Designation: F3058 – 16 (Reapproved 2021)

Standard Practice for Preliminary Field Testing of Thermoplastic Pipe Joints for Gravity Flow (Non-Pressure) Sewer Lines[1]

This standard is issued under the fixed designation F3058; 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 covers procedures for testing single joints of thermoplastic pipe for gravity flow (non-pressure) sewer lines, when using either air or water under low pressure to demonstrate the integrity of the joint. This practice is used for testing 27 in. (675 mm) and larger inside diameter PVC (Polyvinyl Chloride), HDPE (High Density Polyethylene) and PP (Polypropylene) sewer lines utilizing flexible gasketed joints with elastomeric seals, Specification F477.

1.2 This practice is used for assessing the watertight integrity of a joint at the time of the test. It is not a pipeline acceptance test as it does not evaluate the integrity of the pipe barrel or any long-term pipeline deformation effects from backfill settlement

NOTE 1—The user of this practice is advised that methods described herein is typically used as a preliminary test to enable the installer to demonstrate the integrity of a sewer pipe joint prior to placement of final backfill. Such testing after initial backfill can detect if a gasket has rolled or dirt was pushed into the joint during the mating of the pipe. Repair of these types of installation problems can be done very quickly and effectively prior to final backfill, but once final backfill is placed, repairs are very difficult and costly.

NOTE 2—This practice may be used at any time to check the integrity of a joint prior to acceptance testing or to locate a leaking joint when a pipeline fails a hydrostatic infiltration/exfiltration test, vacuum test or air pressure test during any time of the installation and acceptance process.

NOTE 3—The user of this practice is advised that no correlation has been found between air loss and water leakage.

1.3 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.

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *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]

F412 Terminology Relating to Plastic Piping Systems

F477 Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

F2487 Practice for Infiltration and Exfiltration Acceptance Testing of Installed Corrugated High Density Polyethylene and Polypropylene Pipelines

3. Terminology

3.1 *Defintions*—For definitions of terms relating to plastic pipe, see Terminology F412.

4. Summary of Practice

4.1 The joint in the sewer line to be tested is covered on the inside of the pipe by a ring with two end element sealing tubes. Air or water is introduced at low pressure through a connection on the ring into the annular space between the ring and joint. The amount of air, or water, loss is used to determine the acceptability of the joint.

5. Significance and Use

5.1 The values recorded are applicable only to the sewer joint being tested and at the time of testing.

6. Safety Precautions

6.1 The use of compressed air is dangerous. Always observe proper sewer line preparation and procedures.

6.2 It is imperative that all pressures be relieved completely before the test apparatus is loosened for removal.

[1] This practice is under the jurisdiction of ASTM Committee F17 on Plastic Piping Systems and is the direct responsibility of Subcommittee F17.40 on Test Methods.

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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.

6.3 Pressurizing lines for the two end element sealing tubes shall be separate from the lines for pressurizing the void volume created by the joint test apparatus. The pressures required to seal the end element tubes shall be as specified by the apparatus manufacturer, and are greater than the pressure required to test the joint. The line for pressurizing the void volume shall include a 6 psi (41 kPa) pressure relief device to reduce hazards and avoid over pressurization.

7. Preparation of the Sewer Joint

7.1 Check the size of access openings to ensure that the test apparatus will fit in the sewer line.

NOTE 4—Due to the size of test apparatus and difficulty of accessing pipelines through restricted openings in manholes and fittings, it is advisable to test pipe joints as the pipe is being laid and initial backfill placed. Some types of fittings and joints may not be able to be tested due to their configuration or geometry. Testing prior to final backfill also allows failing joints to be repaired, replaced or reinstalled without costly excavation.

7.2 Clean the joint and interior joint surfaces to eliminate debris prior to testing.

7.3 Review safety precautions in Section 6.

8. Procedure

8.1 The following procedures apply to testing with either air or water. Fig. 1 provides an example of a joint isolation apparatus, where only the area between the two watertight bladders is pressurized.

8.1.1 Review proper operation, safety, and maintenance procedures as provided by the manufacturer of the joint test apparatus. Insure the apparatus has documentation indicating it has been properly calibrated.

8.1.2 Move the joint test apparatus into the sewer line to the joint to be tested and position it to straddle the joint. Make sure the end element sealing tubes straddle both sides of the joint and the hoses are attached. For the water test, the bleed-off petcock must be located at top dead center.

8.1.3 Inflate end element sealing tubes with air in accordance with equipment and manufacturer's instructions.

NOTE 5—An erroneous joint failure may occur if the joint test apparatus does not obtain a full and continuous contact to a relatively clean and dry pipe surface. Leakage may result around the bladder of the test apparatus.

NOTE 6—The user of this practice is advised that all test pressures are measured as gage pressure, which is defined as any pressure greater than atmospheric pressure. Since water produces a pressure of 0.43 psi (3 kPa) for every foot of depth, in a trench that is not completely dewatered, the test pressures must be increased by 0.43 psi (3 kPa) per foot of groundwater depth to offset the depth of groundwater over the springline of the sewer line.

8.1.4 An air or water reservoir shall be included in the joint test system. By maintaining a constant supply of air or water in a reservoir, continuous pumping of air or water is not required, and any variances in test equipment and joint space will be negated. The reservoir shall have a minimum volume of 2.5 ft^3 (0.071 m^3) .

8.2 *Joint Air Test:*

8.2.1 Observe procedures in 8.1

8.2.2 Pressurize the void volume with air to 3.5 psi (24 kPa) greater than the pressure exerted by highest groundwater above the pipe. Unless the Owner specifies a design groundwater height (that is, design project requirement), the groundwater height shall be determined by site conditions at the time of the pipe installation. Allow the air pressure and temperature to stabilize before shutting off the air supply, and start of test timing.

NOTE 7—Determination of groundwater height should take into consideration the impacts of any well points or other factors which could result in varying the groundwater elevations around the pipe at the time of testing.

8.2.3 If pressure holds, or drops less than 1 psi (6.9 kPa) in 5 s, the joint passes. Practically, the test is a go/no go test.

8.2.4 If the joint being tested fails, the pipe and test equipment shall be inspected to insure all the sealing surfaces were properly cleaned and the test equipment positioned correctly. The joint shall then be retested, or repaired if necessary, and retested, in accordance with this practice.

8.2.5 After the joint test is completed, exhaust void volume, then exhaust end element tubes prior to removal of apparatus.

8.2.6 The outcome of this test does not preclude final acceptance by appropriate water infiltration and exfiltration testing (see Practice F2487), or other means.

8.3 *Joint Water Test:*

8.3.1 Review procedures in 8.1.

8.3.2 Introduce water into void volume until water flows evenly from open petcock at the top of the joint. Close the petcock and pressurize with water to 3.5 psi (24 kPa) above the pressure exerted by groundwater above the pipe. Shut off the water supply.

8.3.3 If the pressure holds, or drops less than 1 psi (6.9 kPa) in 5 s, the joint passes. Practically, the test is a go/no go test.

8.3.4 If the joint being tested fails, it shall be retested, or repaired if necessary, and retested, in accordance with this practice.

8.3.5 After the joint test is completed, exhaust end element tubes which will automatically release the water from the void volume, prior to removal of apparatus.

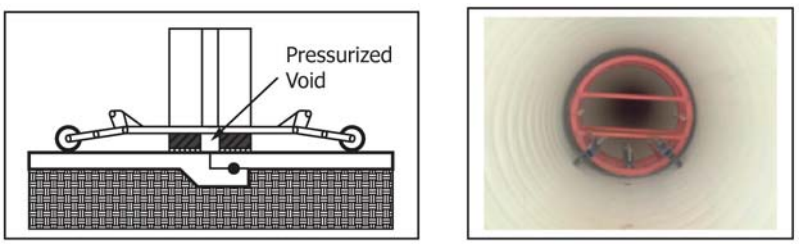

FIG. 1 Joint Isolation Apparatus