



Standard Specification for Black Crosslinked Polyethylene (PEX) Pipe, Fittings and Joints For Pipe for Gas Distribution Applications¹

This standard is issued under the fixed designation F2968/F2968M; 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 outside diameter controlled, ~~black metric-sized and IPS-sized~~ inch-sized black or yellow crosslinked polyethylene (PEX) pipe, ~~fittings and joints~~, made in pipe dimension ratios ranging from 6 to 17, and pressure rated for gas distribution. Included are requirements and test methods for material, workmanship, dimensions, burst pressure, hydrostatic sustained pressure, stabilizer functionality, bent-pipe hydrostatic pressure, degree of crosslinking, chemical resistance, minimum operating temperature and squeeze-off. Requirements for pipe and fittings markings are also given. The pipe, fittings and joints pipe covered by this specification are intended for buried gas distribution and gas transmission pressure piping applications.

1.2 This specification also includes requirements for joints made between PEX pipe and polyethylene electrofusion fittings (such as Specification **F1055**). Fittings to be used with PEX pipe manufactured to this specification are in Specification **F2829**. Installation considerations are in **X3.2**.

NOTE 1—Inch-sized fittings should not be used for metric-sized pipe, and metric-sized fittings should not be used for inch-sized pipe.

1.3 The text of this specification references notes, footnotes, and appendixes, which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the specification.

1.4 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

NOTE 1—Metric sized (SI units) pipe should only be joined with corresponding metric sized fittings, and inch sized pipe should only be joined with corresponding inch sized fittings. Inch sized fittings should not be used for metric sized pipe, and metric sized fittings should not be used for inch sized pipe.

1.5 *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.*

1.6 *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

D543 Practices for Evaluating the Resistance of Plastics to Chemical Reagents

D618 Practice for Conditioning Plastics for Testing

D792 Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

D1505 Test Method for Density of Plastics by the Density-Gradient Technique

D1598 Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure

D1599 Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings

D1600 Terminology for Abbreviated Terms Relating to Plastics

D1603 Test Method for Carbon Black Content in Olefin Plastics

¹ This specification is under the jurisdiction of ASTM Committee **F17** on Plastic Piping Systems and is the direct responsibility of Subcommittee **F17.60** on Gas. Current edition approved Nov. 1, 2014/March 1, 2020. Published December 2014/April 2020. Originally approved in 2014. Last previous edition approved in 2014 as D2968/D2968M-14-14a. DOI: 10.1520/F2968-14A; 10.1520/F2968/F2968M-20.

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.

- [D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings](#)
- [D2290 Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe](#)
- [D2565 Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications](#)
- [D2765 Test Methods for Determination of Gel Content and Swell Ratio of Crosslinked Ethylene Plastics](#)
- [D2837 Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products](#)
- [D4218 Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique](#)
- [F412 Terminology Relating to Plastic Piping Systems](#)
- [F876 Specification for Crosslinked Polyethylene \(PEX\) Tubing](#)
- [F1041 Guide for Squeeze-Off of Polyolefin Gas Pressure Pipe and Tubing](#)
- [F1055 Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene \(PEX\) Pipe and Tubing](#)
- [F1563 Specification for Tools to Squeeze-off Polyethylene \(PE\) Gas Pipe or Tubing](#)
- [F1948 Specification for Metallic Mechanical Fittings for Use on Outside Diameter Controlled Thermoplastic Gas Distribution Pipe and Tubing](#)
- [F2657 Test Method for Outdoor Weathering Exposure of Crosslinked Polyethylene \(PEX\) Tubing](#)
- [F2829 Specification for Metric- and Inch-Sized Fittings for Crosslinked Polyethylene \(PEX\) Pipe](#)
- [F2897 Specification for Tracking and Traceability Encoding System of Natural Gas Distribution Components \(Pipe, Tubing, Fittings, Valves, and Appurtenances\)](#)
- 2.2 *Federal Standard*.³
- [FED-STD-123 Marking for Shipment \(Civil Agencies\)](#)
- 2.3 *Military Standard*.³
- [MIL-STD-129 Marking for Shipment and Storage](#)
- 2.4 *ISO Standards*.⁴
- [ISO 1167 Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method](#)
- [ISO 13477 Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack propagation \(RCP\) — Small-scale steady-state test \(S4 test\)](#)
- [ISO 14531-1 Plastics pipes and fittings — Crosslinked polyethylene \(PE-X\) pipe systems for the conveyance of gaseous fuels — Metric series — Specifications — Part 1: Pipes](#)
- [ISO 14531-2 Plastics pipes and fittings — Crosslinked polyethylene \(PE-X\) pipe systems for the conveyance of gaseous fuels — Metric series — Specifications — Part 2: Fittings for heat-fusion jointing](#)
- [ISO 14531-3 Plastics pipes and fittings — Crosslinked polyethylene \(PE-X\) pipe systems for the conveyance of gaseous fuels — Metric series — Specifications — Part 3: Fittings for mechanical jointing \(including PE-X/metal transitions\)](#)
- 2.5 *PPI Standards*.⁵
- [PPI TR-3 Policies and Procedures for Developing Hydrostatic Design Basis \(HDB\), Pressure Design Basis \(PDB\), Strength Design Basis \(SDB\), and Minimum Required Strength \(MRS\) Ratings for Thermoplastic Piping Materials or Pipe](#)
- [PPI TR-4 PPI Listing of Hydrostatic Design Basis \(HDB\), Strength Design Basis \(SDB\), Pressure Design Basis \(PDB\) and Minimum Required Strength \(MRS\) Ratings for Thermoplastic Piping Materials or Pipe](#)

3. Terminology

3.1 *Definitions*—Definitions are in accordance with Terminology [F412](#), and abbreviations are in accordance with Terminology [D1600](#), unless otherwise specified. The abbreviation for crosslinked polyethylene is PEX. Plastic pipe denotes a particular diameter schedule of plastic pipe that is outside diameter controlled.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *crosslinked polyethylene, n*—a polyethylene material that has undergone a change in molecular structure using a chemical or a physical process whereby the polymer chains are chemically linked.

3.2.2 *PEX pipe material designation code*—The PEX pipe material designation code shall consist of the abbreviation for crosslinked polyethylene (PEX) followed by four Arabic digits as shown in [Table 1](#), and as defined in Terminology [F412](#) for PEX pipe materials.

4. Pipe Classification

4.1 *General*—This [standards specification](#) covers black-PEX pipe that is pressure rated based on HDB at 73°F [23°C] and 200°F [93°C], 73 °F [23 °C] and 200 °F [93 °C]. Pressure ratings for temperatures between 73°F [23°C] and 200°F [93°C] are determined by temperature interpolation in accordance with PPI TR-3.

³ DLA Document Services Building 4/D 700 Robbins Avenue Philadelphia, PA 19111-5094 <http://quicksearch.dla.mil/>

⁴ Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, <http://www.iso.org>.

⁵ Available from Plastics Pipe Institute (PPI), 105 Decker Court, Suite 825, Irving, TX 75062, <http://www.plasticpipe.org>.

TABLE 1 PEX Pipe Material Designation Codes

PEX Pipe Material Designation Code	73°F [23°C] HDB Psi [MPa]	200°F [93°C] HDB Psi [MPa]
PEX 0006	1250 [8.62]	630 [4.34]
PEX 0008	1600 [11.03]	630 [4.34]
PEX 0009	1800 [12.41]	630 [4.34]

4.2 *Classification*—PEX pipes are classified by their PEX pipe material designation codes as shown in [Table 1](#).

5. Materials

5.1 *General*—PEX pipes, meeting the requirements of this specification, are defined by means of (1) degree of crosslinking per [6.7](#), and (2) long-term strength tests per Test Method [D2837](#) to determine HDB per [Table 1](#). The HDB is a property of the PEX compound, which is used to make the PEX pipe.

5.2 *Basic Materials*—PEX pipe and fittings shall be made from PE compounds, which have been crosslinked by peroxides, azo compounds, or silane compounds in extrusion, or by electron beam after extrusion, such that the pipe meets the performance requirements of Section [6](#). The materials, procedure for mixing, and the process for crosslinking shall result in a product with Hydrostatic Design Basis ratings equal to or better than those shown in [Table 1](#), when determined in accordance with procedures no less restrictive than those of Test Method [D2837](#), and the PEX material shall have a Plastics Pipe Institute (PPI) long-term hydrostatic design stress and hydrostatic design basis rating per PPI TR-3. See [Appendix X1](#) for additional information on PPI hydrostatic stress ratings.

5.3 *Pipe Material Designation Code*—The PEX material meeting the requirements of this specification shall be designated PEX 0006, PEX 0008 or PEX 0009.

NOTE 2—The first two digits in the pipe material designation code are for chlorine resistance and UV resistance. A “0” indicates “not tested”. If either of these properties has been tested, then the “0” is replaced by the appropriate digit.

5.4 *Density*—When determined in accordance with [7.5](#), the PE base resin used for PEX pipe, without carbon black, used for PEX pipe shall have a minimum average density of 0.926 g/cm³.

5.5 *Carbon Black—Color*: PE compounds used to make PEX pipe shall contain 2.0 to 3.0 percent well dispersed carbon black as measured in the PEX pipe by Test Methods [D1603](#) or [D4218](#).

5.5.1 PE compounds used to make black PEX pipe shall contain well dispersed carbon black as a colorant.

5.5.2 PE compounds used to make yellow PEX pipe shall contain a yellow pigment as a colorant.

5.6 *UV Protection*:

5.6.1 Black pipe with or without yellow stripes shall be stabilized and protected against deterioration from unprotected UV exposure for not less than 10 years. Yellow pipe shall be stabilized and protected against deterioration from unprotected UV exposure for not less than 3 years.

5.6.2 If the carbon black content is less than 2.0 %, the pipe shall be tested in accordance with Test Method [F2657](#), Practice [D2565](#) or ISO 14531-1 Annex C. After PEX pipe has been weathered, it shall meet the thermal stability, 95 °C hydrostatic strength (for stress values, use 536 psi (3.7 MPa) for PEX 0006, 681 psi (4.7 MPa) for PEX 0008, or 768 psi (5.3 MPa) for PEX 0009), and elongation at break requirements of ISO 14531-1, Table 8.

5.6.3 If the carbon black content is greater than 2.0 % and less than 3.0 % as measured by Test Method [D1603](#) or Test Method [D4218](#), the UV exposure time requirement of [5.6.2](#) is not applicable. This is consistent with ISO 14531-1, Table 8. The carbon black shall be well dispersed, and have the correct type (furnace) and particle size (40 nm or less), such as N550.

5.7 *Rework Material*—PEX rework shall not be used in the manufacture of PEX pipes and fittings made in accordance to this specification.

5.8 *Chemical Resistance*—The PEX material shall not increase in weight more than 0.5 % (1.0 % for toluene in methanol). Where the test specimen is a pipe ring, the material shall not change more than ±12 % in apparent tensile yield strength when measured in accordance with [7.11](#).

NOTE 3—This test is only an indication of what will happen as a result of short-term exposure to these chemicals. For long-term results, additional testing is required.

6. Requirements

6.1 *Workmanship*—The pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, or other defects. The pipe shall be as uniform as commercially practicable in color, opacity, density, and other physical properties.

6.2 *Out-of Roundness*—The maximum out-of roundness requirements shown in [Table 2](#) and [Table 3](#) for pipe apply to the average measured diameter in accordance with [7.4.1](#).

TABLE 2 Metric-sized Outside Diameters and Tolerances for PEX Pipe

Pipe Size	Average Outside Diameter		Tolerances for Average Diameter		Out-of-Roundness
	mm	mm	mm	mm	mm
16		16.15		±0.15	1.2
20		20.15		±0.15	1.2
25		25.15		±0.15	1.2
32		32.15		±0.15	1.3
40		40.20		±0.20	1.4
50		50.20		±0.20	1.4
63		63.20		±0.20	1.5
75		75.25		±0.25	1.6
90		90.30		±0.30	1.8
110		110.35		±0.35	2.2
125		125.40		±0.40	2.5
140		140.45		±0.45	2.8
160		160.50		±0.50	3.2
180		180.55		±0.55	3.6
200		200.60		±0.60	4.0
225		225.70		±0.70	4.5
250		250.75		±0.75	5.0
280		280.85		±0.85	9.8
315		315.95		±0.95	11.1
355		356.10		±1.10	12.5
400		410.20		±1.20	14.0
450		451.35		±1.35	15.6
500		501.50		±1.50	17.5
560		561.70		±1.70	19.6
630		631.90		±1.90	22.1
710		713.20		±3.20	24.8
800		813.00		±3.60	28.0
900		904.05		±4.05	31.5
1000		1004.50		±4.50	35.0

TABLE 3 Inch-sized Outside Diameters and Tolerances for PEX Pipe

Pipe Size	Outside Diameter		Tolerances for Outside Diameter (±)	
	in.	in.	in.	in.
3		3.500		0.016
4		4.500		0.020
5		5.563		0.025
6		6.625		0.030
8		8.625		0.039
10		10.750		0.048
12		12.750		0.057
14		14.000		0.063
16		16.000		0.072
18		18.000		0.081
20		20.000		0.090
22		22.000		0.099
24		24.000		0.108
26		26.000		0.117
28		28.000		0.126
30		30.000		0.135
32		32.000		0.144
34		34.000		0.153
36		36.000		0.162
42		42.000		0.189
48		48.000		0.216
54		54.000		0.243

6.3 Dimensions and Tolerances:

6.3.1 *Outside Diameters*—The outside diameters and tolerances shall be as shown in Table 2 or Table 3, when measured in accordance with 7.4 and 7.4.1.

6.3.2 *Wall Thickness*—The wall thickness and tolerances shall be as shown in Table 4 or Table 5, when measured in accordance with 7.4 and 7.4.2.

6.4 *Sustained Pressure 73°F [23°C]*—The PEX pipe shall not fail in less than 1000 h when tested in accordance with 7.6. For PEX 0006 the stress shall be 1320 psi [9.1 MPa], for PEX 0008 the stress shall be 1650 psi [11.3 MPa], and for PEX 0009 the stress shall be 2050 psi [14.1 MPa]. Piping intended for use at temperatures of 100°F [38°C] and higher shall be tested at both 73°F [23°C] and the maximum design temperature. The test fiber stress shall be 90 % of the HDB.

TABLE 4 Metric-sized Wall Thickness and Tolerances for PEX Plastic Pipe

Pipe Size [mm]	Minimum Wall Thickness (t), mm (tolerance is plus 12%)							
	DR 6	DR 7.4	DR 9	DR 11	DR 13.6	DR 16.2	DR 17	DR 21
16	3.0	2.3	2.0	...	...	...	...	...
20	3.4	3.0	2.3	2.0	...	...	...	...
25	5.4	3.5	3.0	2.3	2.0	...	...	...
32	5.4	4.4	3.6	3.0	2.4	2.0	2.0	2.3
40	6.7	5.5	4.5	3.7	3.0	2.5	2.4	2.8
50	8.3	6.9	5.6	4.6	3.7	3.1	3.0	3.4
63	10.5	8.6	7.1	5.8	4.7	3.9	3.8	4.3
75	12.5	10.3	8.4	6.8	5.6	4.6	4.5	5.1
90	15.0	12.3	10.1	8.2	6.7	5.6	5.4	6.1
110	18.3	15.1	12.3	10.0	8.1	7.7	6.6	7.4
125	20.8	17.1	14.0	11.4	9.2	7.7	7.4	8.3
140	23.3	19.2	15.7	12.7	10.3	8.7	8.3	9.3
160	26.6	21.9	17.9	14.6	11.8	9.9	9.5	10.6
180	29.9	24.6	20.1	16.4	13.3	11.1	10.7	11.9
200	33.2	27.4	22.4	18.2	14.7	12.4	11.9	13.2
225	37.4	30.8	25.2	20.5	16.6	13.9	13.4	14.9
250	41.5	34.2	27.9	22.7	18.4	15.5	14.8	16.4
280	46.5	38.3	31.3	25.4	20.6	17.3	16.6	18.4
315	52.3	43.1	35.2	28.6	23.2	19.5	18.7	20.7
355	59.0	48.5	39.7	32.2	26.1	21.9	21.1	23.4
400	...	54.7	44.7	36.3	29.4	24.7	26.2	23.7
450	...	61.5	50.3	40.9	33.1	27.8	26.7	29.5
500	...	...	55.8	45.4	36.8	30.9	29.7	32.8
560	...	...	62.5	50.8	41.2	34.6	33.2	36.7
630	...	...	70.3	57.2	46.3	38.9	37.4	41.3
710	...	...	79.3	64.5	52.2	43.9	42.1	46.5
800	...	...	89.3	72.6	58.8	49.4	47.4	52.3
900	...	...	...	81.7	66.2	56.6	53.3	58.8
1000	...	...	...	90.2	72.5	61.8	59.3	65.4

TABLE 5 Inch-sized Wall Thickness and Tolerances for PEX Plastic Pipe

Pipe Size, in.	Minimum Wall Thickness (t), in (tolerance is plus 12%)							
	DR 7.3	DR 8.3	DR 9	DR 11	DR 13.5	DR 15.5	DR 17	DR 21
3	0.479	0.422	0.389	0.318	0.259	0.226	0.206	0.167
4	0.616	0.542	0.500	0.409	0.333	0.290	0.265	0.214
5	0.762	0.670	0.618	0.506	0.412	0.359	0.327	0.265
6	0.908	0.798	0.736	0.602	0.491	0.427	0.390	0.315
8	1.182	1.039	0.958	0.784	0.639	0.556	0.507	0.411
10	1.473	1.295	1.194	0.977	0.796	0.694	0.632	0.512
12	1.747	1.536	1.417	1.159	0.944	0.823	0.750	0.607
14	1.918	1.687	1.556	1.273	1.037	0.903	0.824	0.667
16	2.192	1.928	1.778	1.455	1.185	1.032	0.941	0.762
18	2.466	2.169	2.000	1.636	1.333	1.161	1.059	0.857
20	...	2.409	2.222	1.818	1.481	1.290	1.176	0.952
22	...	...	2.444	2.000	1.630	1.419	1.294	1.048
24	...	...	2.667	2.182	1.778	1.548	1.412	1.143
26	...	...	...	2.364	1.926	1.677	1.529	1.238
28	...	...	...	2.545	2.074	1.806	1.647	1.333
30	...	...	...	2.727	2.222	1.935	1.765	1.429
32	...	...	...	2.909	2.370	2.065	1.882	1.524
34	...	...	...	3.091	2.519	2.194	2.000	1.619
36	...	...	...	3.273	2.667	2.323	2.118	1.714
42	...	...	...	...	...	2.710	2.471	2.000
48	...	...	...	...	...	3.097	2.824	2.286
54	...	...	...	...	...	...	3.176	2.571

6.5 *Minimum Hydrostatic Burst Pressure (Quick Burst)*—The pipe shall fail in a ductile manner when tested in accordance with 7.7. For pipe sizes above 4 in [110 mm] nominal diameter, the testing lab shall be allowed to replace the quick burst test by the apparent ring tensile strength test in 6.6.

6.6 *Apparent Tensile Strength at Yield*—When tested in accordance with 7.8, the PEX pipe shall demonstrate a minimum of 3000 psi [20.7 MPa] for PEX 0006, 3700 psi [25.5 MPa] for PEX 0008, and 4600 psi [31.7 MPa] for PEX 0009.

6.7 *Degree of Crosslinking—Crosslinking*: When tested in accordance with 7.9, the degree of crosslinking for PEX pipe material shall be within the range from 65 to 89 % inclusive. Depending on the process used, the following minimum percentage crosslinking values shall be achieved: 73 % by peroxides, 65 % by electron beam, or 65 % by silane compounds.

6.7.1 When tested in accordance with 7.9, the degree of crosslinking for PEX pipe material shall be within the range from 65 to 89 % inclusive. Depending on the process used, the following minimum percentage crosslinking values shall be achieved: 70

% by peroxides, 65 % by electron beam, or 65 % by silane compounds. PEX pipe shall meet these minimum crosslink requirements before the manufacturer can release this pipe for installation by the user.

6.7.2 In addition, for pipe with a wall thickness greater than 0.5 in (12.7 mm), the degree of crosslinking shall be measured at four points separated by 90 degrees in the middle of the wall. For one of these points, measure at three points along the wall thickness. See Fig. 1 below. Collect shaving samples, about 0.004 in (0.10 mm) thick, by drilling a hole in the axial pipe direction with a 1/8 in. (3 mm) drill to collect a 0.007 – 0.014 oz (0.2 – 0.4 gram) sample size.

6.7.3 The degree of crosslinking over the entire wall thickness of all thick-wall pipe tested per 6.7.2 shall meet the minimum requirements specified in 6.7.1. The degree of crosslinking shall not vary outside the limits specified in 6.7.1 at any time at any part of the pipe.

6.8 *Stabilizer Functionality*—Stabilizer Functionality shall be tested in accordance with 7.10. The test need only be performed for the original validation of pipe made from a particular compound.

6.9 *Bent Pipe Hydrostatic Sustained Pressure Strength:*

6.9.1 *General*—PEX pipe sizes and DR's deemed suitable for bending by the pipe manufacturer shall meet the requirements in 6.9.2.

6.9.2 Cold-bent pipe, with a radius of six (6) times the outside diameter and consisting of a continuous bend length inducing not less than 90° angle, shall meet the minimum hydrostatic sustained pressure strength requirements in 6.4 when tested in accordance with 7.6.

6.10 *Squeeze-Off*—This requirement is limited to pipe sizes, wall thicknesses, squeeze procedures, and conditions deemed suitable for squeeze-off in service by the pipe manufacturer. Squeeze-off shall be performed per Guide F1041 using tools that meet Specification F1563. There shall be no leakage or visual evidence of splitting, cracking, breaking or reduction in ~~1000-h~~1000 h sustained pressure category when pipe is tested in accordance with 7.12.

6.11 *Elevated Temperature Service*—piping materials intended for use at temperatures above 100°F [38°C] shall have the PPI hydrostatic design basis (HDB) determined at the specific temperature in accordance with Test Method D2837. The 100 000-h intercept (long-term strength) shall be categorized in accordance with Table 6 and be listed as the “hydrostatic design basis of XXX psi at XXX °F [C°] for (compound name).”

6.12 All tests shall be repeated if there is a change in the crosslinking agent, antioxidant package or the base PE resin for the PEX compound.

6.13 *Minimum Operating Temperature:*

6.13.1 Pipe shall have a minimum operating temperature established by testing in accordance with 6.13.2. Squeeze-off tests are then conducted on the pipe at this minimum operating temperature in accordance with 6.14.

6.13.1.1 These tests need only be performed for the original pipe made from a particular compound. Re-testing is required for a compound change that also requires re-testing of the new formulation. Changes in compound formulations are defined in PPI TR-3: <https://standards.iteh.ai/catalog/standards/sist/57205629-f69e-4fed-8548-3497ec446932/astm-f2968-f2968m-20>

6.13.2 The minimum operating temperature shall be greater than the Small-Scale-SteadyState RCP critical temperature when determined in accordance with ISO 13477 at a constant hoop stress of 928 psi (6.4 MPa) for PEX with an HDB of 1250 psi (8.6 MPa), or 1160 psi (8.0 MPa) for PEX with an HDB of 1600 psi (11 MPa).

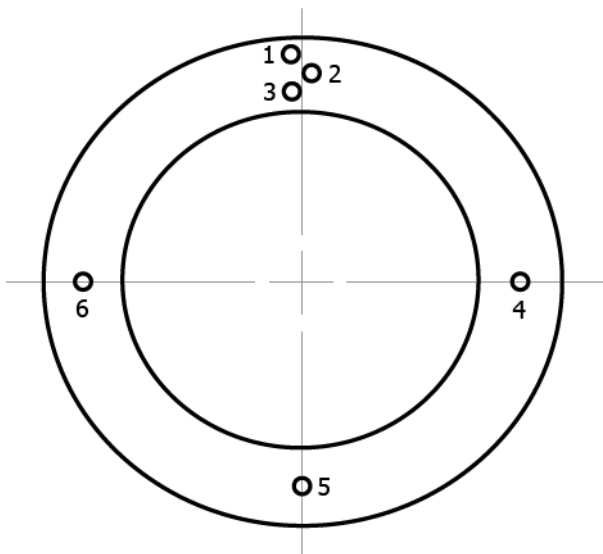


FIG. 1 Sample Location for Degree of Crosslink Test on Thick-wall Pipe