



Standard Test Method for RESISTANCE TO PLASTIC FLOW OF FINE-AGGREGATE BITUMINOUS MIXTURES BY MEANS OF THE HUBBARD-FIELD APPARATUS¹

This Standard is issued under the fixed designation D 1138; 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.

1. Scope

1.1 This method covers the determination of the resistance to plastic flow of specimens of compressed bituminous mixtures composed of fine aggregate (passing a No. 10 (2.00-mm) sieve) and bituminous material, by means of the Hubbard-Field Apparatus. The method is for testing mixtures of the hot-mix, hot-laid type in which the bituminous material is tar or asphalt cement.

2. Apparatus²

2.1 *Specimen Molds*—Cylindrical molds (Fig. 1) of specially hardened steel, 2 ± 0.001 in. (50.8 ± 0.03 mm) in inside diameter by $4\frac{3}{4}$ in. (120.7 mm) in height, for forming test specimens. A minimum of three such molds is recommended.

2.2 *Bottom Plungers*—Steel plungers (Fig. 2), 2 in. (50.8 mm) in length, machined to provide a clearance of 0.002 in. (0.05 mm) between plungers and specimen molds, the nominal diameter being 1.998 ± 0.001 in. (50.75 ± 0.03 mm) to serve as bottom plungers for specimen molds. A minimum of three such plungers is recommended.

2.3 *Temporary Supports for Specimen Molds*—Two steel bars, 1 in. (25.4 mm) square and 3 in. (76.2 mm) in length.

2.4 *Top Plunger*—A steel plunger (Fig. 2), $4\frac{3}{4}$ in. (120.7 mm) in length, consisting of a steel bottom cylindrical compression plate

screwed to the shaft of the plunger. The compression plate shall be machined to provide a clearance of 0.002 in. (0.05 mm) between plunger and specimen molds, the nominal diameter being 1.998 ± 0.001 in. (50.75 ± 0.03 mm) and the thickness approximately $\frac{1}{8}$ in. (3.2 mm). The plunger shaft shall have at least four curved surfaces 1.98 ± 0.001 in. (50.75 ± 0.03 mm) in diameter, as illustrated in Fig. 2. A minimum of three such plungers is recommended.

NOTE—Compaction plungers conforming to requirements for the 5.5-in. (139.70-mm) long compaction plunger specified by ASTM Method D 915, Testing Soil-Bituminous Mixtures,³ may also be used.

2.5 Testing Mold and Ring:

2.5.1 *Type I*—A cylindrical testing mold (Fig. 3), 2.02 ± 0.002 in. (51.3 ± 0.05 mm) in inside diameter for the bottom 1.5 in. (38.1 mm) of the mold, tapering to a maximum inside diameter of 2.06 ± 0.002 in. (52.3 ± 0.05 mm) at the top, and approximately 3.02 in. (76.7 mm) in outside diameter. The mold shall be $4\frac{1}{2}$ in. (114.3 mm) in height, and be made of tool steel. The testing mold shall be

¹ This method is under the jurisdiction of ASTM Committee D-4 on Road and Paving Materials and is the direct responsibility of Subcommittee D04.20 on Mechanical Tests of Bituminous Mixes.

Current edition approved April 27, 1973. Published June 1973. Originally published as D 1138 - 50 T. Last previous edition D 1138 - 52 (1968).

² This apparatus is commonly known as the Hubbard-Field stability test apparatus.

³ *Annual Book of ASTM Standards*, Part 19.