FAST FUSION PROCEDURE - FF01
Weld Cooling

This is intended for the added use of Fast Fusion® weld cooling procedure in conjunction with the Butt Fusion Jointing of PE Pipes and Fittings Recommended Parameters within the industry standards of ISO 21307, TR 33, F2620, CSA 2662-11,& India 7634 (part II) that more fully explains the background, scope and purposes of the generic butt fusion procedures. This Fast Fusion procedure has been qualified for use in accordance with industry standards with particular piping product or combination of piping products. Any copying or reproduction of this procedure without written permission of Fast Fusion, LLC, is a violation of the patent and copyrights.

Fast Fusion® does not replace industry approved fusion procedures. It is a proprietary technology of a weld bead temperature control used in conjunction with industry approved pipe joining fusion procedures and is added to industry known and accepted pipe joining fusion equipment.

This Fast Fusion procedure is for the butt fusion joining of PE pipe produced in accordance with the industry standards intended for butt fusion joining for gas, water distribution, waste water, industrial, irrigation, mining, etc., as well as PE fittings and other approved PE products for pressurized and non-pressurized applications :

- PE 4710
- PE 100
- PE 80
- PE 3408
- PE 2406

Butt Fusion Procedure Parameters:
Pipe Joining Standards & Industry Guidelines specify butt fusion procedures for the jointing of PE pipes with three proven butt fusion jointing procedures for pipes and fittings;

- Single pressure – low fusion jointing procedure
- Dual pressure – low fusion jointing pressure
- Single pressure – high fusion jointing pressure

The butt fusion procedure includes the welding parameters and values required to join the pipe under the standard and the actual pipe joining equipment being used.

With the added use of Fast Fusion® - Only the calculation for Minimum Cooling Time in Machine Under Pressure is changed to the specific time period of seconds contained within this procedure and is Fast Fusion® Appendix 1 for IPS, DIPS and metric pipe sizes OD & SDR.

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Procedures Fast Fusion:

1. Each Fast Fusion machine will have a current copy of the Industry Guidelines for the Butt Fusion Jointing of PE Pipes and Fittings – recommended Parameters.

2. The Operators Manual for the industry approved fusion equipment installed or used with a Fast Fusion machine will be provided for its operation and will be in the machine.

3. Certification of Completion of training is only issued by Fast Fusion.

4. The certified technician must have their current certification on the Fast Fusion machine.

5. Fast Fusion certified training program has the requirement of annual recertification and under the procedures of the Fast Fusion Certified Operator.

6. A fusion technician that does not complete a qualified production fusion weld within a period of thirty (30) days from the last, certification is revoked and they must be re-qualified. Certification is non-transferable from company to company.

7. At completion of the specified Fast Fusion weld cooling time period and before fusion pressure is released, each fusion weld bead surface temperature will be verified with a pyrometer or other electronic surface temperature device & recorded in the daily fusion log. If the weld bead temperature were to be above the procedure specified temperature, then fusion pressure will remain in place until 140° F or (60°C) or less and the problem identified with the Fast Fusion equipment and repaired before used again.

8. Visually inspect and compare the joint against the pipe and fusion equipment manufacturer's recommended appearance guidelines. Visually, the bead height above the pipe and the beads width should be rounded and uniformly sized all around the pipe circumference. The appearance of the weld may have some slight visual change from the initial air when applied but is not a weld bead defect.

9. A daily fusion log will be maintained on each machine & each fusion will identified on the pipe of who completed it and the log signed off by the certified tech each day.

Fast Fusion® Weld Bead Temperature Control:

Following the Fast Fusion® Appendix 1 based upon the pipe OD and SDR the Fast Fusion® procedure would replace the calculation for the **minimum cooling time in machine under pressure** in the pipe fusion parameters and the joint will remain immobile under fusion force until the joint has cooled adequately to develop strength. Allowing proper cooling times under fusion force prior to removal from the clamps of the machine is important in achieving joint integrity. The fusion force should be held between the pipe ends until the melt bead is cooled to the industry standard to release fusion pressure which is currently referenced to be 140 °F (60°C) or less for pressurized pipe.

The Fast Fusion® technology is a fully automatic process applied through Fast Fusion specific proprietary designed equipment that is controlled through either a PLC or micro-processor that has Fast Fusion® proprietary software installed. If the equipment being used does not have the Fast Fusion® identifying trademark shown below, its use is a violation of the patent and proprietary method and is an invalid method and not approved for use.

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