



Designation: D5040 – 90 (Reapproved 2005)

## Standard Test Methods for Ash Content of Adhesives<sup>1</sup>

This standard is issued under the fixed designation D5040; 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.

*This standard has been approved for use by agencies of the Department of Defense.*

### 1. Scope

1.1 These test methods cover procedures used in determining the ash content of adhesives. This standard is intended as a replacement for Method 4032.1 of Federal Test Method Standard 175B, “Adhesives: Methods of Testing.”

1.2 Two test methods are used:

1.2.1 *Test Method A* is used for a starch adhesive or other type glue, where there is no danger from the non-volatile content forming a rubbery mass when ignited.

1.2.2 *Test Method B* employs nitric acid to avoid the non-volatile residue being transformed into a viscous foam when ignited.

1.3 These methods are not applicable to adhesives containing decomposable salts such as zinc chloride.

1.4 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

1.5 *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.* For a specific hazard statement, see 9.2.3.

### 2. Referenced Documents

2.1 *ASTM Standards*:<sup>2</sup>

D301 [Test Methods for Soluble Cellulose Nitrate](#)

D907 [Terminology of Adhesives](#)

D2415 [Test Method for Ash in Coal Tar and Pitch](#)

### 3. Terminology

3.1 *Definitions*—Definitions of terms in this standard may be found in Terminology D907.

<sup>1</sup> These test methods are under the jurisdiction of ASTM Committee D14 on Adhesives and are the direct responsibility of Subcommittee D14.10 on Working Properties.

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<sup>2</sup> 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.

### 4. Summary of Test Methods

4.1 Ash content of adhesive materials is determined by heating a sample of material to remove all of the volatile components. Complete oxidation and removal of all carbonaceous material may be enhanced by the addition of concentrated HNO<sub>3</sub>. The general method of burning the residual ash in a muffle furnace at 600 ± 25°C (1112 ± 45°F) for 8 h or until constant weight, is used.

### 5. Significance and Use

5.1 This test method measures the amount of inorganic material in the sample.

### 6. Apparatus

6.1 *Crucible*, porcelain, silica or platinum with a tightly fitting lid, having a capacity of 30 to 45 mL.

6.2 *Evaporating Dish*, porcelain, silica, or platinum, with a capacity of 150 mL.

6.2.1 *Watch Glasses* to cover evaporating dishes.

6.3 *Desiccator*, equipped with drying agent and tray.

6.4 *Analytical Balance*, sensitive to 1 mg.

6.5 *Steam Bath*.

6.6 *Drying Oven*, with temperature control for maintaining temperature at 100 to 105°C (212 to 221°F).

6.7 *Electric Hotplate*.

6.8 *Muffle Furnace*, for igniting crucibles containing test specimens. Capable of maintaining desired temperature regulation (600 ± 25°C (1112 ± 45°F)).

### 7. Reagents

7.1 *Nitric Acid* (HNO<sub>3</sub>), concentrated, sp gr 1.42.

### 8. Test Specimens

8.1 For each test, use 5 to 6 g of material.

8.2 The specimen being tested should represent the entire lot of material. Two specimens shall be taken for testing from each sample unit.

### 9. Procedure

9.1 *Test Method A*—Place a 5.0 ± 0.5-g test specimen in an ignited and tared crucible and evaporate to dryness on a steam bath. Cool in a desiccator and weigh accurately. Heat the