Durapipe ABS Jointing Guide

Solvent cement welding offers a simple and quick means of constructing high integrity, leak-free joints.

The solvent cement operates by chemically softening the joint surfaces. Joint integrity will be greatly reduced if these surfaces are not clean and properly prepared.

Durapipe ABS solvent cement **must** be used.
The jointing procedure detailed below must be followed.

This relates to the new 'one-step' solvent cement. With this cement it is not necessary to abrade pipe or fitting (unless making a joint on to old ABS pipe).

No attempt should be made to increase the clearance between the pipes and fittings.

Procedure

1. The pipe must be cut clean and square. A suitable wheel cutter will eliminate swarf. As an alternative (and on larger sizes) a carpenters saw should be used, however this may create dust and swarf which can enter the system.



2. Chamfer the end of the pipe using a coarse file or suitable chamfering tool. The chamfer should be approximately 45° by 3mm to 5mm depending on the pipe size. Reducing bushes should also be chamfered (unless where a moulded chamfer is included).



3. Mark the pipe a known distance from the end and clear of the area to be cleaned. This mark should be used to confirm full insertion of pipe into socket of fitting.



4. Ensure joint surfaces are clean and free from moisture. Clean surfaces thoroughly with Durapipe Eco-cleaner using lint free cloth/paper towel.



5. Using a clean brush apply cement to the pipe and fitting. The joint surfaces should be completely covered by cement.

   Cement should be applied using an appropriate size brush and tin of cement. It is important to apply cement quickly to enable assembly without excessive force being required.
   When applying cement with brush, the size of the brush should be approximately half the size of the pipe to be jointed - brush size up to $2^{1}/_{2}$" (63mm) for 0.5 litre and up to 3" (75mm) for 1 litre tins.



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6. Immediately after applications of cement, push pipe fully home into the fitting. Do not twist. Hold the pipe and the fitting for times varying from a few seconds on sizes 3/8" or 16mm up to 1 minute on sizes 12" or 315mm. The slight taper moulded into the fitting may otherwise cause it to slide off the pipe with consequent loss of joint strength. Application of the correct amount of cement will result in a neat bead of cement at the edge of the fitting and at the edge of the pipe. Excessive deposits inside the fittings must be avoided as these can weaken the wall, particularly on smaller sizes.
   When working under cold conditions make sure the joints are free from frost and moisture.



7. Wipe off excess cement from the outside of the joint.



8. Using the mark previously made, check that the pipe has been fully inserted.



9. Do not disturb a joint for least 10 minutes. On larger sizes do not subject the joint to bending or twisting forces for at least 4 hours. When making subsequent joints, which can be done without waiting, take care not to transmit forces to freshly made joints in the system.
10. Replace lids on containers.

CAUTION

- **DO NOT use near naked flames**
- **DO NOT smoke in the working area**
- **DO NOT use in confined spaces**
- **DO NOT joint in the rain or wet conditions**
- **DO NOT use dirty brushes**
- **DO NOT use dirty or oily cleaning cloths**
- **DO NOT use the same brushes for different cements**
- **DO NOT dilute or decant Durapipe ABS solvent cement**
- **Follow safety instructions on Durapipe solvent cement and Eco-cleaner containers**
- **Always wear appropriate personal protective equipment**

Notes

1. The integrity of Durapipe ABS systems may be affected if Durapipe ABS One-step solvent cement and Durapipe Eco-cleaner are not used.
   Durapipe UK disclaims responsibility for any Durapipe ABS system constructed with any other cement or not fabricated in accordance with the instructions herein.
2. Use the appropriate size of solvent cement tin/container and method of application for the size of pipe and fitting to be assembled.
3. To achieve the correct speed of application on sizes 5"/140mm and above, cement should be applied simultaneously to pipe and fitting, by two people.

Drying times

The drying times will vary with fit, amount of solvent cement applied, ambient temperature and working pressure. It is recommended that, wherever possible, joints of sizes up to 8"/225mm are allowed to dry for at least 24 hours, and sizes 10" and 12"/250mm and 315mm for at least 48 hours.
These guidelines are based on an ambient temperature of between 10°C to 40°C. Longer drying times will be required at lower and higher ambient temperatures.

It is recognised that there will be occasions when the system will need to be put into service within a few hours of being made. A rough but safe working guide where the ambient temperature is between 10°C to 40°C and the contents temperature does not exceed 20°C is as follows:

Size Range	Up to 2 1/2" 75mm	3" to 4" 90mm to 125mm	5" & 6" 140mm & 160mm	8" 200mm & 225mm	10" & 12" 250mm & 315mm
Drying Time	0.5 hour / bar	1.0 hour / bar	1.5 hours / bar	2.0 hours / bar	48 hours minimum

Note - minimum drying period should never be less than 1 hour.

An indication of the number of joints to be made per litre of cement is as follows:

Size mm	Size inch	Recommended container size	Joints per litre ABS
16 - 32	3/8 - 1	0.5 Litre	400
40 - 63	1 1/4 - 2	0.5 Litre	200
75 - 110	2 1/2 - 4	0.5 Litre	70
125 - 140	5	1 Litre	20
160 - 225	6 - 8	1 Litre	10
250 - 315	10 - 12	1 Litre	5

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Branch connections - reduced bore

Reduced branch connections can be made as follows:

Imperial range:
Bushed equal tees or Y-Pieces, solvent cemented saddles.

Metric range:
Bushed equal tees or Y-Pieces, reduced branch tees.

Saddles permit branch connections to be made with the main pipe in situ. The following procedure must be followed carefully:

1. After making sure that the pipe is empty, drill a hole in the pipe wall to suit the connection. The size of hole and cutter to be used for each size of saddle is indicated below:

Pipe size (Imperial)	Hole diameter (mm)	Cutter size (Imperial)
2	48	$1^{7}/_{8}$
3	61	$2^{3}/_{8}$
4	74	$2^{7}/_{8}$
6	74	$2^{7}/_{8}$



2. Mark out the area covered by the saddle on the pipe.



3. Clean surfaces with Eco-cleaner.



4. Feed on to pipe two worm drive (Jubilee) clips which will clamp the saddle during fitting. These should be placed either side of the socket on the saddles. Apply cement to pipe area and saddle. **It is important to apply cement quickly**.



5. Position saddle immediately, ensuring that spigot locates in hole in pipe wall. Clamp in place using worm drive clips without delay.





6. Wipe off any excess cement.



7. Replace lids on containers.
8. Clean brush with Eco-cleaner.

Important:

1. See page 18 for details of drying times. Allow 24 hours before removing straps.
2. On no account should a branch tee be constructed by drilling through the wall of a pipe and/or fitting and attempting to solvent weld a smaller fitting into the hole.

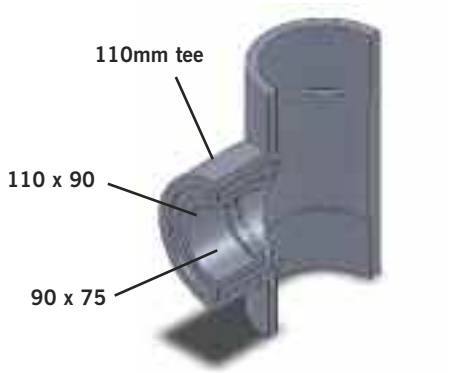
The use of bushes, reducers and threaded adaptors

Reducing bushes

Reducing bushes offer a neat and simple method of reducing socket size in the minimum of space.

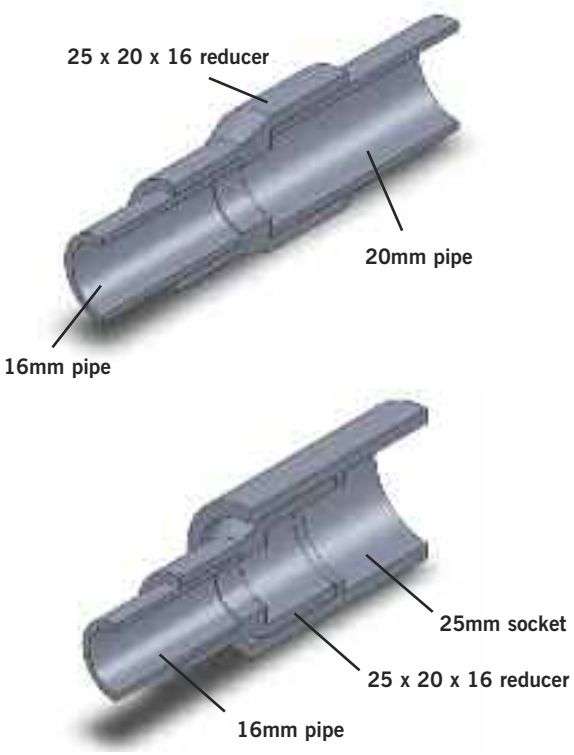
Care must be taken to properly prepare all jointing surfaces as recommended earlier, with the end of the bush being chamfered (unless a moulded chamfer is included).

Example in the use of reducing bushes



The use of reducers

All fittings have female ends, dimensionally controlled for cold fusion jointing. In addition, reducing sockets in the Metric series have controlled outside diameter at the larger end. This allows use as a male or female component, as illustrated.



Metric series threaded adaptors

Female and male threaded adaptors have controlled inside and outside diameters on the plain end. They can therefore be used as a male or female component.

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Threaded connections

Connections - plastics to metal

There are several recommended methods to connect metal and plastic systems:
Composite unions
Flanges
Male threaded fittings
Female threaded fittings

Plastics expand or contract more than metals for any given change in temperature. The practice of connecting plastic threaded fittings to metal threads is not recommended where the joint is likely to experience a temperature change of more than +/-5ºC, otherwise leaks may occur.

Composite unions are available with brass male or female BSP threaded adaptors.

If it is required to cut a thread on to Durapipe ABS pipe, use a sharp die especially reserved for plastic pipes and cut full thread depth without lubricant, in one operation.
This should only be attempted on pipe sizes up to 2" n.b. Class T pipe must be used. Pipes from Durapipe ABS metric range are not suitable for threading.
Assembly should be carried out by hand and final tightening by a strap wrench, if necessary.
Extra care must be taken not to overtighten or damage the thread.
Pipe wrenches must not be used.
It is recommended that PTFE tape be used when making threaded joints/connections.
Any other sealing compound must be confirmed by Durapipe as being suitable.
'Boss White' and anaerobic adhesive sealants, such as Loctite 542 and 572, can chemically attack ABS and must **not** be used.

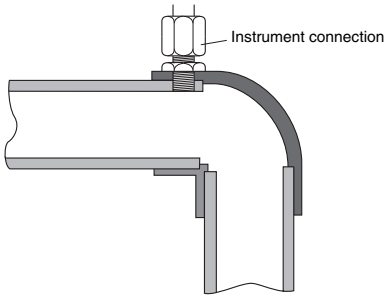


Connection to instrumentation

Instrumentation connections can be made by drilling through pipe and socket where the material is at its thickest and tapping the hole to receive a threaded fitting, as shown below:

Pipe size	Connection size
16mm-63mm/3/8"-2"	Use tees, reducing bushes and threaded fittings
75mm-110mm/2 1/2"-4"	Max. tapping 1/2" BSP.
125mm-140mm/5"	Max. tapping 3/4" BSP.
160mm & above/6" & above	Max. tapping 1" BSP.

Such connections, if correctly drilled and tapped with full thread form will be limited to Class C/PN10 pressures.



Flanged joints

Full face flanges are available from 1/2" to 6".

Stub flanges are available from 2" to 12" and in metric sizes from 16mm to 315mm and provide a convenient means of converting from Imperial to Metric systems in sizes 8"/200mm and above.

The correct galvanised mild steel backing ring and rubber gasket must be used with both types.

Flange bolting procedure

The following procedure is recommended for installing Durapipe ABS flanges:

1. Inspect flange faces and ensure that they are clean and undamaged.
2. Check that the correct backing ring and rubber gaskets have been supplied. Durapipe supplies a matched system of flanges and backing rings - do not interchange Metric and Imperial components.
3. Loosely assemble flanges. Ensure that flanges and bolt holes align and that the flange faces are parallel. Ensure that the gasket is correctly positioned between the flanges.
4. Ensure that the appropriate sized washer is placed under both bolt heads and nuts.
5. Tighten the nuts and bolts in a diagonally opposite sequence (see below) to ensure even loading around the flange to avoid distortion. It is recommended that the nuts and bolts be tightened as uniformly as possible progressively from a finger tight start.
6. Repeat as necessary until tightness of all bolts is achieved.

Tightening torques for flange bolts in ABS piping systems

Recommended Torque Values (Nm)

Size	Torque
16	15
20	15
25	15
32	15
40	20
50	30
63	35
75	40
90	40
110	40
125	50
140	50
160	60
200	70
225	70
250	80
315	100

The tolerance on torque is +/-10%

Tightening sequence

