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Superseding J380 SEP2002

(R) Specific Gravity of Friction Material

1. **Scope**—Specific gravity is a nondestructive test used as a quality control check of the consistency of formulation and processing of brake lining. The specific gravity and the range of specific gravity are peculiar to each formulation and, therefore, the acceptable values or range must be established for each formulation by the manufacturer. Specific gravity alone shows nothing about a materials in use performance.

The specific gravity of sintered metal powder friction materials, particularly those which have steel backing members, is usually determined somewhat differently. Reference ASTM B 376.

- 1.1 **Purpose**—To establish a uniform procedure for determining the specific gravity of brake friction material.

2. **References**

- 2.1 **Applicable Publication**—The following publication forms a part of this specification to the extent specified herein.

- 2.1.1 ASTM PUBLICATION—Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 376—Density of Sintered Metal Friction Material (Latest Version)

3. **Equipment**—(See Figure 1.)

- 3.1 A scale or balance that will weigh to an accuracy of 0.1% of dry sample weight (i.e., a 100 g sample requires 0.1 g scale accuracy).
- 3.2 A support for the scale or balance.
- 3.3 A container of clear water 20 to 30 °C (68 to 86 °F) large enough to hold a completely submerged sample without contacting the inside surfaces of the container.
- 3.4 A monofilament cord and tray fastened to the weighing mechanism from which a sample can be suspended and be completely immersed in the water.

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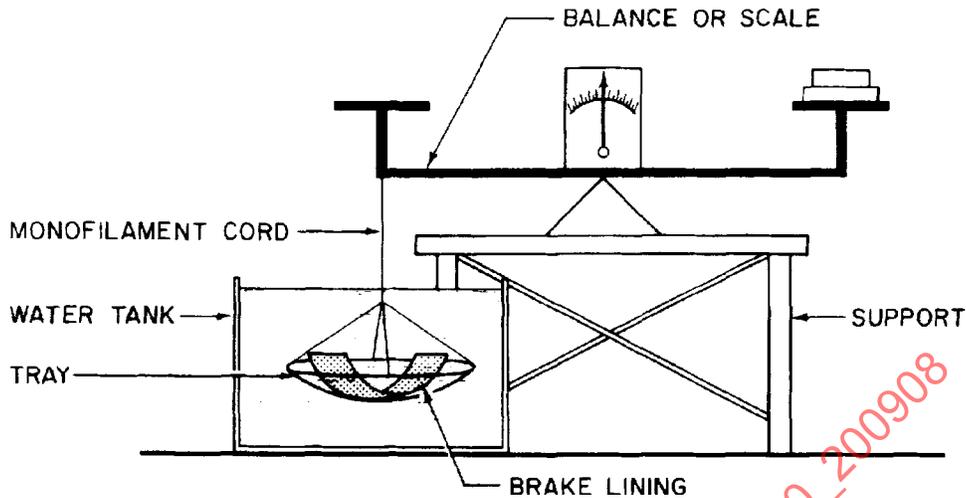


FIGURE 1—EQUIPMENT ARRANGEMENT

4. Procedure

- 4.1 If the specific gravity of the friction material is desired, remove all backing layers and plates from the sample. This is the preferred method.

A representative sample or the entire assembly can be used for the measurement. The specific gravity thus measured should only be used for direct comparisons. The type of sample used needs to be clearly reported.

- 4.2 Adjust the scale or balance to zero with the empty tray immersed in the water.
- 4.3 Place the sample on the scale or balance and determine the “weight in air.” Record the weight in air to 0.1% of the total.
- 4.4 Place the sample on the tray and completely immerse the lining in the water. Record the “weight in water” of the brake lining to 0.1% of dry weight.
- 4.5 Subtract the “weight in water” from the “weight in air” and divide the “weight in air” by the difference.

The resultant figure, to the closest two decimal places, is the specific gravity of the brake sample.

EXAMPLE:

$$\text{Specific gravity} = \frac{A}{A - B} \quad (\text{Eq. 1})$$

where:

A = weight in air, g
B = weight in water, g

CAUTION—The weighing in water should be performed as rapidly as possible (within 15 s) to minimize the absorption of the liquid in the sample. Care should be taken to eliminate air bubbles from the specimen. The addition of up to 5 parts of a wetting agent to 1000 parts water will help eliminate air bubbles and improve the accuracy of the test results.

5. Notes

- 5.1 Marginal Indicia**—The change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. An (R) symbol to the left of the document title indicates a complete revision of the report.

PREPARED BY THE SAE BRAKE LININGS COMMITTEE

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