



Designation: D2412 – 11 (Reapproved 2018)

Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading¹

This standard is issued under the fixed designation D2412; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This test method covers the determination of load-deflection characteristics of plastic pipe under parallel-plate loading.

1.2 This test method covers thermoplastic resin pipe, reinforced thermosetting resin pipe (RTRP), and reinforced polymer mortar pipe (RPMP).

1.3 The characteristics determined by this test method are pipe stiffness, stiffness factor, and load at specific deflections.

1.4 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.

NOTE 1—While this test method can be used in measuring the pipe stiffness of corrugated plastic pipe or tubing, special conditions and procedures are used. These details are included in the product standards, for example, Specification F405.

1.5 The text of this test method references notes and footnotes that provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the test method.

1.6 *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.*

1.7 *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.*

¹ This test method 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. Referenced Documents

2.1 *ASTM Standards:*²

D695 Test Method for Compressive Properties of Rigid Plastics

D1600 Terminology for Abbreviated Terms Relating to Plastics

D2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

F405 Specification for Corrugated Polyethylene (PE) Pipe and Fittings (Withdrawn 2015)³

F412 Terminology Relating to Plastic Piping Systems

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 Δy —measured change of the inside diameter in the direction of load application expressed in inches (millimetres).

3.2.2 *initial inside diameter (d)*—the average of the inside diameters as determined for the several test specimens and expressed in inches (millimetres).

3.2.3 *load (F)*—the load applied to the pipe to produce a given percentage deflection. Expressed as newtons per metre or pounds-force per linear inch.

3.2.4 *mean radius (r)*—the mid-wall radius determined by subtracting the average wall thickness from the average outside diameter and dividing the difference by two. Expressed as inches (millimetres).

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 The last approved version of this historical standard is referenced on www.astm.org.

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