Copper Press Fitting Technical Brochure

2022

alro products international

Contents

ABOUT PRESS

1

General

Available in copper and Lead-free brass alloys, the ALRO Copper Press fittings range facilitates a rapid, flame-free and straightforward installation. The 1/2” to 2”, featuring a leak-before-press O-ring, is NSF approved and ensures a secure, permanent and leak-free joint suitable for a variety of applications. The range is manufactured under an accredited Quality Management System to ISO 9001-2015 and products are cUPC certified and NSF approved

1.1 Product features and benefits

- Suitable for use in potable water, hot and cold water, chilled water, compressed air and vacuum installations.
- Easy and rapid installation reduces valuable Labor time.
- A flame-free and permanent connection with no fire hazard.
- Copper tube used must be in compliance with ASTM B88 for Types K,L and M hard temper copper tube through 1/2” to 2” and soft copper tube 1/2” to 1-1/4”. When soft tube is used, rounding and sizing of the tube ends must be performed where needed
- Certified by leading international approval authorities.
- Maximum working pressure 300 PSI
- Maximum working temperature 0ºF-250ºF
- Sourced in full compliance with relevant standards, only the highest quality raw materials are used in manufacturing the range,
- If, by accident or oversight, any joint has not been pressed, it is easily identified by means of the range’s use of leak-before-press O-rings.
- Compatible with most press tools in common use.
- 50 year product guarantee (Please see full details of page 5).
- No soldering.
- Every type of tee is manufactured in one-piece and we test every single of them before packaging.

1.2 Materials and threads

- ALRO Copper Press fittings are manufactured from copper and copper alloy material.
- Copper bodies are made from DHP phosphorus deoxidized copper (ASTM B85 Alloy C12200).
- Copper alloy fittings are produced from Lead-free brass (C46500)
- Threaded ends conformance to ASME B1.20.1

All components in contact with water are manufactured using low lead materials complying with requirements for materials in contact with drinking water

1.3 Storage and handling

ALRO Press fittings should be kept in a cool and dry place in order to protect them from contamination, dust and general damage. They should also be protected from direct sunlight and stored in their original packaging to safeguard the lubricant on the O-ring prior to installation.

1.4 Leak before press function

In the event of a joint having accidentally missed being pressed, the O-ring,which contains 4 indentations that allow indentation that allows water to pass it, will leak at least one water drop/second when the system is subjected to a low pressure test.

1.5 System testing

Bending Test

The fitting was assembled by joining a coupling with an internal stop and two 40 inchs long hard drawn copper tubes. Fitting was placed on supports six (6) feet apart. A concentrated load was applied at the center of the coupling. The test fitting was pressurized to 400 PSI for one (1) h.

Vacuum Test

Fittings were subjected to a vacuum pressure of 24.5 inches of mercury for one (1) hour.

Hydraulic Shock (Water Hammer) Test

Fittings were subjected to a hydraulic pressure of 400 PSI for 10000 cycles.

Vibration Test

Fitting assemblies were subjected to a hydrostatic cyclic vibration test at 350 PSI for 1,000,000 vibration cycles. After the completion of 1,000,000 cycles, the assemblies were pressurized to 400 PSI for 48 h.

Thermal Cycling Test

Test assemblies were constructed using type L copper tube and press connect fittings. The test assemblies were subjected to flowing water at 150PSI cycled between 68ºF (20ºC) and 200ºF(93ºC) for a period of 15 minutes at each temperature for nominal size 2" and smaller

Cycling continued for 5,000 cycles for sizes 2" and smaller.

Applications and best installation practice

ALRO Copper press fittings are suitable for use in numerous applications. Some of the principal ones are as per the following table

Usage	Comments	Pressure	Temp
Hot & Cold Potable Water		300PSI	32°F-250°F
Rainwater| Gray Water		300PSI	-20°F-250°F
Chilled water	Ethylene | Propylene Glycol	300PSI	-20°F-250°F
Hydronic Heating	Ethylene | Propylene Glycol	300PSI	-20°F-250°F
Cooling Water	Up to 50% Ethylene Glycol or Propylene Glycol solution	200PSI	-20°F-250°F
Compressed Air	Less than 25mg/m3 oil content	200PSI	up to 250°F

For information on ALRO Copper press fittings' suitability for other applications, please consult.

2.1 Corrosion Resistance

Frost Protection

Technical regulations request that all water pipes should be protected from frost and excessive heat gain. Using a suitable thickness of insulation is a suitable method or if the risk is particularly acute in, for example, unheated roof spaces, a trace heating tape should be considered.

Precautions against freezing must also be undertaken particularly in new build housing involving properties which may not be occupied for extended periods. For heating and cooling applications, in such circumstances, ALRO copper press fitting can be used with glycol-water mixtures up to a mixing ratio of 50:50 without affecting the product quality and the sealing element. However, all chemical additions must be agreed before use to rule out negative interactions with materials and sealing elements (O-rings) and the mixing ratio must be checked annually.

Corrosion Protection

Pipework may need to be protected from external corrosion. Several solutions are available including ducting, insulation and corrosion resistant paint finishes etc. The most suitable one for the particular situation involved should be chosen.

Copper and copper alloy tubing fittings generally have a high resistance to internal corrosion. However, if an installed system is left 'wet', it should flushed at regular intervals prior to being commissioned to reduce the risk of carbon film cold water pitting and the possible development of legionella bacteria in stagnant water.

2.2 Pressure Testing

Test specimens shall be assembled by joining fittings and pipes or tubes with plain ends, or a tube with press connection end with a plain - end tube, in accordance with the manufacturer's instructions, unless otherwise specified in the test procedure.Connect gauges to the test specimen to measure the joint displacement.Fill the test specimen with water at 68 ± 5ºF.Pressurize the test specimen to 600 ± 7 PSI or two times the manufacturer's rated pressure, whichever is greater.Maintain the test pressure for 48 h.Measure the slippage 1 h after pressurizing and at the completion of the test.

Warranty

ALRO Products International, LLC warrants:

ALRO Press Fittings to be free from defects in materials and workmanship under normal use and service, for a period of 50 years from the Warranty Commencement Date. The Warranty Commencement Date for ALRO press systems fittings shall be the date upon which the fitting is installed.

This limited warranty applies to all ALRO Fittings installed in accordance with ALRO approved and published installation, testing, and application recommendations and instructions.

PRESS
1/2" to 2"

2

Press Fittings

Press fittings are quick and easy to install and are available in copper and copper alloy. This flame-free fitting is designed with an innovative 3-point press system to ensure a leak-free, secure, permanent joint and is suitable for multiple applications.

Fitting Construction

The Press design has the advantage of a 3-point press profile; comprising of two mechanical presses on either side of the bead, and one press on the O-ring bead. The EPDM O-ring compresses to form a permanent leak-proof joint.

Press copper fittings have a 'leak before press indicator' that highlights unpressed connections at test pressures of 1.5 to 87 PSI. Any unpressed joints can easily be identified during the test phase and pressed, saving valuable time and money. There is no need to drain down as the pressing operation can be carried out while the water is still in the system.

Press fittings are installed using a press tool with a compatible press jaw. Jaws are sized to match the fitting required. When force is exerted through the press tool the jaw closes to make a permanent joint.

Please refer to the approved list of press machines and jaws in Section 3.1.

Compatible Press Tools

3.1 Tool chart

1/2” to 1-1/4” Compact Machines			
Manufacturer	Press machine	Press jaws	Jaw profile
Rothenberger	Romax Compact	Rothenberger - Compact	SV
	Romax Compact TT	Rothenberger - Compact	SV
Rems	Mini Press ACC	Rems - Mini	V
Klauke	MAP1/MAP2L/MAP215	Klauke - SBM	KSP4
	MAP219/MAP2L19	Klauke - SBMX	KSP4
Novopress	ACO102/ACO103	NovoPress - V-PB1	V
Milwaukee	M12	Milwaukee - J12	V
Hilti	NPR 019 IE-A22	Hilti - NPR PM V	V
Ridgid	RP 200/210/240/241	Ridgid - Compact Series	V
Conel	PM 1	Conel - V-PB1	V
Viega	Picco	Viega Picco	PT2

1/2” to 2” Standard 32kn machine			
Manufacturer	Press machine	Press jaws	Jaw profile
Rothenberger	Romax 3000/4000	Rothenberger - Standard*	SV
Rems	Power-Press/ Akku-Press	Rems - Standard*	V
Novopress	ECO/ACO202/203	Novopress - V-PB2*	V**
Conel	PM 2	Conel - V-PB2*	V
Klauke	UAP2/UAP3L/UAP332	Klauke - Standard SB*	KSP4
Ridgid	RP 320/330/340	Ridgid - Standard Series*	V
Hilti	NPR 032 IE-A22	Hilti - NPR PS V*	V
Milwaukee	M18	Milwaukee - J18*	V**
Viega	Pressgun 5/6	Viega Standard*	PT2

* Press Jaw only - not press slings, collars, chains or rings.

** Novopress & Milwaukee jaws with the marking only

For inter tool compatibility please refer back to the manufacturer.

Press Installation Process

4.1 Minimum distance for press fittings from an existing brazed joint

To ensure proper sealing of both the brazed and pressed joints, the following minimum distances must be maintained between the joints. Please see following table for further information.

Tube Diameter (inches)	Minimum distance from Soldered(inches)	Minimum distance from Soldered(mm)	Minimum distance from Brazed(inches)	Minimum distance from Brazed(mm)
½	¼	7	1	26
¾	¼	7	1 ½	38
1	7⁄16	11	2	51
1 ¼	7⁄16	11	2 ½	64
1 ½	⅝	16	3	76
2	¾	19	4	102

4.2 Minimum brazing distance to an existing pressed fitting

Caution: Brazing or soldering near to Press joints should be avoided as this may cause the seal to degrade due to heat transfer. Flowing table states the minimum distance away from the press joint which is acceptable to braze. If this distance cannot be maintained then adequate precautions must be taken such as fabricating the brazed section prior to assembly with the press fittings, wrapping in a wet rag or applying a hot block, to prevent heat transfer to the press fitting during brazing.

Tube Diameter (inches)	Soldering minimum distance (inches)	Soldering minimum distance (mm)	Brazing minimum distance (inches)	Brazing minimum distance (mm)
½	1 ½	38	4 ½	114
¾	2 ¼	57	6 ¾	172
1	3	76	9	229
1 ¼	3 ¾	95	11 ¼	286
1 ½	4 ½	114	13 ½	343
2	6	153	18	457

4.3 Press tube compatibility table

ALRO press fittings may only be pressed onto copper tube in accordance with ASTM B88. When pressing onto B88 copper tube, types K, L,and M may be used. Tempers O60 and O50, known as “soft copper”, are limited to nominal sizes ½" to 1 ¼". Temper H58, known as hard copper,may be used with nominal sizes ½" to 2".

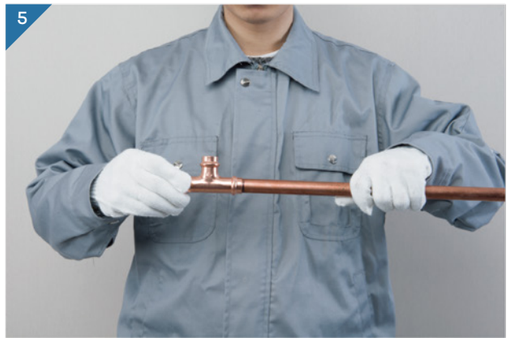
WARNING. Fully read all ALRO copper press fitting installation instructions. Failure to follow all instructions may result in extensive property damage, serious injury or death.

1.Cut the Pipe: Pipe should be cut completely square and there should be no defects and scratches on the tube which may affect the integrity of joints.

2.Deburr the Pipe: Using the deburr tool to make sure both inside and outside of the pipe end is free from any burrs or sharp edges. Make the tube clean to avoid damaging O-ring.

3.Insert the Fitting for Copper Body and Seal: Before inserting the pipe, check the body of fitting is free from any physical damage, check the correct material type (O-ring color) of seal is used, and check the O-ring is clean, lubricated and seated in the place.

4.Insert the Pipe and Mark the Insertion Depth: Pipe needs to be fully inserted to the stop ends to make a perfect joint. Mark the pipe and any movement of the pipe could be detected. Besides, if the fitting is not properly pressed later on, the mark will be visible on the fittings. Soapy water can be used if joining is difficult.



5.Press the Joint: Right jaw sizes should be used. Depress and hold the trigger of tool until the press cycle of the tool is automatically completed. In addition, please refer to tool manufacture’s operation manual for details of instructions.

6.Check and Complete: Remove the warning label on the fitting to show the joint is properly pressed and visually inspect the pressed fitting. In addition, conduct necessary pressure test complying with the local regulation.

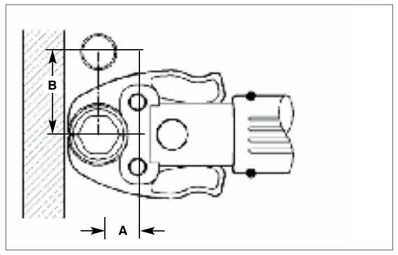
PRESS
1/2" to 2"

3

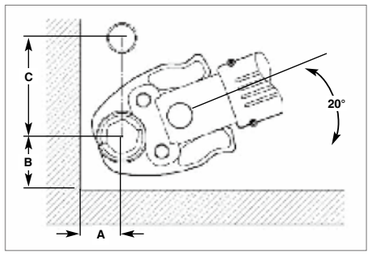
Installation Requirements

1.1 Space required for the pressing process

The following minimum clearances are required from structural components to allow operation of tool for press fitting.

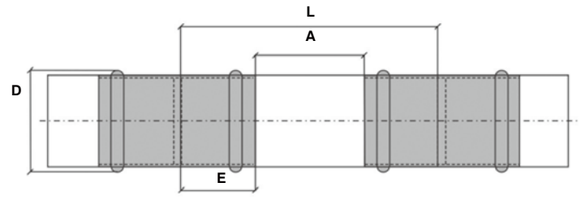


Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)
½	¾	19	1 ⅝	41
¾	⅞	22	2 ⅛	54
1	1	26 T307	2 ½	64
1 ¼	1 ⅛	29	2 ⅞	73
1 ½	1 ¾	45	3 ½	89
2	2	51	4 ⅜	111



Tube Diameter (inches)	A minimum (inches)	A minimum (mm)	B minimum (inches)	B minimum (mm)	C minimum (inches)	C minimum (mm)
½	⅞	23	1 ⅜	35	2 ½	64
¾	1	26	1 ½	38	2 ½	64
1	1 ⅛	29	1 ¾	45	3	76
1 ¼	1 ¼	32	2 ¼	57	3 ⅛	80
1 ½	1 ⅜	48	2 ½	64	3 ¾	95
2	2 ⅛	54	3 ⅛	80	5	127

1.2 Insertion depth and minimum distances between pressings



Insertion depth and minimum distance between pressings								
Size	Minimum distance		Minimum distance		Minumum tube length		Insertion depth	
Inch	Inch	D - mm	Inch	A - mm	Inch	L - mm	Inch	E - mm
1/2"	0	0	0	0	1.57	40	0.79	20
3/4"	0	0	0	0	2.05	52	1.02	26
1"	0	0	0	0	2.05	52	1.02	26
1-1/4"	0.44	7/16"	0.39	10	2.44	62	1.22	31
1-1/2"	0.63	5/8"	0.59	15	2.99	76	1.50	38
2"	0.75	3/4"	0.79	20	3.31	84	1.65	42

Due to reforming of the tube profile when pressed, it is advised that a minimum distance is allowed between each fitting.

1.3 Installation Instructions:Quick Reference Checklist

1.Cut tube square w/tubing cutter or fine tooth saw.

2.Deburr and ream inside & outside of tube end. Make sure surface is smooth with no burrs or sharp edges.

3.Check fitting/valve for O-ring seal.

4.Mark insertion depth on tube and insert tube (slightly turning) into fitting. (Do NOT use any lubricants).

5.Safely press fitting/valve with proper tools & jaws.

6.Double-check joint to confirm that each fitting/valve has been aligned correctly and fully crimped.

7.Test system in accordance with ALRO USA installation instructions and in accordance with engineering jurisdiction piping codes. System rated @ 200 PSI -20ºF to 250 ºF.

Insertion Depth Chart	
Tube size	Insertion Depth
Inch	Inches
1/2"	0.75"
3/4"	0.88"
1"	0.88"
1-1/4"	1.08"
1-1/2"	1.44"
2"	1.56"

ALRO Copper Press Fittings recommends pressing with the tool/machine brands as set out in Section 3.1 on Page 8. Contact the appropriate brand's customer service department for specific jaw set compatibility

PRESS
1/2" to 2"

4

The Range

T301
90° Elbow
PxP

T302
90° Street Elbow
FTGxP

T305
90° Elbow Female
PxFPT

T306
90° Elbow Drop Ear
PxFPT

T201
45° Elbow
PxP

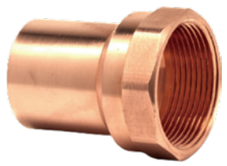
T202
45° Street Elbow
FTGxP

T101
Equal Tee
PxPxP

T102
Reducing Tee
PxPxP

T107
TEE ADAPTER FEMALE
PxPxFPT

T407
Copper Adapter
P x FPT



T408
Street Adapter - Female
FTGxFPT

T405
Copper Adapter
P x MPT

T406
Street Adapter - Male
FTGxMPT

T501
Cap
PxCap

T410
UNION
PxP

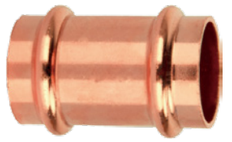
T411
Union - Male
PxMPT

T404
Bushing
FTGxP

T412
Union - Female
PxFPT

T303
90° Elbow Reducing
PxP

T401A
COUPLING WITH STOP
PxP

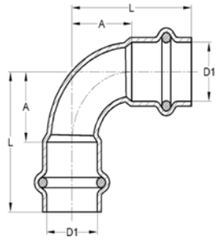


T402
COUPLING NO STOP
PxP

T403
Reducing Coupling
PxP

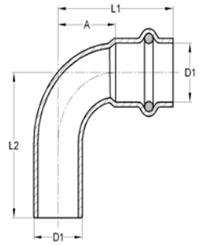
The Range

90° Elbow PxP
T301



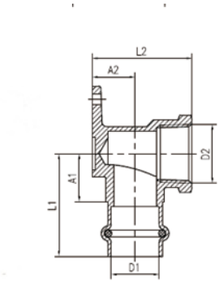
ALRO Part NO	Size D1	L(inch)	A(inch)
P8797	½"	1.56	0.75
P8754	¾"	1.97	1.02
P9321	1"	2.22	1.30
P8853	1¼"	2.64	1.50
P8699	1½"	3.23	1.77
P8852	2"	3.98	2.36

90° Street Elbow FTGxP
T302



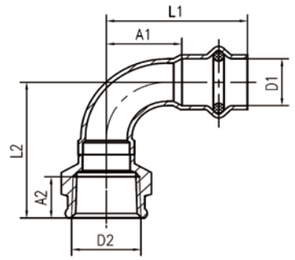
ALRO Part NO	Size D1	L1(inch)	A(inch)	L2(inch)
P9018	½"	1.57	0.75	1.73
P8755	¾"	2.01	1.08	2.13
P8854	1"	2.24	1.30	2.36
P8715	1¼"	2.62	1.50	2.93
P8700	1½"	3.21	1.77	3.52
P8729	2"	3.96	1.61	4.31

90° Elbow Drop Ear PxFPT
T306



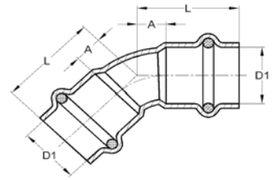
ALRO Part No	Size D1	Size D2	L1(inch)	A1(inch)	L2(inch)	A2(inch)
P11808	½"	½"	1.77	0.94	1.77	0.67
P11809	¾"	¾"	1.97	1.06	1.95	0.83

90° Elbow Female PxFPT
T305



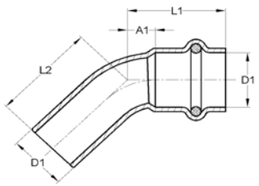
ALRO Part No	Size D1	Size D2	L1(inch)	A1(inch)	L2(inch)	A2(inch)
	½"	⅜" FPT	1.56	0.75	1.50	0.45
P11810	½"	½" FPT	1.73	0.93	1.81	0.55
	½"	¾" FPT	1.73	0.93	1.93	0.61
	¾"	½" FPT	2.03	1.08	2.01	0.55
P11811	¾"	¾" FPT	2.03	1.08	2.13	0.61
	1"	½" FPT	2.24	1.30	2.26	0.55
P11812	1"	1" FPT	2.24	1.30	2.56	0.69
	1 ¼"	1 ¼" FPT	2.64	1.50	3.01	0.79
	1 ½"	1 ½" FPT	3.23	1.77	3.31	0.79
	2"	2" FPT	3.98	2.36	4.25	0.96

90° 45° Elbow PxP
T201



ALRO Part NO	Size D1	L(inch)	A(inch)
P8694	½"	1.10	0.30
P8799	¾"	1.40	0.45
P8687	1"	1.42	0.47
P8713	1¼"	1.97	0.83
P8697	1½"	2.30	0.85
P8727	2"	2.44	0.83

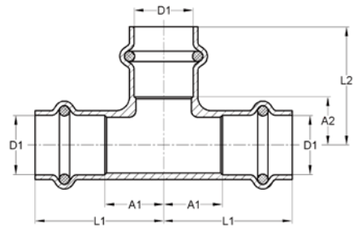
45° Street Elbow FTGxP
T202



ALRO Part NO	Size D1	L1(inch)	A(inch)	L2(inch)
P8783	½"	1.10	0.30	1.22
P8753	¾"	1.40	0.45	1.46
P8688	1"	1.52	0.57	1.57
P8714	1¼"	1.97	0.83	1.91
P8698	1½"	2.30	0.85	2.36
P8728	2"	2.44	0.83	2.76

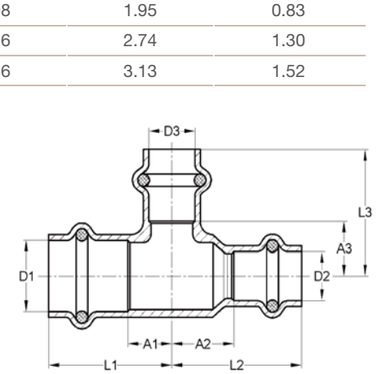
The Range

Equal Tee PxPxP
T101



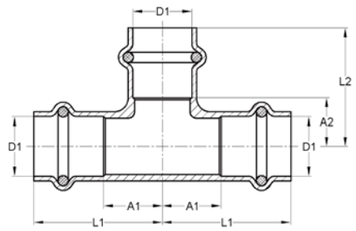
ALRO Part No	Size D1	L1(inch)	A1(inch)	L2(inch)	A2(inch)
P9241	½"	1.54	0.75	1.28	0.47
P8800	¾"	1.77	0.85	1.57	0.65
P11576	1"	1.91	0.96	1.73	0.79
P8818	1¼"	2.13	0.98	1.95	0.83
P9358	1½"	2.62	1.16	2.74	1.30
P8731	2"	2.97	1.36	3.13	1.52

Reducing Tee PxPxP
T102



ALRO Part No	Size D1	Size D2	Size D3	L1(inch)	A1(inch)	L2(inch)	A2(inch)	L3(inch)	A3(inch)
	½"	½"	1"	2.22	1.42	2.22	1.42	1.73	0.79
P8812	½"	½"	¾"	1.71	0.91	1.71	0.91	1.54	0.59
P11767	¾"	½"	½"	1.63	0.69	1.75	0.94	1.44	0.63
P8811	¾"	¾"	½"	1.63	0.69	1.63	0.69	1.44	0.63
P11768	¾"	½"	¾"	1.79	0.85	1.87	1.06	1.59	0.65
	¾"	¾"	1"	2.03	1.08	2.03	1.08	1.73	0.81
	1"	½"	½"	1.63	0.69	2.01	1.20	1.59	0.79
P11771	1"	¾"	½"	1.63	0.69	1.91	0.96	1.59	0.79
P11774	1"	1"	½"	1.63	0.69	1.63	0.69	1.59	0.79
P11769	1"	½"	¾"	1.79	0.85	2.13	1.32	1.73	0.79
P11772	1"	¾"	¾"	1.79	0.85	2.01	1.06	1.73	0.79
P9212	1"	1"	¾"	1.79	0.85	1.79	0.85	1.73	0.79
P11770	1"	½"	1"	1.91	0.96	2.22	1.42	1.73	0.79
P11773	1"	¾"	1"	1.91	0.96	2.17	1.22	1.73	0.79
	1"	1"	1¼"	2.24	1.30	2.24	1.30	2.05	0.91
	1¼"	¾"	½"	1.77	0.63	2.19	1.24	1.73	0.93
P11778	1¼"	1"	½"	1.77	0.63	2.09	1.14	1.73	0.93
P8810	1¼"	1¼"	½"	1.77	0.63	1.77	0.63	1.73	0.93

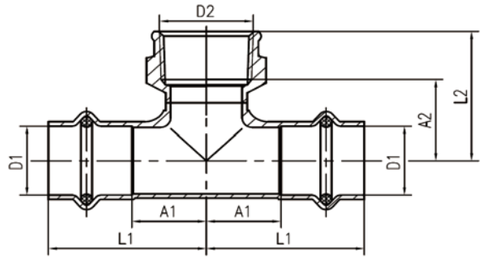
Reducing Tee PxPxP
T102



ALRO Part No	Size D1	Size D2	Size D3	L1(inch)	A1(inch)	L2(inch)	A2(inch)	L3(inch)	A3(inch)
P11775	1¼"	¾"	¾"	1.87	0.73	2.28	1.34	1.97	1.02
P11779	1¼"	1"	¾"	1.87	0.73	2.11	1.16	1.97	1.02
P9192	1¼"	1¼"	¾"	1.87	0.73	1.87	0.73	1.95	1.02
P11776	1¼"	¾"	1"	1.99	0.85	2.38	1.44	2.05	1.10
P11780	1¼"	1"	1"	1.99	0.85	2.22	1.28	2.05	1.10
	1¼"	½"	1¼"	2.13	0.98	2.62	1.81	1.97	0.83
P11777	1¼"	¾"	1¼"	2.13	0.98	2.44	1.50	1.97	0.83
	1¼"	1"	1¼"	2.13	0.98	2.24	1.30	1.97	0.83
P11781	1¼"	1¼"	1"	1.97	0.85	1.97	0.85	2.03	1.10
	1½"	1¼"	½"	2.05	0.59	2.15	1.00	1.91	1.10
P11783	1½"	1½"	½"	2.05	0.59	2.05	0.59	2.01	1.20
	1½"	1"	¾"	2.13	0.67	2.36	1.42	2.09	1.14
	1½"	1¼"	¾"	2.13	0.67	2.28	1.14	2.09	1.14
P8807	1½"	1½"	¾"	2.13	0.67	2.13	0.67	2.09	1.14
P11782	1½"	1"	1"	2.26	0.81	2.38	1.44	2.09	1.14
	1½"	1¼"	1"	2.26	0.81	2.34	1.20	2.09	1.14
P11816	1½"	1½"	1"	2.26	0.81	2.26	0.81	2.09	1.14
	1½"	1¼"	1¼"	2.38	0.93	2.54	1.40	2.24	1.10
P11784	1½"	1½"	1¼"	2.38	0.93	2.38	0.93	2.24	1.10
	1½"	½"	1½"	2.62	1.16	2.91	2.11	2.56	1.10
	1½"	1"	1½"	2.62	1.16	2.70	1.75	2.56	1.10
	1½"	1¼"	1½"	2.62	1.16	2.78	1.63	2.56	1.10
P11786	2"	2"	½"	2.42	0.81	2.42	0.81	2.15	1.34
	2"	1½"	¾"	2.42	0.81	2.85	1.40	2.40	1.46
P8819	2"	2"	¾"	2.42	0.81	2.42	0.81	2.40	1.46
	2"	1"	1"	2.66	1.04	2.62	1.67	2.44	1.50
	2"	1½"	1"	2.54	0.93	2.93	1.48	2.44	1.50
P8802	2"	2"	1"	2.54	0.93	2.54	0.93	2.44	1.50
P11785	2"	1¼"	1¼"	2.66	1.04	2.89	1.75	2.60	1.46
	2"	1½"	1¼"	2.66	1.04	3.09	1.63	2.60	1.46
P11787	2"	2"	1¼"	2.66	1.04	2.66	1.04	2.60	1.46
	2"	1½"	1½"	2.78	1.16	3.25	1.79	2.78	1.32
P10829	2"	2"	1½"	2.78	1.16	2.78	1.16	2.99	1.54
	2"	1½"	2"	2.91	1.30	3.27	1.81	2.91	1.30

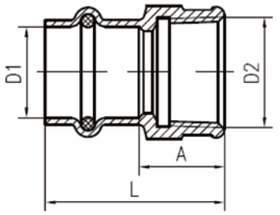
The Range

TEE ADAPTER FEMALE PxPxFPT
T107



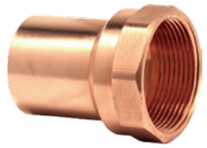
ALRO Part No	Size D1	Size D2	L1(inch)	A1(inch)	L2(inch)	A2(inch)
P11801	½"	½" FPT	1.56	0.75	1.44	0.89
P11802	¾"	¾" FPT	1.79	0.85	1.63	1.02
P11803	¾"	½" FPT	1.79	0.85	1.56	1.00
P11804	1"	½" FPT	1.79	0.85	1.71	1.16
P11805	1"	¾" FPT	1.91	0.96	1.85	1.24
P11806	1 ¼"	½" FPT	1.87	0.73	1.73	1.18
P11807	1 ¼"	¾" FPT	1.99	0.85	1.81	1.20
	1 ½"	½" FPT	2.13	0.71	1.89	1.34
	1 ½"	¾" FPT	2.13	0.67	1.36	1.97
	2"	½" FPT	2.54	0.93	2.09	1.54
	2"	¾" FPT	2.54	0.93	2.30	1.69

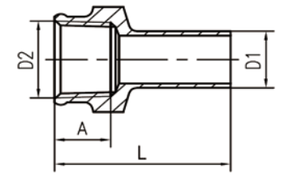
Copper Adapter P x FPT
T407



ALRO Part NO	Size D1	Size D2	L(inch)	A(inch)
	½"	⅜" FPT	1.65	0.79
P8851	½"	½" FPT	1.69	0.83
P11733	½"	¾" FPT	1.69	0.83
P12763	¾"	½" FPT	1.65	0.63
P10684	¾"	¾" FPT	1.85	0.83
	1"	½" FPT	2.09	0.85
	1"	¾" FPT	1.77	0.75
P8689	1"	1" FPT	1.93	0.91
	1"	1¼" FPT	2.13	1.10
	1¼"	1" FPT	2.13	0.98
P8718	1¼"	1¼" FPT	2.20	1.06
	1¼"	1½" FPT	2.24	1.10
	1½"	1¼" FPT	2.52	1.06
P8703	1½"	1½" FPT	2.52	1.06
P8730	2"	2" FPT	2.87	1.26

Street Adapter - Female, Lead Free Brass, FTGxFPT
T408

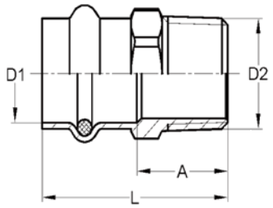




ALRO Part NO	Size D1	Size D2	L(inch)	A(inch)
	½"	⅜" FPT	1.57	0.47
P11734	½"	½" FPT	1.73	0.55
	½"	¾" FPT	1.93	0.63
	¾"	½" FPT	1.73	0.55
P11735	¾"	¾" FPT	1.93	0.63
	1''	½" FPT	1.81	0.55
	1''	¾" FPT	1.93	0.63
P11736	1''	1'' FPT	1.99	0.71
	1 ¼"	½" FPT	2.03	0.55
P11737	1 ¼"	1 ¼" FPT	2.32	0.79
P11738	1 ½"	1 ½" FPT	2.58	0.83
P11739	2''	2'' FPT	3.07	0.98

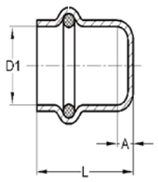
The Range

Copper Adapter P x MPT
T405



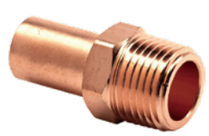
ALRO Part NO	Size D1	Size D2	L(inch)	A(inch)
P11740	½"	⅜" MPT	1.65	0.79
P8696	½"	½" MPT	1.73	0.87
P11431	½"	¾" MPT	1.81	0.94
P11741	¾"	½" MPT	2.05	1.02
P8798	¾"	¾" MPT	1.93	0.91
P11742	¾"	1" MPT	2.09	1.06
P11743	1"	½" MPT	2.13	1.10
	1"	¾" MPT	1.97	0.94
P8690	1"	1" MPT	1.97	0.94
P11744	1"	1¼" MPT	2.09	1.06
P11745	1¼"	1" MPT	2.20	1.06
P8719	1¼"	1¼" MPT	2.20	1.06
	1¼"	1 ½" MPT	2.28	1.14
	1 ½"	1¼" MPT	2.70	1.24
P8704	1 ½"	1 ½" MPT	2.64	1.18
	1 ½"	2" MPT	2.68	1.22
	2"	1 ½" MPT	2.87	1.26
P11570	2"	2" MPT	2.83	1.22

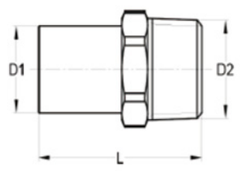
Cap PxCap
T501



ALRO Part NO	Size D1	L(inch)	A(inch)
P9210	½"	0.94	0.10
P9040	¾"	1.06	0.10
P8771	1"	1.06	0.12
P8773	1¼"	1.26	0.12
P8772	1½"	1.69	0.16
P8774	2"	1.85	0.16

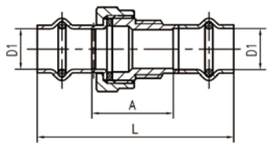
Street Adapter - Male, FTGxMPT
T406





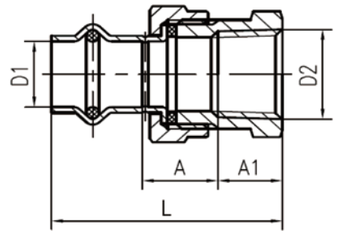
ALRO Part NO	Size D1	Size D2	L(inch)
	½"	⅜"	1.69
P11746	½"	½"	1.77
	½"	¾"	1.93
	¾"	½"	0.75
P11747	¾"	¾"	1.97
	1"	¾"	1.97
P11748	1"	1"	2.13
P11749	1¼"	1¼"	2.48
P11750	1 ½"	1 ½"	2.87
P11751	2"	2"	3.19

UNION PxP
T410



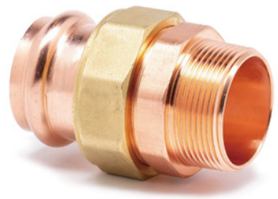
ALRO Part NO	Size D1	Size D2	L(inch)	A(inch)
P11761	½"	½" FPT	0.10	1.16
P11762	¾"	¾" FPT	0.10	1.02
P11763	1''	1'' FPT	0.12	1.04
P11764	1 ¼"	1 ¼" FPT	0.12	1.14
P11765	1 ½"	1 ½" FPT	0.16	1.18
P11766	2''	2'' FPT	0.16	1.36

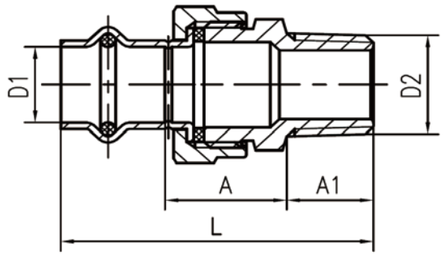
Union - Female PxFPT
T412



ALRO Part No	Size D1	Size D2	L(inch)	A(inch)	A1(inch)
	½"	½"	1.99	0.65	0.55
	¾"	¾"	2.15	0.51	0.63
	1''	1''	2.26	0.51	0.75
	1 ¼"	1 ¼"	2.93	0.91	0.83
	1 ½"	1 ½"	2.91	0.57	0.83
	2''	2''	3.31	0.67	0.98

Union - Male PxMPT
T411

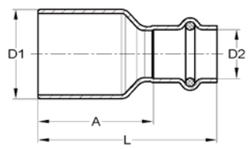




ALRO Part No	Size D1	Size D2	L(inch)	A(inch)	A1(inch)
	½"	½" FPT	2.34	0.91	0.65
	¾"	¾" FPT	2.72	1.02	0.69
	1''	1'' FPT	2.89	1.08	0.81
	1 ¼"	1 ¼" FPT	3.27	1.20	0.87
	1 ½"	1 ½" FPT	3.66	1.28	0.87
	2''	2'' FPT	4.04	1.40	0.98

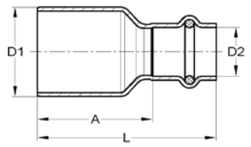
The Range

Bushing FTGxP
T404



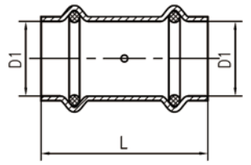
ALRO Part NO	Size D1	Size D2	L(inch)	A(inch)
P9211	¾"	½"	2.15	1.34
P8691	1"	½"	2.32	1.52
P9240	1"	¾"	2.24	1.30
P8723	1¼"	½"	2.62	1.83
P8724	1¼"	¾"	2.64	1.69
P8720	1¼"	1"	2.52	1.57
	1½"	½"	3.03	2.20
P8711	1½"	¾"	3.09	2.13
P8705	1½"	1"	2.93	1.97
P8709	1½"	1¼"	3.01	1.85
	2"	½"	3.64	2.81
	2"	¾"	3.74	2.76
P11720	2"	1"	3.52	2.56
P11721	2"	1¼"	3.56	2.40
P11722	2"	1½"	3.70	2.20

Reducing Coupling PxP
T403



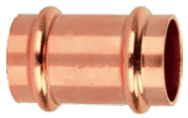
ALRO Part NO	Size D1	Size D2	L(inch)	A(inch)
P8758	¾"	½"	2.11	0.35
P8692	1"	½"	2.28	0.51
P8821	1"	¾"	2.24	0.35
	1¼"	½"	2.66	0.73
P8725	1¼"	¾"	2.64	0.51
P8721	1¼"	1"	2.48	0.39
P8712	1½"	¾"	3.21	0.83
P8820	1½"	1"	3.01	0.53
P8710	1½"	1¼"	3.07	0.41
P8735	2"	¾"	3.74	1.18
P8732	2"	1"	3.52	1.00
P8734	2"	1¼"	3.56	0.83
P8733	2"	1½"	3.74	0.63

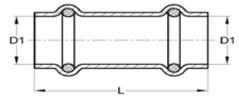
COUPLING WITH STOP PxP
T401A



ALRO Part NO	Size D1	L(inch)
P8695	½"	1.61
P8756	¾"	2.05
P8801	1"	2.05
P8716	1¼"	2.44
P8701	1½"	3.03
P8726	2"	3.35

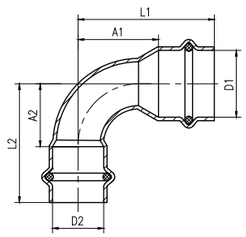
COUPLING NO STOP PxP
T402





ALRO Part NO	Size D1	L(inch)
P8814	½"	1.61
P8780	¾"	2.05
P8684	1"	2.05
P8717	1¼"	2.44
P8702	1½"	3.03
P8813	2"	3.35

90° Elbow Reducing PxP
T303



ALRO Part No	Size D1	Size D2	L1(inch)	A1(inch)	L2(inch)	A2(inch)
P8759	¾"	½"	46.5	22.5	43.0	22.5
P8693	1"	¾"	58.5	34.5	51.0	27.0