



Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings¹

This standard is issued under the fixed designation F1290; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice describes general procedures for making joints with polyolefin pipe and fittings by means of electrofusion joining techniques. These should be regarded as general procedures and not as a substitute for the installation procedures specified by the manufacturers. Manufacturers should be requested to supply specific recommendations for joining their products.

NOTE 1—Reference to the manufacturer in this practice is defined as the electrofusion fitting manufacturer.

1.2 The techniques covered are applicable only to joining polyolefin pipe and fittings of related polymer chemistry, for example, polyethylenes to polyethylenes using a polyethylene electrofusion fitting. Consult the manufacturer's recommendations for compatibility of the electrofusion fitting with the specific pipe or fitting material to be joined.

1.3 The electrofusion joining technique described can produce sound joints between polyolefin pipe and fittings, provided that all products involved (that is, pipe and fittings) meet the appropriate ASTM specifications.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D1600 Terminology for Abbreviated Terms Relating to Plastics

F412 Terminology Relating to Plastic Piping Systems

F1055 Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing

¹ This practice is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.20 on Joining.

Current edition approved Feb. 1, 2011. Published March 2011. Originally approved in 1990. Last previous edition approved in 2004 as F1290 – 98a(2004). DOI: 10.1520/F1290-98AR11.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminology **F412**, and abbreviations are in accordance with Terminology **D1600**, unless otherwise specified.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *control box*—the apparatus placed between the power source and the electrofusion fitting to regulate energy input to the fitting.

4. Significance and Use

4.1 Using the procedures in Sections 8 and 9, the manufacturer's instructions and equipment, pressure-tight joints can be made between manufacturer-recommended combinations of pipe that are as strong as the pipe itself.

5. Operator Experience

5.1 Skill and knowledge on the part of the operator are required to obtain a good quality joint. Each operator shall be qualified in accordance with recommended procedures and any regulatory agency or industry organization that has jurisdiction over these practices.

5.2 These procedures require the use of electrical and mechanical equipment. The person responsible for the joining of polyolefin pipe and fittings should ensure that recommended procedures developed for the electrofusion fittings involved, including the safety precaution to be followed, are issued before joining operations commence. It is especially important that the operator be aware of specific instructions regarding the use of electrical equipment in the presence of a potentially explosive environment.

6. Electrofusion Joining Processes

6.1 Electrofusion is a heat-fusion joining process where a heat source is an integral part of the fitting. When electric current is applied, heat is produced, melting and joining the components. Fusion occurs when the joint cools below the melt temperature of the material. The specified fusion cycle used requires consideration of the properties of the materials being joined, the design of the fitting being used, and the environmental conditions. See Specification **F1055** for performance requirements of polyethylene electrofusion fittings.

6.2 Adequate joint strength for field testing is attained when the fitting is not disturbed or moved until the joint material