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Designation: D 5040 – 90 (Reapproved 1997)ε1

# Standard Test Methods for Ash Content of Adhesives[1]

This standard is issued under the fixed designation D 5040; 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.

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

ε[1] NOTE—Section 13, Keywords, was added editorially in September 1997.

## 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 *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:*

D 301 Test Methods for Soluble Cellulose Nitrate[2]

D 907 Terminology of Adhesives[3]

D 2415 Test Method for Ash in Coal Tars and Pitches[4]

## 3. Terminology

3.1 *Definitions*—Definitions of terms in this standard may be found in Terminology D 907.

## 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 $HNO_3$. 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* ($HNO_3$), 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 crucible and its contents in a muffle furnace, gradually heating the furnace until the temperature reaches 600 ± 25°C (1112 ±

[1] These test methods are under the jurisdiction of ASTM Committee D-14 on Adhesives and are the direct responsibility of Subcommittee D14.10 on Working Properties.

Current edition approved March 30, 1990. Published May 1990.

[2] *Annual Book of ASTM Standards*, Vol 06.03.

[3] *Annual Book of ASTM Standards*, Vol 15.06.

[4] *Annual Book of ASTM Standards*, Vol 05.01.

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