

Description of Buttwelding Joint Method for HDPE pipes

General

Most common method to connect HDPE pipes is buttwelding.

Buttwelding equipments consist of basic frame with clamping devices of several pipe sizes, electrical planer, heating element and hydraulic pump. As an option welding protocol units and CNC controlled welding units are available.

Welding conditions

Required minimum temperatures for buttwelding indicated in the Norms as DVS 2207, part 1 (Deutscher Verband für Schweißtechnik) are between +5°C (41°F) and 40°C (104°F).

Humidity should be less then 85%.

If the project conditions diverge from these requirements please follow our recommendations TI 110-34.

Buttwelding procedure

Both pipe ends to be joined are clamped using the clamping devices of the basic frame.

Pipe end faces are squared using an electrical planer for pipe paralism and pipe deviation smaller 0.1 x pipe thickness.

The heating element needs to be heated up to 220°C for HDPE and about 200°C for PP pipe welding.

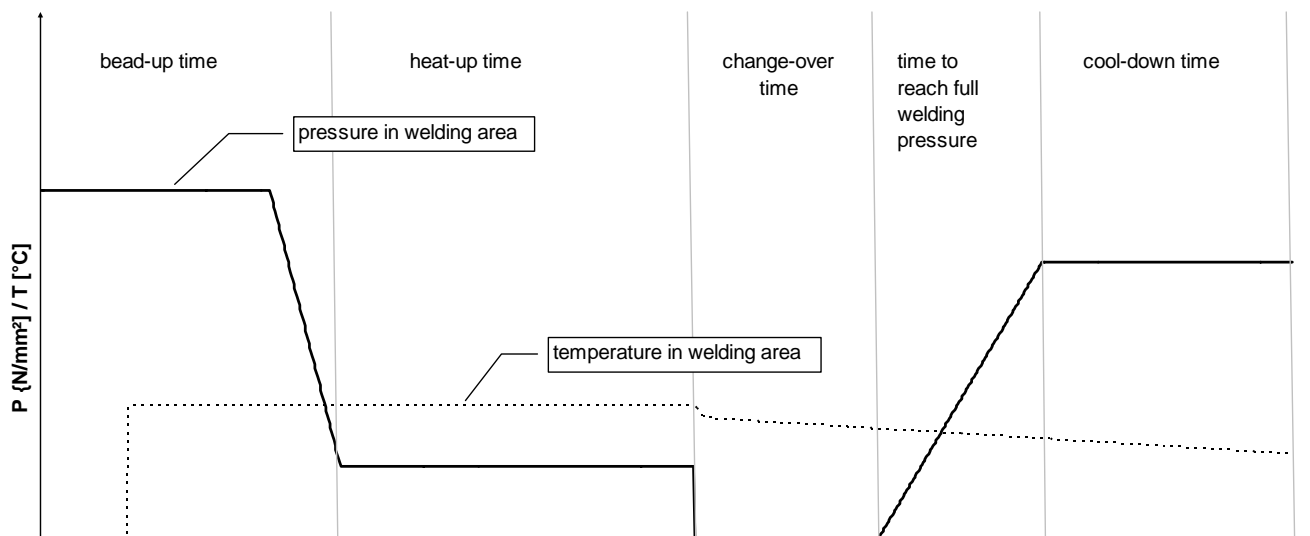
After the heating, the element is placed between the two pipe ends, a high pressure for a short duration called the **Bead up Time** using the hydraulic unit, is applied to increase the welding zone by arising welding bead.

After the necessary bead is achieved the **Heat up Time** follows with very low pressure during longer period to constantly melting up the pipe material at the pipe end area to the welding temperature.

During the **Change Over Time**, to be kept as short as possible, the hydraulic is released, the heating element removed and the pipe ends joined softly under constantly increasing hydraulic pressure during BUILT UP TIME until final welding pressure is reached.

The welding area is cooling down in still clamped pipe position during the complete **Cooling Time**.

The welding operation is finalised after cooling time and pipe can be unclamped.



Welding Quality

It is verified that the duration of the cooling time has a significant influence in the welding quality. A common failure is to reduce the cooling time which is more than half of the total welding operation time to increase jointing capacity.

The Buttwelding process generates weld beads both inside and outside the pipe.

Inspections of the Beads provide useful welding quality check for experts.

Good welding quality concludes in same joint strength as the basic material. In fact the test results might reach more than 100% of pipe value if the welding bead is not removed because of more material in the welding area.

Removal of welding beads

Removal of inner welding bead is common for gas pipelines and others and do not reduce the welding quality if executed with special inner welding bead removal equipments.

Either removal of external welding bead is possible without reduction of welding quality.

Both operations should be executed during the cooling time for easy and accurate execution without damage of welding area.

Welding parameters

Welding parameters as heating pressure, heating time, change over time, welding pressure and cooling time depend on the pipe size, wall thickness and welding equipment model.

Please refer to the operation manual of the welding equipments.