



Designation: F 584 – 87 (Reapproved 2005)

## Standard Practice for Visual Inspection of Semiconductor Lead-Bonding Wire<sup>1</sup>

This standard is issued under the fixed designation F 584; 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.

### 1. Scope

1.1 This practice covers conditions for nondestructive visual inspection of the surface finish of spooled aluminum and gold wire used for making internal semiconductor device connections and hybrid microelectronic connections.

1.2 This practice specifies the recommended lighting, magnification, and specimen positioning for inspecting spooled wire under an optical microscope.

1.3 Photographs (Figs. X1.1–X1.5 ) are included in Appendix X1 as guides to aid the inspector in identifying particular surface conditions. These photographs are not intended as standards for specifying wire surface quality.

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.*

### 2. Referenced Documents

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

F 72 Specification for Gold Wire for Semiconductor Lead Bonding

F 487 Specification for Fine Aluminum-1 % Silicon Wire for Semiconductor Lead-Bonding

F 638 Specification for Fine Aluminum-1 % Magnesium Wire for Semiconductor Lead-Bonding

#### 2.2 Federal Standard:

Fed. Std. No. 209B Clean Room and Work Station Require-

ments, Controlled Environment<sup>3</sup>

### 3. Terminology

#### 3.1 Definitions of Terms Specific to This Standard:

3.1.1 *chatter marks*—for the purposes of this practice—repetitive closely spaced wire surface blemishes.

3.1.2 *dark area*—for the purposes of this practice—wire surface shadowed from direct light-source illumination.

3.1.3 *fingerprint*—for the purposes of this practice—residual surface contamination deposited during handling.

### 4. Summary of Practice

4.1 The wire spool to be inspected is first mounted on a holding fixture that permits rotation of the spool about its axis. The spool fixture is then placed on the stage of a binocular microscope. The wire surface is illuminated with light incident at a grazing angle; the microscope and fixture are positioned so that the microscope field shows the partially shadowed wire wrap just adjacent to the brilliantly lit surface at the top of the spool.

4.2 Inspection is accomplished by slowly rotating the spool about its axis and moving the fixture over the microscope stage until the operator has viewed the entire exposed wire surface area under partially shadowed illumination.

4.3 The defects to be identified, the manner in which their presence is reported, and the manner in which the wire surface quality is to be characterized should be agreed upon by the parties to the inspection.

Note 1.—Viewing a wire spool in the partial shadow of glancing illumination is particularly revealing of surface flaws and soil. The viewing arrangement amounts to dark-field illumination with imperfections appearing as bright glints on the wire surface.

### 5. Significance and Use

5.1 Spooled wire viewed under bright direct lighting or in deep shadow generally exhibits a flawless appearance. Proper arrangement of the viewing angle and illumination, however, permits accurate observation of wire-surface condition. This

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee F04 on Electronics and is the direct responsibility of Subcommittee F04.07 on Interconnection Bonding/Carrier Bonding.

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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.

<sup>3</sup> Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

F584 June 2013

**Victor M. Corman**



## F584 June 2013:

Surviving Job Loss Kenneth A. Root, Rosemarie J. Park, 2016-02-11 Root and Park examine the plight of workers displaced from two paper mills and their paths to reemployment retirement decisions and the personal struggles they faced as a result of their dislocations They provide insightful personal portraits of workers that are representative of the hundreds who lost their jobs as a result of two mill closings one in Sartell Minnesota and the other in Bucksport Maine In addition the authors describe the types of assistance that were offered to the workers displaced by the mill closings dedicate a chapter each to the plights of female workers and of spouses who were both displaced by the closings discuss the importance of community when economic displacement occurs compare the experience of a mill closing in Canada with the Maine and Minnesota closings and conclude with ways that society can be more proactive in assisting workers who suffer job displacement and the economic and psychological impacts that so often occur as a result Overall this book adds a human perspective to the problems facing dislocated workers not only in the shrinking paper industry but also in other contracting industries in the United States    **Monthly Catalog of United States Government Publications** ,1963    *United States Exports of Domestic and Foreign Merchandise* ,1957    **Journal of the American Medical Association** American Medical Association,1924    **Jane's Fighting Ships 2010-2011** Stephen Saunders,2010-06-17 Jane s Fighting Ships is your essential reference to the world s navies Country by country you will find authoritative commentaries for each ship complete with comprehensive details of displacement and dimensions main machinery speed and range weapons systems construction and modernisation programmes latest operational status and strength of fleet including sales to other navies    **Renwick Invitational 2018** Abraham Thomas,2018 Published in conjunction with the exhibition of the same name on view at the Renwick Gallery of the Smithsonian American Art Museum Washington DC from November 9 2018 through May 5 2019    **The Commercial and Financial Chronicle** ,1926    *Emerging Infectious Diseases* ,2013    **Moody's Manual of Investments: American and Foreign** ,1933    *Out of the House of Bondage* Gad Heuman,2013-06-17 Slave rebellions have been studied in considerable detail but this volume examines other patterns of slave resistance concentrating on runaway slaves and the communities some of them formed These essays show us who the runaways were suggest when and where they went and who harboured them    Bank and Quotation Record ,1948    **Dictionary Catalog of the Department Library** United States. Department of the Interior. Library,1969    **Chess Life** ,1997    □ □ □ □ □ □ **2015 :** **OECD □ □ □ □ G20 □ □ □ □ □ □ □ □ □ □** OECD,2018-02-06 6 OECD G20 4 1 4 1

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