



Designation: B926 – 03

Standard Method for Pinhole Determination in Aluminum and Aluminum Alloy Plain Foil by Means of a Light Table¹

This standard is issued under the fixed designation B926; 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 method covers the identification and counting of pinholes, including roll holes, in plain foil using a light table, and inspector with normal 20/20 or corrected 20/20 vision, and a darkened inspection area.

1.2 *This method may involve hazardous materials, operations, and equipment. 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

B373 Specification for Aluminum Foil for Capacitors

B479 Specification for Annealed Aluminum and Aluminum-Alloy Foil for Flexible Barrier, Food Contact, and Other Applications

E252 Test Method for Thickness of Foil, Thin Sheet, and Film by Mass Measurement

3. Terminology

3.1 *Definitions:*

3.1.1 *calibration*—determination of the values of the significant parameter(s) by comparison with a value(s) indicated by a reference instrument or by a set of reference standards.

3.1.2 *foil*—a rolled metallic product rectangular in cross-section and of a thickness less than 0.006 in. (0.15 mm). This method was developed based on aluminum foil, but could be applied to other types of metallic foil as well.

3.1.3 *pinhole*—any small void in the foil that will permit the transmission of light. Classification criteria for pinholes limits these voids to those that are too small in size to be clearly visible to the unaided eye ($1\times$ visual inspection).

3.1.4 *roll hole*—the producer's classification of a pinhole caused by an imperfection on any type of roll the foil contacts during production. The distinguishing feature of a roll hole(s) is the repeatability of this void on a regular interval. This interval is directly proportional to the circumference of the roll causing the void (this interval will also increase proportionally to subsequent thickness reductions).

4. Summary of Method

4.1 This method contains guidelines for determining the number of pinholes present in the area with the highest pinhole concentration in a sample of foil.

4.2 A full width sample is placed on the light table, and the pinholes are counted in a sample of known area (five or more square feet).

5. Significance and Use

5.1 Foil in thickness of about 0.002 in. (0.05 mm) and heavier is virtually free of pinholes. With decrease in thickness, the number of pinholes may increase.

5.2 This method is provided to develop and maintain uniformity in the methods of evaluating pinholes in aluminum foil. The pinhole data provides assessments of process capability and quality levels of the foil as well.

6. Apparatus

6.1 A light table which provides illumination between 1500 and 1800 lux light intensity with a smooth and uniform inspection surface on which the foil is examined. The light table must be in a black booth or in an area where the lights are turned off to provide darkness of less than 50 lux. The light table should be able to accommodate the widest width of foil to be examined. The usual construction of the light table consists of a shallow box painted white on the inside with rows of fluorescent lights and with a frosted or milk glass covering to provide uniform light diffusion.

¹ This test method is under the jurisdiction of ASTM Committee B07 on Light Metals and Alloys and is the direct responsibility of Subcommittee B07.03 on Aluminum Alloy Wrought Products.

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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.