

GUIDANCE

Joining polyethylene (PE) pipes in cold temperatures.



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Now that the cold weather is upon us, we thought it useful to remind our colleagues in the pipeline industry of some useful guidance on how to achieve a good quality joint, when using the electrofusion and butt-fusion welding techniques in cold temperatures.

Let's start with electrofusion jointing.

We know that PE pipes can be joined using electrofusion fittings at temperatures between -30°C to +50°C. At colder temperatures, PE pipes become a little harder, stiffer and less easy to flex; and as a consequence, it will take a little longer to scrape or prepare the pipe ready for joining. At colder temperatures, the heat takes a little longer to transfer from the fitting to the pipe, therefore, more time may be required to effect a joint.

In the UK, the gas and water industry specifications have specified minimum and maximum ambient temperatures

of -5°C to +23°C for the fixed electrofusion fittings welding times (fuse and cool times), that are embossed on our electrofusion fittings and manually entered into electrofusion control units.

With the above in mind, how do you set the correct welding times, when temperatures are below -5°C, to make sure that the joint receives adequate heat input, which helps ensure that your joint is a good quality joint?



(cont'd...)



1) Use a barcode scanner to automatically read the fusion barcode

The fusion barcode, which caters for temperatures ranging between -30°C and +50°C, has integrated time-temperature compensation, whereby the welding parameters are automatically adjusted to take into consideration the ambient temperature. The barcode is affixed to all our 40V fittings.

At ambient temperatures below -5°C, for instance, the fusion time is automatically generated and increased to allow adequate heat to transfer between the pipe and the fitting. Nowadays, electrofusion control boxes have the technology to integrate a barcode scanner, which facilitates pipeline jointing at different ambient temperatures. Please contact your equipment supplier for further details.

2) If you are not using a barcode scanner and are manually inputting the welding times on the electrofusion control unit.

- a. Use the table of welding times found on our fitting's packaging label. The 'Manual temperature compensation' table provides a range of temperatures with the associated fusion times. Input the correct fusion time for the corresponding ambient temperature.
- b. Make the weld in a heated environment such as a heated shelter. As the fixed fuse and cool times cater for joining at ambient temperatures between -5°C and +23°C, the ambient temperature will need to be raised.

Note

Always seek guidance from the relevant adopting or overseeing authority as to which, if any of the above techniques, are acceptable.

Butt-fusion jointing.

Use a heated shelter.

The butt-fusion equipment is pre-programmed with welding parameters depending on the pipe's material, diameter and SDR, based on ambient temperatures of 0°C and above, as identified in the UK water specification, or -5°C and above as required by the UK gas industry.

The aim of a heated shelter is to gradually raise and control the ambient temperature to above 0°C and preferably to above +5°C. This helps prevent icing of the butt-fusion machine chassis and thickening of hydraulic control fluids.

Important notes on using a heated shelter.

-  Use a heated shelter in cold weather may cause condensation, ensure no moisture is present on the pipe or fitting's jointing surfaces when making the joint.
-  If using a warm air blower, ensure that there is no dust disturbance that may contaminate the pipe surfaces.
-  Ensure the warm air blower is not directed at the pipe, but instead heats the whole sheltered area evenly.

Gas industry reference documents.

- IGEM/TD3/Edition 5 'Steel and PE pipelines for gas distribution'.

Water industry reference document.

- UK Water Industry Specification WIS 4-32-08 - Issue 4 'Specification for the fusion jointing of polyethylene pressure pipeline systems using PE80 and PE100 materials'.

Always follow industry/network specific and the manufacturer's best practice when joining polyethylene pipes.
For more information, please contact our technical support team @ Techsupport@radius-systems.com.



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