



## Standard Test Method for DENSITY OF SINTERED METAL FRICTION MATERIALS<sup>1</sup>

This standard is issued under the fixed designation B 376; 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.

<sup>ε1</sup> NOTE—Paragraph 1.3 and Section 6 were added editorially in August 1985.

### 1. Scope

1.1 This test method covers determination of the density of sintered metal friction materials.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI equivalents are in parentheses and may be approximate.

1.3 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

### 2. Test Specimen

2.1 The test specimen shall be prepared from the part to be tested, except where the part is of such simple shape that its volume can be easily calculated from measurements.

2.2 The specimen shall be in the form of a square or rectangle, no smaller than ½ in. (12.7 mm) and no larger than 2 in. (50.8 mm) on a side, and of the full thickness of the part.

2.3 The specimen shall be cut from the part by sawing, milling, grinding, or some similar method. Shearing and blanking shall not be permitted.

### 3. Procedure

3.1 Either of the two procedures described in 3.1.1 and 3.1.2 may be used to impregnate the test specimen for the purpose of determining weights of the oil-impregnated specimens in air,  $B$ , or in water,  $C$  (Section 4):

3.1.1 Immerse the specimen for at least 4 h in a fully inhibited motor oil (viscosity of approxi-

mately 200 SUS at 100°F or 37.8°C) at a temperature of  $180 \pm 10^\circ\text{F}$  ( $82.2 \pm 5.5^\circ\text{C}$ ). Then cool the specimen to room temperature by immersing it in oil at room temperature.

NOTE 1—Generally, any high quality SAE 10 or 10 W motor oil will satisfy this requirement.

NOTE 2—After removal from the room temperature oil, the edges of the specimen may be blotted lightly to remove any adhering drops of oil.

3.1.2 Immerse the specimen in oil at room temperature. Reduce the pressure over the specimen to not more than 2 in. (50.8 mm) of mercury and hold for 30 min. Then allow the pressure to increase to atmospheric. Keep the specimen immersed in oil at room temperature and atmospheric pressure for 10 min.

3.2 The following procedure shall be used for determining weight,  $E$ , and volume,  $F$ , of the backing material (Section 4).

3.2.1 Determine the volume,  $F$ , of the backing material from measurements of the test specimen. Since the presence of the friction material prevents micrometer measurement of the backing material thickness, use a microscope with a micrometer eyepiece to measure this thickness.

3.2.2 Determine the weight,  $E$ , of the backing material from the volume,  $F$ , and the density,  $D$ , of the backing material, where  $E = F \times D$ .

3.2.3 Grind the friction material from the test specimen, then determine the density of the backing material either by weighing and measur-

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee B-9 on Metal Powders and Metal Powder Products and is the direct responsibility of Subcommittee B09.07 on Friction Materials.

Current edition approved Aug. 31, 1965. Published October 1965. Originally published as B 376 - 61 T. Last previous edition B 376 - 61 T.