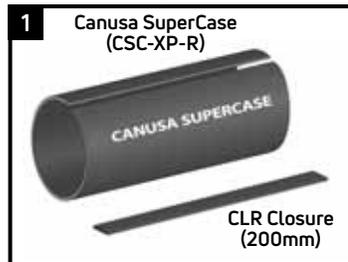


# Canusa SuperCase (CSC-XP Repair)

## CSC-XP-R Solution for Damaged Mainline Coating Sections and Joint Rehabilitation

### Product Description



SuperCase CSC-XP-R shall be cut and v-shaped along entire length of casing.

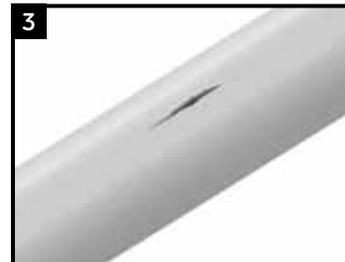
**Option:** Canusa to supply pre-cut and pre-bevelled casings.

### Equipment List



Hot Air Tool, Field Extrusion Welder, Welding Clamp, Polyethylene Welding Material (PE Rod), Knife, Chamfering Tools, Surface Preparation Tools (sandpaper, solvent, rags), Thermometer, Triangle Scraper, Angle Grinder with 40-60 Flap Disks, PPE.

### Minor Damage



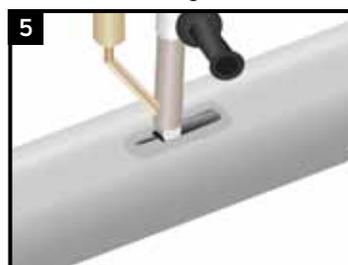
Deep PE jacket gouges not penetrating through to foam

### Damaged Area Preparation



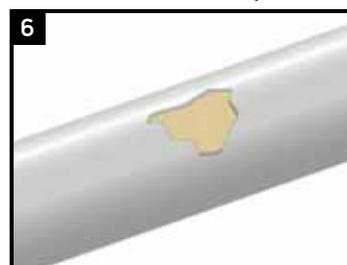
Remove all protruding PE material and expose fresh PE material in preparation for PE welding along and around the entire gouge. Clean the affected area with suitable solvent.

### Extrusion Welding



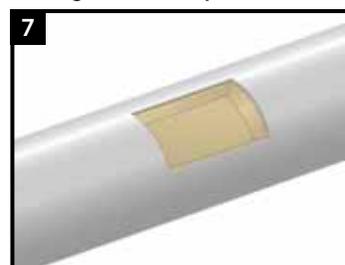
Use appropriate welder settings and compatible PE welding rod to fill in the gouge. Ensure that sufficient pre-heat is achieved on the underlying PE jacket as the hand held welder is pushed along the length of the gouge. Excess extruded PE material should be removed with the angle grinder.

### Major Damage: Not Extending Around the Circumference of the Pipe



Repairs limited to 300mm longitudinal PE jacket pipe damage, not extending around the entire pipe circumference and affecting maximum of 1/2 of PU foam thickness.

### Damaged Area Preparation



In preparation for the installation of the CSC-XP-R (Repair Casing) and PU foam filling, all damaged PE jacket and affected foam must be completely removed from the affected area with a hand held circular saw and appropriate chisel tool. Moreover, all damaged material containing moisture must be completely removed and the cavity checked for presence of moisture.

### PU Foam Infill



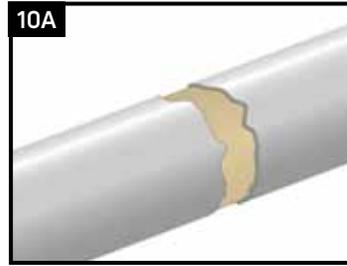
Prepared cavity, which does not encompass the entire circumference of the pipe, is foamed using a removable steel mould. Suitable foam shall be used.

### PU Foam Inspection



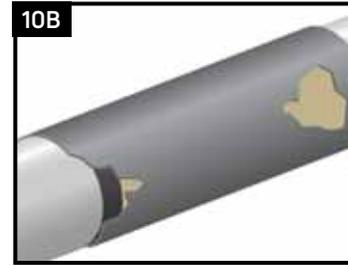
Once the foam cures, the mould is removed and foam inspected. Proceed to step 12.

### Major Damage: Extending Around the Circumference of the Pipe



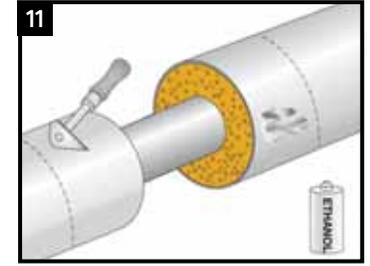
Repairs limited to 450mm longitudinal PE jacket pipe damage, extending (up to) around the entire pipe circumference and affecting entire depth of PU foam. (Repairs to corrosion protection layer are not included in this repair guide.)

### Major Damage: Damaged Joint Casing



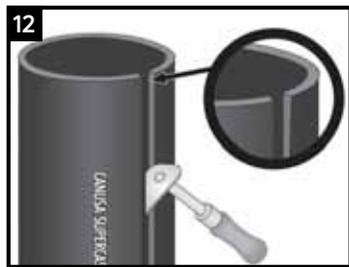
Joint casing replacement (rehabilitation work)

### Cutback & Surface Preparation



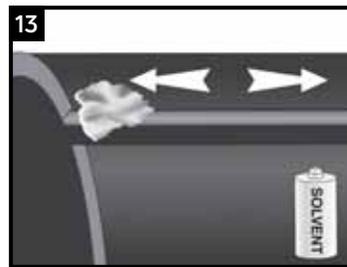
Carefully remove all damage PE jacket and/or the entire damaged joint casing and all damaged PU foam by using suitable circular saw and chisels. Restore the corrosion protective coating as required and any other connection across the joint (ex. heat tracing lines, alarm systems, etc.). Ensure the PE jacket adjacent to the newly created "joint cavity" is clean and free of contamination and burrs. Moreover, all damaged material containing moisture must be completely removed and the cavity checked for presence of moisture.

### CSC-XP-R Edge Preparation



Using a triangle scraper or sand paper, gently remove the oxidized PE layer of both ends of the prepared V-shape on the SuperCase CSC-XP-R to obtain a "fresh" surface for welding.

### Cleaning



Clean V-shape with a cloth using solvent.

### CSC-XP-R & Closing Clamp Placement



CSC-XP-R is wrapped around the pipe and fixed in a clamp tool in order to hold it properly for hot air and extrusion welding.

### Gap Tolerance



Gap between both ends should be adjusted to min. 1mm and max. 2mm prior to closing the clamp.

### Close Clamp



Closing of the clamp.

### Hot Air PE-Root-Seam Welding



Adjust the hot air gun to ~ 270°C so that the air temperature is between ~ 235 and ~ 240°C, measure with temperature gauge. Position the nozzle inside the V-shape at one end of the SuperCase CSC-XP-R and start to heat the CSC-XP-R V-shaped welding surfaces. In parallel, feed the recommended PE-Welding Rod through the nozzle to the very end to assure appropriate pre-heat. Ensure that the PE-Welding Rod is free of any contamination. When both PE materials turn shiny, start to press the PE-Welding Rod constantly and at a moderate speed (ca. 300 mm/min.) through the nozzle of the hot airtool. Ensure a sufficient preheat while pulling the hot air gun along the V-shape to the other end of the SuperCase CSC-XP-R.

### Cool Down



Allow the PE-root-weld-seam to cool down.

### Grind Out PE-Root-Weld-Seam



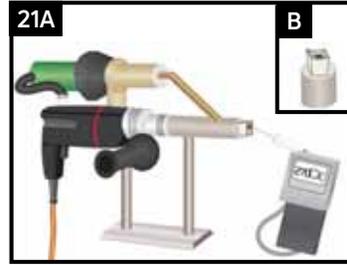
Use a grinder with a flap disc grade 40 - 60 to grind out the root seam. This ensures "fresh" substrate for further welding and to remove any excessive PE-seam.

### Clean V-Shape Seam



Clean V-shape seam with a cloth using solvent.

### Extrusion Weld - Preheat



a) Shown above, the field extrusion welder must be preheated to the correct temperature (~ 270°C).

b) Use appropriate welding shoe (with a flat carved out shape) and adjust the temperature of the PE-Welding-Material to ~ 270°C.

### Extrusion Welding



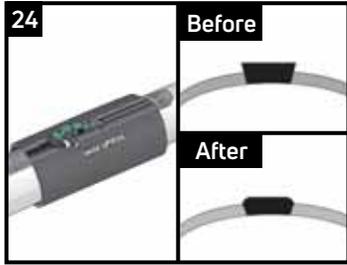
Position the field-extrusion welder on top of the V-shape at one end of the SuperCase CSC-XP-R and start to heat the V-shaped CSC-XP-R welding surfaces. Ensure that the used PE-Welding Rod is free of any contamination. When both sides of the V-shape turn shiny, press the start button to begin welding. Note: The PE-Welding process with a field extrusion welder requires pushing of the equipment rather than pulling as carried out for the PE-root-seam welding. At a moderate speed (ca. 300mm/min.; rod feeding speed 4-5) continue the welding process. Ensure a sufficient pre-heat and a flat weld seam is being created on top of the SuperCase CSC-XP-R while pushing the field extrusion welder along the V-shape to the other end of the SuperCase CSC-XP-R.

### Cool Down



Allow the PE-extrusion-weld-seam to cool down.

### Grind PE-Extrusion-Weld-Seam



Using a grinder with a flap disc grade 40-60 grind both sides of the weld seam to a round cap shape.

### Canusa CLR-200 Closure Application



Measure a piece of CLR-200 closure material - 5 mm shorter than the full width of the CSC-XP-R and prepare the ends by cutting the corners off (1 by 1 cm) to reduce possibility of lifting. The CLR-200 is installed along the entire weld seam to prevent overheating during the application process.

### Closure Application (Continued)



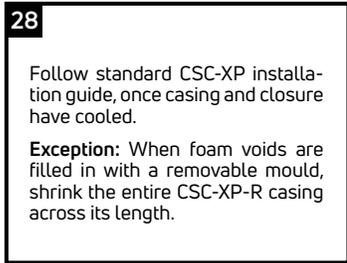
Ensure that the CLR-200 closure is fully conforming around the weld seam by rolling the full surface.

### Removal of PE-Welding Clamp



Allow the PE-extrusion-weld-seam and closure to cool down.

### Standard SuperCase CSC-XP Installation Process



Follow standard CSC-XP installation guide, once casing and closure have cooled.

**Exception:** When foam voids are filled in with a removable mould, shrink the entire CSC-XP-R casing across its length.

### Backfilling Guidelines

To prevent damages to the CSC-XP-R, use selected backfill material (no sharp stones or large particles).

## Storage & Safety Guidelines

To ensure maximum performance, store Canusa products in a dry, ventilated area. Keep products sealed in original cartons and avoid exposure to direct sunlight, rain, snow, dust or other adverse environmental elements. Avoid prolonged storage at temperatures above 40°C (104°F) or below -10°C (14°F). Product installation should be done in accordance with local health and safety regulations.

These installation instructions are intended as a guide for standard products. Consult your Canusa representative for specific projects or unique applications.

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## Quality Management system registered to ISO 9001

Canusa warrants that the product conforms to its chemical and physical description and is appropriate for the use stated on the installation guide when used in compliance with Canusa's written instructions. Since many installation factors are beyond our control, the user shall determine the suitability of the products for the intended use and assume all risks and liabilities in connection therewith. Canusa's liability is stated in the standard terms and conditions of sale. Canusa makes no other warranty either expressed or implied. All information contained in this installation guide is to be used as a guide and is subject to change without notice. This installation guide supersedes all previous installation guides on this product. E&OE

Part No.  
IG\_CSC-XP-R\_rev010