

Buttwelding of HDPE pipes and fittings in ambient of very low or very high temperature.

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 than 85%.

We clearly point out, that we fully agree with this specified norm and the following recommendations are given without responsibility. If it cannot be avoided to weld out of the specified values, we recommend the following parameters to increase the welding quality in cold ambient temperatures down to -30°C (-22°F).

1. First of all the buttwelding operations need to be executed from skilled and experienced welding stuff only!
2. We recommend to perform a test - welding to check the final welding bead design during welding and after cooling time. Of course the best is to execute a tensile and bend test of the buttwelding joint.
3. Welding equipment used in ambient temperatures below -10°C (14°F) are recommended to use with a hydraulic oil of higher viscosity and hydraulic hoses, sealing and electric cables should be replaced by special parts for this use.
4. Pipe material temperature should reach up more than 0°C (32°F).
Preheating of the pipes and fitting's recommended.
Small fitting should be stored warm until welding is executed.
5. Cold ambient temperatures outside the pipe of course influence pipe material temperatures as well as fast cooling of welding mirror. To reach minimum ambient temperature of -10 °C (14°F) special heated tents or enclosures should be used to cover welding equipment and pipe ends (to be weld). At least pipe ends should be pre-heated symmetrical all around by using a fan/heater.

6. If ambient temperatures are below +5°C (41°F), the pipe material is too cold to reach necessary welding zone temperature during indicated heating time.
To reach necessary welding zone temperature we recommend to increase the heating temperature for HDPE of the welding mirror by +10°C (+50°F) to 220°-230°C (428°-446°F) and to increase the heat up time by 30% – 40% of the standard time, given in the instruction manual for the buttwelding equipment used. Additional the time to reach welding bead height to the indicated value should be increased.
It is further recommended to remove the outside welding bead one time all around the pipe, after 1/3 of the standard recommended heat up time, to allow a regular welding bead design after the increased heating time.
7. Welding in very hot ambient temperatures is less critical and more easy to solve, by just using umbrellas / tents for sun protection of the welding area to reduce pipe temperatures. Heating up time can be reduced down to 70%. Time to reach full welding pressure can be reduced to the time needed to reach indicated welding bead height.
8. If humidity is higher than 80%, dehumidification is recommended to avoid shaves of water in the welding zone.