



Designation: ~~G13/G13M—13~~ G13/G13M – 21

## Standard Test Method for Impact Resistance of Pipeline Coatings (Limestone Drop Test)<sup>1</sup>

This standard is issued under the fixed designation G13/G13M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method covers the determination of the relative resistance of pipeline coatings to impact by observing the effects of falling stones on coated pipe specimens.

1.2 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.

1.3 *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.*

1.4 *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:*<sup>2</sup>

~~G12D7091 Test Method Practice for Nondestructive Measurement of Dry Film Thickness of Pipeline Coatings on Steel Non-magnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals (Withdrawn 2013)~~

G62 Test Methods for Holiday Detection in Pipeline Coatings

2.2 *AASHTO Standard:*<sup>3</sup>

M80–51 (No. 67) Specification for Coarse Aggregate for Portland Cement Concrete

### 3. Summary of Test Method

3.1 The impact resistance of pipeline coatings is determined by dropping weighed amounts of a specified type of limestone

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.48 on Durability of Pipeline Coating and Linings.

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<sup>2</sup> 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.

<sup>3</sup> Available from American Association of State Highway and Transportation Officials (AASHTO), 444 N. Capitol St., NW, Suite 249, Washington, DC 20001, http://www.transportation.org.

through a chute onto a coated pipe specimen. Results are reported as the number of drops required to pierce through the coating to bare metal, as determined visually ~~or~~and electrically.

#### 4. Significance and Use

4.1 This test method is intended to simulate the effects of backfilling after pipe has been placed in the trench. The backfill is often rocky soil and, if it is unscreened and the coated pipe is unshielded by sand or other protective padding, the falling rocks may seriously damage the coating.

#### 5. Apparatus

5.1 The impact apparatus shall be essentially as shown in Fig. 1 and shall include the following:

5.1.1 *Box with Chute*, providing a means of dropping stones from a height of 1830 mm [6.0 ft] measured to the top of a piece of coated pipe under test. Construction details are shown in Fig. 2.

NOTE 1—The box and chute described in Fig. 2 are designed for testing coatings on 100-mm [4-in.] and 150-mm [6-in.] pipe specimens. Smaller diameter pipe may be used by inserting wood V-blocks in the trough in the box below the chute.

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5.1.2 *Stones*, hard, coarse, limestone aggregate, conforming to AASHTO Designation: M80-51 (No. 67) which is taken from America Association of State Highway and Transportation Officials “Standard Specifications for Coarse Aggregate for Portland Cement Concrete.”

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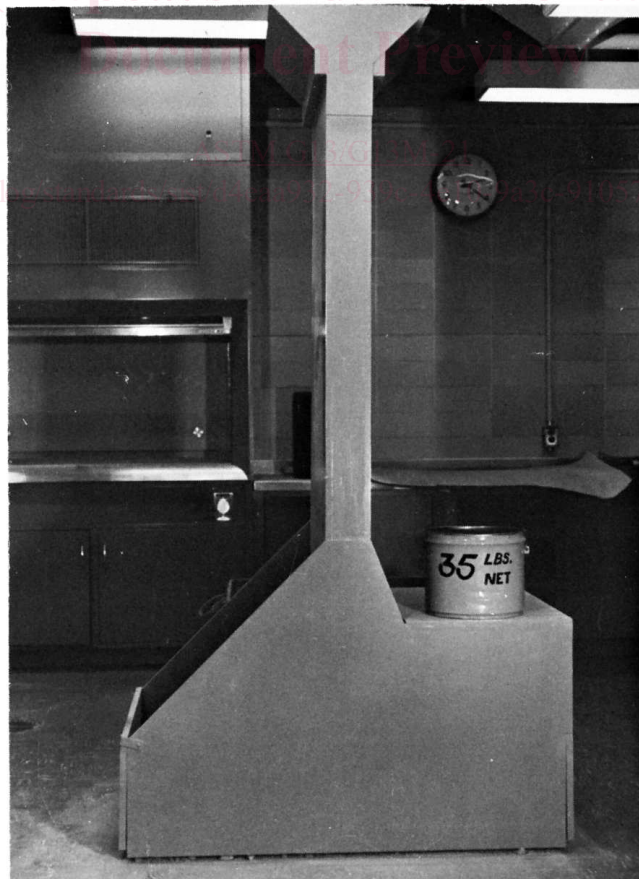
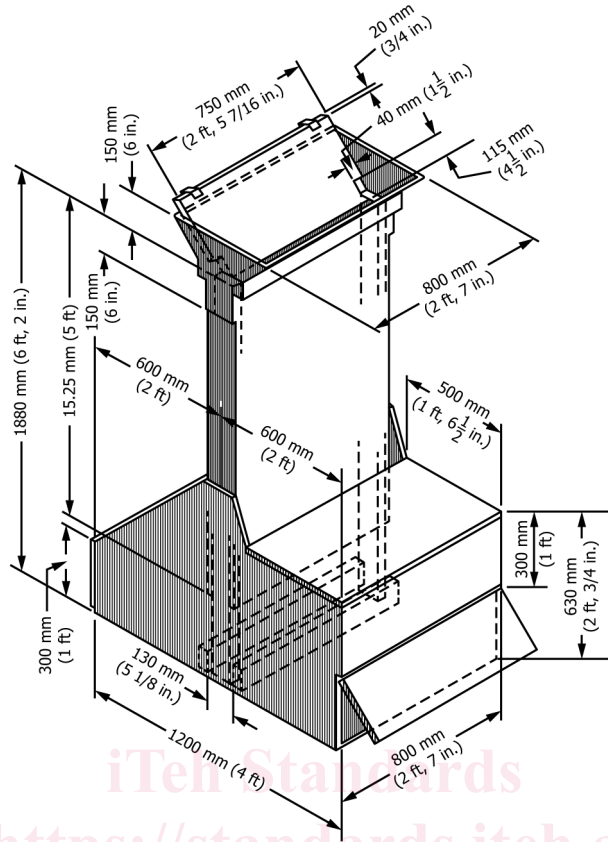


FIG. 1 Box, Chute, and Bucket



NOTE 1—Framing lumber 40 by 90 mm [2 by 4 in.]; all other material 20 mm [3/4 in.].

FIG. 2 Construction Details of Box and Chute

NOTE 2—These specifications cover the quality and size of coarse aggregate. No. 67 designates a 19-mm [3/4-in.] to No. 4 size stone with the following sieve analysis:

Square Opening, mm [in.]	Weight % Passing
25 [1]	100
19 [3/4]	95 to 100
10 [3/8]	20 to 55
No. 4	0 to 10

5.1.3 *Bucket*—Any suitable bucket that will hold 16 kg [35 lb] of stones.

5.1.4 *Holiday Detectors*—Two types are High or low voltage detector (as appropriate based on coating thickness) is needed as described in Test Methods G62.

NOTE 3—A holiday is defined as small faults or pinholes that permit current drainage through protective coatings on steel pipe.

5.1.5 *Coating Thickness Gauges*—Gage—Any instrument suitable for use with Test Method Practice D7091 G42 that is capable of measuring within the range of coating thickness of the test specimens.

5.1.6 *Surface Temperature Thermometer*—Any instrument capable of measuring surface temperature at the prescribed testing temperature.

5.1.7 *Conditioning Chamber*—Freezer or oven capable of storing the test specimens (only required if the test temperature is different from the room temperature).