



Standard Test Method for Cleanliness of Powder Metallurgy (PM) Bearings and Structural Parts¹

This standard is issued under the fixed designation B970; 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.

1. Scope

1.1 This test method covers a quantitative procedure to determine the cleanliness of PM bearings and structural parts.

1.2 This is a laboratory test consisting of cleaning sample parts under controlled conditions and calculating the amount or percent of residue from the mass of the removed contaminants.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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*:²
[B243 Terminology of Powder Metallurgy](#)

3. Terminology

3.1 Definitions of PM terms can be found in Terminology [B243](#). Additional descriptive material is available in the Related Materials section of Volume 02.05 of the Annual Book of ASTM Standards.

4. Summary of Test Method

4.1 The parts are washed with a solvent to remove surface residue.

4.2 The rinse solution is collected and filtered to capture the residue removed from the parts.

4.3 The filter is dried and the mass of residue measured.

¹ This test method is under the jurisdiction of ASTM Committee [B09](#) on Metal Powders and Metal Powder Products and are the direct responsibility of Subcommittee [B09.04](#) on Bearings.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

5. Significance and Use

5.1 Residue on a bearing may be detrimental to its longevity due to abrasive wear.

5.2 Residue on structural parts may affect the fit of assemblies or disturb the performance of the entire piece of equipment via excess friction or wear.

5.3 Part producers can utilize this procedure to determine the cleanliness of their processes. High residue levels on sintered parts may indicate a lubricant removal problem. Residue levels may also indicate the condition of various fluids used in part processing.

5.4 This test method can be applied when required by the user or internally for process engineering or quality control/compliance purposes by the producer.

6. Apparatus

6.1 *Basket*—Perforated aluminum, wire or stainless steel basket with handle to submerge parts in the solvent when using cleaning Method A.

6.2 *Container*—Glass or metal container sized to hold test fluid and parts.

6.3 *Solvent*—Laboratory grade toluene, petroleum ether or others as specified, since these are extremely flammable materials, extra care should be used to avoid ignition sources.

6.4 *Filter apparatus and filters*—Unless otherwise specified, a 10 μm nylon filter shall be used.

6.5 *Analytical Balance*—With a sensitivity of 0.0001 g.

6.6 *Balance*—Capable of weighing the parts tested to four significant figures if reporting a mass %.

6.7 *Container*—Weighing bottle or petri dishes.

6.8 *Squirt Bottle*—50 mL suggested.

6.9 *Drying Oven*—Capable of 120 °C, should be explosion proof if solvent is highly flammable.

6.10 *Vacuum Pump*—Capable of sustaining a pressure lower than 70 kPa.

6.11 *Ultrasonic Bath*—If used to replace manual agitation (see section [8.2](#)).