tee fitting reduced middle section



Art.	A	B	C	D	E
823-400-320-400	Ø40x3,5	Ø32x3	Ø40x3,5	121	59
823-500-400-500	Ø50x4	Ø40x3,5	Ø50x4	152	66
823-630-400-630	Ø63x4,5	Ø40x3,5	Ø63x4,5	173	71
823-630-500-630	Ø63x4,5	Ø50x4	Ø63x4,5	173	78

Art. 824

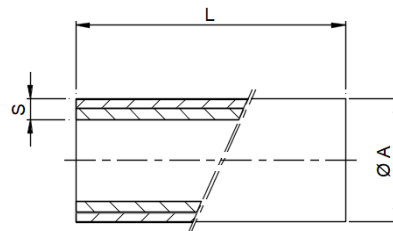
Tee fitting reduced



Art.	A	B	C	D	E
824-400-320-320	Ø40x3,5	Ø32x3	Ø32x3	120	59

Art. 8781/B

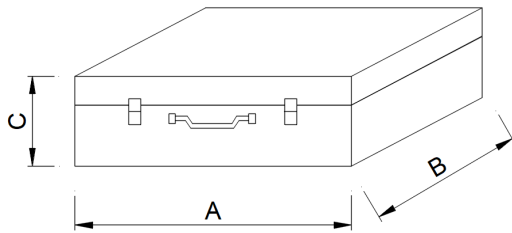
Multilayer pipe PE-Xb/Al/PE-Xb in rods



Art.	ØA x S	L
8781/B-40035	Ø40x3,5	4 m
8781/B-50040	Ø50x4	4 m
8781/B-63045	Ø63x4,5	4m

Art. 862

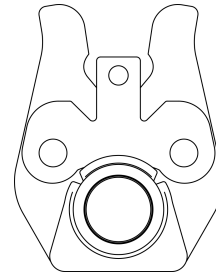
Electric radial pressing machine with automatic return



Art.	A	B	C
862	510	290	125

Art. 870

TH profile tongs for pressing machine Art. 862



Art.	Øe Pipe
870-40	40 mm
870-50	50 mm
870-63	63 mm

Installation instructions

The assembly instructions below must be carefully followed step by step in order to avoid any malfunction or water leakage in the system. The absence of defects on the pipes and fittings must be visually checked before installation. After assembly, as required by local standards and general rules, the system requires testing to verify that all connections are pressed and that there are no water leaks.

1) CUT

Cut the pipe being careful not to make it oval and that the cut is perpendicular to its axis.

2) CALIBRATION

Use a reamer tool to calibrate and chamfer the end of the pipe, determining the correct internal diameter and creating a flare that prevents damage to the O-ring during insertion of the pipe into the fitting.

3) INSERTING THE FITTING

Insert the fitting into the pipe as far as it will go, ensuring that the pipe is completely visible through the openings on the plastic ring. It is permitted to use lubricants compatible with EPDM-PX compounds with which the O-rings on the fitting are made.

4) PRESSING

Open the TH profile tongs of the pressing machine and position the fitting so as to have the collar of the plastic ring inside the dedicated seat in the tongs. Press the fitting only once and release it after the pressing cycle is completed. For correct use of the pressing machine, follow the instructions contained in the manufacturer's manual.

5) CHECK

At the end of the process, carry out a visual and hydraulic check to ensure that the fitting has been pressed correctly. The testing is necessary to verify that there are no leaks, especially if the fitting is positioned hidden in the structures and therefore not visible.

Non-pressed te-sa fittings leak when subjected to a pressure leak test.

Pressure test of the system

After finishing the assembly, the system must be inspected and subjected to pressure tests, and the results need to be recorded on a report that in copy remain available for the end user.

The purpose of the system pressure test is to verify its completeness, internal pressure resistance and tightness. Before the pressure test, the end fittings need to be plugged, the system must be filled with clean water and the remaining entrapped air totally discharged in the highest points.

The test procedure depends to the local rules or standards that could be a little different in the European Countries. Generally speaking, the rule provides that the systems are tested applying a pressure amounting to 1.5 time of the operating pressure, that however needs to be at least of 1.5 MPa (15 bar).

In Germany the referring standard is the DIN1988 that prescribe a preliminary test before the final test. The preliminary test is made by increasing the system pressure at 15 bar, then after 15 minutes needs to be readjusted and maintained for 30 minutes. The reduction of system pressure needs to be less than 0,3 bar, otherwise an immediate check of the system is required to verify where the losses are. After a positive preliminary test, the system pressure is reduced to zero and increased again to 15 bar. In order to consider the test positive, the reduction of the system pressure after two hours needs to be less than 0,3 bar. Only after the final positive test, the system can be finished with the masonry works, by maintaining the pressure into the system.

te-sa suggests to make a preliminary test with pressure air at 6 bar for a time of minimum one hour to verify if all fittings are pressed, and that there aren't macroscopic leakages. Then in a second time, perform the pressure test of the system with water at 15 bar for at least 2 hours. To be sure that the system is totally reliable, it is possible also make a third test at low pressure by using water at pressure 2 bar for 12 hours.

Technical detail

Bending radius of the pipe

The large diameter te-sa multilayer pipe is usually used in straight lengths of bar, but, if necessary, it can be bent using suitable pipe bending equipment. In these cases, the recommended minimum bending radius is equal to approximately 5 times the external diameter of the tube ($R_{min} = 200$ mm for the 40x3.5, $R_{min} = 250$ mm for the 50x4, $R_{min} = 320$ mm for the 63x4.5). Radii smaller than the aforementioned are prohibited as in these cases the pipe could collapse or its ovality reduce the flow of water.

Longitudinal thermal expansion of the pipe and its clamping

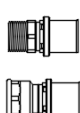


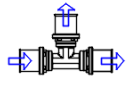
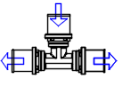
The **te-sa** Press Multilayer PE-Xb/Al/PE-Xb pipe, as per all other materials, when submitted to temperature variations it is subjected to longitudinal thermal expansion. Thanks to the internal aluminum layer this elongation is very low, but in any case, needs to be taken into consideration when the pipes are fixed with collars or when the straight pipe lines are long. For the **te-sa** Press Multilayer pipe the Thermal expansion coefficient is 0,026 mm/mK (for example 10 m of pipe submitted to a difference of temperature of 50°C have an elongation ΔL that is $0,026 \times 50 \times 10 = 13$ mm). The pipes when installed not concealed in the structures, need to be fixed by using a number of collars with enough number to maintain stable the pipeline. The suggested centre distance between the fixing points is 75÷80 cm with additional collars close to Elbows and Tee fittings at about 25 cm distance. To avoid damaging of the pipe is forbidden to use metallic collars without insulation rubber.

Losses of pressure in the system

The loss of pressure in a distribution system can be easily calculated by using the KV factors that calculation software permit to use. The low rugosity of the **te-sa** multilayer pipe and the developed shape of the press fitting series, allow to obtain a distribution system characterized by very low loss of pressure with consequently high-water flow available.

The table below contain the KV factors of the main components of **te-sa Press System Series 40 50 63 CR**.

The KV factors are determined for water temperature of 50°C.

	PIPE STRAIGHT	PIPE CURVED					
Size	KV						
40x3,5	64	116	165	143	77	143	64
50x4	114	255	510	360	147	360	120
63x4,5	229	512	1024	724	296	724	242