

ASSEMBLY INSTRUCTIONS FOR CPS SLEEVES

1. Entry control sleeve

1.1. Check the accompanying documentation for the sleeve.

1.2. Check the integrity of the sleeve packaging:

- Integrity of the carton
- Integrity of the polyethylene sleeve wrap
- Integrity of bushing detents

1.3 Visually check the integrity and quality of the anti-corrosion coating. Coating defects (chips, through porosity, individual swellings) are not allowed on the inner and end surfaces of the sleeve.

2. Preparing the sleeve for installation

2.1. Remove the protective wraps from the sleeve without damaging the thermoset cuffs immediately prior to installation.

2.2. Clean the inner cavity of the pipes in the area of the ends of dust and other contaminants. If there is an internal burr on electric-welded pipes, the burr should be removed to the border of the uncoated zone.

2.3. Degrease with acetone the inner cavity of the pipes in the area of the ends to a depth of 100 mm.

3. Installing the sleeve in the pipe

3.1. Insert the sleeve into the pipe until detents, while simultaneously turning it around the axis, avoiding scuffing of the cuffs made of heat-insulating and thermosetting materials. During installation, the use of a percussion instrument through a wooden gasket is allowed.

3.2. When installing the sleeve, a slight tightness is allowed. If there is a gap between the sleeve and the pipe more than 1 mm, it is required to center the sleeve as accurately as possible using wooden wedges or electrodes.

3.3. If necessary, press the detents against the end of the pipe to prevent them from burning. To ensure the longitudinal stability of the sleeve, tack all (!) detents of the sleeve to the pipe.

3.4. Using a pipelayer, insert the second pipe onto the sleeve.

3.5. Using an external centralizer, align the axes of the pipes to be connected, providing the gap required by the pipe welding technology.

3.6. Tack the connected pipes and remove the centralizer.

3.7. Using an angle grinder, cut off the protruding parts of the sleeves' detents until the welded edges of the pipes are dulled and clean the tacks (see Fig. 1)

4. Pipe joint welding

4.1. Pipe welding shall be carried out according to the current technology approved by the contractor.

4.2. Welding of pipes with a diameter of 426 mm and above, in order to avoid insufficient heating of the thermosetting material of the sleeve, carry out simultaneously by two welders. It is recommended to start welding from the bottom tack at 5 or 7 o'clock. 4.3. When welding the root joint, it is required to avoid burns (!) of metal and forcing (!) of the electrode or welding wire into the pipe cavity. The height of the return roller must not exceed 1.5 mm.

4.4. Joints with a thickness of 6-10 mm. we recommend cooking in 3 passes, and with a thickness of more than 10 mm. in 4-5 passes using manual arc welding with electrodes of the LB-52 brand (or similar). The root of the joint is recommended to be welded with an electrode $\text{Ø}2.6$ mm at a current of 65-75 A, and filling and facing joints $\text{Ø}3.2$ mm. at a current of 90-100 A.

4.5. After welding the root of the joint, clean the joint and fill it. After filling the joint, clean it and weld the facing joint. The time for cleaning the weld before applying the next layer should be 1-2 minutes.

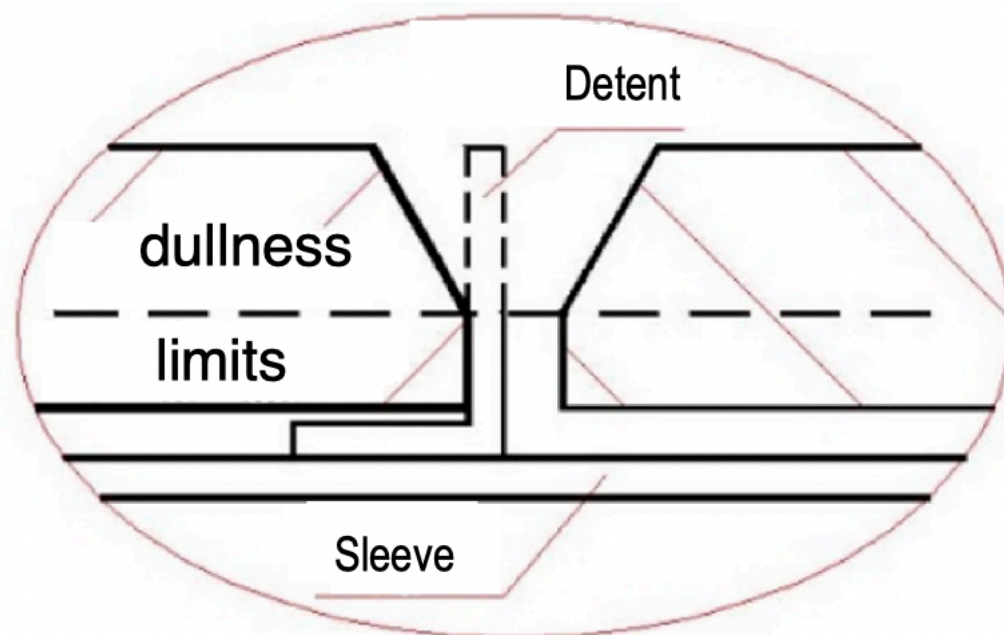
4.6. Do not stop welding work until at least the 3rd coat has been applied.

4.7. On sleeves of small diameters type "MT" designed to connect pipes with a wall thickness of more than 10 mm. in order to avoid local overheating and complete extrusion of the rubber cuff beyond the dimensions of the sleeve, it is recommended to stop welding the joint after filling 3 layers for 60-90 minutes. After the joint has cooled down, continue welding.

4.8. When performing welding and installation work on sleeves $\text{Ø}89$ - 219 mm with wall thicknesses of 4-6 mm at negative air temperatures, additional heating of the welded joint is necessary to ensure the opening of the thermosetting material. Additional heating should be carried out immediately after welding of the joint with a gas burner (propane gas), continuously along the entire perimeter of the joint until the temperature of the metal surface reaches $200\text{ }^{\circ}\text{C}$. Recommended heating time for pipes with a diameter of: $\text{Ø}89$ mm - 1 minute, $\text{Ø}114$ -2 minutes, $\text{Ø}159$ -3 minutes and $\text{Ø}219$ - 4 minutes. The heating time can be changed by instrumental temperature control.

4.9. After cooling of the welded joint, the pipeline is ready for operation. The exit of thermoactive material beyond the dimensions of the sleeve is allowed, but not required. On sleeves of type "M" and "MT", partial extrusion of the rubber cuff beyond the dimensions of the sleeve is allowed.

4.10. If single defects in the weld are detected, it is allowed to repair the weld without dismantling the sleeve installed earlier.



Picture 1