Designation: C1339/C1339M – 18

Standard Test Method for Flowability and Bearing Area of Chemical-Resistant Polymer Machinery Grouts[1]

This standard is issued under the fixed designation C1339/C1339M; 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 test method covers the measure of flowability of chemical-resistant polymer machinery grouts as evaluated in a 50-mm [2-in.] or 25-mm [1-in.] pour thickness in a laboratory setting. The test method provides for the assessment of upper surface plate contact area (bearing area). These grouts will typically be at least two component formulations that may be used for installations where grout thickness will range from 25 to 150 mm [1 to 6 in.] underneath the base or plates being grouted.

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 may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

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:*[2]

C904 Terminology Relating to Chemical-Resistant Nonmetallic Materials

3. Terminology

3.1 *Definitions*—For definition of terms used in this test method, see Terminology C904.

4. Summary of Test Method

4.1 Polymer machinery grout of a flowable consistency is poured into a hopper at one end of a shallow plastic trough with a clear plastic cover plate.

4.2 A movable gate is raised, allowing the grout to flow from the hopper into the trough. The times for the grout to first contact the end plate and to establish full length contact with the top cover plate are recorded and used as indices of flowability.

4.3 After the grout hardens, the mold and top plate are removed. The top surface of the grout is wire brushed to expose any surface air bubbles or voids, and a visual estimate is made of the percentage of grout top surface area that is in contact with the plate. Visual guides are provided for comparative purposes (see Fig. 1 and Fig. 2).

NOTE 1—Two figures are used to visually represent sections of two different types of void distribution as the rating of effective bearing area is based on comparison from these illustrations. The void distribution and appearance may vary from these illustrations based on the rheological characteristics of different grouts. It is suggested that a photograph of the actual grout surface be retained after the testing.

5. Significance and Use

5.1 Chemical-resistant polymer machinery grouts are used to provide precision support for machinery or equipment.

NOTE 2—The machinery or equipment or support bases or plates, or combination thereof, are positioned to the precise elevation and location required. The bases or plates are typically placed on prepared foundations and supported on temporary shims or support bolts (jack screws). Forms are installed to contain the flowable grout. The grout is poured around the perimeter in such a manner as to allow the grout to flow around and under the equipment base or plates. The grout subsequently hardens to provide a strong rigid support layer capable of withstanding the stresses transferred by the equipment to the foundation. Although the actual machinery base plate is typically metal and the cover plate in this test uses acrylic glass, different grouts using acrylic glass cover plates has proven useful for comparative purposes as described in this test in laboratory conditions.

5.2 In addition to the required physical properties of the grout, the flow and bearing area achieved are important

[1] This test method is under the jurisdiction of ASTM Committee C09 on Concrete and Concrete Aggregates and is the direct responsibility of Subcommittee C09.41 on Hydraulic Cement Grouts.

Current edition approved Dec. 15, 2018. Published February 2019. Originally approved in 1996. Last previous edition approved in 2012 as C1339 – 02 (2012). DOI: 10.1520/C1339_C1339M-18.

[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.

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

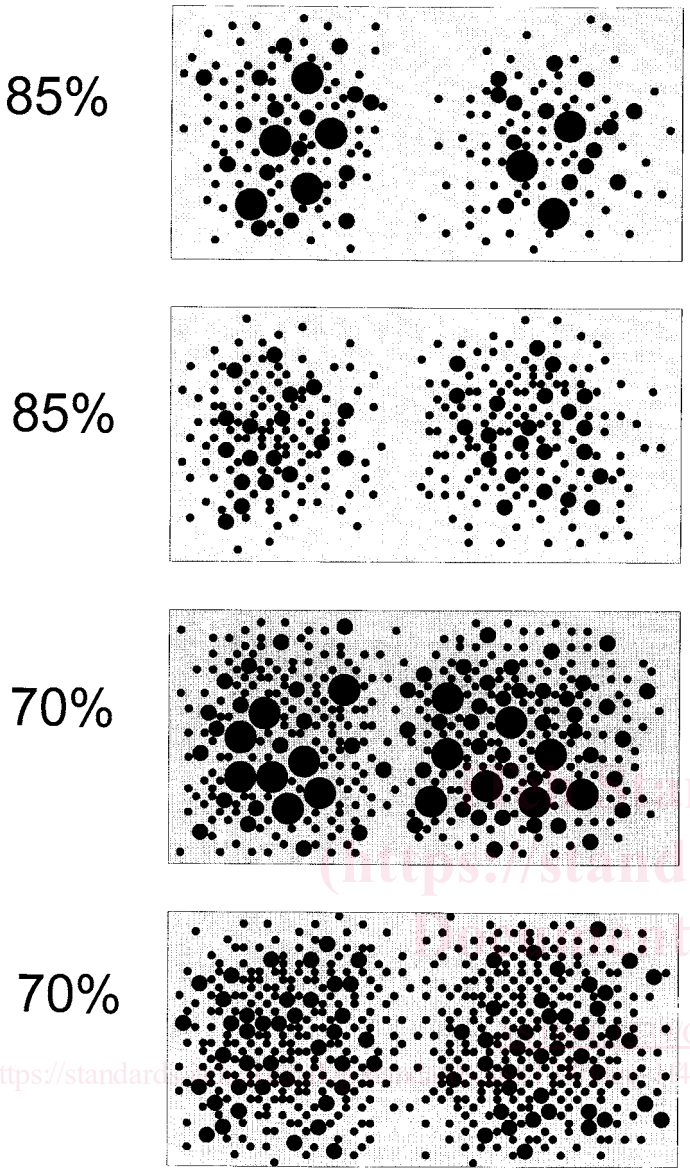


FIG. 1 Grout Top Surface

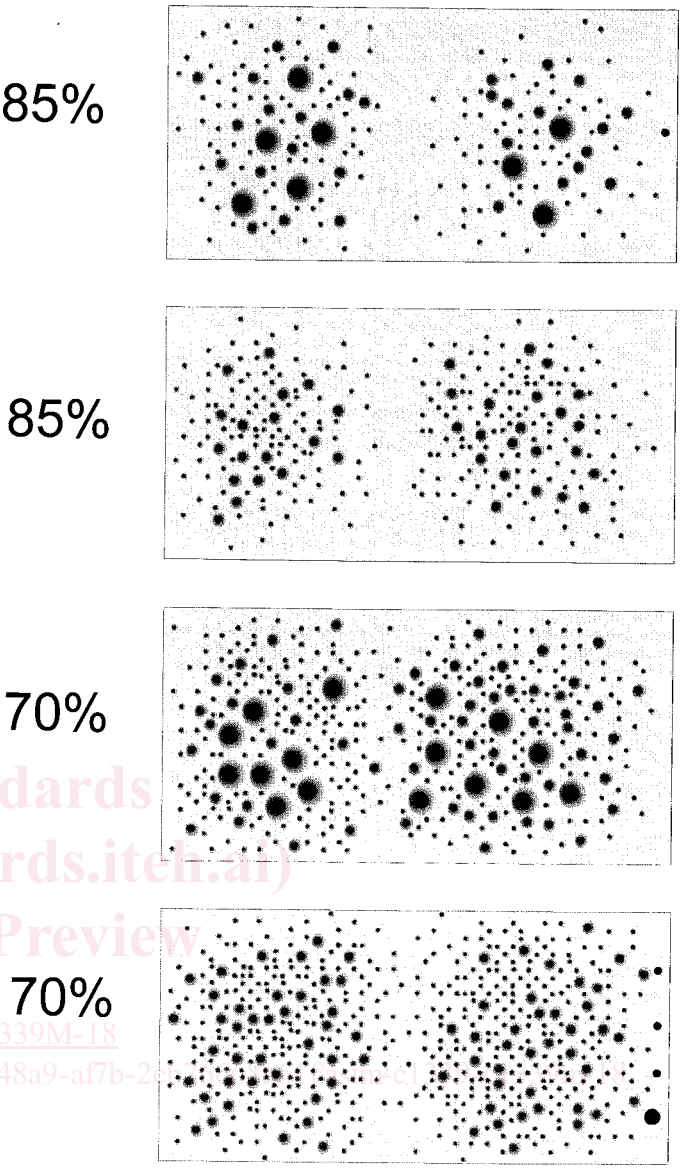


FIG. 2 Grout Top Surface

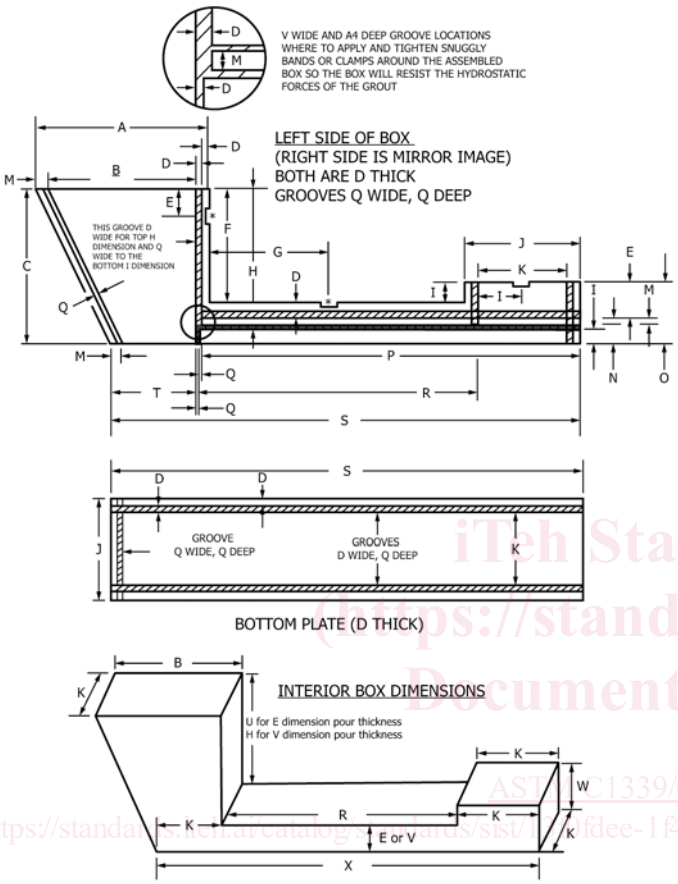
considerations for effective grout installation. The two characteristics measured by this test method are flow and bearing area.

5.3 The flow test simulates typical application conditions for a flowable polymer machinery grout in a laboratory environment. It may be used to evaluate the suitability of a particular grout for a specific application, to compare the flowability and bearing area of two or more grouts, or to evaluate the effects of formulation changes, temperature, mixing techniques, or other factors on flowability.

5.4 The estimated amount of upper grout surface contact in percent can be used to compare two or more grouts or show the effects of temperature, formulation changes, or other factors on bearing area. A limited set of results using visual guides (see Fig. 1 and Fig. 2) is used to classify the bearing as "high"—greater than 85 %," "medium—70 to 85 %," and "low—less than 70 %."

6. Apparatus

6.1 *Flow Box,* a plastic flow box as shown in Fig. 3 with demountable sides and ends and a sliding gate, having a transparent cover plate of acrylic glass.



BACK PLATE - Y WIDE × Q THICK × Z HIGH
END PLATE - A1 WIDE × Q THICK × A2 HIGH
FRONT PLATE - A1 WIDE × Q THICK × V HIGH
GATE PLATE - A1 WIDE × Q THICK × Z HIGH
COVER PLATE (PLEXIGLASS) - A1 WIDE × Q THICK × R LONG
HEAD PLATE - A1 WIDE × Q THICK × E HIGH (FOR E POUR THICKNESS),
× A3 HIGH (FOR V POUR THICKNESS)

FIG. 3 Grout Flow Box

TABLE 1 Dimensions and Tolerances for Fig. 3[A]

Dimensions	SI Units, mm	Inch-Pound Units, in.
A	340	13.75
B	300	12
C	310	12.5
D	10	0.5
E	50	2
F	240	9.5
G	270	11
H	280	11.25
I	30	1.25
J	200	8
K	150	6
L	80	3
M	20	0.75
N	60	2.25
O	100	4.25
P	750	30.25
Q	5	0.25
R	590	23.75
S	930	37.5
T	160	6.75
U	250	10.25
V	25	1
W	100	4
X	890	35.75
Y	160	6.5
Z	350	14.0
A1	160	6.5
A2	120	4.75
A3	70	2.75
A4	3	0.125

[A] Dimension tolerance ±1 %.

6.2 *Stopwatch,* of normal commercial accuracy, readable to at least 1 s.

6.3 *Thermometer or Thermocouple,* suitable for insertion into the grout while still plastic.

6.4 *Mixer,* a commercial mixing device that is able to rotate a 20-L [5-gal] metal or plastic pail with a stationary mixing blade to stir the grout mix. Typical operating speed is 3.1 to 10.5 rad/s [30 to 100 rpm] (see Fig. 4).

7. Preparation of Apparatus

7.1 Prewax all the component parts of the flow box with paste wax and buff before assembly to ensure that the grout does not adhere. The top cover plate shall not be waxed because the wax may have an adverse effect on the bearing area.

7.2 Assemble the box as follows: