



Designation: F 315 – 70 (Reapproved 1996)

AMERICAN SOCIETY FOR TESTING AND MATERIALS An American National Standard

100 Barr Harbor Dr., West Conshohocken, PA 19428

Reprinted from the Annual Book of ASTM Standards. Copyright ASTM
If not listed in the current combined index, will appear in the next edition.

Standard Test Methods of Identification of Solder and Solder Flux Contaminants in Aerospace Fluids¹

This standard is issued under the fixed designation F 315; 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 the chemical identification of solder and solder flux contamination in aerospace fluids by spot test procedures.

1.2 *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 Document

- 2.1 *ASTM Standard:*
D 1193 Specification for Reagent Water²

3. Reagents

3.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.³ Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean reagent water conforming to Specification D 1193.

IDENTIFICATION OF ROSIN IN SOLDER FLUX CONTAMINATION BY SPOT TEST PROCEDURE

4. Summary of Test Method

4.1 Rosin dissolved in acetic anhydride and reacting with concentrated sulfuric acid produces a fleeting running purple color at the periphery. The purple color persists for 1 or 2 s.

4.2 The limit of identification is 10 μ g of rosin.

NOTE 1—One gamma is equal to 1 μ g or 0.000001 g.

NOTE 2—Pure rosin particles (approximately 5 mg in size) observed under a long-wave ultraviolet light will produce a light blue fluorescence.

¹ This test method is under the jurisdiction of ASTM Committee E-21 on Space Simulation and Applications of Space Technology and is the direct responsibility of Subcommittee E21.05 on Contamination.

Current edition effective Aug. 14, 1970. Originally issued 1966. Replaces D 2546 – 66 T. Redesignated F 315 in 1970.

² *Annual Book of ASTM Standards*, Vol 11.01.

³ *Reagent Chemicals, American Chemical Society Specifications*, American Chemical Society, Washington, DC. For suggestions on the testing of reagents not listed by the American Chemical Society, see *Analar Standards for Laboratory Chemicals*, BDH Ltd., Poole, Dorset, U.K., and the *United States Pharmacopeia and National Formulary*, U.S. Pharmaceutical Convention, Inc. (USPC), Rockville, MD.

This fluorescence test, however, cannot be used to detect rosin concentrations of 1000 gammas (0.001 g) or less.

5. Significance and Use

5.1 After a soldering operation, the flux residue becomes a contaminant. It is essential to identify the presence of residual flux for the selection of a proper flux-removal solvent.

6. Interferences

6.1 Any organic or inorganic colored compound soluble in acetic anhydride will interfere with the color formation of the reaction.

7. Apparatus

7.1 *White Porcelain Spot Test Plate*, with a test area of approximately 5 cm² or a hanging drop microscope slide.

7.2 *Capillary Tubes*, approximately 2.0 by 100 mm in size.

7.3 *Hanging Drop Microscope Slides*.

7.4 *White Filter Paper*.

8. Reagents

8.1 *Acetic Anhydride* (99 to 100 % pure).

8.2 *Sulfuric Acid* (sp gr 1.84)—Concentrated sulfuric acid (H₂SO₄).

9. Sampling

9.1 Scrape the sample from the surface and transfer to a white indented spot plate or place in the depression of a hanging drop microscope slide. Place the slide on top of a white filter paper.

10. Procedure

10.1 From the capillary tube add 2 micro drops of acetic anhydride to the contaminant. Stir the acetic anhydride to dissolve the rosin. Add 2 micro drops of concentrated sulfuric acid (H₂SO₄, sp gr 1.84), allowing the acid to run into the acetic anhydride. A fleeting running purple color will appear in the acetic anhydride if rosin is present.

IDENTIFICATION OF LEAD OR TIN IN SOFT COMMON SOLDER BY SPOT TEST PROCEDURE

11. Summary of Test Method

11.1 Lead in solution will react with a saturated solution of sodium sulfide and produce a black-brown precipitate of lead sulfide.