



Standard Test Method for Constant Tensile Load Joint Test (CTLJT)¹

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1. Scope

1.1 The constant tensile load joint test (CTLJT) is designed to demonstrate that a joint in a plastic piping system is resistant to the effects of long-term creep.

1.1.1 The joint is subjected to an internal pressure at least equal to its operating pressure and a sustained axial tensile load for a specified time period, usually 1000 h. The joint shall not leak, nor may the pipe *completely* pull out for the test duration. The total axial stress is set by the referencing document.

1.1.2 Some typical conditions for testing of joints on polyethylene pipe are described in Appendix X1.

1.2 This test is usually performed at 73°F (22.8°C).

1.3 The CTLJT was developed to demonstrate the long-term resistance to pullout of mechanical joints on polyethylene gas pipe. The CTLJT has also been successfully applied to the evaluation of other components of plastic piping systems. These applications are discussed in Appendix X1.

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:

D 638 Test Method for Tensile Properties of Plastics²

D 1600 Terminology for Abbreviated Terms Relating to Plastics²

D 2122 Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings³

D 2513 Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings³

F 412 Terminology Relating to Plastic Piping Systems³

2.2 ANSI Standard:

B31.8 Gas Transmission and Distribution Piping Systems⁴

2.3 *Code of Federal Regulations:*
OPS Part 192, Title 49⁵

3. Terminology

3.1 Definitions:

3.1.1 *General*—Definitions are in accordance with Test Method D 638 and Terminology F 412, unless otherwise specified. Abbreviations are in accordance with Terminology D 1600.

3.1.2 The gas industry terminology used in this test method is in accordance with the definitions given in ANSI B31.8 or OPS Part 192, Title 49, unless otherwise indicated.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *mechanical joint, Category 1*—a mechanical joint design that provides a seal plus a resistance to force on the pipe end, equal to or greater than that which will cause a permanent deformation of the pipe or tubing. **(D 2513)**

3.2.2 *mechanical joint, Category 3*—a mechanical joint design that provides a seal plus a pipe restraint rating equivalent to the anticipated thermal stresses occurring in a pipeline. This category has a manufacturers' pipe-end restraint that allows slippage at less than the value required to yield the pipe. **(D 2513)**

3.2.3 *pipe*—refers to both pipe and tubing.

4. Summary of Test Method

4.1 A joint is subjected to a sustained axial load for a specified period of time (usually 1000 h). The test duration and the actual test conditions (axial stress, internal pressure, test duration, and test temperature) are either specified by a referencing document or, for new or unique applications, agreed upon between the user and the manufacturer. X1.2 contains a background discussion of axial stress values and axial load determination.

4.2 The joint is made to plastic pipe of the type, grade, size, and dimension ratio to be used in the final application. The axial tensile stress should be as high as possible, but shall be lower than the stress at which the plastic material continues to stretch and finally yields (the long-term yield strength) (see Note 1).

NOTE 1—During the first hours of a test, the pipe elongates measurably.

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 *Annual Book of ASTM Standards*, Vol 08.01.

³ *Annual Book of ASTM Standards*, Vol 08.04.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁵ Available from Superintendent of Documents, Government Printing Office, Washington, DC 20402.