



## Vulcathene jointing options

Mechanical and enfusion fittings are available in the Vulcathene range. Whichever is specified, these solutions offer significant benefits to chemical drainage installation

- **Chemically resistant, fully matched pipework**
- **Full BBA approval for peace of mind**
- **Flexibility of design**
- **Easy to install**
- **High impact resistance**
- **UV protection**

### Mechanical fittings

With a unique nut and tongued olive method, mechanical fittings are simple and easy to install, allowing connections to be rejoined where necessary and without affecting the joint's efficiency. This provides significant installation flexibility and cost benefits.

Alongside a broad range of pipe and fittings, laboratory bench items such as sinks, drip cups, wastes and anti-siphon traps complete the portfolio, catering for a broad range of chemical drainage installation needs.

### Enfusion fittings

Where a fusion welded joint is preferred, Vulcathene enfusion fittings are available in sizes from 38mm to 152mm. These are ideal where pipework is to be buried, run overhead in ceiling voids, or in less accessible locations such as drainage stacks.

Vulcathene enfusion fittings incorporate moulded socket ends with an integral resistance wire in place. Jointing is completed by energizing the resistance wire via a dedicated enfusion control unit.

The Vulcathene enfusion and mechanical systems are interchangeable, offering great versatility to the installer of chemical waste drainage systems.



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## Making the mechanical joint

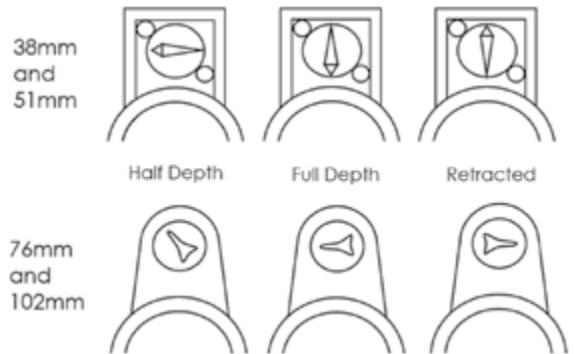
**Step 1** - Cut pipe to length using a rotary plastic pipe cutter as shown. Where possible clamp the pipe in a vice avoiding excessive distortion.



This method is favored over the use of a hacksaw as the finish is clean (no loose swarf or burr on the pipe). The pipe must be square. If a saw is used, it is essential that all burrs and loose material are removed.

To achieve full joint integrity, it is essential that a groove is cut around the pipe with the appropriate grooving tool, into which the tongued olive will be located.

**Step 2** - Fully insert the pipe into the grooving tool. Adjust the depth of the cutting blade to approximately half its depth. Rotate the cutting tool in an anti-clockwise direction around the pipe. Then adjust cutting blade to full depth, further rotating the cutter anti-clockwise. When completed, retract the blade and remove the tool making sure that any swarf created by the grooving action is removed. Do not attempt to cut the groove with the blade at full depth first time.



**Step 3** - To begin assembling the joint, first slide the nut onto the pipe. The threaded connection should be facing the groove that has been made, once this has been done you are ready to slide the olive into place (widest end first) seating the tongue of the olive into the groove in the pipe. To aid installation, Vulcathene lubricant should be used, especially when fitting 76mm & 102mm olives.

When the olive is correctly seated you are ready to make your joint, before progressing ensure that the thread of your fitting is clean, proceed by applying Vulcathene lubricant to the threads of the fitting.



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Loosely assemble the joint and proceed to hand tighten each nut. Using two Vulcathene spanners. The joint should then be tightened further to its full thread capacity.



**NOTE:** Always tighten the nuts as work progresses. They should not be left until the job is completed. When installing a Vulcathene chemical drainage system it is imperative that Vulcathene grooving tools and spanners must be used to ensure joint integrity.

## Making the enfusion joint

**Step 1** - Cut pipe to length using a rotary plastic pipe cutter as shown. Where possible clamp the pipe in a vice avoiding excessive distortion.

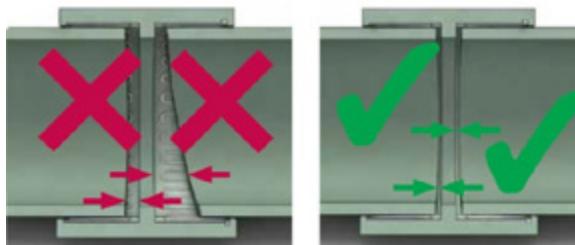


This method is favored over the use of a hacksaw as the finish is clean (no loose swarf or burr on the pipe). The pipe must be square. If a saw is used, it is essential that all burrs and loose material are removed.

**Step 2** - Using a pipe scraper, scrape the end of the pipe equivalent to the depth of the socket, plus at least 10% for safety margin. Removal of the smooth, oxidized layer on the surface of the pipe is imperative to obtain a good fusion joint. Once prepared it is very important not to handle this area or allow it to get dirty.

### Important notes

Ensure pipes are cut square and inserted all the way to the stop at the bottom of the socket.



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Before moving forward to create the enfusion joint it is important to check that the power source to the enfusion control unit is providing 104 to 126 volts at 45 to 65 cycles with 16amp capacity. The enfusion controller provides for reasonable and normal power variation – generators should be checked to ensure that the correct, rated output is being provided.

If multiple joints are to be simultaneously, refer to the table below which indicates the maximum number of joints relative to the pipe size. This information is also detailed on the enfusion machine.

Pipe Size	Maximum no. of joints
38mm	8
51mm	6
76mm	4
102mm	3
152mm	2

If jointing fittings of different sizes, the sum of joint sizes during a single weld cycle must not exceed 306mm.

**Step 3** - Loosely fit the correct sized clamp over the hub of the socket to be jointed and align edge of the clamp with front face of the socket.



Before fully tightening it is imperative to ensure correct positioning of clamp.

**Step 4** - Tighten the clamp around the hub of the socket. It is important that the clamp is tightened sufficiently to stop pipe rotation in the socket. Do not overtighten.

## Important notes

The following instructions refer to the current L2601 hand-held / peli case enfusion welding machine, these machines incorporate the latest software updates. Please contact our technical support team for advice on the latest software.

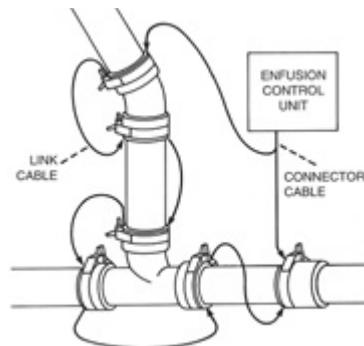
For calibration advice, please contact the enfusion control unit manufacturer.

ALL cables MUST be removed from the peli case before using the hand-held enfusion control unit.

Terminal pin extension adaptors are available where access to the fitting terminal pin is restricted. For example, where enfusion fittings are positioned close or hard against a wall.

**Step 5** - Turn the enfusion control unit on and it will perform a self-test. Ensure the unit boots correctly and is not due for re-calibration.

**Step 6** - Follow the instruction on the display to connect the output lead. If making a single joint, connect the output leads from welding machine directly onto terminal pins of the fitting. If making multiple joints, utilise the link leads as demonstrated below.



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**Step 7** - Press the start button to begin the welding process. The enfusion control unit will display the temperature and the welding time.

When the fusion cycle has been completed, the enfusion control unit will emit an audible beep, the enfusion control unit will then start an initial cooling time of 30 seconds.

**Step 8** - Following the initial 30 seconds cooling time, carefully disconnect leads from the fitting. The enfusion control unit will now reset, ready for the next operation. Leave the joint undisturbed for at least 5 minutes before removing clamps.

## Enfusion troubleshooting

If the enfusion control unit stops before joint completion, the unit will send an audible alarm and the machine will display an error message such as *interrupted weld, output fault or connection fault*.

In the event of an error occurring, the joint will need to be allowed to cool. Check that all connections are secure. Once the fault has been corrected, the full cycle can be run again. (Allow 38mm to 76mm fittings to cool for 5 minutes and 102mm to 152mm fittings to cool for 7 minutes.)

The enfusion control unit should be re-set by shutting it off, switching it back on and pressing the START button when prompted.

**NOTE:** When working in very cold conditions try to screen the joint from direct contact with the wind. Protecting the joint with a suitable blanket will also help prevent excessive loss of heat due to wind chill.

Enfusion control units contain sophisticated electronic components and should therefore be handled with care. Should the machine for any reason experience a malfunction, please do not tamper with it and instead call your local Vulcathene distributor or representative for advice.

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# UniCollar® fire protection

## 1. Removing the casing and accessories from the box

The box contains the fixings and accessories required to install the collar. Open the box at the position clearly marked with an arrow. Remove the box of accessories.



The end of the collar can now be pulled and the strip will uncoil. Ensure the soft Graftex faces up. The collar strip has snapping perforations at 15mm centres.

Only pull out enough strip for the collar length required.

## 2. Cutting and snapping the strip

Identify the outside diameter of the pipe that is to have the collar applied to. On the box is a table, which gives the number of segments for each size pipe and the length of strip required. Either count the number of (15mm) segments required or measure the strip.



Cut through the Graftex at the appropriate position eg. for a 114mm OD pipe, cut at segment marked 30.

Hold the strip with a finger and thumb on each side of the cut and as close to the cut as possible, and fold in a downward direction as far as possible. Repeat this folding until the steel snaps.



## 3. Fixing the collar

The ends of the Graftex, once cut, will be square. To make it easy to fix, cut these square ends away at a slight angle. Shape the strip to the approximate diameter of the pipe.



If the pipe is small (eg. under 75mm) pay extra attention to the ends of the strip to ensure they have been shaped correctly. Push one of the prongs of a bracket through the notch at one end of the strip. Fold the strip around the pipe and push the other prong through the notch on the other end of the strip. (The bracket can be gently hammered in to position if pushing is difficult). Attach the bracket to the wall or floor as described over and shown on the box drawings. Fix the other bracket(s) as required.



Ensure the correct number of brackets are always used and the 2 ends of the strip always have a connecting bracket.

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#### 4. Floors

The UniCollar® achieves Fire Resistance Level (FRL) up to 4 hours with Vulcathene pipes up to 114mm diameter, bolted to soffit of floor slab (with a similar fire rating or the same or greater thickness) using the 20mm x 5mm steel anchors provided, through the holes in the brackets provided.



The concrete must be in a condition that will ensure the anchors hold securely. Larger steel fixings may be used if deemed appropriate. Back fill any gap between the pipe and concrete greater than 8mm with mortar or commercial grade mortar mix. Acrylic, intumescent or silicone sealant may be applied around the pipe on the topside of the floor slab if a water seal is required. If there is a possibility of pipe movement occurring that will cause cracks in the seal between the pipe and mortar mix (if used), it may be advisable to seal the pipe with acrylic, intumescent or silicone sealant to prevent cold smoke egress. This however is not required for the fire rating to be achieved. If the gap between the pipe and slab is less than 8mm, apply a bead of acrylic, intumescent or silicone sealant approx. 8mm deep in to the gap at the soffit.

**Fire resistance: (BS 476: Part 20)**

**Pipe size integrity: 38mm-102mm 4 hours  
(\*152mm 2 hours)**

\*Note: 2 UniCollars® are required on 152mm size pipe.

#### 5. Walls

For framed walls, use the 40mm x 10 laminating screws provided. For masonry walls, use the 20mm x 5mm steel anchors provided. The wall or floor must be in a condition that will ensure the anchors hold securely. Larger steel fixings may be used if deemed appropriate. Ensure the annular gap between the wall and pipe is minimal and seal this gap with a bead of acrylic, intumescent or silicone sealant.

Attach a collar to both faces of the wall. Fire tests were conducted with 2 brackets on pipes 69mm and under. For framed walls, 3 brackets are recommended if framing studs are not available to screw in to.

**Fire resistance: (BS 476: Part 20)**

**Pipe size integrity: 38mm-152mm 2 hours**

For details of suitability and approvals for use of UniCollar® for other pipe materials and sizes contact our Technical Support Team on: +44 (0) 1543 471680 (Option 2).

Pipe Diameter (mm)	No. of Collars per Carton
38	8
51	7
76	6
102	5
152	3

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## Additional advice

### Waste pipe falls

Horizontal waste runs should be installed to provide a natural fall to the Vulcathene stack. It is recommended that falls are maintained between 2° to 3° to ensure optimum waste flow. The fall should never be less than 1°.

### Typical pipework falls for Vulcathene pipes

Pipe length	Fall in pipework at 1°	Fall in pipework at 2°	Fall in pipework at 2.5°	Fall in pipework at 3°
	Metres	Millimetres		
1	17.46	34.93	43.67	52.24
1.5	26.19	52.39	65.5	78.36
2	34.91	69.85	87.33	104.48
2.5	43.64	87.31	109.17	130.6
3	52.37	104.78	131	156.72
3.5	61.1	122.24	152.83	182.85
4	69.83	139.7	174.67	208.97
4.5	78.56	157.16	196.5	235.09
5	87.29	174.63	218.34	261.21
5.5	96.01	192.09	240.17	287.33
6	104.74	209.55	262	313.45
6.5	113.47	227.01	283.84	339.57
7	122.2	244.48	305.67	365.69
7.5	130.93	261.94	327.5	391.81
8	139.66	279.4	349.34	417.93
8.5	148.38	296.86	371.17	444.05
9	157.11	314.33	393	470.17
9.5	165.84	331.79	414.84	496.29
10	174.57	349.25	436.67	522.42
10.5	183.3	366.71	458.5	548.54
11	192.03	384.18	480.34	574.66
11.5	200.76	401.64	502.17	600.78
12	209.48	419.1	524	626.9

### Supporting Vulcathene pipes

Horizontal runs at room temperature do not typically require continuous support. Instead, Vulcathene pipe clips must be fixed at the following recommended centres:

Nominal I.D.	38mm	51mm	76mm	102mm	152mm
Horizontal Fixing Centres	1.22m	1.37m	1.52m	1.83m	1.83m
Vertical Fixing Centres	1.5m	1.5m	1.5m	1.5m	1.5m

Vulcathene pipe clips are snap fit, retaining the pipe securely whilst still allowing linear movement of the pipe caused by temperature variations.

When longer than typical vertical runs are installed in 76mm and 102mm, strain may be caused by thermal movement. Where this is the case metal straps can be used to retain the pipe.

Metal hangers are also recommended for applications where Vulcathene pipework needs to be suspended.

Galvanized support channels should be used for horizontal runs where consistent temperatures in excess of 40°C (104°F) are expected.

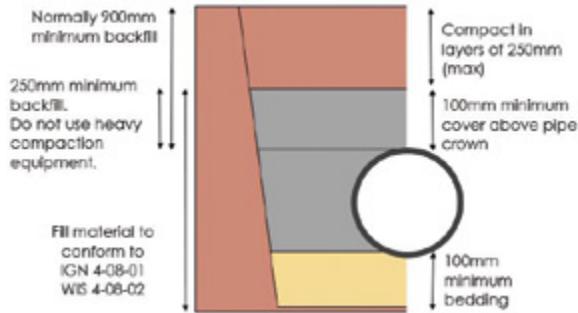
### Buried pipes

Generally, when burying pipe, trenches should not be less than one metre deep. The trench should be as narrow as possible to allow proper consolidation. The trench bottom should be level and free from rock, debris and sharp objects.

A 100mm bed of suitable pipe bedding should be laid in the bottom of the trench. Backfilling with similar material, this should continue until a 100mm layer over the pipe is achieved.

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Pipes may be jointed in the trench, but if jointed above ground should be allowed to cool sufficiently.



### Thermal movement

To overcome the issue of expansion and contraction, Vulcathene stress relief units (SRU's) are purpose designed to cater for the stresses caused by thermal movement.

When installing an SRU, care should be taken to ensure an accurate linear 'thrust and pull' movement. Pipe clips should not grip the pipe tightly but allow it to slide freely avoiding buckling. The body of the SRU should always be firmly anchored.

Vulcathene SRU's are designed to move easily at around 5psi, the total movement for all sizes being approximately +/- 25mm. The co-efficient of expansion for Vulcathene plumbing is 1.4mm per metre, per 10°C.

An SRU should be installed on the stack at every floor level where there is a stack input connection. If there is no stack connection, one SRU should be installed every two floors.

SRU's should be installed on horizontal pipes where there are insufficient changes in direction to accommodate thermal movement, such as long runs or where fluids at elevated temperatures are expected.

### Installing Vulcathene thermal stress relief units

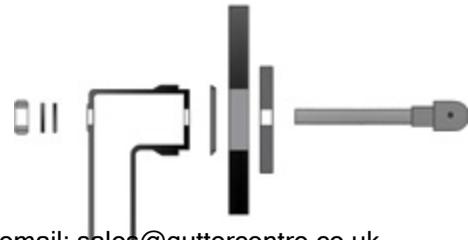
All Vulcathene SRUs should be installed in line with the intended flow of the effluents. 38mm and 51mm SRU tail end pipes should be pushed fully home and its position marked. It should then be withdrawn by up to 38mm.

The 76mm, 102mm & 152mm SRU's are spigot ended on one side for either mechanical or enfusion jointing. The other side of the units are socket ended, complete with an integral 'O' ring seal and fitted with a dust cap.

The dust cap should be removed and slid up the pipe. The pipe should then be chamfered, lubricated and then slid into the chamber of the SRU until it hits the stop. The pipe should then be marked to show the limit of travel, then withdrawn approximately 25mm to 38mm. The dust cap should then be firmly replaced.

### Installing drip cups and wastes

When 504 wastes are used with a plastic or thin walled vessel, a butyl rubber gasket should be fitted between the back nut and underside of the sink. All sinks, drip cups and slotted waste assemblies should be bedded with a suitable chemical resistant sealant.



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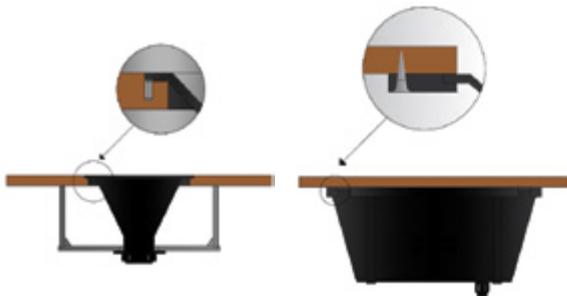
The below illustration shows a 509 overflow assembly with flexible hose to connect to the waste. The overflow bend and face-plate should be set with a suitable sealant.



The illustration below shows the slotted version of the 504 waste assembly used in conjunction with the 509 overflow assembly. The waste, overflow collar and gaskets should all be set with a suitable sealant.

### Sink fitting

The illustrations below show the recommended method of supporting Vulcathene sinks using wooden battens screwed to the underside of the work top. Larger capacity sinks may need additional supporting metal straps in the manner shown



### Installing clamp saddles

Vulcathene clamp saddles enable fast and easy connection of new branch pipes to existing Vulcathene stacks, without the need for special tools or equipment.

Clamp bolts should be tightened with care. Avoid over-tightening. Note: 76mm saddles are supplied with 4 bolts, 102mm saddles are supplied with 6.



**1. Position lower half of saddle around pipe.**



**2. Taking care to seat gasket in the branch outlet, bolt both halves together.**



**3. Use a spanner to tighten bolt heads making sure not to over-torque.**



**4. Drill pipe wall.**

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## Storage

The high impact strength of Vulcathene provides a degree of protection against damage on site. However certain precautions should be taken:

- **Pipe should be stored on a level flat surface free from sharp or abrasive objects**
- **Small pipes may be 'nested' inside larger pipe if required**
- **The stack of stored pipes should be supported or braced to prevent collapse**
- **38mm to 76mm pipes should not be stacked higher than 20 units & 102mm pipes, no higher than 12 units**
- **When stored at higher temperatures for prolonged periods, the pipes should be covered**

## Connecting to other systems

The Vulcathene system offers a wide range of fittings to facilitate connection to other pipe systems. We recommend that this is only used where retrofitting is required.

It is important to ensure that the system being connected to Vulcathene is also suitable for chemical drainage.

These fittings include:

- **BSP threaded and flange adaptors**
- **Flex-Seal adaptors**
- **Vulcathene 'polyfusion' adaptors**
- **Adaptors for borosilicate glass systems**

If connections to other pipe systems are required, we are available to provide advice and guidance to suggest the most efficient options for your installation. Please feel free to contact our technical support team for more details.

## Technical Support Team contact details

**Tel: +44 (0) 1543 471680 (select option '2')**

**Email: [vulcathene@alixaxis.com](mailto:vulcathene@alixaxis.com)**

## System testing

The system should be inspected for any possible leaks in accordance with BS EN 12056. Air should be pumped into the system through a branch of a tee piece until a pressure equal to 38mm water gauge is achieved. The inlet valve should then be closed, and the system should maintain the pressure for a minimum of three minutes.

## System maintenance

The anti-siphon bottle traps and dilution recovery traps have sumps that can be removed for cleaning.

The W612 dilution recovery trap is cleaned by removing the dip tubes and carefully flushing the interior of the dilution chamber.

The 910G dilution recovery trap is complete with a removable lid & gasket seal, both held in place by a stainless-steel clamp which can be easily removed for access & maintenance.

Access pipes should be fitted to provide access for testing and maintenance.

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