

Electrofusion Jointing Procedure

Electrofusion Fittings contain electrical filament wires which, when correctly connected to an appropriate power source for the specified period of time, will fuse the coupling onto the pipe.

The correct jointing procedures for the installation of electrofusion couplers are contained within WIS 3-32-08.

Electrofusion fittings for water and sewerage applications in both PE80 and PE100 are manufactured in accordance with WIS 4-32-14 and EN 12201-3

It is possible to join dissimilar polyethylene pipe and wall thickness by using electrofusion fittings. For example PE80 fittings may be used to join to PE100 pipe.

1. Tooling required for the welding of an electrofusion fitting is a suitable electrofusion control box with power supply and a scraper capable of removing 0.2-0.4mm from the outside of the polyethylene pipe.

An alignment clamp should be used to ensure that the joint's movement is kept to a minimum during the heating and cooling cycle together, with cleaning cloths and an indelible pen. A welding shelter should also be used to provide protection of the welding area against adverse weather conditions and contamination.



2. Using cleaning cloths firstly clean the area of the pipe to be welded of any surface debris.

Without removing the sealed packaging mark on the pipe the area which is to be scraped, ie approximately 15-20mm beyond the insertion depth of the coupler.

Do not touch the scraped surface.

4. Open one side of the sealed bag containing the electrofusion fitting and slide it on to the pipe.

3. Using a suitable pipe surface preparation tool "scraper" remove the pipe surface in the selected area to a depth of

0.2-0.4mm; it is imperative at this stage of the operation that this is preformed correctly.

Wherever possible a mechanical end preparation tool is the preferred method of pipe surface preparation as it is capable of removing a continuous, even layer from the pipe surface.



The electrofusion coupler is fitted with a centre stop. Slide the fitting along the pipe until it comes into contact with the centre stop. Mark the insertion depth using an indelible marker pen.



Leave the bag over the end of the coupler to protect against contamination coming into contact with the inside of the fitting.

Scrape the second pipe as demonstrated in 3.

5. Remove the bag covering the coupler and insert the second pipe up to the centre stop. Then mark the insertion depth using an indelible marker pen.



6. Correctly position and fit the restraining clamp to the assembly.

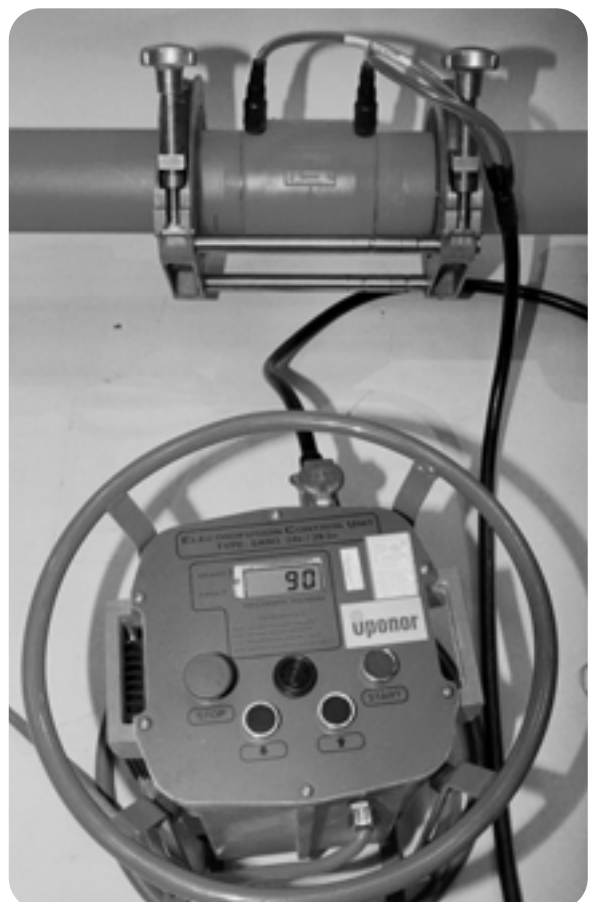
Clamps should always be used to secure an electrofusion assembly during the fusion cycle.

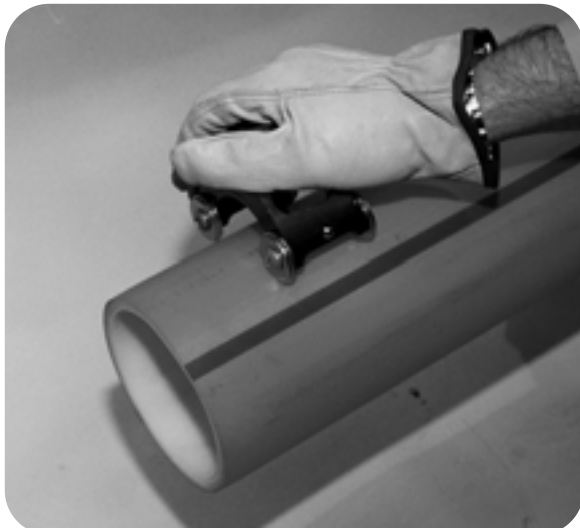
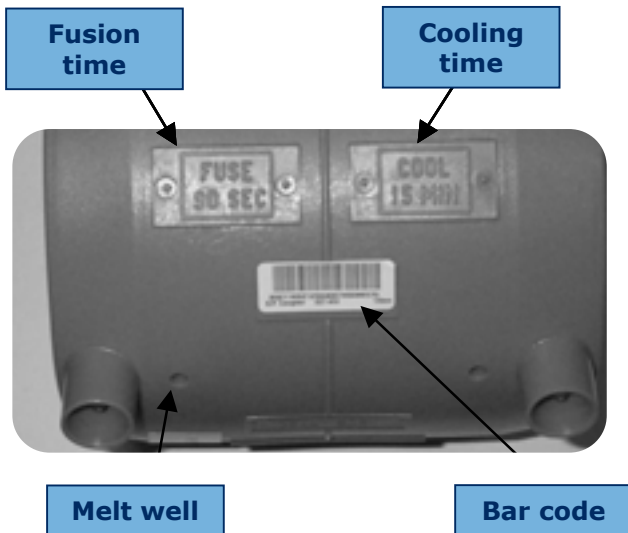


7. Having ensured the power supply is working correctly connect the electrofusion control box to the fitting and power supply.

Follow the instructions given on the fusion box's display screen.

Input the fusion time either by using the information embossed on the coupler or by using the bar code affixed to the fitting. The method used will depend on the type of control box being used.





Once the coupler has completed the fusion cycle check that the melt indicators/melt wells show a successful fusion cycle has taken place. Melt wells, as shown above, should fill with melt to a point approximately flush to the surface of the fitting. The melt indicators fitted to predominantly smaller fittings will rise beyond the body of the electrofusion fitting.

The coupler must be left in retaining clamps for the full cooling time specified on the fitting although the terminal leads may be removed with care at the end of the fusion time.

C. Turn the tool 90° and hook the cutting tool under the edge of the flared skin. Then cut along the pipe.



Installing Electrofusion Couplers when using ProFuse Pipe

Profuse pipe allows electrofusion couplers to be installed without the pipe having to be scraped in the area to be welded.

- A. Firstly remove any surface debris and clean the general area of pipe to be welded.
- B. Score the ProFuse pipe skin beyond the insertion depth of the coupler.

Guide the Pipe Exposure Tool in the direction of the arrow on the cutter around the pipe whilst depressing the cutter to lift the skin, resulting in a flared edge.

D. Hold the edge of the skin and steadily peel the skin to expose the naturally coloured pipe beneath.





- E. Open one side of the bag containing the coupler and slide it on to the pipe. Then follow Electrofusion Procedure From stage 4.

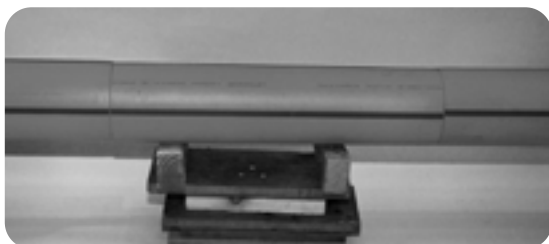
Using Electrofusion Couplers in the Slip Mode

The centre stops fitted in the Radius coupler have been designed to be removable, enabling the coupler to slip completely along the pipe thereby allowing electrofusion to be used for pipe repairs and connections.

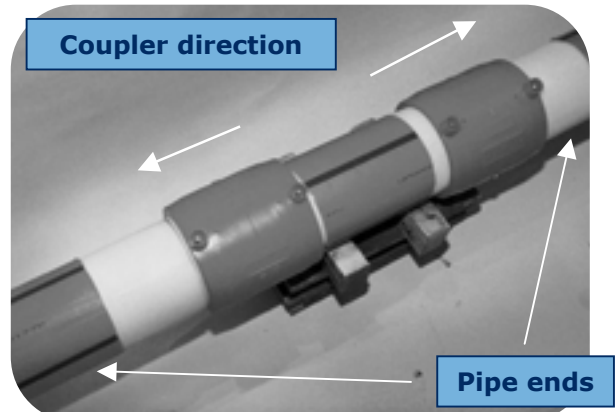
1. In the first instance of a pipe repair, the pipe ends must be cut square.



2. Cut a section of pipe to bridge the two exposed pipe ends. Also position timbers to support the gap section of pipe.

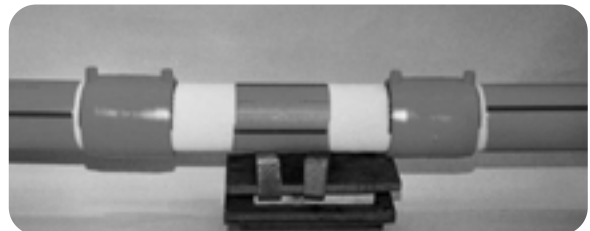


3. Scrape or in this case score the Profuse pipe skin and peel beyond the full length of the couplers. Remove the centre stops and position the fittings onto the pipe.



4. Slide the couplers back into position and mark the pipe with an indelible pen, making sure the pipe joint is central to the couplers.

As with the electrofusion procedure the assembly should be clamped prior to fusing.



Electrofusion Tapping Tee Assembly Procedure.

Electrofusion Tapping Tees are available in a range of sizes with both 32 and 63mm outlets. These fittings are suitable for joining to a range of pipe sizes and wall thicknesses, the details of which are normally printed on each individual fitting.

1. Tooling required for the fitting of the tee is a 40volt control box, a top loading clamp, scraper, a 12mm hexagon-tapping key, cleaning cloths and an indelible pen. Begin by checking that the pipe and fitting sizes are compatible.

2. Using cleaning cloths firstly **clean the area of pipe**, where you intend to weld the fitting.

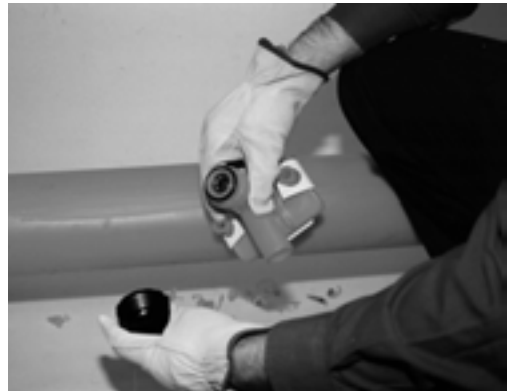
3. **Without removing the fitting from its packaging** place the fitting over the required position on the pipe. With an indelible pen, mark on to the pipe around the fitting the area to be scraped.



4. Using a suitable scraping tool, scrape the surface of the pipe to a depth of 0.2 to 0.4mm over the whole of the identified area.



5. Remove the fitting from its packaging and then remove the cap, exposing the cutter, which should be flush. Do not touch the fitting base.



6. Ensure the loading screw on top of the loading clamp is screwed out fully, and then secure the fitting onto the clamp.



DO NOT TOUCH SCRAPED SURFACE

7. Remove the filament protection cover and position the fitting over the prepared area of the pipe securing the clamp to the manufactures instructions at the same time.

During this operation it is imperative that the scraped pipe surface and the fusion pad are kept **clean and free from contamination.**



8. Apply the correct loading by winding down on the clamp until the correct load is indicated. The preset load indicator may vary slightly between tools. The procedure recommended by the clamp manufactures should be followed to



apply the correct loading onto the fitting.

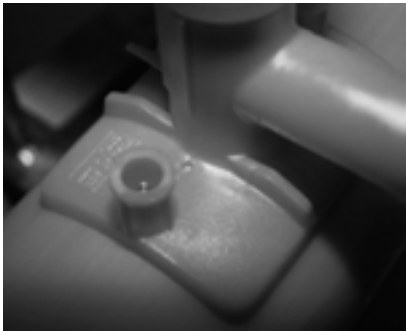
Check that there is sufficient fuel in the generator to fuse the service connection and that the fusion box and leads are in a good serviceable condition.

9. Start the generator and connect the fusion box. Then connect the leads from the fusion box to the terminals of the tee. **Follow the instructions given on the fusion boxes display screen** and input the fusion time either by using the fusion time embossed on the fitting or by using the bar code affixed to the fitting, the method used will depend on the type of control box being employed.



Once fused the fitting must be left with the clamp on for the **full cooling time**, which is also embossed on the fitting.

Check that melt well has been filled with melt before proceeding.



10. During the cooling time it is the ideal time to assemble the service pipe, fittings and equipment needed to connect the tapping tee outlet to the surface pipe.

The tee outlet is classified as pipe and as such, follow the Radius Systems procedure for jointing couplers. The service outlet requires scraping and clamping



An even layer 0.2 to 0.4mm should be removed from the outside of the outlet



and from the service pipe. A range of mechanical scrapers are on the market, which best perform this function.

Clamps are available for all combinations of surface connection.

A number of industry specifications advise that service connections are pressure tested before tapping into the host main. Details of this operation should be sourced from the relevant industry specifications.

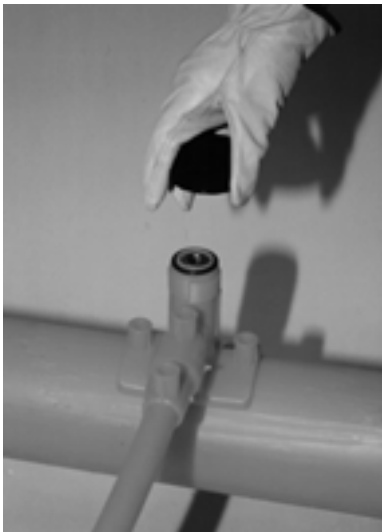
11. When the service pipe is in place and has been successfully tested then the host main may be tapped. The pipeline may be tapped in or out of service. Firstly engage the hexagon drive key into the cutter then wind the cutter down in a continuous clockwise direction until the cutter comes into contact with the pipe.



When you are ready to tap the main, continue screwing the cutter in a **continuous clockwise direction** through the wall of the pipe. This forces a coupon of polyethylene up

into the cutter body to form a seal. The load needed to rotate the tapping key will drop as soon as the main is tapped. Continue rotating the cutter clockwise for another two revolutions before retracting the cutter in an anticlockwise direction.

12. Retract the cutter until the cutter is nearly flush with the top of the fitting, remove the tapping key and then replace the cap.



Installing Tapping Tees using ProFuse Pipe

ProFuse pipe allows electrofusion fittings to be installed without having to scrape the area of pipe to be



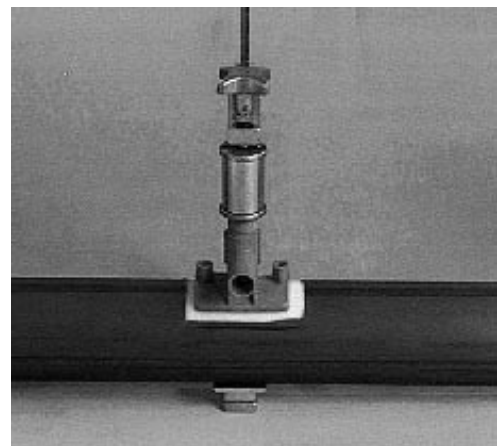
jointed.

A. Firstly follow stages 1,2 and 3 of the Tapping Tee assembly procedure but instead of a scraper, when using ProFuse pipe, a peeling tool is required.

B. With the ProFuse peeling tool score the marked area



C. Remove the peeled section of ProFuse skin. Follow the Tapping Tee assembly procedure from number 5. Weld to the exposed section of pipe

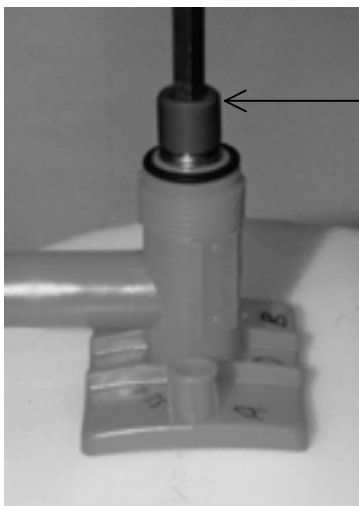


Tapping thick wall Polyethylene

When tapping larger diameter and thicker walled pipes with Radius Systems tapping tees, the fittings are fitted with a two-part cutter.

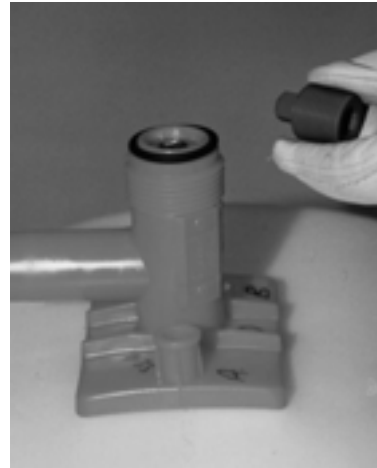
The operation to tap the main is the same as already mentioned, until the point of retraction of the cutter. At this point the cutter and thread follower 'coloured red' are retracted to the point where the cutter is nearly flush to the top of the fitting, at which point the thread follower is removed.

A. Retract the cutter and thread follower until the thread follower can be removed.



**Thread
Follower**

B. Remove the thread follower 'if the follower is not removed it will restrict the outlet'



C. replace the cap



Underclamp Service Connections Fitting Instructions

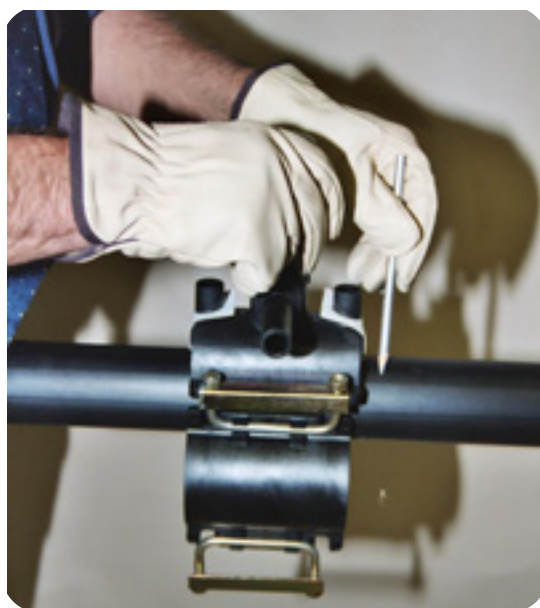
The electrofusion underclamp fittings are available in a range of outlet sizes 20mm, 25mm and 32mm and are available in diameters from 40mm to 180mm.

1. Tooling required for installing of the underclamp fitting is a 40volt control unit, a 13mm spanner or socket, a pipe scraper, a 12mm hexagon-tapping key, cleaning cloths and an indelible marker pen. Begin by checking that the pipe and fitting sizes are compatible.
2. Using cleaning cloths firstly clean the area of pipe, where you intend to weld the fitting.
3. Remove the fitting from its protective bag and slacken the retaining nuts on one side of the underclamp.



4. Without removing the protective cardboard matt cover, place the fitting over the required position on the pipe.

With an indelible pen, mark the area to be scraped on the pipe.



5. Using a suitable scraping tool, scrape the surface of the pipe to a depth of 0.2 to 0.4mm over the whole of the identified area.



6. Remove the cardboard matt cover and place the fitting in position.



Follow the instructions given on the fusion box display screen and input the fusion time either by swiping the bar code label affixed to the fitting with the LED pen connected to the control box, or alternatively the fusion time can be inputted into the fusion box manually. The manual fusion time is embossed onto the fitting body.

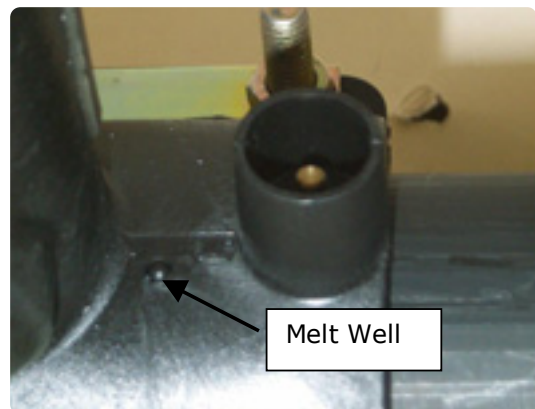


7. Firmly clamp the fitting into position by tightening the clamping straps up to a positive stop using a 13mm spanner or socket.



Once the fitting has completed its fusion time it must be left to cool. The cooling time will be indicated by the fusion box or is embossed on the body of the fitting.

Before continuing to install the service check that the melt well has filled



Check that there is sufficient fuel in the generator to fuse the service connection and that the fusion box leads are in a good serviceable condition.

9. Start the generator and connect the fusion box. Then connect the leads from the fusion box to the terminals of the tee.



When you are ready to tap the main, continue screwing the cutter in a **continuous clockwise direction** through the wall of the pipe. This forces a coupon of polyethylene up into the cutter body to form a seal. The load needed to rotate the tapping key will drop as soon as the main is tapped. Continue rotating the cutter clockwise for another two revolutions before retracting the cutter in an anticlockwise direction.

11. Retract the cutter until the cutter is nearly flush with the top of the fitting, remove the tapping key and then replace the cap.

10. When the service pipe is in place and has been successfully tested then the host main may be tapped. The pipeline may be tapped in or out of service. Firstly engage the 12mm hexagon drive key into the cutter then wind the cutter down in a continuous clockwise direction until the cutter comes into contact with the pipe.

