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# LARGE DIAMETER ELECTROFUSION COUPLERS

## METRIC SIZE UP TO 1000MM

## ASTM SIZE UP TO 36”

### INSTALLATION INSTRUCTIONS

Smart Joint EF couplers are produced from PE100 and can be fused with pressure pipes made of PE80 & PE100. They cannot be fused with any other materials such as PP, PVC etc.

It is recommended to use pipes with close tolerances, grade B (EN 1555-2:2002)

Working Temperature: Smart Joint EF Couplers could be fused at ambient temperatures of between -10°C (+15 F) and +45°C (+115 F)

Special care should be taken to provide a balanced temperature level of both pipes and fittings before fusion operation.

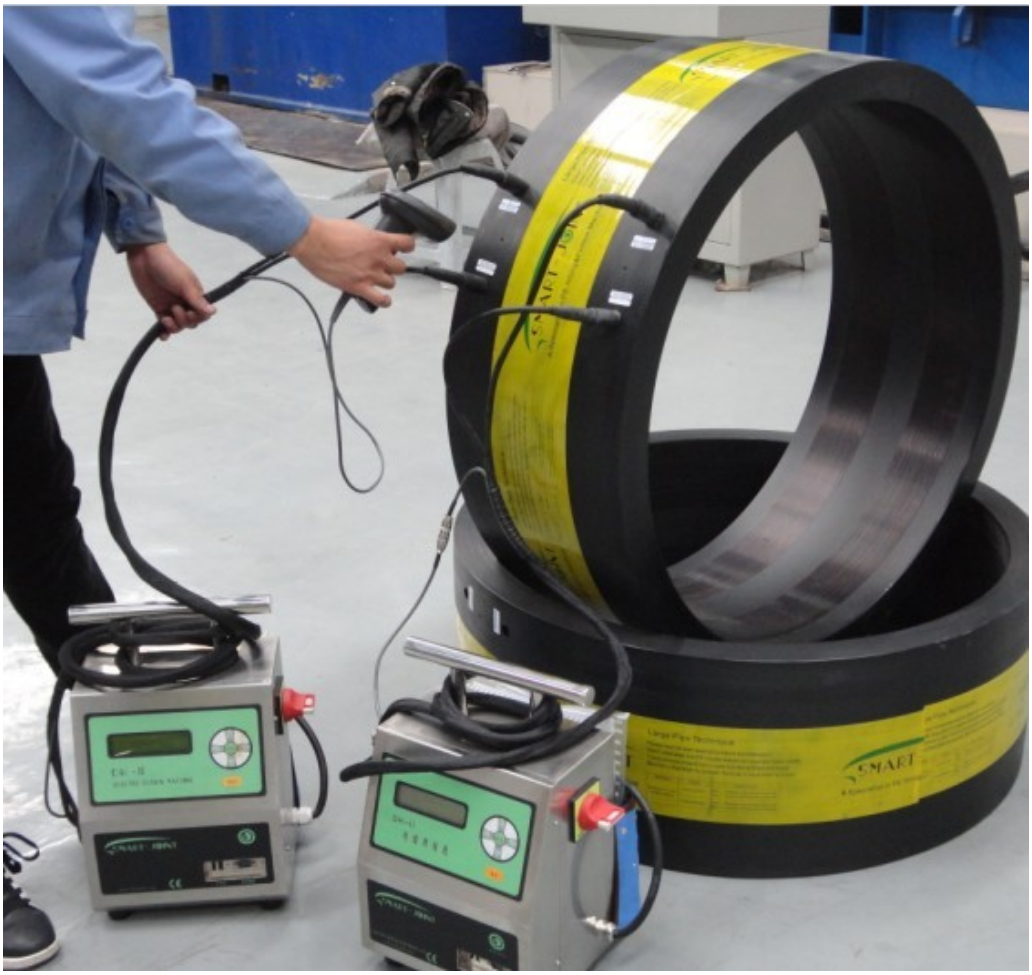
Smart Joint EF Couplers could be fused with Smart Joint Specially designed PH-3 electrofusion machine up to 800mm & PH-4 electrofusion machine up to 1000mm. For other fusion machine, pls contact with Smart Joint to confirm if that brand of electrofusion machine can be used or not.

### 1. Introduction

In principle, the same installation methods are used as for small diameter couplers. But, some steps are more work-intensive. Suitable equipments should be available when transporting and installing large diameter pipes in trench. Whole operation (preparation, installation, fusion etc.) has to be carried out by an experienced team.

### 2. Tools and devices for assembling

- Pipe cutting device (suitable for PE pipe cutting)
- Peeling tool (suitable for large size pipes)
- Hand scraper
- Re-rounding device
- Pipe alignment device
- EF welding machine



### 1. Cutting Pipe Ends

Cut the pipe ends at right angles to the pipe axis. Do not allow the use of any lubricant on the cutting tool. Oil on the cutting tool will create a non-fusible barrier between the pipe and coupling which will lead to joint failure.

For the pipe cutting, a suitable cutter for plastics must be used. If the pipe is not cut at right angles to the pipe axis, this could mean that the heating coils are not in contact with pipe surface, which causes overheating and uncontrolled flow of molten material.

If possible, saw with a right-angled guide is recommended. If it is not possible to provide a cutting device with guide, the cutting lines should be marked on whole circumference of pipe to achieve a right-angle cut-off pipe.

## 2. Marking The Fusion Zone

Fusion Zone: Fusion zone is the half-length of the coupler.

Fusion zone must be measured and marked with a marker on the pipe end as shown in Figure 1.

Figure 1

## 3. Scraping The Fusion Zone

In order to remove the oxide layer completely, the pipe end must be scraped so that shavings are formed as shown in Figure 2. This operation ensures removal of oxide layer, which may cause unsuitability for the jointing. The oxide layer must be removed completely; otherwise it may cause cold welding resulting in leakage.

It must taken into account that the surface of pipe must be smooth (i.e. without any groves, etc).

If there is any unscraped area on pipe surface (especially due to ovality), these areas must also be scraped.

The prepared surface must be protected against dirt, grease and unfavorable weather conditions.

After scraping do not touch the fusion zone again.

Do not scrape the inside of the fitting.

Figure 2

## 4. Deburring/Rounding

Next the internal end of pipe must be deburred, then round off outer edge as shown Figure 3.

Round off the internal and outer edges with a hand scraper.

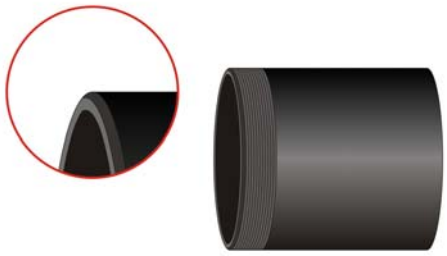


Figure.3

## 5. Use of ReRound Clamps to correct Pipe Ovality

Possible ovality should be corrected using a suitable pipe re-rounding clamps Figure 4

Check the fit of pipe into the coupler. If the pipe is considered too large, the peeling operation has to be repeated. Localized high spots can be removed with a hand scraper. But special care must be taken to ensure that the annular gap formed is as small as possible.

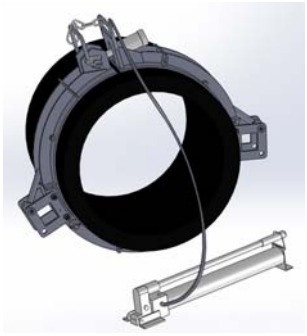


Figure 4

## 6. Degrease the Fusion Zone & Remark

The prepared pipe end and internal face of EF fitting must be degreased with a suitable cleaning agent and a white absorbent and non-fibrous cloth.

The cleaning agent (trichloroethane, acetone or alcohol <greater than 96%>) must be completely evaporated before starting fusion operation. Then remark the fusion zone.

Degreased surfaces must be protected against dirt or unfavorable weather conditions.

Operator should wear clean cotton gloves to ensure the cleaned surfaces don't come in contact with bare hands or any equipment/debris.

## 7. Insert the Pipe into the Coupler

Inserting of the pipe end into the coupler should be done without causing any tilting as shown in Figures 5.

Tapping with a plastic hammer around the face of the coupler can assist insertion. The pipe end must be inserted into the fitting up to the mark.

Pipe should not be inserted if the fit is too tight.

In order to control bending stresses do not let the pipes support their own weight in the coupler. In order to provide unstressed assembly it is recommended to use a suitable holding device. This stress-free condition must be maintained during the cooling period.

The contact terminals of the fitting must be easily accessible.

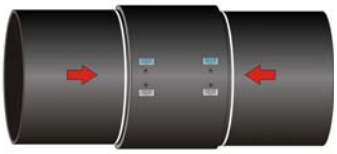


Figure 5

**An assembly, which is stressed, can result in defective joint.**

Before starting fusion operation, check seating of pipe insertion by means of line marks. If necessary do corrections. The maximum allowable gap between the two pipes to be less than > ½".

## 8. Carrying out the Fusion

Provided that the installation instructions are followed step by step, the fusion process can be started. Fusion parameters are included in the barcode label on the fitting as shown in Figures 6.

The fusion parameters are transferred into the fusion control box by means of barcode reader. After reading the barcode, the data on barcode label should be compared with the data on display.

**Each side of bifilar couplers (coupler with two separate windings) has to be fused separately.**

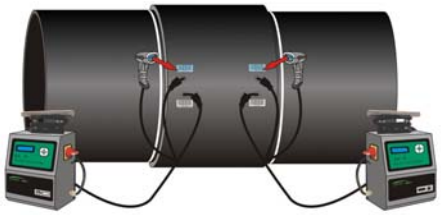


Figure 6

Start the fusion process. Progress of fusion operation can be followed by the display on fusion unit to see if the process is going on properly or not.

**As a safety precaution, be careful to stay at least 1 m away from the fusion area.**

If the fusion process is interrupted for any reason (e.g. due to power failure) the fusion process can be repeated after the joint has cooled adequately.

Cooling time is indicated as CT on the barcode label. It is the time necessary to allow the jointed part to cool down to a temperature. Before completion of cooling time it is not allowed to move the jointed components.