Designation: F1056 – 18

An American National Standard

Standard Specification for Socket Fusion Tools for Use in Socket Fusion Joining Polyethylene Pipe or Tubing and Fittings[1]

This standard is issued under the fixed designation F1056; 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 specification covers socket fusion tools for use in making socket fusion joints between polyethylene pipe or tubing and fittings as specified by Specifications D3035, D2513, and D2683. This specification covers newly manufactured heater faces and used heater faces which have been recoated. Requirements for materials, workmanship, and dimensions are included. Where applicable on this specification, "pipe" shall mean "pipe" and "tubing."

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D1600 Terminology for Abbreviated Terms Relating to Plastics

D2513 Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings

D2683 Specification for Socket-Type Polyethylene Fittings for Outside Diameter-Controlled Polyethylene Pipe and Tubing

D3035 Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter

F412 Terminology Relating to Plastic Piping Systems

3. Terminology

3.1 *Definitions:*

3.1.1 *General*—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 *chamfer tool*—a device that is used to chamfer the outside edge of the pipe. The chamfer allows the pipe end to easily enter the pipe heater face and easily enter the heated fitting. Chamfering is optional for all sizes but commonly done for 1¼-in. IPS and larger sizes.

3.2.2 *depth gage*—a device that is used to locate the rounding clamp a prescribed distance from the end of the pipe.

3.2.3 *heating tool*—a device used to heat the heater faces.

3.2.4 *fitting heater face or adapter*—A block of heat conducting material that attaches to the heating tool and is dimensioned to melt the internal surface of the fitting socket.

3.2.5 *pipe heater face or adapter*— A block of heat conducting material that attaches to the heating tool and is dimensioned to melt the external surface of the pipe.

NOTE 1—The fitting heater face and pipe heater face can be in one block of heat conducting material.

3.2.6 *rounding clamp or cold ring*—a device that is clamped around the pipe to round the pipe and limit the distance the pipe end goes into the pipe heater face and the socket fitting.

4. Materials and Manufacture

4.1 Heater faces may be manufactured from aluminum, steel, or other suitable heat conducting material.

NOTE 2—Polyethylene may stick to hot metal heating surfaces. This sticking may be minimized by covering the heating surfaces with a stick-resistant coating such as polytetrafluoroethylene (PTFE) or polyphenylene sulfide (PPS). Copper or copper alloys are not suitable without coating because some polyolefins react with copper.

5. Dimensions, Mass, and Permissible Variations

5.1 Heater face dimensions and tolerances shall be as shown in Table 1. The dimensions in Table 1 are for heater faces at the commonly used operating temperature of 500°F (260°C). Annex A1 contains Table A1.1 which gives dimensions to measure for coated aluminum faces at 73.4°F (23°C).

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

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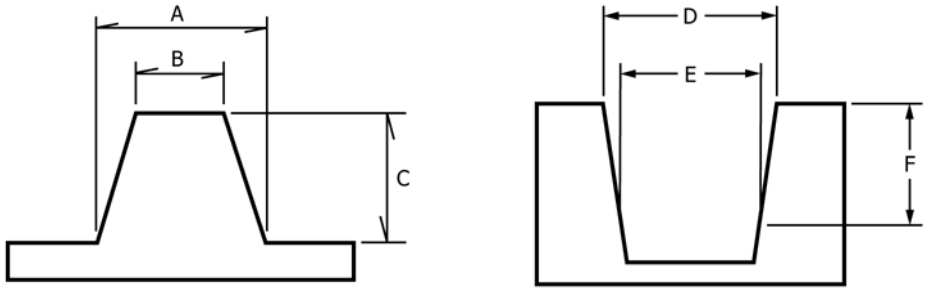
[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

***A Summary of Changes section appears at the end of this standard**

TABLE 1 Socket Fusion Heater Faces[A,B,C,D]



Size in.	Fitting Heater Face						Pipe Heater Face					
	A Diameter, in. (mm)		B Diameter, in. (mm)		C Depth, in. (mm)		D Diameter, in. (mm)		E Diameter, in. (mm)		F Depth, in. (mm)	
	max	Tolerance	max	Tolerance	max	Tolerance	min	Tolerance	min	Tolerance	min	Tolerance
½ IPS	0.837	–0.007	0.793	–0.007	0.625	–0.010	0.851	+0.007	0.807	+0.007	0.625	+0.010
	(21.26)	(–0.18)	(20.14)	(–0.18)	(15.88)	(–0.25)	(21.62)	(+0.18)	(20.50)	(+0.18)	(15.88)	(+0.25)
¾ IPS	1.046	–0.008	1.004	–0.008	0.625	–0.010	1.062	+0.008	1.020	+0.008	0.625	+0.010
	(26.57)	(–0.20)	(25.50)	(–0.20)	(15.88)	(–0.25)	(26.97)	(+0.20)	(25.91)	(+0.20)	(15.88)	(+0.25)
1 IPS	1.312	–0.008	1.259	–0.008	0.687	–0.010	1.328	+0.008	1.275	+0.008	0.687	+0.010
	(33.32)	(–0.20)	(31.98)	(–0.20)	(17.45)	(–0.25)	(33.73)	(+0.20)	(32.39)	(+0.20)	(17.45)	(+0.25)
1¼ IPS	1.657	–0.008	1.604	–0.008	0.875	–0.010	1.673	+0.008	1.620	+0.008	0.875	+0.010
	(42.09)	(–0.20)	(40.74)	(–0.20)	(22.23)	(–0.25)	(42.49)	(+0.20)	(41.15)	(+0.20)	(22.23)	(+0.25)
1½ IPS	1.896	–0.010	1.840	–0.010	0.875	–0.010	1.916	+0.010	1.860	+0.010	0.875	+0.010
	(48.16)	(–0.25)	(46.74)	(–0.25)	(22.23)	(–0.25)	(48.67)	(+0.25)	(47.24)	(+0.25)	(22.23)	(+0.25)
2 IPS	2.371	–0.010	2.315	–0.010	0.875	–0.010	2.391	+0.010	2.335	+0.010	0.875	+0.010
	(60.22)	(–0.25)	(58.80)	(–0.25)	(22.23)	(–0.25)	(60.22)	(+0.25)	(59.31)	(+0.25)	(22.23)	(+0.25)
3 IPS	3.494	–0.014	3.426	–0.014	1.000	–0.010	3.522	+0.014	3.454	+0.014	1.000	+0.010
	(88.75)	(–0.36)	(87.02)	(–0.36)	(25.40)	(–0.25)	(89.46)	(+0.36)	(87.73)	(+0.36)	(25.40)	(+0.25)
4 IPS	4.495	–0.014	4.421	–0.014	1.125	–0.010	4.523	+0.014	4.449	+0.014	1.125	+0.010
	(114.17)	(–0.36)	(112.29)	(–0.36)	(28.58)	(–0.25)	(114.88)	(+0.36)	(113.00)	(+0.36)	(28.58)	(+0.25)
½ CTS	0.622	–0.007	0.571	–0.007	0.625	–0.010	0.636	+0.007	0.585	+0.007	0.625	+0.010
	(15.80)	(–0.18)	(14.50)	(–0.18)	(15.88)	(–0.25)	(16.15)	(+0.18)	(14.86)	(+0.18)	(15.88)	(+0.25)
¾ CTS	0.871	–0.008	0.817	–0.008	0.625	–0.010	0.887	+0.008	0.833	+0.008	0.625	+0.010
	(22.12)	(–0.20)	(20.75)	(–0.20)	(15.88)	(–0.25)	(22.53)	(+0.20)	(21.16)	(+0.20)	(15.88)	(+0.25)
1 CTS	1.122	–0.008	1.059	–0.008	0.625	–0.010	1.138	+0.008	1.075	+0.008	0.625	+0.010
	(28.50)	(–0.20)	(26.85)	(–0.20)	(15.88)	(–0.25)	(28.91)	(+0.20)	(27.31)	(+0.20)	(15.88)	(+0.25)
1¼ CTS	1.372	–0.008	1.314	–0.008	0.687	–0.010	1.388	+0.008	1.330	+0.008	0.687	+0.010
	(34.85)	(–0.20)	(33.38)	(–0.20)	(17.45)	(–0.25)	(35.26)	(+0.20)	(33.78)	(+0.20)	(17.45)	(+0.25)

[A] Dimensions are for heater faces at the commonly used operating temperature of 500°F (260°C) (see Annex A1 for dimensions for coated, aluminum heater faces at 73.4°F (23°C)).
[B] Recommended heater faces should be manufactured close to maximum diameter for fitting heater faces and close to minimum diameter for pipe heater faces to allow for wear and recoating.
[C] Minimum dimensions have zero negative tolerance. Maximum dimensions have zero positive tolerance. The sketches and designs of the heater faces are illustrative only. Entrance and base chamfer or radius is optional. The maximum entrance and base chamfer or radius is 0.03 in. (0.7 mm).
[D] "F" Depth Tolerances are intended as a point of measurement of "E" diameter only and not as a limit of actual socket tool depth. The depth of the pipe heater face socket may be of any dimension greater than "F".

5.2 Depth gage dimensions and tolerances shall be as shown in Table 2.

5.3 Chamfer dimensions shall be limited to a maximum of 20 % of the ASTM depth gage depth along the pipe wall and 60 % of the wall thickness.

6. Workmanship, Finish, and Appearance

6.1 The manufacture of these socket fusion tools shall be in accordance with good commercial practice so as to produce socket fusion tools meeting the requirements of this specification. Heater faces shall have surfaces free of cracks, voids, foreign inclusions, or injurious defects.

7. Sampling

7.1 Select at random a sufficient quantity of socket fusion tools from each lot to be tested to determine that the basic properties and dimensions are in conformance with this specification.

8. Inspection

8.1 Inspection of socket fusion tools shall be agreed upon between the purchaser and the supplier as part of the purchase contract.

8.2 Inspection for dimensional accuracy shall be done with dial calipers, micrometers, or similar devices that have an accuracy within 0.001 in. (0.025 mm).

9. Product Marking

9.1 Each heater face or depth gage shall, space permitting, be permanently marked with the following on a portion of the heater face or depth gage which will not interfere with use or performance:

9.1.1 Nominal size of pipe for which the heater face or depth gage is designed; including IPS or CTS designation,

9.1.2 Manufacturer's name or trademark,

9.1.3 ASTM designation number, and