Designation: C 230/C 230M – 98ε1

Standard Specification for Flow Table for Use in Tests of Hydraulic Cement[1]

This standard is issued under the fixed designation C 230/C 230M; 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.

ε[1] NOTE—The designation of this standard was editorially corrected and a Research Report was added in August 1999.

1. Scope

1.1 This specification coves requirements for the flow table and accessory apparatus (Note 1) used in making flow tests for consistency of mortars in tests of hydraulic cement.

NOTE 1—To help clarify the design of the flow table and accessory apparatus see the drawing in Fig. 1. This drawing is for informational purposes only.

1.2 The values stated in either inch-pound units or SI units shall be regarded separately as standard. The values stated are not exact equivalents; therefore, each system must be used independently of the other. It is permissible to use an inch-pound caliper and mold with a SI flow table or a SI caliper and mold with an inch-pound flow table. It is not permissible to mix a SI mold with an inch-pound caliper or an inch-pound mold with a SI caliper.

2. Flow Table and Frame

2.1 The flow table apparatus shall consist of an integrally cast rigid iron frame and a circular rigid table top 10 ± 0.1 in. [255± 2.5 mm] in diameter, with a shaft attached perpendicular to the table top by means of a screw thread. The table top and shaft with contact shoulder shall be mounted on a frame in such a manner that it can be raised and dropped vertically through the specified height of 0.500 ± 0.005 in. [12.7± 0.13 mm] for new tables and of 0.500 ± 0.015 in. [12.7 ± 0.38 mm] for tables in use, by means of a rotated cam. The table top shall have a fine machined plane surface, free of blowholes and surface defects. The top shall be scribed with eight equidistant lines 2⅝ in. [68 mm] long, extending from the outside circumference toward the center of the table. Each line shall end with a scribed arc, ¼ in. [6 mm] long, whose center point is the center of the table top with a radius of 2⅜ in. [59.5 mm]. The scribe lines shall be made with a 60° tool to a depth of 0.01 in. [0.25 mm]. The table top shall be of cast brass or bronze having a Rockwell hardness number not less than 25 HRB with an edge thickness of 0.3 in. [7.5 mm], and shall have six integral radial stiffening ribs. The table top and attached shaft shall weigh 9 ± 0.1 lb [4.08± 0.05 kg] and the weight shall be symmetrical around the center of the shaft.

2.2 The cam and vertical shaft shall be of medium carbon machinery steel, hardened on the end of the shaft contacting the cam and the tip of the cam contacting the shaft. The shaft shall be straight and the difference between the diameter of the shaft and the diameter of the bore of the frame shall be not less than 0.002 in. [0.05 mm] and not more than 0.003 in. [0.08 mm] for new tables and shall be maintained at 0.002 to 0.010 in. [0.05 to 0.25 mm] for tables in use. The end of the shaft shall not fall upon the cam at the end of the drop, but shall make contact with the cam not less than 120° from the point of drop. The face of the cam shall be a smooth spiraled curve of uniformly increasing radius from ½ to 1¼ in. [13 to 32 mm] in 360° and there shall be no appreciable jar as the shaft comes into contact with the cam. The cam shall be so located and the contact faces of the cam and shaft shall be such that the table does not rotate more than one revolution in 25 drops. The surfaces of the frame and of the table that come into contact at the end of the drop shall be maintained smooth, plane, and horizontal and parallel with the upper surface of the table and shall make continuous contact over a full 360°.

2.3 The supporting frame of the flow table shall be integrally cast of fine-grained, high-grade cast iron. The frame casting shall have three integral stiffening ribs extending the full height of the frame and located 120° apart. The top of the frame shall be chilled to a depth of approximately ¼ in. [6 mm], and the face shall be ground and lapped square with the bore to give 360° contact with the shaft shoulder. The underside of the base of the frame shall be ground to secure a complete contact with the steel plate beneath.

2.4 The flow table shall be driven by a motor (Note 2), connected to the cam shaft through an enclosed worm gear speed reducer and flexible coupling. The speed of the cam shaft shall be approximately 100 r/min. The motor drive mechanism shall not be fastened or mounted on the table base plate or frame.

NOTE 2—A 1/20-hp [40-W] motor has been found adequate.

2.5 The performance of a flow table shall be considered satisfactory if, in calibration tests, the table gives a flow value that does not differ by more than 5 percentage points from flow

[1] This specification is under the jurisdiction of ASTM Committee C-1 on Cement and is the direct responsibility of Subcommittee C01.22 on Workability.

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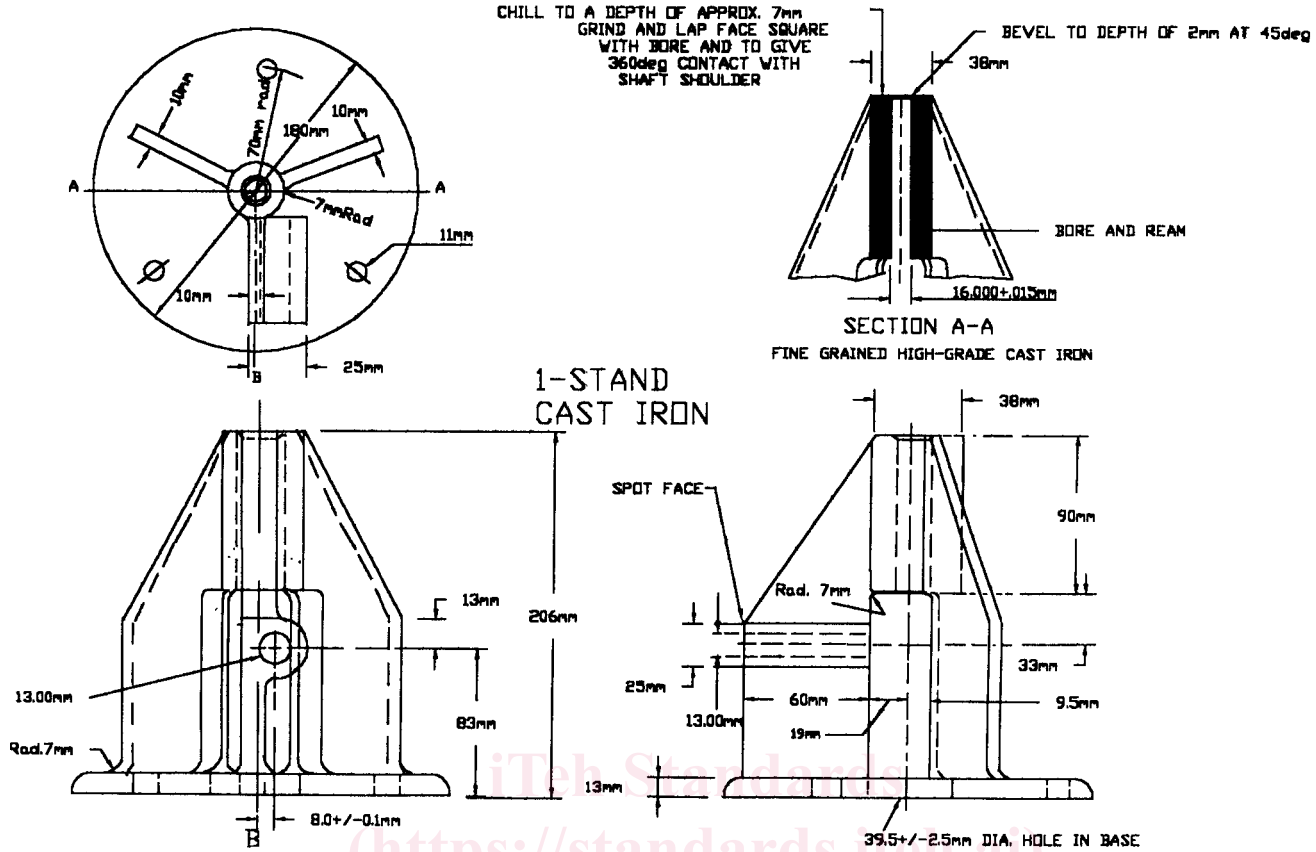

FIG. 1 Flow Table and Accessory Apparatus (Partial)

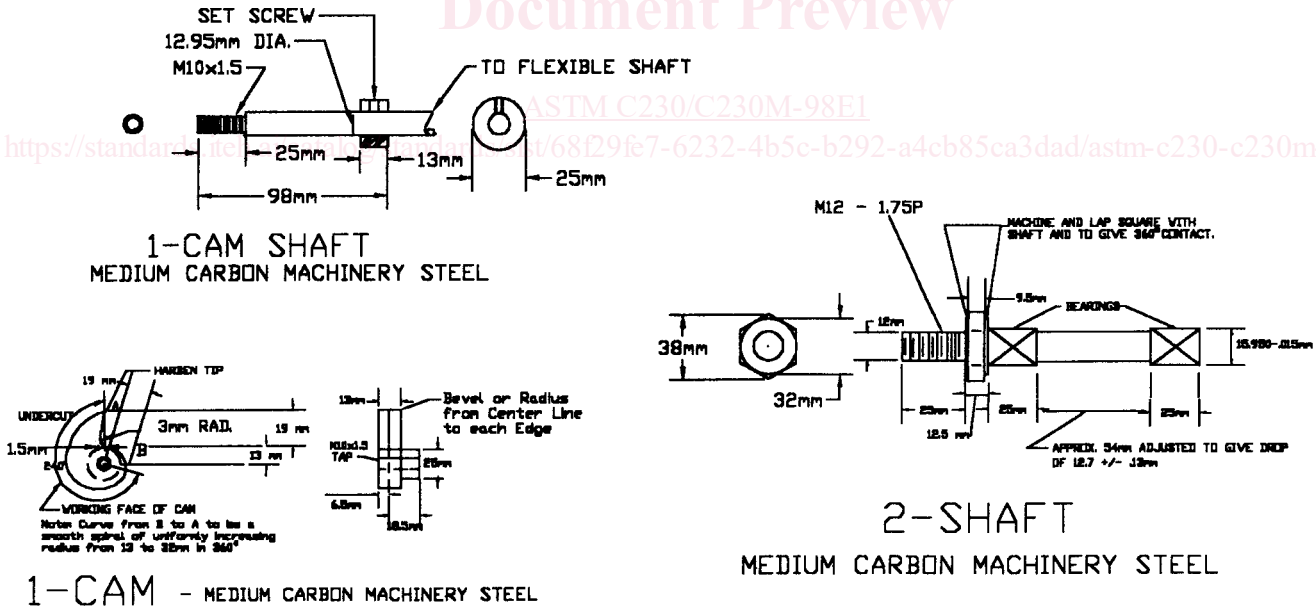

FIG. 1 Flow Table and Accessory Apparatus (Partial) *(continued)*

values obtained with a suitable calibration material.[2,3]

3. Flow Table Mounting

3.1 The flow table frame shall be tightly bolted to a cast iron or steel plate at least 1 in. [25 mm] thick and 10 in. [250 mm] square. The top surface of this plate shall be machined to a smooth plane surface. The plate shall be anchored to the top of a concrete pedestal by four ½-in. [13-mm] bolts that pass

[2] Such a material can be obtained from the Cement and Concrete Reference Laboratory at the National Institute of Standards and Technology, Gaithersburg, MD 20899.

[3] Supporting Data are available from ASTM Headquarters. Request RR: C01–1006.