

Welding Procedure

The **Bänninger** PP-R/PP-RCT pipe-work is coupled by socket fusion welding. The pipes and fittings are connected longitudinally overlapping. The heating of pipe ends and sockets is done by a heating element with fitted bushes. After the necessary welding temperature is reached the joining process is done. The pipe and socket diameter as well as the respective heated bush diameters are matched to build up the necessary pressure during the joining process.

The heating element is electrically heated. It has to comply with DVS Directive 2208 part 1 in construction and accuracy.

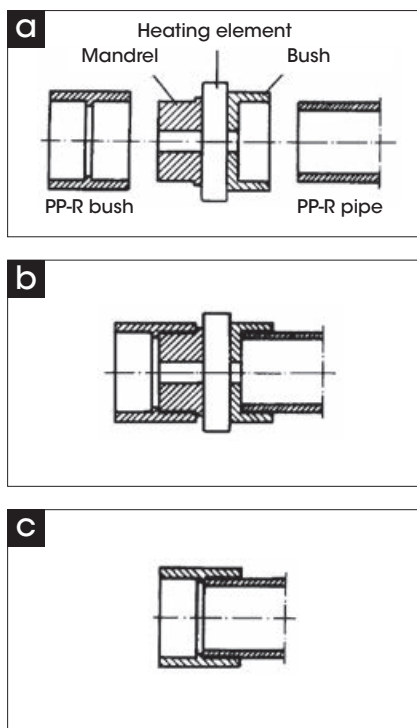
Note on the welding process:
The heating elements (mandrel and bush) must correspond to DVS 2208 part 1, par. 5, table 2, type A (excluding mechanical processing of pipe).

Figures a, b and c schematically show the 3 welding process stages:

a = Welding preparation

b = Warming up

c = Welded joint



Preparations

Cut pipes square into sections. Thoroughly clean both joint faces, the pipe end and socket with spirit and absorbent paper. Mark socket depth on the pipe. Bring the heating element to 260° C. Check the set temperature before the welding process. Temperature tolerance $\pm 10^\circ \text{C}$. The heating element should have an integrated thermometer, otherwise the temperature of the heating element must be controlled by an appropriate measuring device.

Do not start heating the joint parts before the heating temperature has reached 260° C. The mandrel and bush must be clean and have to be cleaned before each following welding process.

1	2	3	4
Pipe outside diameter mm	Heating phase s	Switch s	Cooling min
16	5		
20	5	4	2
25	7		
32	8		
40	12	6	4
50	18		
63	24	8	6
75	30		
90	40	10	8
110	50		
125	60		

Fig. 14
Standard values for socket fusion welding at a room temperature of 20° C. At a room temperature below +5° C the heating phases should be increased by up to 100%.

Welding

Push the pipe and fitting quickly and axially up to the stop of the mandrel and the marked insertion depth respectively and hold them fast without torsion. The heating of the joint faces is done according to the table in fig. 14. After the end of the heating period pull the pipe and fitting abruptly off the heating element and join them immediately axially aligned and without torsion. In considering the correct insertion depth (fig. 15). The pipe must be pushed in up to marked insertion depth respectively up to the socket bottom. We recommend to fix the two joint parts again for a certain time (approximately the heating period).

The welded joint must not be stressed mechanically before end of the cooling time.

Pipe Ø d (mm)	Bush depth=Insertion depth (mm)
16	13,0
20	14,5
25	16,0
32	18,0
40	20,5
50	23,5
63	27,5
75	30,0
90	33,0
110	37,0
125	40,0

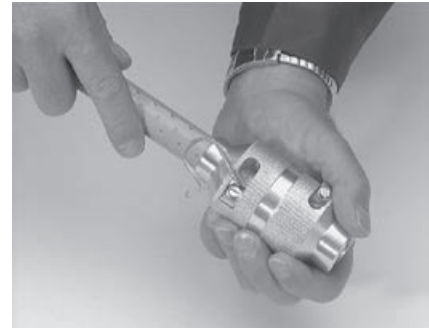
Fig. 15:
Bush depths for PP-R and PP-RCT fittings



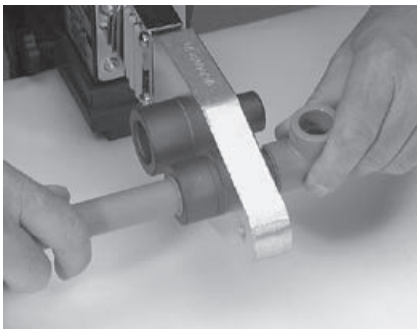
1. Pipes are measured and cut to the required length. Cutting should be rectangular to the pipe axis (90°).



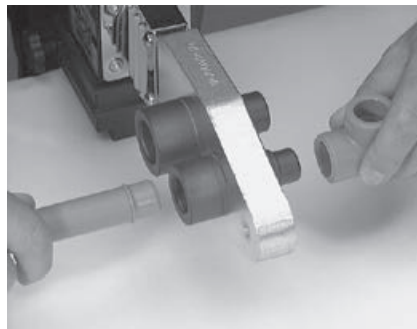
2. Clean the joint area with cleaner. Mark the insert depth of the fitting on the pipe.



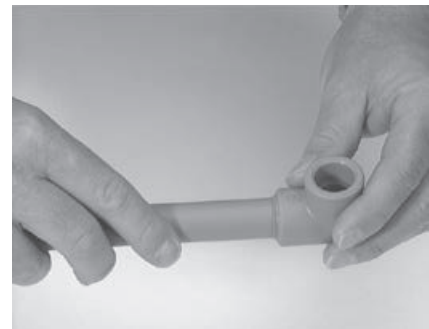
3. When using **Bänninger Stabi-Pipes**, the aluminum coating has to be peeled off before welding them. The length of the peeled zone is determined by the peeling device.



4. Pipe and fitting have to be heated simultaneously. Push in parts to be joined axially.



5. At the end of heating period fitting and pipe end from the heating elements have to be pulled off fully and simultaneously.



6. Adapt and join pipe and fitting within the max. allowed period without turning the parts against each other.

Immediately after the cooling time the fused joints can fully work under pressure. The fusion of the joint parts results in a unique longitudinally force-locked joint.