



Standard Test Methods for Concrete Joint Sealers¹

This standard is issued under the fixed designation D 1191; 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.

^{ε1} NOTE—Keywords were added editorially in June 1994.

1. Scope

- 1.1 These test methods cover tests for evaluating concrete joint sealers of the hot poured elastic type.
- 1.2 Test procedures can be the following:

Test	Paragraph
Bond	7.1
Flow	7.2
Penetration	7.3

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

2. Referenced Documents

- 2.1 *ASTM Standards:*
 - C 33 Specification for Concrete Aggregates²
 - C 109 Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens)³
 - C 150 Specification for Portland Cement³
 - C 192 Practice for Making and Curing Concrete Test Specimens in the Laboratory²
 - D 5 Test Method for Penetration of Bituminous Materials⁴
 - D 217 Test Method for Cone Penetration of Lubricating Grease⁵

3. Significance and Use

3.1 These test methods establish test procedures for laboratory evaluation of materials that will form a resilient and adhesive compound capable of effectively sealing joints against the infiltration of moisture and foreign material throughout repeated cycles of expansion and contraction with temperature changes.

4. Apparatus

4.1 *Laboratory Melter*—The equipment for melting of the joint sealer must be a double-boiler, oil-jacketed melter equipped with a mechanical agitator and thermometers for

the oil bath and material in the melting vat. The heat source for the oil bath shall be thermostatically controlled and capable of maintaining temperatures up to 550°F (288°C). Mechanical agitator speed of approximately 30 ± 5 rpm is recommended. See Fig. 1 and Fig. 2 for typical laboratory melters.

4.2 *Penetrometer*—As described in Test Method D 5.

4.3 *Cone Penetrometer*—As described in Test Method D 217 except that the interior construction may be modified as desired. The total moving weight of the cone and attachments shall be 150.0 ± 0.1 g.

4.4 *Forced-draft Oven*—This oven shall be capable of uniformly maintaining a temperature of 140 ± 2°F (60 ± 1.1°C).

4.5 *Bond Extension Equipment*—The extension machine used in the bond test shall be so designed that the specimen can be extended 0.50 in. (12.7 mm) at a uniform rate of approximately 1/8 in. (3.2 mm)/h. It shall consist essentially of one or more screws rotated by an electric motor through suitable gear reductions. Self-aligning plates or grips, one fixed and the other carried by the rotating screw or screws, shall be provided for holding the test specimen in position during the test. A machine suitable for testing three specimens simultaneously is shown in Fig 3.

4.5.1 The extension machine may be an integral part of a low temperature environmental chest or capable of being placed in a low temperature chest capable of maintaining 0 ± 2°F (−17.8 ± 1.1°C).

4.6 *Vernier Caliper*, with accuracy of ±0.25 mm.

5. Standard Conditions for Test

5.1 The laboratory atmospheric conditions, hereinafter referred to as standard conditions, shall be a temperature of 75 ± 7°F (24 ± 4°C) and a relative humidity of 50 ± 10 %.

5.2 The Safe Heating Temperature and Pouring Temperature for the sealer shall be supplied by the manufacturer. The Safe Heating Temperature shall not be exceeded during the melting of the sealer or at the time of preparation of test specimens.

5.3 After test specimens have been prepared, the specimens shall be stored at laboratory standard conditions for 24 ± 2 h before the beginning of any test.

6. Preparation for Testing

6.1 *Mortar Blocks*—Prepare cement mortar blocks, each 1 by 2 by 3 in. (25 by 50 by 75 mm) in size, using one part of high early strength portland cement conforming to Type III of Specification C 150 to two parts by weight of clean, uniformly graded, concrete fine aggregate conforming to

¹ These test methods are under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.33 on Formed-In-Place Sealants for Joints and Cracks in Pavement. Current edition approved June 29, 1984. Published August 1984.

² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 04.01.

⁴ Annual Book of ASTM Standards, Vol 04.03.

⁵ Annual Book of ASTM Standards, Vol 05.01.

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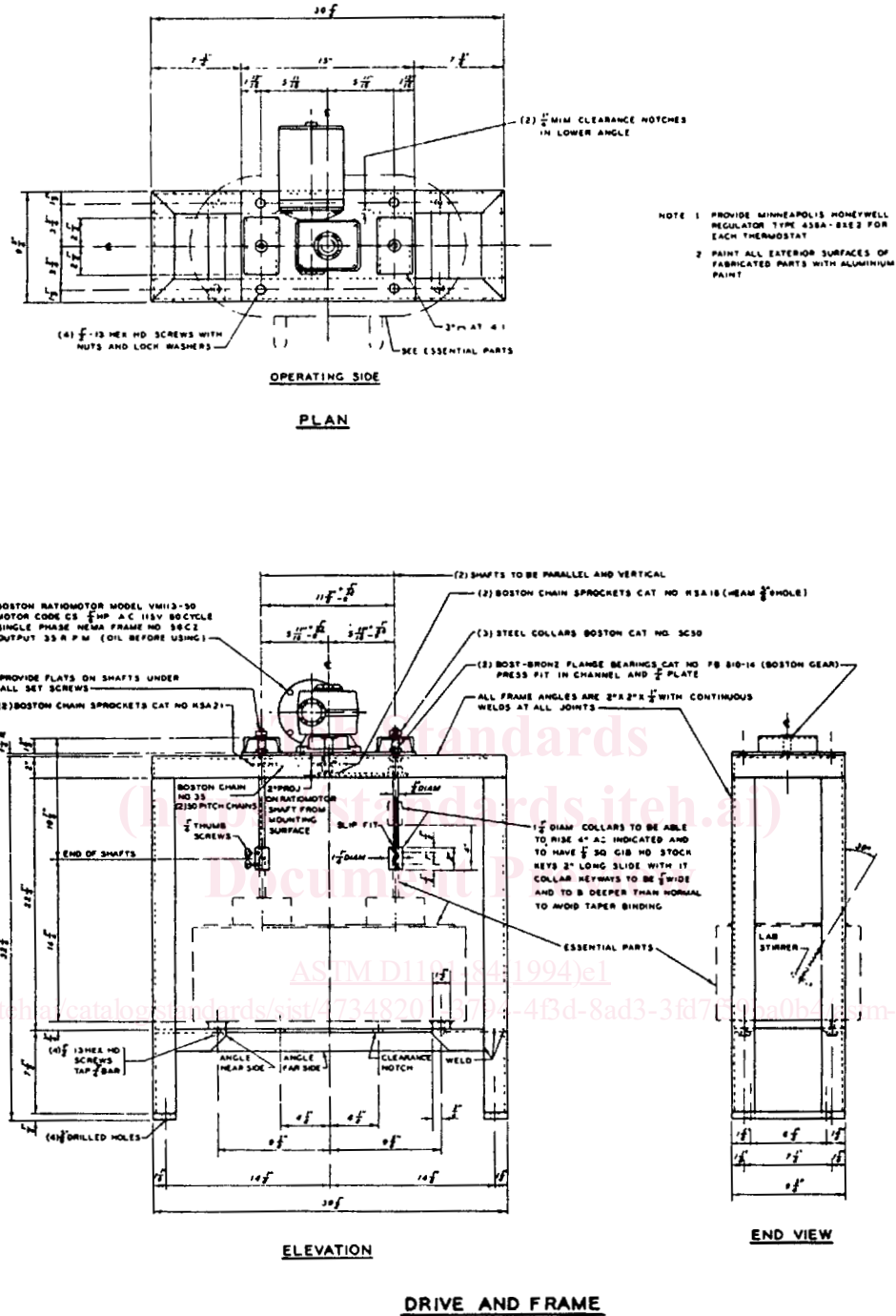


FIG. 1 Joint Sealant Laboratory Melting Unit

Specification C 33. Use sufficient water to produce a flow of 100 ± 5 when tested in accordance with the procedure for the determination of consistency of cement mortar described in Method C 109. After curing 1 day in moist air and 6 days in water at $73.4 \pm 3^\circ\text{F}$ ($23 \pm 1.6^\circ\text{C}$), surface one 2 by 3 in. (50 by 75 mm) face of each block by wet grinding with a silicon carbide stone, designated as C-30-Q + - VHD, until the aggregate is uniformly exposed. Return the blocks to lime water storage until needed. Prior to use, oven-dry the blocks to constant weight at a temperature of 220 to 230°F (104 to 110°C), cool to room temperature in a desiccator, and clean

the surface of the blocks of film or powder by vigorous brushing with a stiff-bristled fiber brush. Store the prepared blocks in the desiccator until ready for the pouring operation.

6.2 *Melting of the Hot Pour Sealer*—Select a sample of the fresh material, weighing approximately 600 g, in such a manner as to avoid inclusion of the surface layer. Cut sample into approximately 50 g segments by the use of a knife or spatula. Heat 200 g of the sample, with gentle stirring, to a pouring consistency in a clean container placed in an oil bath or similar heating unit. The temperature of the batch shall