

# HYDROPRESS

STAINLESS STEEL PRESS-FIT

316 STAINLESS STEEL PIPE FITTINGS FOR QUICK AND EASY INSTALLATION



Press a 28mm fitting onto the stainless tube in under 6 seconds.

## FAST TO INSTALL

Hydropress offers large time savings compared to welding, threading, grooving or glueing.

## SAFER TO USE

- One button tool operation.
- Lightweight battery tools.
- No flames or hot work permits.
- No heavy gas tanks.
- No hazardous fumes.
- Less risk.

## QUALITY TO INSTALL

- Approved to WaterMark, ActivFire,
- Australian & International standards.
- Material traced from coil to tube & fittings (3.1 certs).
- Superior temperature tolerance.
- TIG welded stainless tube.

## RELIABLE DESIGN

- Suits a wide range of applications.
- Permanent high strength with the original 'M' press join profile.
- Consistent low profile join look & quality each time.

## ENVIRONMENTAL CHOICE

- Long service life.
- Closed loop material (recycled to make more stainless).
- Efficient and waste free install.
- Green Star project experience.

## EXPERIENCE COUNTS

- The first press-fit system available in Aus/NZ 20 years ago.

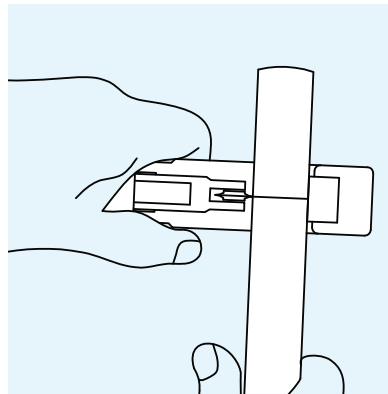
Hydropress is installed easily & quickly using a Press Tool to form a permanent 'M' profile pressed joint between tube and fitting.

Check for suitability.

Both the piping material (eg 316L stainless steel) and the elastomer (the rubber ring seal) must be checked if suitable for the conveyed fluid and exterior environments.

Ensure you select the correct press tool, jaw or collar to suit the fitting dimension and application pressures

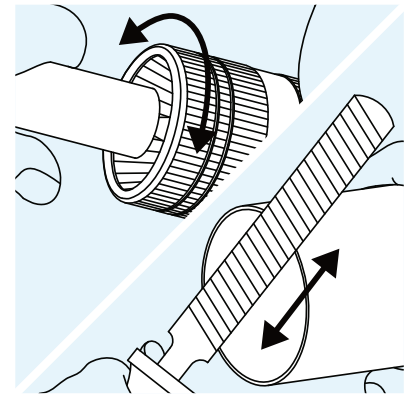
This guide is for standard applications.



#### Cut to Length

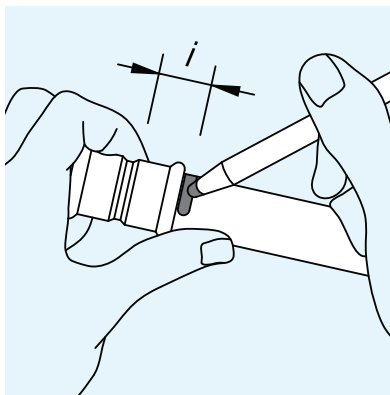
Cut the tube at right angles using a tube cutter or fine tooth saw.

Note: Using the same cutting tool on different metals can lead to corrosion (eg steel then stainless).



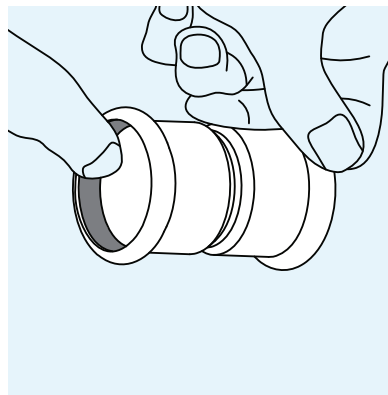
#### Deburr Tube

Deburr both inside & outside edges of tube to prevent damage to the ring seal of the fitting.



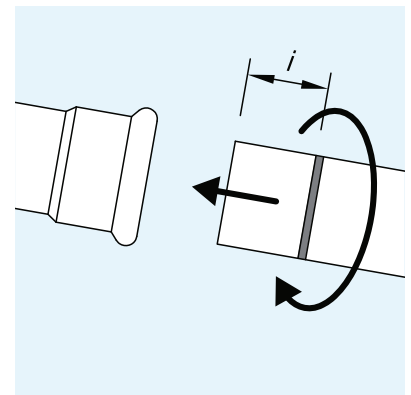
#### Mark the Insertion Depth "i"

Measure or use a depth gauge to mark the insertion depth (socket depth) onto the tube end. This is a visual quality control mark to ensure the tube is fully inserted.



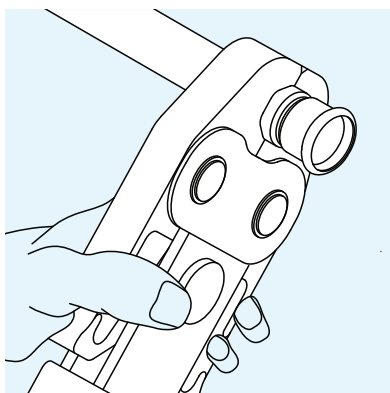
#### Inspect Fitting & Ring Seals

Check that the rubber ring seal is:  
The correct material type (colour) of seal is used.  
The seal is not damaged.  
Both fitting and seal are free of debris.



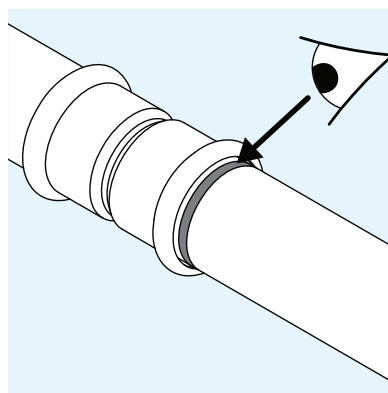
#### Join the Tube & Fitting

Insert the tube into the fitting press socket, turning slightly until it reaches the previously marked insertion depth.  
Soapy water can be used if joining is difficult.



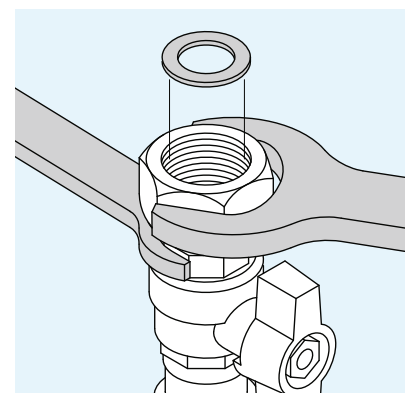
#### Press the Join

Using a suitable press tool and M-profile jaw or collar, align the press jaw with the fitting and join following the tool manufacturer's instructions.



#### Check & Complete

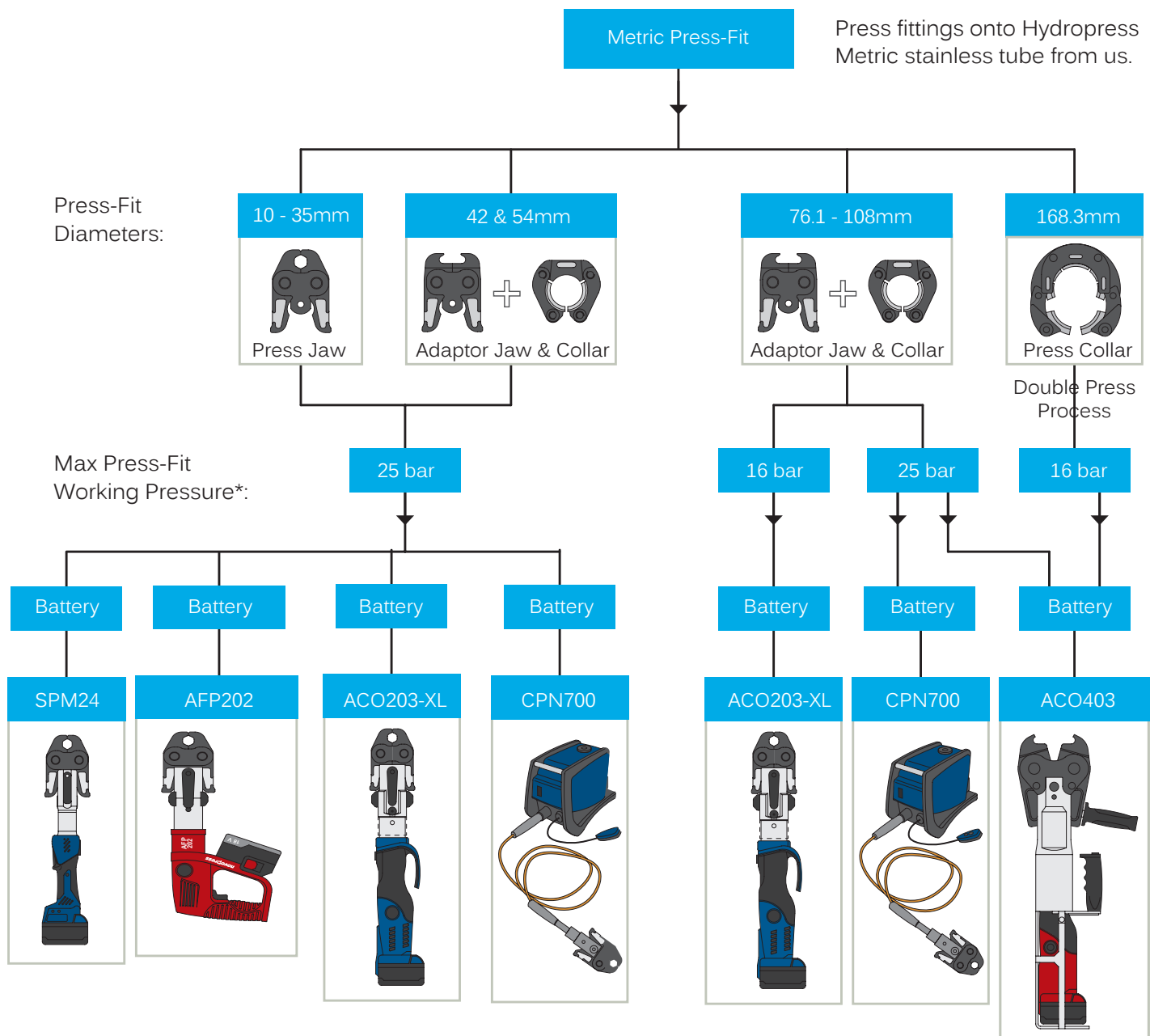
Visually inspect the pressed fitting & that the insertion mark is aligned with the end of the socket.



#### Threaded Ends

Tighten threads with the fitting supported, don't tighten against a pressed joint alone.  
Lubricate the Press Tool as recommended.

# Tool Selection Guide



## The M Profile Press

Hydropress Press-Tools are calibrated to suit our products and although they may look similar to others, the tolerances of the systems are different.

Our tooling recognises the difference and does not complete a full press. Any warranty or similar is void as a result.

Please Note:

This chart is a guide and full specifications and instructions are available on request.

\* This value is the Maximum Working Pressure, not the safety or testing pressure of the system. Maximum also depends on the application - check with us first.

### Need to convert units?

1 bar = 100kPa  
1 bar = 14.5psi

16 bar = 1600kPa  
16 bar = 232 psi

25 bar = 2500 kPa  
25 bar = 362psi

# Installation Tools

Please note using the same cutting or deburring tool on different metals can lead to corrosion (eg cut steel then cut stainless steel).

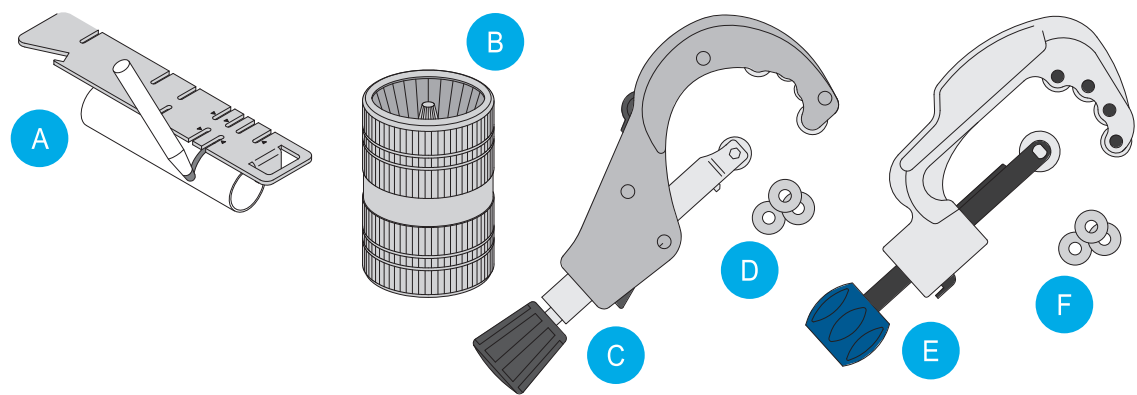


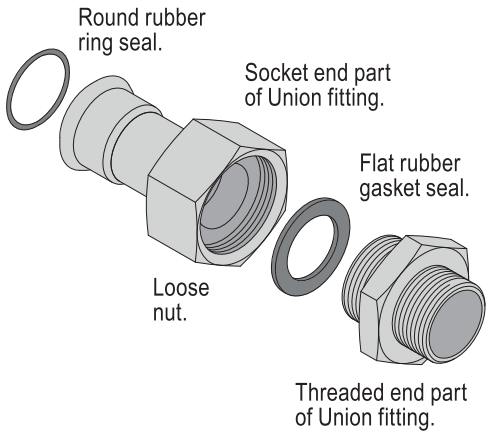
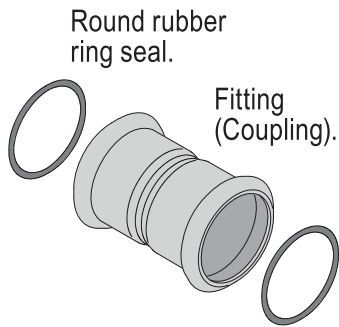
Image		Suits	Product No.
A	Depth Gauge	10 - 168.3mm	HPSSDG
B	Manual Deburrer	10 - 54mm	HPSSDBT1054
C	Manual Tube Cutter Large	6 - 76.1mm	HPSSTC676
D	Replacement Cutting Wheel for 'C'	(each)	HPRCW676
E	Manual Tube Cutter Medium	3-35mm	HPSSTC335
F	Replacement Cutting Wheel for 'E'	(each)	HPRCW335

## Rubber Ring Seals

Depending on the application, the ring seals may need to be changed to a different type for higher chemical or temperature resistance.

Fittings with a press-fit socket are fitted with a EPDM rubber ring seal as standard. Depending on the media, this ring seal should be changed to a different rubber material to suit the application. Refer to our relevant Technical Media Chart for suitability or contact us for more information.

Union fittings with a (flat) rubber gasket seal and a (round) ring seal, both EPDM as standard.



## Union Gaskets

Depending on the media, both seals should be changed to a different rubber material to suit the application.

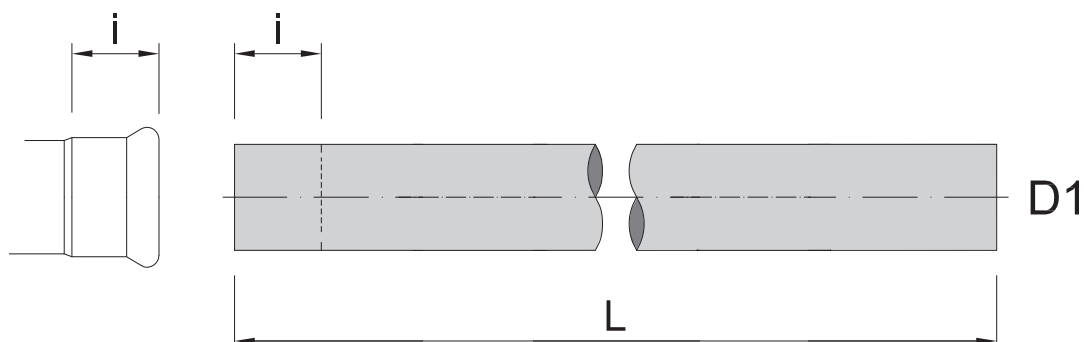
Unions are not approved to be used for gas or steam applications.



# What Stainless Grade should I use?

We stock grade 316L stainless steel tube in metric diameters to suit the Hydropress range. Fittings are supplied in 316L stainless steel and are compatible with either 304L or 316L metric tube.

There is more than just cost differences between the two types.



**TUBE - METRIC OD STAINLESS**

D1 (mm) OD	DN	i depth	Length (L)	t Wall	Tube Weights (kg)		
					dry/m	dry/6m	wet/m
10	8	10	3m	1.0	0.2	1.4	0.3
15	12	20	6m	1.0	0.4	2.1	0.5
22	20	21	6m	1.2	0.6	3.8	0.9
28	25	23	6m	1.2	0.8	4.9	1.3
35	32	26	6m	1.5	1.3	7.6	2.1
42	40	30	6m	1.5	1.5	9.2	2.7
54	50	35	6m	1.5	2.0	11.9	4.0
76.1	80	53	6m	2.0	3.7	16.9	7.8
88.9*	90	60	6m	2.0	4.4	26.3	10.0
108**	100	75	6m	2.0	5.3	32.1	13.8
168.3*	150	121	6m	2.0	8.4	50.3	29.6

i = insertion depth. Tube must be inserted into the press socket a minimum distance to ensure the join is pressed successfully.

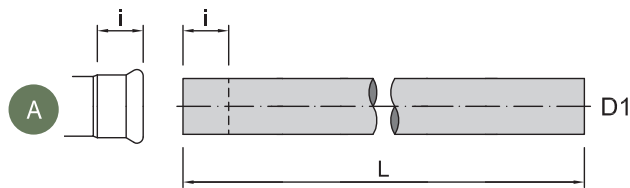
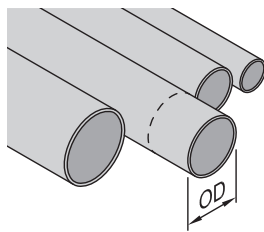
\* Special order only

\*\* Limited stock holding

COMMON APPLICATIONS *	316L STAINLESS
WaterMark Approval	Approved
ActivFire Approval	Approved
Potable Water	Suitable
Compressed Air	Suitable
Hygiene Sensitive Areas	Recommended
Corrosive Environments	Recommended
Food Processing Areas	Recommended
Fuels & Oil Supply	Suitable
Material Cost	More than 304
Resistance to Corrosion	More than 304
Resistance to Chlorides	More than 304
Performance at Elevated Temperatures	More than 304

\* Read in conjunction with Technical information and data sheets. For more information please contact Hydropress.

# Mini-Press Metric Tube (10mm)



**i = insertion depth.** Tube must be inserted into the press socket a minimum distance to ensure the join is pressed successfully.

Image	Product No	Description	D1 (mm)	DN	i depth	L (mm)	t Wall	Weight/lm (dry-wet)
A	*Special order	Tube 10mm	10	8	10	3000	1.0	0.2 - 0.3 kg

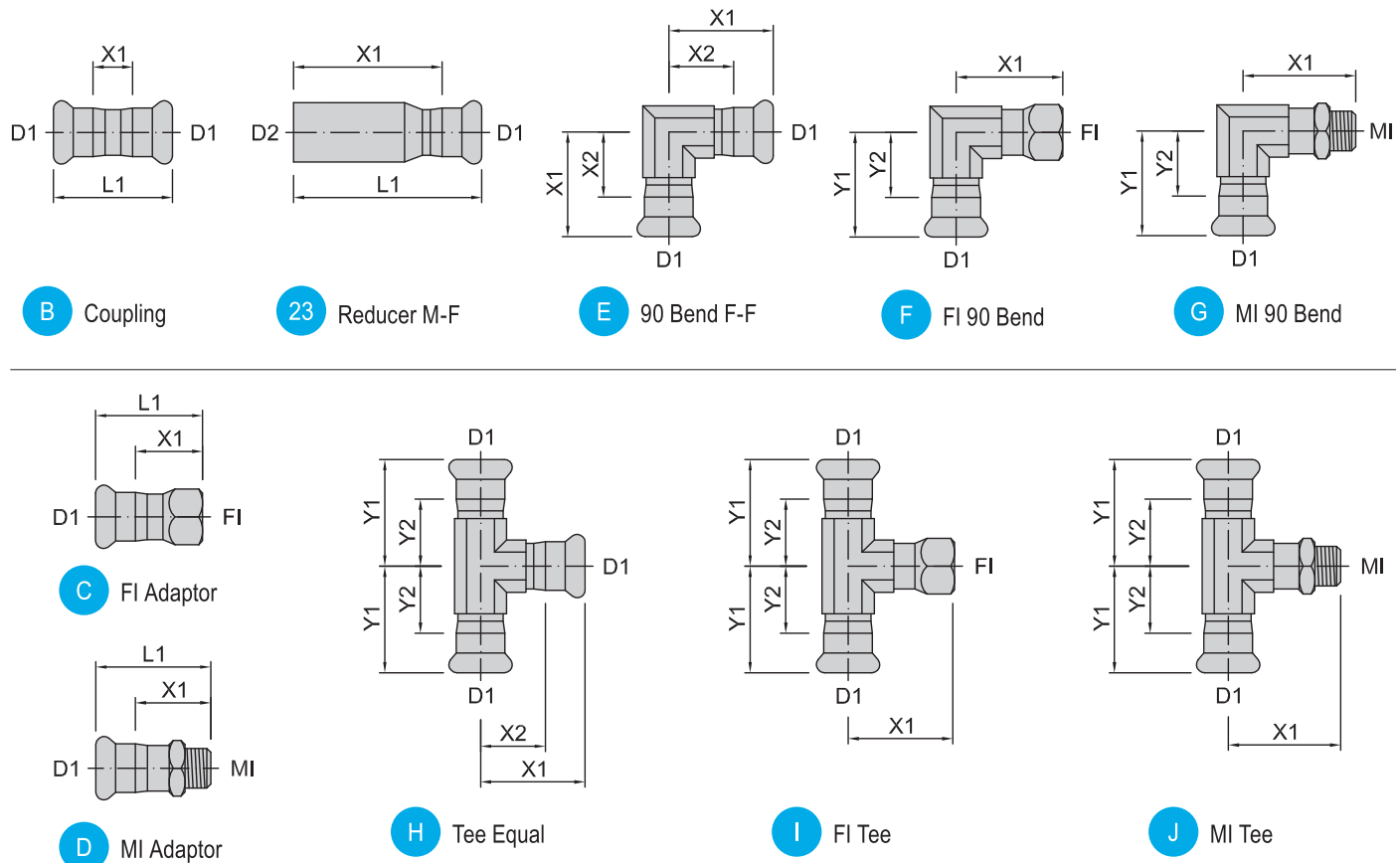
Blucher Mini-Press is designed for instrument & compressed air.

All 10mm fittings are prefitted with FKM ring seals standard.

Mini-Press is not intended for or approved for potable water.

## MINI-PRESS FITTINGS (10MM)

\*AVAILABLE BY SPECIAL ORDER ONLY



Material: 316L stainless steel.

Ring Seal: FKM only, refer table below for quantity per item.

Image	Description	D1	D2 or MI or FI	L1	X1	X2	Y1	Y2	Ring Seal Qty
B	Coupling	10	-	30	10	-	-	-	2
23	Reducer M-F	10	15	48	38	-	-	-	1 (10mm)
C	FI Adaptor	10	3/8" BSP	27	17	-	-	-	1
D	MI Adaptor	10	3/8" BSP	29	19	-	-	-	1
E	90 Bend F-F	10	-	-	26	16	-	-	2
F	FI 90 Bend	10	3/8" BSP	-	27	-	26	16	1
G	MI 90 Bend	10	3/8" BSP	-	28	-	26	16	1
H	Tee Equal	10	-	-	26	16	27	17	3
I	FI Tee	10	3/8" BSP	-	26	-	27	17	2
J	MI Tee	10	3/8" BSP	-	28	-	27	17	2

MATERIAL PERFORMANCE

The 'M' Pressed Join

By using the correct calibrated Press Tool, each join is permanent and uniform as the join is deformed in two parts - the physical strength between the fitting socket, & the tube spigot and secondly, the deformation of the rubbering seal. Hydropress use an M profile and is only compatible with the Hydrpress fitting and tooling. Alternative, similar options will not press correctly.

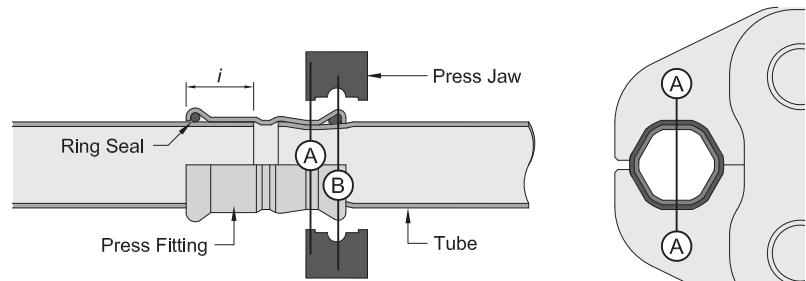
Two different cross sections are pressed depending on the tube diameter - the hexagonal and the lemon shape.

SECTION A:

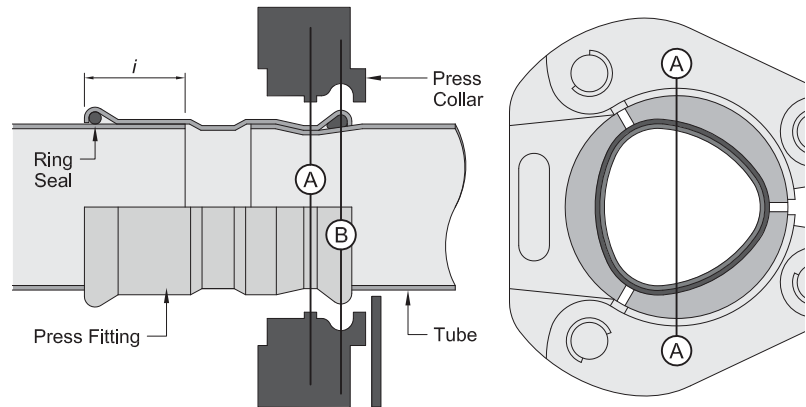
This forms the mechanical strength of the pressed join.

SECTION B:

The deformation of the rubber ring seal ensures a permanently tight join.



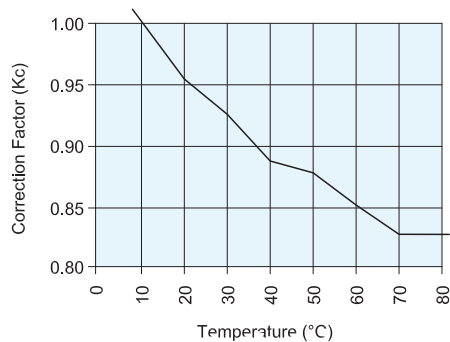
Above: Hexagonal shape section profile - Before pressing (fitting left), after pressing (fitting right) & Section A through pressed join.



Above: Lemon shape section profile - Before pressing (fitting left), after pressing (fitting right) & Section A through pressed join.

MATERIAL CHARACTERISTICS

	AISI 316L
Grade No:	1.4404
Cr%	16.5 - 18.5
Ni%	10 - 13
Mo%	2 - 2.5
Mn% max	2
Si% max	1
P% max	0.045
S% max	0.015
C% max	0.03



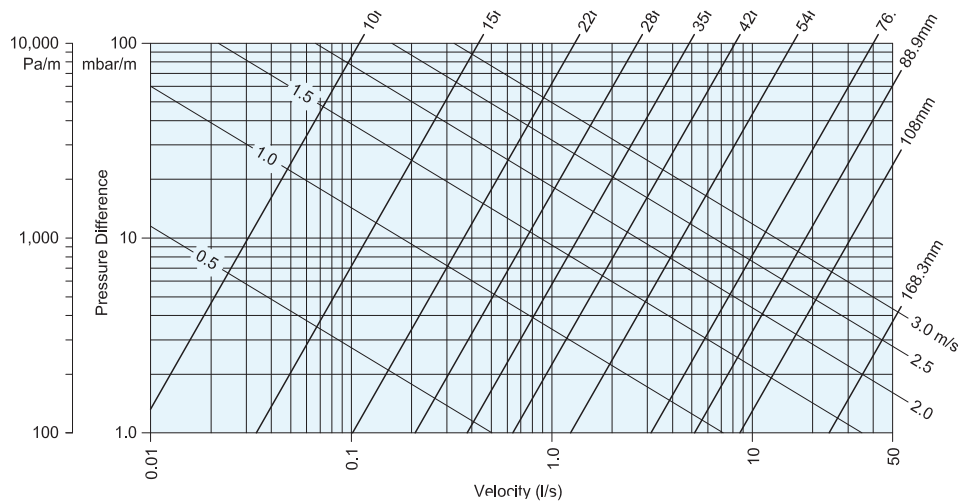
TEMPERATURE CORRECTION FACTOR

This graph shows the correction factor (Kc) based on the water temperature.

FLOW RATE

The graph adjacent shows the relationship between pressure loss, flow velocity for each diameter.

- Material: Stainless Steel 316
- Media: Water
- Test Temperature: 10°C
- Surface Roughness Coefficient: 0.0015mm (average).



# Using the Press Tools

Read with the manufacturers instructions.

## Calibration

Tool calibration by an authorised repair centre is required every 2 years or 40,000 presses.

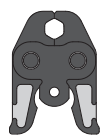


due 11/2015

## Diameters

10 - 35mm

1/2 - 1" IPS



7

## Diameters

42 - 168.3mm

1 1/2 - 2" IPS



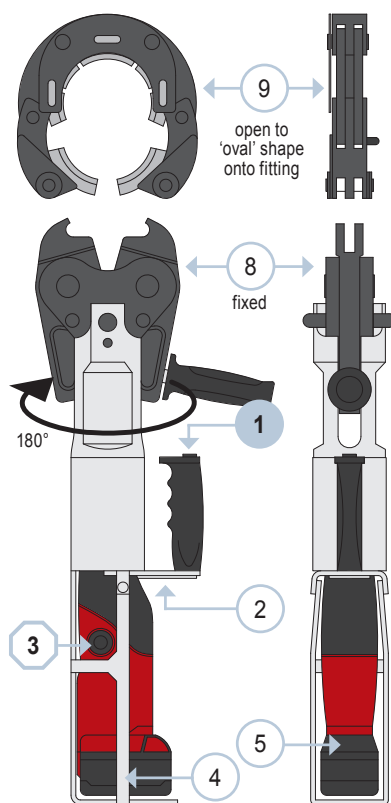
8

9

open to 'round' shape onto fitting

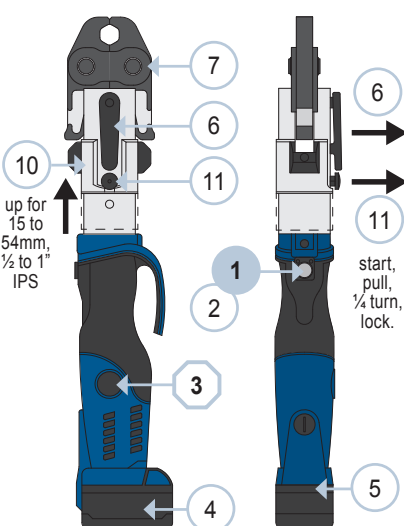
1. Start Button
2. LED Status Indicators
3. STOP & Reset Button
4. Rechargeable Battery
5. Battery Charge Indicator
6. Retaining Pin
7. Press Jaw
8. Adaptor Jaw
9. Press Collar
10. Sliding Finger Guard
11. Stroke Limit (ACO203-XL only)

## ACO403



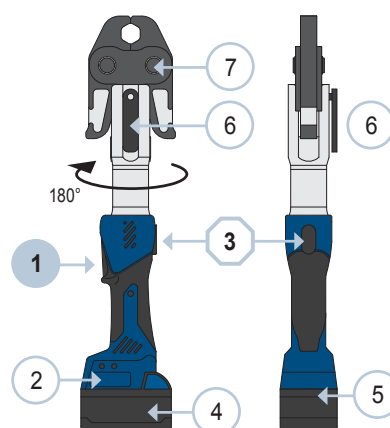
Serial number located under the removable battery.

## ACO203-XL



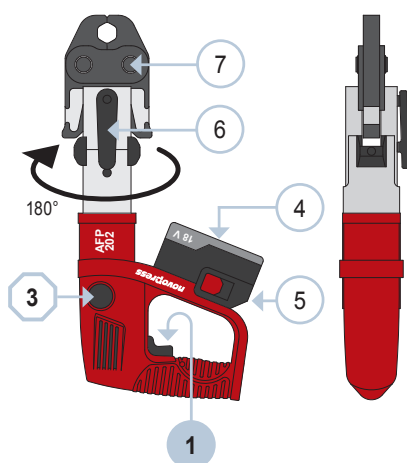
Serial number located under the removable battery.

## SPM24



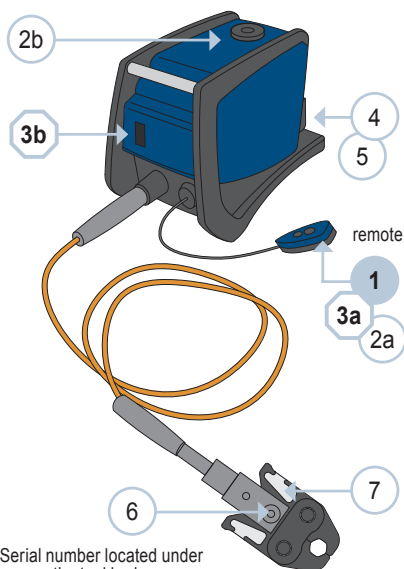
Serial number located on side above battery.

## AFP202



Serial number located under the removable battery.

## CP700



Serial number located under the tool body.



# Using the Press Tools

Read with the manufacturers instructions.

Before using a Press Tool, you must of completed the relevant Hydropress Tool Training.

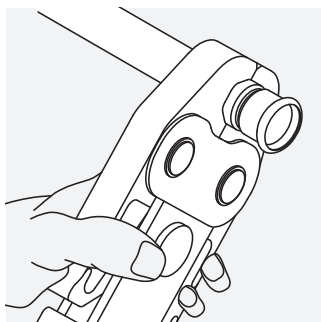
Hydropress Press Tools are calibrated to only fully press Hydropress fittings.

**Start here**

You should know...

10 - 35mm	Size OD	Size OD	42 - 168.3mm
1/2 - 1" IPS			1 1/2 - 2" IPS

- 1 Retract Retaining Pin (6).
- 2 Insert the Press Jaw (7) to match the diameter, close the Retaining Pin (6).
- 3 Open Press Jaw (7) and align the fitting socket lip with the jaw inner groove.



- 4 Press the Start Button (1) to commence the press.
- 5 When complete, release the Press Jaw (7) and inspect pressed join.

## Half or Cancelled Press?

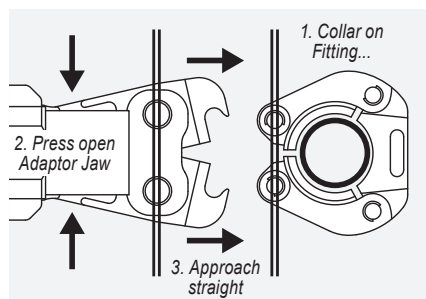
If the press tool operation is stopped or cancelled before completing a full press cycle, the press tool must be released by pressing the Reset Button (3) before proceeding.

- 1 Open Press Collar (9), align with the fitting socket lip and inner groove of collar.

**Note:** Some Press Collars have 'pipe side' written on them for fitting correctly.

**ACO403 Only:** For 76.1, 88.9 & 108mm Press Collars, open the collar to an oval 'egg' shape to fit onto the fitting.

- 2 Retract the Retaining Pin (6). *(not required for ACO403).*
- 3 Insert the Press Adaptor (8) & close the pin. *(not required for ACO403).*
- 4 Align the Adaptor Jaw (8) with, the already fitted to the fitting, Press Collar (9).



- 5 Press the Start Button (1).
- 6 **ACO203-XL Only:** For 108mm size, repeat steps 3 to 6 for the 'Secondary Press' using the second Adaptor Jaw (8) and leaving the same Press Collar on the fitting.

## Use the Right Tool...

The Press Tool used determines the maximum working pressure of the installation.

Use the 'Select a Press Tool' chart to check suitability.

## Safety & Tool Training

We offer onsite tool training and maintain records of attendees for OH&S and Quality Assurance.

## Tool Maintenance

**Every 10 Presses:**  
Light lubricate inside groove of Jaw/Collar.

### Weekly:

Lubricate and inspect Press & Adaptor Jaws and Press Collars.

**40,000 Presses or 2 Years:**  
Service tool & all parts by authorised repairer.

## Tool Not Working?

- Press the Reset Button?
- LED status?
- Contact Us...

### Green LED

- Off = Tool is on standby or press is in progress.
- Steady = Tool is ready.
- Flash = Check Retaining Pin (6) or Battery Charge.

### Red LED

- Steady = Fault / Service.
- Flash (x3) = Extreme temperatures or tool fault.

### Red & Green LEDs

- Flash = Service.

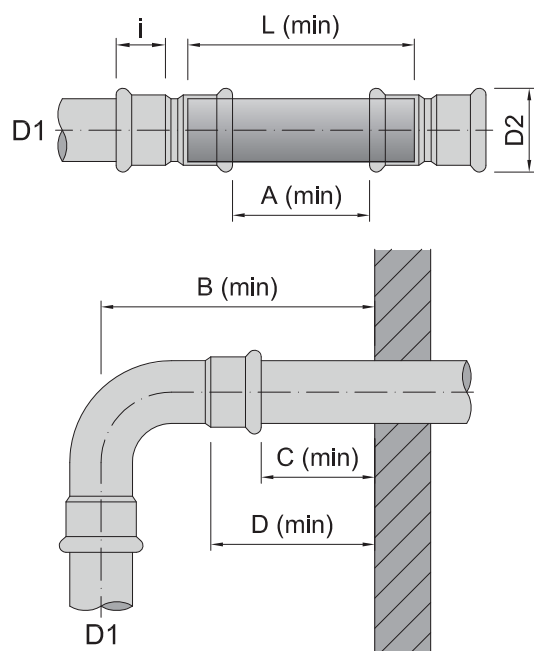
## Generators

Please contact us before using generators with the 240V Press Tools.

## Batteries

Li-Ion batteries should be fully discharged & fully recharged 10x before partial charging to prolong their lifespan.

# Clearances & Spacings



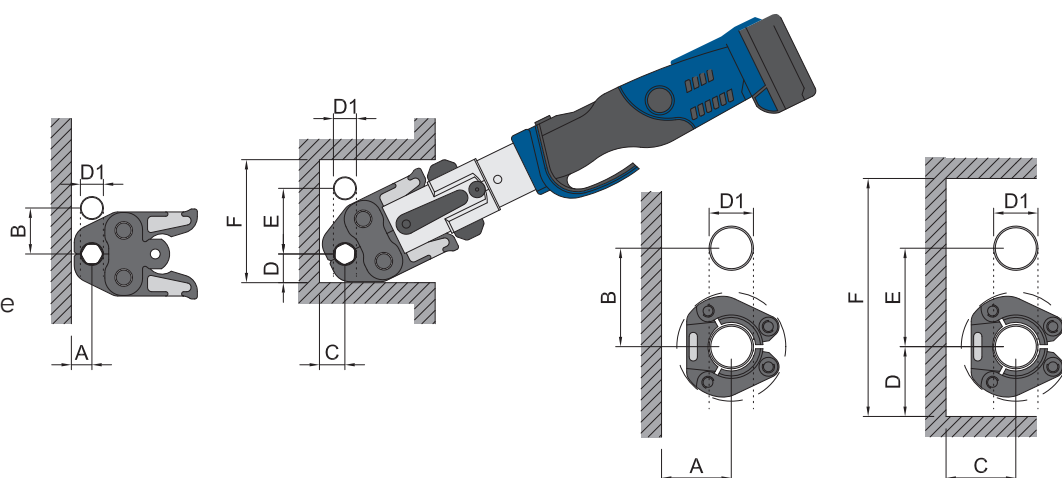
D1	L	A	D2	B	C	D
10	50	30	16	62	35	45
15	50	10	23	85	35	55
22	52	10	32	95	35	56
28	56	10	38	107	35	58
35	62	20	45	121	35	61
42	80	20	54	147	35	65
54	90	20	66	174	35	70
76.1	126	20	95	223	75	128
88.9	140	20	110	249	75	135
108	170	20	133	292	75	150
168.3	279	37	195.4	83	100	221

1/2"	50	10	32	85	35	55
3/4"	50	10	37	89	35	55
1"	50	10	44	95	35	56
1 1/2"	62	10	63	121	75	57
2"	80	20	78	147	75	65

Measurements are dependant on the actual fitting dimensions and the Press Tool used to join. Confirm clearances with your particular installation.

## Tool Jaw & Collar Clearances

Confirm sizes and clearance distances before installing and also refer to the fitting installation clearances.



D1	A	B	C	D	E	F
10	20	56	20	28	75	131
15	20	56	20	28	75	131
22	20	65	31	35	80	150
28	25	75	31	35	80	150
35	30	75	31	45	80	170
1/2"	22	57	22	29	76	133
3/4"	22	60	25	29	76	133
1"	25	67	32	35	80	152

D1	A	B	C	D	E	F
42	75	115	75	75	115	265
54	85	120	85	85	120	290
76.1	110	140	110	110	140	360
88.9	120	150	120	120	150	390
108	140	170	140	140	170	450
168.3	200	335	260	260	335	850
1 1/2"	75	115	75	75	115	265
2"	61	76	76	76	117	269

Dimensions presume the large diameter of the two pipes is shown with the Press Jaw or Collar attached. Measurements may differ depending on the Press Tool model used.

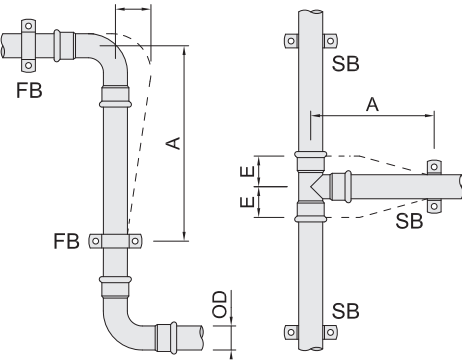
# Expansion & Contraction

## Thermal Coefficient

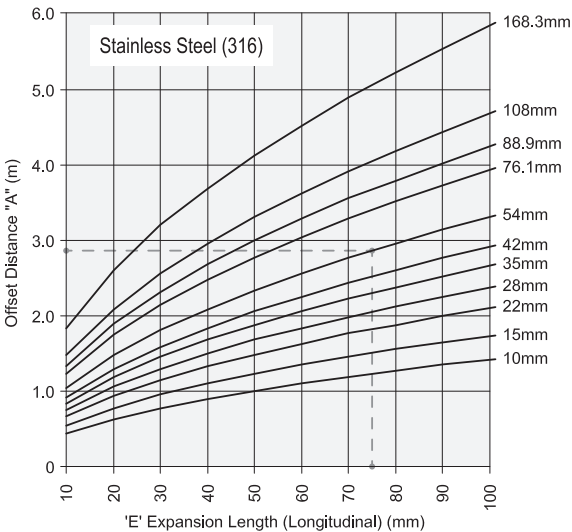
Different materials have different thermal properties, identified by the expansion coefficients below (between +20 to +100°C).  
The larger the number, the greater the material will expand per metre.

Material	$\alpha$
Carbon Steel	0.0117
Stainless Steel (316)	0.0165
Stainless Steel (304)	0.0166
Copper (Cu)	0.0168
Copper Nickel (CuNi)	0.017
PEX	0.018
Aluminium	0.0231
PP-RP	0.035
PVC-U	0.0504
ABS	0.063
HDPE	0.12
PE	0.15

Note: Confirm product specific coefficients with manufacturer.



Above: 'Z' & 'T' Shaped Expansion Compensator Arrangements. Can also be achieved with cold bending the tube. Use the chart below to calculate measurement 'A' based on the diameter.



Above: 'Z' & 'T' Shaped Arrangements - based on  $A = 0.045 \times \sqrt{\text{Tube OD} \times E}$   
For CuNiFe (2.1972.11), use the constant 0.054 for the equation.

10-6m/mK

$$E = \alpha \times TL \times \Delta T$$

**Difference in Temperature (°C)**  
The temperature of the media (eg hot water) minus the ambient temperature (eg external atmosphere) in degrees.

**Tube Length (m)**  
Length of tube from nearest fixed point (bracket, bend, etc) in metres.

### Expansion & Contraction

The table below shows the relative longitudinal expansion of 316 stainless steel tubes 'E', based on the difference in temperature between the external environment and the internal media (based on the formula above).

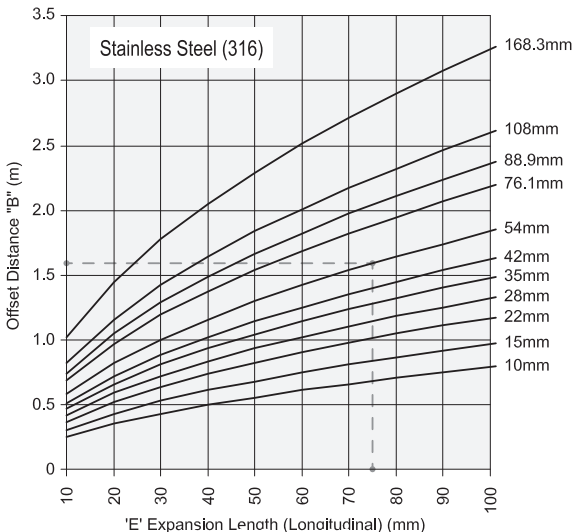
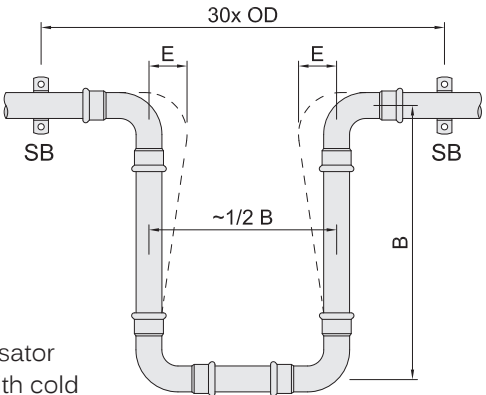
Tube Length	$\Delta T$ :	10	20	30	40	50	60	70	80	90	100°C
1m		0.17	0.33	0.5	0.66	0.83	0.99	1.16	1.32	1.49	1.65 mm
6m		1.02	1.98	3.0	3.96	4.98	5.94	6.96	7.92	8.94	9.90 mm

Note: Positive values are expansion, negative values are compression.

### Allow for Movement

The expansion distance 'E' must be allowed for, particularly in long pipe runs, where expansion compensator arrangements can be used.  
FB = Fixed Bracket (no pipe movement).  
SB = Sliding Bracket (supported pipe movement).

Above: 'U' Shaped Expansion Compensator Arrangement. Can also be achieved with cold bending the tube. Use the chart below to calculate measurement 'B' based on the diameter.



Above: 'U' Shaped Arrangements - based on  $B = 0.025 \times \sqrt{\text{Tube OD} \times E}$   
For CuNiFe (2.1972.11), use the constant 0.031 for the equation.

# Common Installation Topics

Always confirm, before you install, the suitability of:

1. The Material (inside & out)  
The system material with the media internally and the environmental conditions externally (eg coastal areas).
2. The Elastomer (ring seal)  
The fitted rubber ring seal with the media & operating temperatures.
3. The Conditions  
Working pressure, operating temperatures & other operational variables.

The following topics are a brief guide. For full technical and project specific information, please contact us directly.

Approvals	2.0	Lagging	1.0
Bending	5.0	Maintenance	15.0
Bracketing	4.0	Pressure Testing:	
Commissioning	14.0	- General	8.0
Corrosion Resistance	7.0	- Using Air	10.0
De-Scaling	13.0	- Using Water	9.0
Disinfecting	11.0	Sealants	3.0
Flushing	12.0	Steam	6.0
Insulation (Lagging)	1.0	Threaded Fittings	3.0

## 1.0 - INSULATION (LAGGING)

Insulation materials or sleeves used to insulate stainless steel tubes must not have a water soluble chloride ion content exceeding 0.05% by weight.

This issue is critical to the performance of stainless steel installations, especially at temperatures over 40°C.

AS grade insulation materials and sleeves to AGIQ 135 are comfortably below this limit and therefore particularly suitable for stainless steels.

## 2.0 - APPROVALS

Current approvals and testing certificates for Hydropress products are available by request.

## 3.0 - THREADED FITTINGS & SEALANTS

Only commercial chloride free sealant or tapes shall be used to seal stainless steel threads.

Ensure threaded fittings are appropriately secured & supported to prevent torsional or bending forces being applied to the pressed joint.

## 4.0 - BRACKETING

- Install supports, bracketing & centres (spans) to AS 4041 & AS 3500 as required appropriate to the installation.
- Bracketing is not to be positioned directly on a fitting.
- Refer to the Expansion & Contraction section of the technical information for bracket type and positioning.

## 5.0 - BENDING TUBES

Tube up to 35mm diameter can be cold bent using a commercial tube bender to a radius no less than 3.5x the tube diameter. Do not heat stainless or CuNi to bend.

Tube Diameter	15	22	28	35
Min Bending Radius	52.5	77	98	122.5

## 6.0 - STEAM

Please contact team for specific technical advice & requirements.

## 7.0 - CORROSION RESISTANCE

### Potable Water (Internal Resistance)

Corrosion-resistant steels do not react with potable water due to their protective chromium oxide layer. This makes stainless steel corrosion-resistant to potable water.

Local corrosion effects such as pitting or crevice corrosion can occur in water with unduly high chloride content. This can occur from excessive chlorous disinfectant use or naturally occurring such as in bore water. Therefore, the duration of application and concentration for use must be strictly observed.

The content of water-soluble chloride ions at ambient temperature in potable water and water which is similar to potable water should not exceed 250 mg/l (250 ppm).

Corrosion resistance decreases as the temperature increases. Therefore, Hydroflow must be notified of maximum media temperature and media contents (eg water analysis) to enable a suitability recommendation.

### Treated Water (Internal Resistance)

All water treatment methods such as, for example, ion exchange or reverse osmosis can be used with Hydropress 316 stainless steel. No additional measures to protect against corrosion are necessary.

Hydropress stainless steel is corrosion-resistant to treated water such as:

- Softened/decarbonised water.
- Fully desalinated water (deionised, demineralised, distilled and pure condensates).
- Ultrapure water with a conductivity of < 0.1 µS/cm.
- Others on request. Water sample and parameters may be required.

### Resistance Against External Corrosion

316 stainless steel is resistant to corrosion when it is exposed to clean atmosphere (ambient air).

The probability of corrosion is increased by contact

with corrosion promoting construction materials or by installation in corrosive atmospheres such as coastal areas or chemical production facilities.

#### **Resistance Against Bimetallic Corrosion**

The corrosion behaviour of Hydropress Stainless Steel is not influenced by the direction of flow of the water through mixed installations (no-flow rule). In potable water installations, Hydropress stainless steel can thus be combined with all non-ferrous heavy metals (gunmetal, copper, brass).

Colouring caused by deposits of other corrosive products does not indicate any risk of corrosion.

#### **Protection Against External Corrosion**

In areas at risk of corrosion, installation of pipes without corrosion protection should be avoided.

If there is the risk of corrosive substances (e.g. plaster, building materials containing chloride, concrete, nitrite or ammonium) acting on the pipes over prolonged periods, surface-mounting or suitable corrosion protection is recommended.

Protection against external corrosion must meet the following requirements:

- Waterproof.
- Non-porous.
- Resistant to heat and ageing.
- Undamaged.

The use of closed-cell insulation materials or hoses has proved to be effective as corrosion protection.

The minimum protection against external corrosion is coating, priming or painting.

Hoses or felt wrapping is not permissible, as felt retains absorbed moisture for prolonged periods and therefore promotes corrosion.

#### **Protection Against Bimetallic Corrosion**

If Hydropress stainless steel is directly connected to galvanised steel pipes, bimetallic corrosion will occur on the galvanised steel pipes. This can be prevented by taking the following measures:

- Installation of distance pieces (length  $L > 50\text{mm}$  surface in contact with water).
- Installation of a shut-off valve made of non-ferrous heavy metals.

### **8.0 - PRESSURE TESTING (GENERAL)**

- The pressure test of water supply and heating systems can be carried out with water, (oil-free) air or non-corrosive gases.
- The pressure test of gas systems must be carried out with (oil-free) air or non-corrosive gases.
- Subject finished systems to leak tests before covering, insulating or painting.

Note: If the system is to be emptied again after a water pressure test, or not remain completely full, it is advisable

to conduct the pressure test with air in order to avoid an increased risk of pitting and corrosion.

Follow local regulations and AS/NZ 3500 for relevant requirements for your individual installation.

### **9.0 - PRESSURE TESTING (USING WATER)**

#### **Water Supply Systems:**

Conduct the pressure test of laid system in accordance with AS/NZ 3500. Fill the system with filtered water so that it is free from air. Carry out a preliminary and main pressure test. The preliminary test of smaller components, such as connecting and distribution pipes within bathrooms, may be regarded as sufficient in itself.

#### **Heating Systems:**

The pressure test of the laid system is generally conducted with water.

"test hot water heating systems at a pressure equal to 1.5 times the total pressure at any point in the system, and at least 1 bar. As soon as possible after the cold water pressure tests, heat the system up to the design hot water temperature to check whether it also remains water tight at the maximum temperature"

#### **Preliminary Test:**

For this test, apply a pressure equal to the permissible working pressure plus 5 bar, which must be restored twice at 10-minute intervals within a period of 30 minutes. After a test period of a further 30 minutes, the test pressure must not have dropped by more than 0.6 bar (0.1 bar per 5 minutes).

#### **Main Test:**

Conduct the main test immediately after the preliminary test. The duration of this test is 2 hours. The test pressure read off after the preliminary test must not have fallen by more than 0.2 bar after this 2-hour period. There must not be any leaks visible from any point of the tested system.

### **10.0 - PRESSURE TESTING (USING AIR)**

A pressure test with air or non-corrosive gases may be carried out in accordance with the AS/NZ 5601.

#### **Gas Systems:**

Conduct the pressure test of the laid system in accordance with AS/NZ 5601.

Subject the system with working pressures of up to 100 mbar for preliminary and main tests.

#### **Preliminary Test:**

"Conduct the preliminary test with air or a non-corrosive gas (e.g. nitrogen or carbon dioxide), but not with oxygen, at a test pressure of 1 bar. The test pressure must not drop during the 10-minute test period."

#### **Main Test:**

Conduct the main test with air or a non-corrosive gas (e.g. nitrogen or carbon dioxide), but not with oxygen, at a test pressure of 110 mbar. After temperature equalisation the test pressure must not drop during the subsequent test period of at least 10 minutes.



“Subject the system with working pressures between 100 mbar and 1 bar to a combined load and leak test. Conduct the test with air or a non-corrosive gas (e.g. nitrogen or carbon dioxide), but not with oxygen, at a test pressure of 3 bar. The test period must be at least 2 hours, taking account of any possible changes in the temperature of the test fluid, and after a temperature equalisation period of about 3 hours. Use a class 1 pressure recorder and a class 0.6 pressure gauge as measuring instruments.

#### Liquefied gases:

Conduct the pressure test of the laid system in accordance with AS/NZ 5601.

The pressure test requirements apply to low and medium pressure systems. Conduct the pressure test of liquefied gas systems with air or nitrogen at 1.1 times the permissible working pressure, but at least 1 bar, and include the fittings. The test may be carried out as a pressure test, with water as the test fluid, at 1.3 times the permissible working pressure.

If a pressure test with water is planned for the first or regular tests, it must be planned for beforehand when the system is installed, by arranging the lowest points as drain connections so it can be drained thoroughly and completely.

### 11.0 - DISINFECTING THE SYSTEM

This is carried out to meet more stringent hygiene requirements, and in the event of severe microbial contamination. Contact us for more information.

To protect the environment and simplify handling, the NZ Drinking Water Guidelines (DWSNZ) recommend the use of hydrogen peroxide, however chlorine can also be used to disinfect.

Before commissioning the system carefully follow the instructions for use, particularly in relation to the contact time, maximum solution concentration and subsequent flushing requirements.

Note: To reliably prevent corrosion damage, during disinfection do not exceed the maximum chlorine concentration and contact times as tabled below:

- DWSNZ Regulations allow dosing with up to 0.2mg/l of free chlorine in the disinfectant solution, provided a limit of 5.0mg/l of free (active) chlorine is not exceeded in the drinking water.
- Quantities can be increased to 6mg/l and 0.6mg/l respectively in exceptional circumstances for example, high or increased micro bacterial contamination.

Maximum concentration of free chlorine in the water:	100mg/L	50mg/L
Maximum contact time:	16 hours	24 hours
Thorough flushing with potable (drinking) water:	Residue free chlorine in potable (drinking) water <1mg/L ≈ 1ppm.	

### 12.0 - FLUSHING THE SYSTEM

Flush the system with drinking water or an intermittent mixture of compressed air and water, before commissioning.

AS/NZ 3500 has directions for flushing water supply systems.

In the case of stainless steel, the possibility of corrosion promoted by foreign matter such as dirt or swarf can be ruled out. It is therefore sufficient to simply flush the system with potable (drinking) water.

### 13.0 - DE-SCALING

Lime scale on the bore of stainless steel tubes can be caused by a variety of service conditions (high water temperatures, impermissibly high temperatures on the bore of the tube or excessively 'hard' water).

Additives for de-scaling the bore of tubes must be checked for chemical compatibility with the tube & fitting material, the rubber seal ring and approved by Hydroflow before use.

Follow the manufacturer's instructions for use when employing de-scaling or disinfectant solutions.

Stainless steel tubes with a small amount of limescale can be de-scaled with a brief use of pure, diluted Citric Acid (C<sub>6</sub>H<sub>8</sub>O<sub>7</sub>) – Dilute (25%) citric acid up to a temperature of +20°C is suitable as a de-scaler for stainless steel.

When using any solution, ensure the system is flushed correctly and the manufactures instructions are followed in an accurate and safe manner at all times.

### 14.0 - COMMISSIONING

Systems must be commissioned in accordance with the applicable standards and regulations.

The installation contractor must familiarise the user(s) with the system. This is to be documented with a hand-over and acceptance documentation.

The user must also be provided with the manufacturer's maintenance and operating instructions for all installed equipment.

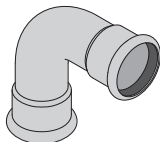
### 15.0 - OPERATION AND MAINTENANCE

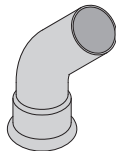
The user of the system (e.g. water supply, heating or gas) is under an obligation to ensure the system is maintained in a serviceable and safe condition at all times.

The system must be operated in such a way that faults and other factors affecting the reliability of the system are resolved before a hazard or issue occurs.

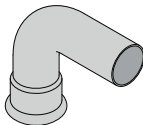
Avoid possible corrosion by keeping the system clean & free of contaminants, protect from sparks, grindings and confirm changes in media before making changes.

The user is therefore advised to enter into a maintenance agreement with an installation contractor.

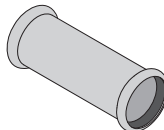
90 BEND SOCKET - SOCKET (FEMALE/FEMALE)		
	Product No	D1
	P0001607	15
	P0001608	22
	P0001609	28
	P0001633	35
	P0001634	42
	P0001635	54
	P0001636	76.1
	P0002345	88.9
	P0001637	108
	P0002346	168.3

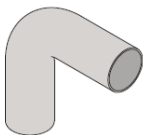
45 BEND SOCKET - TUBE END (MALE/FEMALE)			
	Product No	D1	D2
	P0001619	15	15
	P0001620	22	22
	P0001621	28	28
	P0002078	35	35
	P0002079	42	42
	P0002080	54	54
	P0002081	76.1	76.1
	P0002349	88.9	88.9
	P0002350	108	108
	P0002351	168.3	168.3

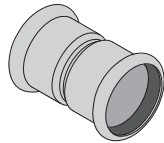
The length of M-F Bends cannot be cut shorter.

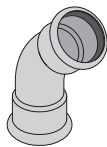
90 BEND SOCKET - TUBE END (MALE/FEMALE)					
	Product No	D1	X1	X2	Y1
	P0001610	15	48	28	67
	P0001611	22	61	40	74
	P0001612	28	72	49	82
	P0002088	35	74	48	85
	P0002089	42	86	56	97
	P0002090	54	105	72	122
	P0002091	76.1	177	124	195
	P0002092	88.9	181	123	202
	P0002093	108	214	140	240
	P0002094	168.3	386	268	404

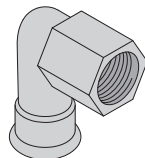
The length of M-F Bends cannot be cut shorter.

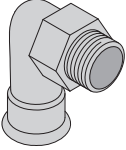
SLIP COUPLING SOCKET - SOCKET		
	Product No	D1
	P0001936	15
	P0001937	22
	P0001938	28
	P0001939	35
	P0001940	42
	P0002054	54
	P0002055	76.1
	P0002344	88.9
	P0002056	108

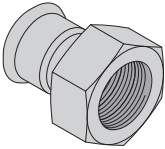
90 BEND TUBE - TUBE END (MALE)			
	Product No	D1	D2
	P0001613	15	15
	P0001614	22	22
	P0001615	28	28
	P0002095	35	35
	P0002096	42	42
	P0002097	54	54

COUPLING SOCKET - SOCKET		
	Product No	D1
	P0001928	15
	P0001929	22
	P0001930	28
	P0001931	35
	P0001932	42
	P0001933	54
	P0001934	76.1
	P0002342	88.9
	P0001935	108
	P0002343	168.3

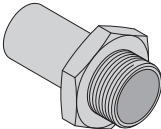
45 BEND SOCKET - SOCKET (FEMALE/FEMALE)		
	Product No	D1
	P0001616	15
	P0001617	22
	P0001618	28
	P0002074	35
	P0002075	42
	P0002076	54
	P0002077	76.1
	P0002347	88.9
	P0069356	108
	P0002348	168.3

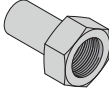
FI 90 BEND SOCKET - FI BSP			
	Product No	D1	D2
	P0002138	15	1/2" BSP
	P0002139	22	3/4" BSP
	P0002140	28	1" BSP
	P0002141	35	1.1/4" BSP

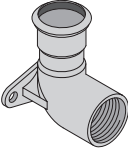
MI 90 BEND SOCKET - MI BSP			
	Product No	D1	MI
	P0002142	15	1/2" BSP
	P0002143	22	3/4" BSP
	P0002144	28	1" BSP
	P0002145	35	1.1/4" BSP
	P0002146	42	1.1/2" BSP
	P0002352	54	2"

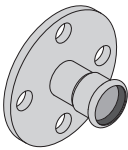
FI ADAPTOR SOCKET - FI THREAD			
	Product No	D1	FI
	P0001908	15	1/2" BSP
	P0001920	15	3/4" BSP
	P0001909	22	1/2" BSP
	P0001910	22	3/4" BSP
	P0001921	22	1" BSP
	P0001911	28	1/2" BSP
	P0001916	28	3/4" BSP
	P0001912	28	1" BSP
	P0001922	28	1.1/4" BSP
	P0001917	35	1" BSP
	P0001913	35	1.1/4" BSP
	P0002385	35	1 1/2" BSP
	P0001918	42	1 1/4" BSP
	P0001914	42	1.1/2" BSP
	P0001919	54	1.1/2" BSP
	P0001915	54	2" BSP

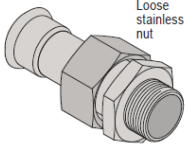
MI ADAPTOR SOCKET - MI THREAD			
	Product No	D1	MI
	P0001817	15	1/2" BSP
	P0001824	15	3/4" BSP
	P0001825	22	1/2" BSP
	P0001818	22	3/4" BSP
	P0001826	22	1" BSP
	P0001903	28	3/4" BSP
	P0001819	28	1" BSP
	P0001829	28	1 1/4" BSP
	P0001904	35	1" BSP
	P0001820	35	1.1/4" BSP
	P0001905	35	1.1/2" BSP
	P0001906	42	1.1/4" BSP
	P0001821	42	1.1/2" BSP
	P0001907	54	1.1/2" BSP
	P0001822	54	2" BSP
	P0069354	76.1	2.1/2" BSP
	P0001827	88.9	3" BSP
	P0001828	108	4" BSP

MI ADAPTOR TUBE END - MI THREAD			
	Product No	D1	MI
	P0001923	15	1/2" BSP
	P0069352	22	1/2" BSP
	P0001924	22	3/4" BSP
	P0069362	28	3/4"
	P0001925	28	1" BSP
	P0001926	35	1 1/4" BSP
	P0001927	42	1 1/2" BSP
	P0069353	54	2" BSP

FI CONNECTOR TUBE END - FI THREAD			
	Product No	M	BSP
	P0001950	15	1/2" BSP
	P0001951	22	1/2" BSP
	P0001952	22	3/4" BSP

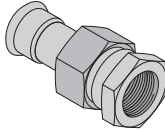
FI 90 BEND WALL FIX SOCKET - FI BSP			
	Product No	D1	FI
	With no wall plate offset:		
	P0002130	15	1/2" BSP
	P0002131	22	3/4" BSP

ADAPTOR FLANGE SOCKET - FLANGE			
	Product No	D1	FL
	P0002134	28	Table D
	P0002391	35	Table D
	P0002135	42	Table D
	P0002136	54	Table D
	P0002137	76.1	Table D
	P0002392	88.9	Table D
	P0008735	108	Table D
	P0002393	108	Table E
	P0002394	168.3	Table D
	P0002395	168.3	Table E

MI UNION SOCKET - MI BSP			
 <small>Loose stainless nut</small>	Product No	D1	FI
	P0002155	15	1/2" BSP
	P0002156	15	3/4" BSP
	P0002157	22	1/2" BSP
	P0002158	22	3/4" BSP
	P0002159	22	1" BSP
	P0002160	28	1" BSP
	P0002161	35	1 1/4" BSP
	P0002162	42	1.1/2" BSP
	P0002163	54	2" BSP

Item not suitable for steam or gas.

### FI UNION SOCKET - FI BSP

	Product No	D1	FI
	P0002147	15	1/2" BSP
	P0002153	15	3/4" BSP
	P0002148	22	3/4" BSP
	P0002154	22	1" BSP
	P0002149	28	1" BSP
	P0002387	28	1 1/4" BSP
	P0002150	35	1.1/4" BSP
	P0002151	42	1 1/2" BSP
	P0002152	54	2

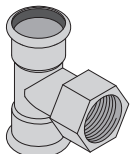
Item not suitable for steam or gas.

### Union Gaskets

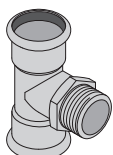
Depending on the media, both seals should be changed to a different rubber material to suit the application.

Unions are not approved to be used for gas or steam applications.

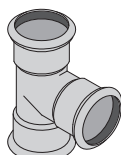
### FI TEE SOCKET ENDS - FI BSP BRANCH

	Product No	D1	FI
	P0001799	15	1/2" BSP
	P0001800	22	1/2" BSP
	P0001801	22	3/4" BSP
	P0001802	28	1/2" BSP
	P0001803	28	3/4" BSP
	P0009327	28	1" BSP
	P0001804	35	1/2" BSP
	P0001805	35	3/4" BSP
	P0002356	35	1" BSP
	P0002357	35	1 1/4" BSP
	P0001806	42	1/2" BSP
	P0001807	42	3/4" BSP
	P0002358	42	1" BSP
	P0002359	42	1 1/2" BSP
	P0001808	54	1/2" BSP
	P0001809	54	3/4" BSP
	P0002360	54	1" BSP
	P0001810	54	2" BSP
	P0001811	76.1	1 3/4" BSP
	P0001812	76.1	2" BSP
	P0002361	88.9	3/4" BSP
	P0002362	88.9	2" BSP
	P0002363	108	3/4" BSP
	P0002364	108	2" BSP

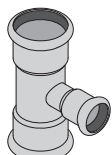
### MI TEE SOCKET ENDS - MI BSP BRANCH

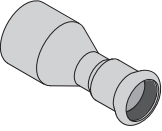
	Product No	D1	MI	D2
	P0001813	15	1/2" BSP	15
	P0001814	22	3/4" BSP	22
	P0001815	22	1" BSP	22
	P0008998	28	3/4" BSP	28
	P0001816	28	1" BSP	28
	P0008999	35	3/4" BSP	35
	P0002355	35	1 1/4" BSP	35
	P0009000	42	3/4"	42

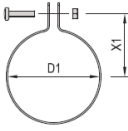
### TEE EQUAL SOCKET ENDS & BRANCH

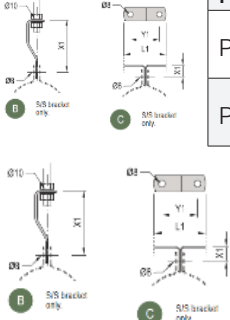
	Product No	D1
	P0001625	15
	P0001626	22
	P0001627	28
	P0001628	35
	P0001629	42
	P0001630	54
	P0001631	76.1
	P0002353	88.9
	P0001632	108
	P0002354	168.3

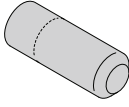
### TEE REDUCED SOCKET ENDS & BRANCH

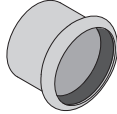
	Product No	D1	D2
	P0001638	22	15
	P0001639	28	15
	P0001640	28	22
	P0001641	35	15
	P0001642	35	22
	P0001789	35	28
	P0001790	42	15
	P0001791	42	22
	P0001792	42	28
	P0001793	42	35
	P0008995	54	15
	P0001794	54	22
	P0001795	54	28
	P0001796	54	35
	P0008994	54	42
	P0008996	76.1	22
	P0001797	76.1	28
	P0008997	76.1	35
	P0001643	76.1	42
	P0001798	76.1	54
	P0002365	88.9	22
	P0002366	88.9	28
	P0002367	88.9	35
	P0002368	88.9	42
	P0002369	88.9	54
	P0002370	88.9	76.1
	P0002371	108	22
	P0002372	108	28
	P0002373	108	35
	P0002374	108	42
	P0069361	108	54
	P0069360	108	76.1
	P0002375	108	88.9
	P0002376	168.3	76.1
	P0002377	168.3	88.9
	P0002378	168.3	108

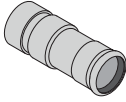
SPIGOT REDUCER SOCKET - TUBE END (MALE/FEMALE)			
	Product No	D1	D2
	P0002057	22	15
	P0002058	28	15
	P0002059	28	22
	P0002060	35	15
	P0002061	35	22
	P0002062	35	28
	P0002063	42	15
	P0002064	42	22
	P0002065	42	28
	P0002066	42	35
	P0002067	54	15
	P0002068	54	22
	P0002069	54	28
	P0002070	54	35
	P0002071	54	42
	P0002072	76.1	42
	P0002073	76.1	54
	P0002100	88.9	42
	P0002379	88.9	54
	P0002380	88.9	76.1
	PLM32345	108	54
	PLM32346	108	76.1
	P0002381	108	88.9
	P0002382	168.3	88.9
	P0002383	168.3	108
	P0002384	168.3	139.7


CLIP HEAD		
 <p><b>A</b> Item 'A' supplied as: - 1x S/S bracket - 1x S/S bolt &amp; Nyloc nut.  Compatible with item 'B' &amp; 'C' brackets.</p>	Product No	D1
	P0002294	15
	P0002295	22
	P0002296	28
	P0002297	35
	P0002298	42
	P0002299	54
	P0002300	76.1
	P0002396	88.9
	P0002397	108


BRACKET HANGER & T PIECE		
 <p><b>B</b> S/S bracket only. <b>C</b> S/S bracket only.</p>	Product No	D1
	P0002304	BRACKET HANGER
	P0002305	BRACKET 'T' PIECE

PUSH IN PLUG TUBE END (MALE)		
	Product No	D1
	P0008788	15
	P0002312	22
	P0002313	28
	P0002314	35
	P0002413	42
	P0002414	54
	P0002415	76.1
	P0002416	88.9
	P0002417	108

CAP END SOCKET END		
	Product No	D1
	P0002082	15
	P0002083	22
	P0002084	28
	P0002085	35
	P0002086	42
	P0002087	54
	P0002388	76.1
	P0002389	88.9
	P0002390	108


ROLL GROOVE ADAPTOR M-BSP		
	Product No	M
	P0002420	54
	P0002421	76.1
	P0002422	108

M10 BOSS HANGER		
	Product No	D1
	P0002286	15
	P0002287	22
	P0002288	28
	P0002289	35
	P0002290	42
	P0002291	54
	P0002292	76
	P0002293	108

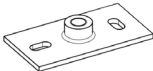
M12 BOSS HANGER		
	Product No	D1
	P0002399	1683




## PLAIN HANGER

	Product No	D1
	P0002324	15
	P0002325	22
	P0002301	28
	P0002326	35
	P0002302	42
	P0002303	54
	P0002327	76
	P0002328	108
	P0002398	168.3

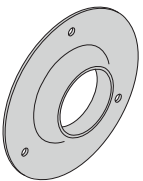
## BACKING PLATE

	Product No	Type
	P0002401	M10
	P0002419	M12

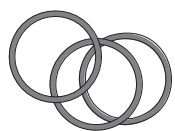
## THREADED ROD 1 METRE

	Product No	Type
	P0002423	M10
	P0002418	M12

## COVER FLANGE

	Product No	D1
	P0008736	15
	P0008737	22
	P0008738	28
	P0008739	35
	P0008740	42
	P0008741	54

## RING SEALS



### Rubber Ring Seals

Depending on the application, the ring seals may need to be changed to a different type for higher chemical or temperature resistance. Fittings with a press-fit socket are fitted with a EPDM rubber ring seal as standard.


Refer to our relevant Technical Media Chart for suitability or contact us for more information. Union fittings with a (flat) rubber gasket seal and a (round) ring seal, both EPDM as standard.

D1	EPDM Black -20°C to +110°C Standard	FKM (Viton) Red or Green -20°C to +200°C High Temperature	NBR Yellow or Grey -20°C to +70°C Oil or Gas
15	P0002500	P0002315	P0002403
22	P0002501	P0002316	P0002404
28	P0002502	P0002317	P0002405
35	P0002503	P0002318	P0002406
42	P0002504	P0002319	P0002407
54	P0002505	P0002402	P0002408
76.1	P0002506	P0002320	P0002409
88.9	P0002507	P0002321	P0002410
108	P0002508	P0002322	P0002411
168.3	P0002509	P0002323	P0002412


## EXPANSION COMPENSATOR

	Product No	D1
	P0009040	15
	P0009041	22
	P0009042	28
	P0009043	35
	P0009044	42
	P0009045	54
	P0009046	76.1
	P0009047	88.9
	P0009048	108


## PIPE BRIDGE PLAIN ENDS (MALE/MALE)

	Product No	D1
	P0009023	15
	P0009024	22
	P0009025	28

## PIPE BRIDGE SOCKET ENDS (FEMALE/FEMALE)

	Product No	D1
	P0009026	15
	P0009027	22
	P0009028	28

## PRE-FORMED PIPE BRIDGE PLAIN ENDS (MALE/MALE)

	Product No	D1
	P0009020	15
	P0009021	22
	P0009022	28

## STAINLESS TUBE SS 316 6M LENGTH

Product No	Thickness	Diameter
P0002164	1.0	15
P0002165	1.2	22
P0002166	1.2	28
P0002167	1.5	35
P0002282	1.5	42
P0002283	1.5	54
P0002284	2.0	76.1
P0002339	2.0	88.9
P0002285	2.0	108
P0002341	2.0	168.3

