NOTICE OF CHANGE

INCH-POUND

The documentation and process measures necessary to comply with this notice shall be completed by 24 Feb. 1999.

MIL-STD-883E
NOTICE 2
24 August 1998

DEPARTMENT OF DEFENSE

TEST METHOD STANDARD
MICROCIRCUITS

TO ALL HOLDERS OF MIL-STD-883E:

1. THE FOLLOWING TEST METHODS OF MIL-STD-883E HAVE BEEN REVISED AND SUPERSEDE THE TEST METHODS LISTED:

NEW METHOD	DATE	SUPERSEDED METHOD	DATE
2002.4	24 August 1998	2002.3	15 January 1982
2007.3	24 August 1998	2007.2	27 July 1990
2015.12	24 August 1998	2015.11	31 December 1996

2. THE FOLLOWING PAGES OF MIL-STD-883E HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

METHOD	NEW PAGE	DATE	SUPERSEDED PAGE	DATE
---	iii	31 December 1996	iii	REPRINTED WITHOUT CHANGE
---	iv	1 December 1997	iv	1 December 1997
---	v	31 December 1996	v	REPRINTED WITHOUT CHANGE
---	vi	31 December 1996	vi	REPRINTED WITHOUT CHANGE
2003.7	3	24 August 1998	3	15 November 1991
	4	15 November 1991	4	REPRINTED WITHOUT CHANGE
2009.9	5	24 August 1998	5	19 August 1994
	6	24 August 1998	6	19 August 1994
2012.7	1	1 June 1993	1	REPRINTED WITHOUT CHANGE
	2	24 August 1998	2	1 June 1993
5005.13	7	24 August 1998	7	19 August 1994
	8	19 August 1994	8	REPRINTED WITHOUT CHANGE
	11	19 August 1994	11	REPRINTED WITHOUT CHANGE
	12	24 August 1998	12	19 August 1994
5011.4	1	31 October 1995	1	REPRINTED WITHOUT CHANGE
	2	24 August 1998	2	31 October 1995
	3	31 October 1995	1	REPRINTED WITHOUT CHANGE
	4	24 August 1998	2	31 October 1995
	11	24 August 1998	11	31 October 1995
	12	31 October 1995	12	REPRINTED WITHOUT CHANGE

AMSC N/A FSC 5962

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3. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

4. Holders of MIL-STD-883E will verify that page changes, additions, and corrections indicated above have been entered. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the military standard is completely revised or canceled.

NOTE: The margins of this notice are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous notice were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous notice.

CONCLUDING MATERIAL

Custodians:
Army - CR
Navy - EC
Air Force - 17
NASA-NA

Review activities
Army - AR, MI, SM
Navy - OS, SH, TD, AS, CG, MC
Air Force - 19, 85, 99

Preparing activity:
DLA - CC

(Project 5962-1820)

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FIGURES

FIGURE

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TEST METHODS

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METHOD 2002.4

MECHANICAL SHOCK

1. PURPOSE. The shock test is intended to determine the suitability of the devices for use in electronic equipment which may be subjected to moderately severe shocks as a result of suddenly applied forces or abrupt changes in motion produced by rough handling, transportation, or field operation. Shocks of this type may disturb operating characteristics or cause damage similar to that resulting from excessive vibration, particularly if the shock pulses are repetitive.

2. APPARATUS. The shock-testing apparatus shall be capable of providing shock pulses of 500 to 30,000 g (peak) as specified with a pulse duration between 0.1 and 1.0 millisecond, to the body of the device. The acceleration pulse shall be a half-sine waveform with an allowable distortion not greater than ±20 percent of the specified peak acceleration, and shall be measured by a transducer and optional electronic filter with a cut-off frequency of at least 5 times the fundamental frequency of the shock pulse. The pulse duration shall be measured between the points at 10 percent of the peak acceleration during rise time and at 10 percent of the peak acceleration during decay time. Absolute tolerances of the pulse duration shall be the greater of ±0.1 millisecond or ±30 percent of the specified duration.

3. PROCEDURE. The shock-testing apparatus shall be mounted on a sturdy laboratory table or equivalent base and leveled before use. The device shall be rigidly mounted or restrained by its case with suitable protection for the leads. Means may be provided to prevent the shock from being repeated due to "bounce" in the apparatus. Unless otherwise specified, the device shall be subject to 5 shock pulses of the peak (g) level specified in the selected test condition and for the pulse duration specified in each of the orientations X_1, X_2, Y_2, Y_1, Z_1, and Z_2. For devices with internal elements mounted with the major plane perpendicular to the Y axis, the Y_1 orientation shall be defined as that one in which the element tends to be removed from its mount. Unless otherwise specified, test condition B shall apply.

Test condition	g level (peak)	Duration of pulse (ms)
A	500	1.0
B	1,500	0.5
C	3,000	0.3
D	5,000	0.3
E	10,000	0.2
F	20,000	0.2
G	30,000	0.12

* CAUTION: If this test is performed using a potting compound type test fixture (e.g., waterglass/sodium silicate) the facility performing the test shall assure that this procedure/material does not mask fine/gross leakers.

3.1 Examination. After completion of the test, an external visual examination of the marking shall be performed without magnification or with a viewer having a magnification no greater than 3X and a visual examination of the case, leads, or seals shall be performed at a magnification between 10X and 20X. This examination and any additional specified measurements and examination shall be made after completion of the final cycle or upon completion of a group, sequence, or subgroup of tests which include this test.

3.2 Failure criteria. After subjection to the test, failure of any specified measurements or examination (see 3 and 4), evidence of defects or damage to the case, leads, or seals, or illegible markings shall be considered a failure. Damage to marking caused by fixturing or handling during tests shall not be cause for device rejection.

4. SUMMARY. The following details shall be specified in the applicable acquisition document:

   a. Test condition, if other than test condition B (see 3).

   b. Number and direction of shock pulses, if other than specified (see 3).

   c. Electrical-load conditions, if applicable (see 3).

   d. When required, measurement made after test (see 3 and 3.1).

   e. When required, measurement during test.

4.1 Preparation of terminations. No wiping, cleaning, scraping, or abrasive cleaning of the terminations shall be performed prior to testing. Any special preparation of the terminations, such as bending or reorientation prior to the test, shall be specified in the acquisition document. The customer/equipment manufacturer, may, at their option, clean the terminations using a nonabrasive, nonactive solvent (e.g., isopropyl alcohol).

4.2 Steam aging. Prior to the application of the flux and subsequent solder dips, all specimens assigned to this test shall be subjected to aging by exposure of the surfaces to be tested to water vapor for 8 hours ±0.5 hour in the apparatus specified in 2.4. The water vapor temperature at the component lead level shall be in accordance with table I. Aging may be interrupted once for 10 minutes maximum. The devices shall be removed from the test apparatus upon completion of the specified test period.

4.2.1 Drying and storage procedures. Upon removing the test specimens from the apparatus, the parts may be dried using one of the following procedures:

a. Bake at 100°C maximum for no more than 1 hour in a dry atmosphere (dry nitrogen atmosphere is recommended).

b. Air dry at ambient temperature for a minimum of 15 minutes.

NOTE: Parts not solderability-tested within 2 hours after removal from the aging apparatus shall be stored in a desiccant jar or dry nitrogen cabinet for a maximum of 72 hours before testing. The parts shall not be used for testing if they have exceeded the storage requirements.

4.3 Application of flux. The terminations to be tested shall be immersed in flux maintained at room ambient temperature. The terminations, unless otherwise specified in the individual specification, shall be immersed according to 1.1.8. The terminations to be tested shall be immersed in the flux for 5 to 10 seconds, and shall be drained for 5 to 20 seconds prior to dipping in the solder pot. The flux shall be covered when not in use and discarded a minimum of once a day. Any obvious droplets of flux clinging to the termination may be removed by blotting.

4.4 Solder dip procedure. The dross and burned flux shall be skimmed from the surface of the molten solder prior to testing. A wave solder pot may be used for this purpose, but the solder shall be static during the dipping procedure. The molten solder shall be at a uniform temperature of 245°C ±5°C (473°F, ±9°F). (Skimming may not be required in wave or flow pots). The part shall be attached to a dipping mechanism (see 2.2) and the flux covered terminations immersed once (except for the possible duplicate immersion of corner terminations on leadless packages) in the molten solder to the depth specified in 1.1.8. NOTE: The test sample shall not be suspended above the hot solder pot for longer than 7 seconds. The immersion and emersion rates shall be 1.0 inch per second ±.25 inch per second. The dwell time in the solder shall be 5 seconds ±.5 second. The dwell time for terminations greater than or equal to 0.040 inch in diameter shall be 7 seconds ±.5 second. After the dipping process, the part shall be allowed to cool in air. Residual flux shall be removed from the terminations by dipping the parts in isopropyl alcohol or other suitable solvent. If necessary, a clean soft cloth, cotton swab, or equivalent, moistened with clean isopropyl alcohol or other suitable solvent, may be used to remove all remaining flux.

* 4.4.1 Solder dipping of gold plated terminations. Gold plated terminations shall be cycled twice in flux and solder using one or two solder pots. The first immersion is to scavenge the gold on the terminations. It is recommended that a separate solder pot be used for gold plated devices. In any case, the user of this test should use two separate pots, a sufficiently large pot, or monitor closely the contamination level of a single small pot to assure that the test is performed as intended.

4.4.2 Immersion angle. Unless otherwise specified, the terminations shall be immersed perpendicular to the solder surface. For leaded or leadless chip carriers, the terminations shall be immersed at a 30° to 45° angle to the solder surface.

4.4.3 Solder bath contaminants. The manufacturer shall have a system to verify that the solder bath does not exceed the contaminant levels specified in table II.

TABLE I. Altitude versus steam temperature (see 4.2).

Altitude (feet)	Steam temperature (°C +3, -5)
0 - 2,000	93
2,001 - 4,000	91
4,001 - 6,000	89
Greater than 6,000	87

TABLE II. Maximum limits of solder bath contaminant (see 4.4.3).

Contaminant	Contaminant percentage limit
Copper	0.300
Gold	0.200
Cadmium	0.005
Zinc	0.005
Aluminum	0.006
Antimony	0.500
Iron	0.020
Arsenic	0.030
Bismuth	0.250
Silver	0.100
Nickel	0.010

NOTE: The total copper, gold, cadmium, zinc, and aluminum contaminants shall not exceed 0.4 percent.

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METHOD 2007.3

VIBRATION, VARIABLE FREQUENCY

1. PURPOSE. The variable frequency vibration test is performed for the purpose of determining the effect on component parts of vibration in the specified frequency range. This is a destructive test.

2. APPARATUS. Apparatus for this test shall include equipment capable of providing the required variable frequency vibration at the specified levels and the necessary optical and electrical equipment for post-test measurements.

3. PROCEDURE. The device shall be rigidly fastened on the vibration platform and the leads or cables adequately secured. The device shall be vibrated with simple harmonic motion having either a peak to peak amplitude of 0.06 inch (±10 percent) or a peak acceleration of the specified test condition A, B, or C (+20 percent, -0 percent g). Test conditions shall be amplitude controlled below the crossover frequency and g level controlled above. The vibration frequency shall be varied approximately logarithmically between 20 and 2,000 Hz. The entire frequency range of 20 to 2,000 Hz and return to 20 Hz shall be traversed in not less than 4 minutes. This cycle shall be performed 4 times in each of the orientations X, Y, and Z (total of 12 times), so that the motion shall be applied for a total period of not less than 48 minutes. When specified, devices with an internal cavity containing parts or elements subject to possible movement or breakage during vibration shall be further examined by radiographic examination in accordance with method 2012 or by delidding or opening and internal visual examination at 30X magnification to reveal damage or dislocation. Where this test is performed as part of a group or subgroup of tests, the post-test measurements or inspections need not be performed specifically at the conclusion of this test, but may be performed once at the conclusion of the group or subgroup.

Test condition	Peak acceleration, g
A	20
B	50
C	70

* CAUTION: If this test is performed using a potting compound type test fixture (e.g., waterglass/sodium silicate) the facility performing the test shall assure that this procedure/material does not mask fine/gross leakers.

3.1 Examination. After completion of the test, an external visual examination of the marking shall be performed without magnification or with a viewer having a magnification no greater than 3X and a visual examination of the case, leads, or seals shall be performed at a magnification between 10X and 20X. This examination and any additional specified measurements and examination shall be made after completion of the final cycle or upon completion of a group, sequence, or subgroup of tests which include this test.

3.2 Failure criteria. After subjection to the test, failure of any specified measurement or examination (see 3 and 4), evidence of defects or damage to the case, leads, or seals, or illegible markings shall be considered a failure. Damage to marking caused by fixturing or handling during tests shall not be cause for device rejection.

4. SUMMARY. The following details shall be specified in the applicable acquisition document:

a. Test condition (see 3).

b. Measurements after test (see 3 and 3.1).

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c. Radial cracks that exhibit the following:

1. Cracks that do not originate at the lead (see figures 2009-5a and 2009-5b).

2. Three or more cracks that extend beyond the midpoints of distance from the lead to the case (see figure 2009-5c).

3. Two cracks that extend beyond the midpoint of the distance from the lead to the case and that lie within the same quadrant (see figure 2009-5d).

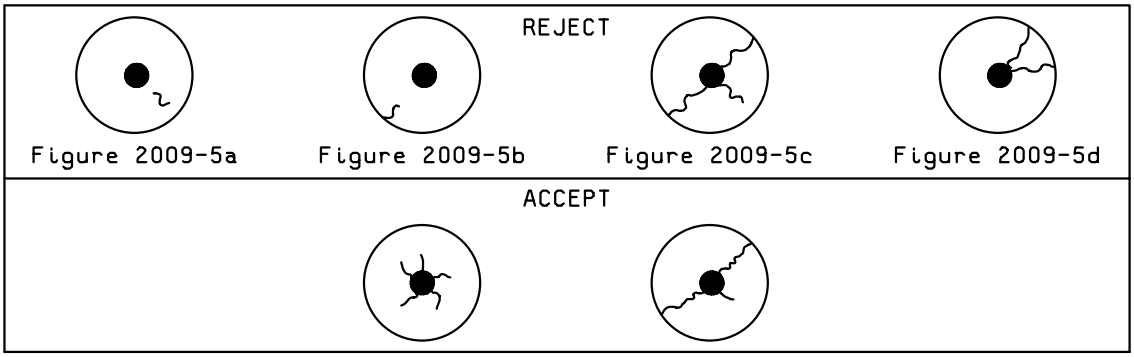
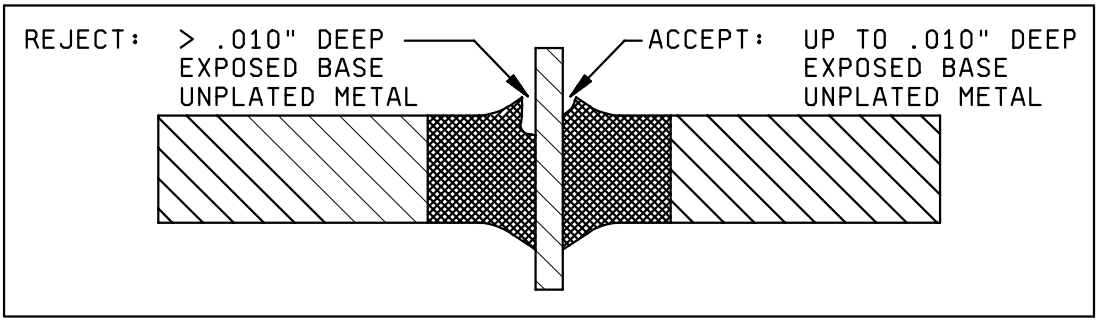


FIGURE 2009-5. Radial Cracks.

d. Any chip-out that penetrates the sealing glass deeper than the glass meniscus plane. The glass meniscus is defined as that area of glass that wicks up the lead or terminal. Exposed base metal as a result of meniscus chip outs is acceptable, provided that the exposed area is no deeper than 0.010 inch (see figure 2009-6).



* FIGURE 2009-6. Chip-outs.

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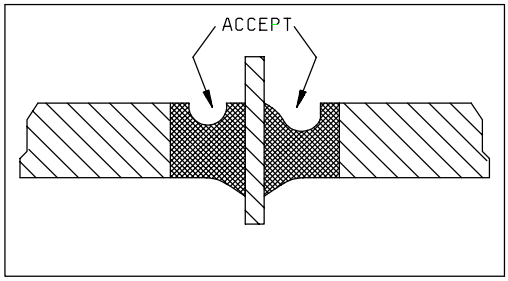

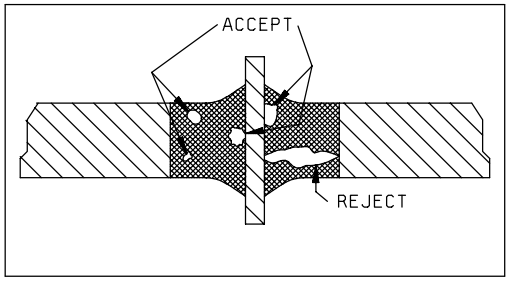

* FIGURE 2009-7a. Surface bubbles. FIGURE 2009-7b. Subsurface bubbles.

e. Surface bubbles that exceed the following:

* 1. Open bubbles in the glass seal that exceed 5 mils in diameter (see Figure 2009-7a).

2. Open bubbles in strings or clusters that exceed 2/3 of the distance between the lead and the package wall.

f. Subsurface bubbles that exceed the following:

1. Large bubbles or voids that exceed 1/3 of the glass sealing area (see Figure 2009-8a).

* 2. Single bubble or void that is larger than 2/3 of the distance between the lead and the package wall at the site of inclusion (see Figure 2009-7b and 2009-8b).

3. Two bubbles in a line totaling more than 2/3 distance from pin to case (see Figure 2009-8c).

4. Interconnecting bubbles greater than 2/3 the distance between pin and case (see Figure 2009-8d).

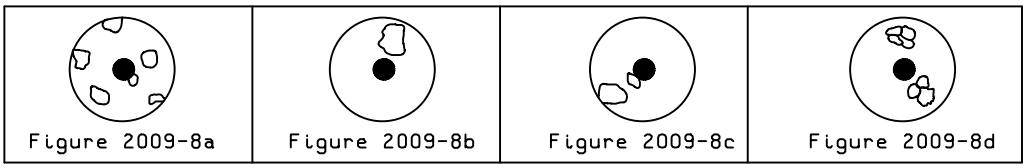

FIGURE 2009-8. Subsurface bubbles.

g. Reentrant seals that exhibit non-uniform wicking (i.e., negative meniscus) at the lead and/or body interface (see

METHOD 2012.7

RADIOGRAPHY

1. Purpose. The purpose of this examination is to nondestructively detect defects within the sealed case, especially those resulting from the sealing process and internal defects such as foreign objects, improper interconnecting wires, and voids in the die attach material or in the glass when glass seals are used. It establishes methods, criteria, and standards for radiographic examination of semiconductor and hybrid devices.

NOTE: For certain device types, opacity of the construction materials (packages or internal attachment) may effectively prevent radiographic identification of certain types of defects from some or all possible viewing angles. This factor should be considered in relation to the design of each device when application of this test method is specified.

2. Apparatus. The apparatus and material for this test shall include:

a. Radiographic equipment with a sufficient voltage range to penetrate the device. The focal distance shall be adequate to maintain a sharply defined image of an object with a major dimension of 0.0254 mm (0.001 inch).

b. Radiographic film: Very fine grain industrial X-ray film grade, either single or double emulsion.

c. Radiographic viewer: Capable of 0.0254 mm (0.001 inch) resolution in major dimension.

d. Holding fixtures: Capable of holding devices in the required positions without interfering with the accuracy or ease of image interpretation.

e. Radiographic quality standards: Capable of verifying the ability to detect all specified defects.

f. Film holder: A 1.6 mm (0.0625 inch) minimum lead-topped table or lead-backed film holders to prevent back scatter of radiation.

3. Procedure. The X-ray exposure factors, voltage, milliampere and time settings shall be selected or adjusted as necessary to obtain satisfactory exposures and achieve maximum image details within the sensitivity requirements for the device or defect features the radiographic test is directed toward. The X-ray voltage shall be the lowest consistent with these requirements and shall not exceed 200 kV.

3.1 Mounting and views. The devices shall be mounted in the holding fixture so that the devices are not damaged or contaminated and are in the proper plane as specified. The devices may be mounted in any type of fixture and masking with lead diaphragms or barium clay may be employed to isolate multiple specimens provided the fixtures or masking material do not block the view from X-ray source to the film of any portion of the body of the device.

3.1.1 Views.

3.1.1.1 Flat packages, dual-in-line packages, hybrid packages, and single ended cylindrical devices. Flat packages, dual-in-line packages, hybrid packages, and single ended cylindrical devices, unless otherwise specified, shall have one view taken with the X-rays penetrating in the Y direction as defined on figures 1 and 2 of MIL-STD-883, GENERAL REQUIREMENTS. When more than one view is required, the second and third views, as applicable, shall be taken with the X-rays penetrating in the Z and X direction respectively (either Z or X for flat packages). The die/cavity interface shall be positioned as close as possible to the film to avoid distortion.

3.1.1.2 Stud-mounted and cylindrical axial lead devices. Stud-mounted and cylindrical axial lead devices, unless otherwise specified, shall have one view taken with the X-rays penetrating in the X direction as defined on figures 1 and 2 of MIL-STD-883, GENERAL REQUIREMENTS. When more than one view is required, the second and third views, as applicable, shall be taken with the X-rays penetrating in the Z direction and at 45° between the X and Z direction. The die/cavity interface shall be positioned as close as possible to the film to avoid distortion.

3.2 Radiographic quality standard. Each radiograph shall have at least two quality standards exposed with each view, located (and properly identified) in opposite corners of the film. These penetrameters shall be of a radiographic density nearest the density of the devices being inspected. The radiographic quality standard shall consist of a suitable ASTM penetrameter as described in the DOD adopted standard ASTM E 801 Standard Practice for Controlling Quality of Radiographic Testing of Electronic Devices, or equivalent.

3.3 Film and marking. The radiographic film shall be in a film holder backed with a minimum of 1/16 inch lead or the holder shall be placed on the lead topped table. The film shall be identified using techniques that print the following information, photographically, on the radiograph:

a. Device manufacturer's name or code identification number.

b. Device type or Part or Identifying Number.

c. Production lot number or date code or inspection lot number.

d. Radiographic film view number and date.

e. Device serial or cross reference numbers, when applicable.

f. X-ray laboratory identification, if other than device manufacturer.

* 3.3.1 Nonfilm techniques. The use of nonfilm techniques is permitted if the equipment is capable of producing results of equal quality when compared with film techniques, and all requirements of this method are complied with, except those pertaining to the actual film. Radiographic quality standards, as specified in 3.2, may be used at the beginning and end of each inspection lot if equipment settings are not modified.

3.3.2 Serialized devices. When device serialization is required, each device shall be readily identified by a serial number. They shall be radiographed in consecutive, increasing serial order. When a device is missing, the blank space shall contain either the serial number or other X-ray opaque object to readily identify and correlate X-ray data. When large skips occur within serialized devices, the serial number of the last device before the skip and the first device after the skip may be used in place of the multiple opaque objects.

3.3.3 Special device marking. When specified (see 4.c), the devices that have been X-rayed and found acceptable shall be identified with a blue dot on the external case. The blue dot shall be approximately 1.6 mm (0.0625 inch) in diameter. The color selected from FED-STD-595 shall be any shade between 15102-15123 or 25102-25109. The dot shall be placed so that it is readily visible but shall not obliterate other device marking.

3.4 Tests. The X-ray exposure factor shall be selected to achieve resolution of 0.0254 mm (0.001 inch) major dimension, less than 10 percent distortion and an "H" and "D" film density between 1 and 2.5 in the area of interest of the device image. Radiographs shall be made for each view required (see 4).

3.5 Processing. The radiographic film manufacturer's recommended procedure shall be used to develop the exposed film, and film shall be processed so that it is free of processing defects such as fingerprints, scratches, fogging, chemical spots, blemishes, etc.

METHOD 2015.12

RESISTANCE TO SOLVENTS

1. PURPOSE. The purpose of this test is to verify that the markings will not become illegible on the component parts when subjected to solvents. The solvents will not cause deleterious, mechanical or electrical damage, or deterioration of the materials or finishes.

1.1 Formulation of solvents. The formulation of solvents herein is considered typical and representative of the desired stringency as far as the usual coatings and markings are concerned. Many available solvents which could be used are either not sufficiently active, too stringent, or even dangerous to humans when in direct contact or when the fumes are inhaled.

1.2 Check for conflicts. When this test is referenced, care should be exercised to assure that conflicting requirements, as far as the properties of the specified finishes and markings are concerned, are not invoked.

2. MATERIALS.

2.1 Solvent solutions. The solvent solutions used in this test shall consist of the following: 1/

a. At 20-30°C a mixture consisting of the following:

(1) One part by volume of an aliphatic alcohol and/or aliphatic ester, USP grade or better.

(2) Three parts by volume of mineral spirits in accordance with TT-T-291, type II, grade A, or three parts by volume of a mixture of 80 percent by volume of kerosene and 20 percent by volume of ethylbenzene.

b. A semiaqueous or nonaqueous based organic solvent e.g., a terpene or heterocyclic compound. 2/

c. This solvent has been deleted. When a suitable replacement for this solvent has been found, it will be added as solution c.

d. At 63°C to 70°C, a mixture consisting of the following: 1/

(1) 42 parts by volume of deionized water.

(2) 1 part by volume of propylene glycol monomethyl ether.

(3) 1 part by volume of monoethanolamine or equivalent inorganic base to achieve the same pH.

2.1.1 Solvent solutions, safety aspects. Solvent solutions listed in a through d above exhibit some potential for health and safety hazards. The following safety precautions should be observed:

a. Avoid contact with eyes.

b. Avoid prolonged contact with skin.

c. Provide adequate ventilation.

d. Avoid open flame.

e. Avoid contact with very hot surfaces.

1/ Normal safety precautions for handling these solutions (e.g., same as those for diluted ammonium hydroxide) based on O.S.H.A rules for Monoethanolamine or other precautionary measures with regard to flash point, toxicity, etc.

2/ Or any EPA demonstrated equivalent. When using EPA approved alternative solutions for test, the device manufacturer should consider the recommended temperature for cleaning specified by the solvent supplier.

2.2 Vessel. The vessel shall be a container made of inert material, and of sufficient size to permit complete immersion of the specimens in the solvent solutions specified in 2.1.

2.3 Brush. The brush shall be a toothbrush with a handle made of a nonreactive material. The brush shall have three long rows of hard bristles, the free ends of which shall lie substantially in the same plane. The toothbrush shall be used exclusively with a single solvent and when there is any evidence of softening, bending, wear, or loss of bristles, it shall be discarded.

* 3. PROCEDURE. The specimens subjected to this test shall be divided into three equal groups. Each group shall be individually subjected to one of the following procedures:

* NOTE: Metal lidded leadless chip carrier (LCC) packages shall be preconditioned by immersing the specimens in room temperature flux type symbols “A” or “B” (flux types “L0” or “L1”) in accordance with ANSI/J-STD-004 previously designated as RMA flux in accordance with MIL-F-14256, for 5 to 10 seconds. The specimens shall then be subjected to an ambient temperature of 215°C ±5°C for 60 seconds +5, -0 seconds. After the preconditioning, each device lid shall be cleaned with isopropyl alcohol.

a. The first group shall be subjected to the solvent solution as specified in 2.1a maintained at a temperature of 25°C ±5°C.

b. The second group shall be subjected to the solvent solution as specified in 2.1b maintained at a suitable temperature.

c. This solution has been deleted, (see 2.1c).

d. The fourth group shall be subjected to the solvent solution as specified in 2.1d maintained at a temperature of 63°C to 70°C.

The specimens and the bristle portion of the brush shall be completely immersed for 1 minute minimum in the specified solution contained in the vessel specified in 2.2. Immediately following emersion, the specimen shall be brushed with normal hand pressure (approximately 2 to 3 ounces) for 10 strokes on the portion of the specimen where marking has been applied, with the brush specified in 2.3. Immediately after brushing, the above procedure shall be repeated two additional times, for a total of three immersions followed by brushings. The brush stroke shall be directed in a forward direction, across the surface of the specimen being tested. After completion of the third immersion and brushing, devices shall be rinsed and all surfaces air blown dry. After 5 minutes, the specimens shall be examined to determine the extent, if any, of deterioration that was incurred.

3.1 Optional procedure for the fourth group. The test specimens shall be located on a test surface of known area which is located 15 ±2.5 centimeters (6 ±1 inches) below a spray nozzle(s) which discharges 0.6 ±0.02 liters/minute (0.139 gpm) of solution (2.1d) per 6.5 square centimeters (1 in^2)surface area at a pressure of 140 ±30 kilopascal (20 ±5 psi). The specimens shall be subjected to this spray for a period of 10 minutes minimum. After removal and within 5 minutes the specimens shall be examined in accordance with 3.1.1. The specimens may be rinsed with clear water and air blow dried prior to examination.

3.1.1 Failure criteria. After subjection to the test, evidence of damage to the device and any specified markings which are missing in whole or in part, faded, smeared, blurred, or shifted (dislodged) to the extent that they cannot be readily identified from a distance of at least 15.0 cm (6 inches) with normal room lighting and without the aid of magnification or with a viewer having a magnification no greater than 3X shall constitute a failure.

4. SUMMARY. The following detail shall be specified in the individual specification: The number of specimens to be tested (see 3).

TABLE IIa. Group B tests for class level S devices - Continued. 1/

Test	MIL-STD-883		Quantity (accept no.) Sample size no. Accept number
	Method	Condition	
Subgroup 6 a. End-point electrical parameters b. Temperature cycling c. Constant acceleration d. Seal (a) Fine (b) Gross e. End-point electrical parameters	 1010 2001 1014	 As specified in the applicable device specification Condition C, 100 cycles minimum Test condition E: Y_1 orientation only As specified in the applicable device specification	Sample size Number = 15, c = 0
Subgroup 7 12/			

1/ Electrical reject devices from that same inspection lot may be used for all subgroups when end-point measurements are not required provided that the rejects are processed identically to the inspection lot through pre burn-in electrical and provided the rejects are exposed to the full temperature/ time exposure of burn-in.

2/ Not required for qualification or quality conformance inspections where group D inspection is being performed on samples from the same inspection lot.

3/ This test is required only if it is a glass-frit-sealed package. Unless handling precautions for beryllia packages are available and followed method 1018, procedure 3 shall be used. See 6/ of table IV.

* 4/ Test three devices; if one fails, test two additional devices with no failures. At the manufacturers option, if the initial test sample (i.e., 3 or 5 devices) fails, a second complete sample may be tested at an alternate laboratory that has been granted current suitability status by the qualifying activity. If this sample passes, the lot shall be accepted provided the devices and data from both submissions is submitted to the qualifying activity along with five additional devices from the same lot. If sample size(accept number) of 5(1) is used to pass the lot, the manufacturer shall evaluate his product to determine the reason for the failure and whether the lot is at risk.

5/ Resistance to solvents testing required only on devices using inks or paints as a marking medium.

6/ Unless otherwise specified, the sample size number for conditions C and D is the number of bond pulls selected from a minimum number of four devices, and for condition F or H is the number of dice (not bonds).

7/ All devices submitted for solderability test shall be in the lead finish that will be on the shipped product and which has been through the temperature/time exposure of burn-in except for devices which have been hot solder dipped or undergone tin-lead fusing after burn-in. The sample size number applies to the number of leads inspected except in no case shall less than three devices be used to provide the number of leads required.

8/ The sample size number of 45 for lead integrity shall be based on the number of leads or terminals tested and shall be taken from a minimum of 3 devices. All devices required for the lead integrity test shall pass the seal test and lid torque test, if applicable, (see 9/) in order to meet the requirements of subgroup 4. For pin grid array leads and rigid leads, use method 2028. For leaded chip carrier packages, use condition B1. For leadless chip carrier packages only, use test condition D and a sample size number of 15 based on the number of pads tested taken from 3 devices minimum. Seal test (subgroup 4b) need be performed only on packages having leads exiting through a glass seal.

9/ Lid torque test shall apply only to glass-frit-sealed packages.

10/ The alternate removal-of-bias provisions of 3.3.1 of method 1005 shall not apply for test temperature above 125°C.

11/ Read and record group A subgroups 1, 2, and 3.

12/ Subgroup 7 has been deleted from table IIa. The requirements for ESD testing are specified in appendix A of MIL-PRF-38535.

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TABLE IV. Group D (package related tests) (for class levels B and S) - Continued.

Test 1/	MIL-STD-883		Quantity/(accept no.) or sample size number accept number
	Method	Condition	
Subgroup 4 5/			
a. Mechanical shock	2002	Test condition B minimum	Sample size number = 15, C = 0
b. Vibration, variable frequency	2007	Test condition A minimum	
c. Constant acceleration	2001	Test condition E minimum (see 3), Y_1 orientation only	
d. Seal	1014	As applicable	
(1) Fine			
(2) Gross			
e. Visual examination	9/		
f. End-point electrical parameters		As specified in the applicable device specification	
Subgroup 5 2/			
a. Salt atmosphere 6/	1009	Test condition A minimum in accordance with visual criteria of method 1009	Sample size number = 15, C = 0
b. Visual examination			
c. Seal	1014	as applicable	
(1) Fine 7/			
(2) Gross			
Subgroup 6 2/			
a. Internal water-vapor content	1018	5,000 ppm maximum water content at 100°C	3(0) or 5(1) 10/
Subgroup 7 2/	2025		Sample size number = 15, C = 0
a. Adhesion of lead finish 11/ 12/			
Subgroup 8 2/ 13/			
a. Lid torque	2024		5(0)

1/ In-line monitor data may be substituted for subgroups D1, D2, D6, D7, and D8 upon approval by the qualifying activity. The monitors shall be performed by package type and to the specified subgroup test method(s). The monitor sample shall be taken at a point where no further parameter change occurs, using a sample size and frequency of equal or greater severity than specified in the particular subgroup. This in-line monitor data shall be traceable to the specific inspection lot(s) represented (accepted or rejected) by the data.

2/ Electrical reject devices from that same inspection lot may be used for samples.

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TABLE IV. Group D (package related tests) (for class levels B and S) - Continued.

3/ The sample size number of 45, C = 0 for lead integrity shall be based on the number of leads or terminals tested and shall be taken from a minimum of 3 devices. All devices required for the lead integrity test shall pass the seal test if applicable (see 4/) in order to meet the requirements of subgroup 2. For leaded chip carrier packages, use condition B1. For pin grid array leads and rigid leads, use method 2028. For leadless chip carrier packages only, use test condition D and a sample size number of 15 (C = 0) based on the number of pads tested taken from 3 devices minimum.

4/ Seal test (subgroup 2b) need be performed only on packages having leads exiting through a glass seal.

5/ Devices used in subgroup 3, "Thermal and Moisture Resistance" may be used in subgroup 4, "Mechanical".

6/ Lead bend stress initial conditioning is not required for leadless chip carrier packages. For fine pitch packages ($\leq$ 25 mil pitch) using a nonconductive tie bar, preconditioning shall be required on 3 devices only prior to the moisture resistance test with no subsequent electrical test required on these 3 devices. The remaining 12 devices from the sample of 15 devices do not require preconditioning but shall be subjected to the required endpoint electrical tests.

7/ After completion of the required visual examinations and prior to submittal to method 1014 seal tests, the devices may have the corrosion by-products removed by using a bristle brush.

8/ At the manufacturer's option, end-point electrical parameters may be performed after moisture resistance and prior to seal test.

9/ Visual examination shall be in accordance with method 1010 or 1011.

* 10/ Test three devices; if one fails, test two additional devices with no failures. At the manufacturer's option, if the initial test sample (i.e., 3 or 5 devices) fails a second complete sample may be tested at an alternate laboratory that has been issued suitability by the qualifying activity. If this sample passes the lot shall be accepted provided the devices and data from both submissions is submitted to the qualifying activity along with 5 additional devices from the same lot. If sample size(accept number) of 5(1) is used to pass the lot, the manufacturer shall evaluate his product to determine the reason for the failure and whether the lot is at risk.

11/ The adhesion of lead finish test shall not apply for leadless chip carrier packages.

12/ Sample size number based on number of leads.

13/ Lid torque test shall apply only to packages which use a glass-frit-seal to lead frame, lead or package body (i.e., wherever frit seal establishes hermeticity or package integrity).

METHOD 5011.4

EVALUATION AND ACCEPTANCE PROCEDURES FOR POLYMERIC MATERIALS

1. Purpose. This method establishes the minimum inspection procedures and acceptance criteria for polymeric materials used in microcircuit applications. These materials shall be classified in two types as follows:

a. Type I being electrically conductive.

b. Type II being electrically insulative.

1.1 The user may elect to supplement Quality Conformance Inspection (QCI) test data or Qualification Testing data as a substitute where applicable for user Certification Testing.

2. Apparatus. Suitable measurement equipment necessary to determine compliance with the requirements of the applicable acquisition document and other apparatus as required in the referenced test methods.

3. Procedures.

3.1 Material acquisition specification. The microcircuit manufacturer shall prepare an acquisition specification describing the detailed electrical, mechanical, chemical, and thermal requirements for the polymeric material to be acquired. The requirements shall not be less than those imposed by this method, but may be increased to reflect the specific parameters of a particular material or the requirements of a particular application.

3.2 Certificate of compliance. The material supplier shall provide upon the users request a certificate of compliance for each polymeric material order. This certificate shall contain the actual test data for the supplier's testing as prescribed in this document.

3.3 Evaluation procedures. Evaluation procedures for polymeric materials shall be performed as specified in 3.4.1 through 3.5.13 for the type of material being tested.

3.4 Properties of uncured materials.

3.4.1 Materials. The components of a polymeric material and/or system shall be examined in accordance with table I and 3.8.1 and shall be uniform in consistency and free of lumps or foreign matter when examined in film, liquid or other acceptable form. Any filler shall remain uniformly dispersed and suspended during the required pot life (see 3.8.3). The electrically conductive fillers used in type I materials shall be gold, silver, alloys of gold or silver, or other precious metals.

3.4.1.1 Encapsulating compounds Encapsulating compounds are liquidous material and are to be tested in accordance with the requirements in Table I.

3.4.1.2 Molding compounds. Molding compounds as used in microelectronic devices are normally solidous material and are to be tested in accordance with MIL-PRF-38535, Appendix H Tables H-IB and H-IIB.

3.4.2 Viscosity. The viscosity of paste materials shall be determined in accordance with 3.8.2. The viscosity, including an acceptable range, shall be specified in the material acquisition document.

3.4.3 Pot life. The pot life when required shall be determined in accordance with 3.8.3 and shall be a minimum of 1 hour. The polymeric material shall be used within the pot life period after removal from the container, after mixing, or after thawing to room temperature in the case of premixed frozen polymers.

3.4.4 Shelf life. The shelf life, defined as the time that the polymeric material continues to meet the requirements of this specification shall be determined in accordance with 3.8.4. This shelf life shall be a minimum of 12 months at -40°C or below for one component system and a minimum of 12 months at room temperature (32°C maximum) for two component systems unless the supplier certifies for some other period of time. For class K devices, no polymeric material shall be used after the expiration date. Materials in class H devices may be requalified once, with acquiring activity and qualifying activity approval. Encapsulants shall have a minimum shelf life of 6 months.

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* TABLE I. Requirements

Test or Condition	Test Method Paragraph	Adhesives				α Absorbers				Film Dielectrics 1/				Particle Getters			
		Supplier		User		Supplier		User		Supplier		User		Supplier		User	
		A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
Materials (3.4.1)	3.8.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Viscosity (3.4.2)	3.8.2	X	X			X	X			X	X						
Pot Life (3.4.3)	3.8.3	X	X			X	X			X	X						
Shelf Life (3.4.4)	3.8.4		X				X				X				X		
Thermogravimetric analysis (3.5.2)	3.8.5	X	X			X	X				X			X	X		
Outgassed materials (3.5.3)	3.8.6				X				X				X				X
Ionic impurities(3.5.4)	3.8.7	X	X			X	X				X				X		
Bond strength (3.5.5)	3.8.8	X 2/	X				X										
Coefficient of linear thermal expansion (3.5.6)	3.8.9		X														
Thermal conductivity (3.5.7)	3.8.10		X														
Volume resistivity (3.5.8)	3.8.11		X														
Type 1 materials		X 2/	X														
Type 2 materials			X			X	X			X	X						
Dielectric constant (3.5.9)	3.8.12		X								X						
Dissipation factor (3.5.10)	3.8.13		X								X						
Sequential test environment (3.5.11)	3.8.14				X				X				X				
Density (3.5.12)	3.8.15																
Mechanical integrity (3.5.13)	3.8.16																X
Operating life test (3.5.14)	3.8.17																X

Test or Condition	Test Method Paragraph	Dessicants				Junction Coatings				T-Wave Absorbers				Encapsulating Compounds			
		Supplier		User		Supplier		User		Supplier		User		Supplier		User	
		A	C	A	C	A	C	A	C	A	C	A	C	A	C	A	C
Materials (3.4.1)	3.8.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Viscosity (3.4.2)	3.8.2														X		
Pot Life (3.4.3)	3.8.3																
Shelf Life (3.4.4)	3.8.4		X				X								X		
Thermogravimetric analysis (3.5.2)	3.8.5	X	X			X	X								X		
Outgassed materials (3.5.3)	3.8.6				X				X				X				
Ionic impurities(3.5.4)	3.8.7	X	X				X							X	X		
Bond strength (3.5.5)	3.8.8													X	X		
Coefficient of linear thermal expansion (3.5.6)	3.8.9														X		
Thermal conductivity (3.5.7)	3.8.10														X		
Volume resistivity (3.5.8)	3.8.11														X		
Type 1 materials																	
Type 2 materials						X	X								X		
Dielectric constant (3.5.9)	3.8.12														X		
Dissipation factor (3.5.10)	3.8.13														X		
Sequential test environment (3.5.11)	3.8.14				X				X								
Density (3.5.12)	3.8.15									X	X	X	X				
Mechanical integrity (3.5.13)	3.8.16																
Operating life test (3.5.14)	3.8.17				X												X

A= Performed at acceptance testing.
C= Performed at certification testing.

1/ Film dielectrics are defined as polymeric materials that are used in film form to act as either interlayer dielectrics, passivation layers, and/or circuit support films.
2/ Required at 25°C test condition only. No high temperature storage required.

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3.5 Properties of cured polymer materials.

3.5.1 Curing of polymer materials. The material must be capable of meeting the requirements of this document when cured according to the supplier's instructions. The cure schedule for supplier tests shall be identical for all tests and shall be reported. The cure schedule for the user tests shall be the minimum cure schedule plus, as a minimum, the pre-seal bake specified in the user's assembly document and shall be reported. Deviation from the suppliers recommended cure schedule will require verification by the user of the materials performance.

3.5.2 Thermogravimetric analysis (TGA).

3.5.2.1 Thermal stability. The thermal stability of the cured material shall be determined in accordance with 3.8.5. Unless otherwise noted, the weight loss at 200°C shall be less than or equal to 1.0 percent of the cured material weight. Equivalent standard, i.e., "classical analytical techniques" are acceptable.

3.5.2.2 Filler content. Polymeric materials using a filler to promote properties such as electrical and thermal conductivity shall be tested in accordance with 3.8.5 to determine the inorganic filler content. For acceptance testing, the percent filler content shall not differ from the filler content in the certified materials by more than ±2 percent.

3.5.3 Outgassed materials. Outgassing of the cured material shall be determined in accordance with 3.8.6. Outgassed moisture, as determined in 3.8.6.1, shall be less than or equal to 5,000 ppmv (0.5 percent V/V) for 3 packages (0 failures) or 5 packages (1 failure). Other gaseous species present in quantities greater than or equal to 100 ppmv (0.01 percent V/V) shall be reported in ppmv or percent V/V. The data obtained in 3.8.6.2 shall also be reported in the same manner but for information only. The outgassing of the cured getter shall be determined in accordance with 3.8.6. The vapor content of the package with getter shall not exceed 2000 ppmv after 24 hours at 150°C and 3000 ppmv after 1000 hours at 150°C.

3.5.4 Ionic impurities. The ionic impurity content shall be determined in accordance with 3.8.7 and shall meet the requirements specified in table II. Ionic content analysis shall be in triplicate for certification and single analysis for acceptance testing. Failure at acceptance shall require the passing of two additional samples.

TABLE II. Ionic impurity requirements.

Total ionic content specific electrical conductance)	< 4.50 millisiemens/meter
Hydrogen (pH)	4.0 < pH < 9.0
Chloride	< 200 ppm
Sodium	< 50 ppm
Potassium	< 50 ppm
Flouride	< 50 ppm

Other ions present in quantities > 5 ppm shall be reported in ppm.

3.5.5 Bond strength. The bond strength of a polymeric material shall be determined in accordance with 3.8.8 at 25°C, and 25°C after 1,000 hours at 150°C. The bond strength shall meet as a minimum the 1.0X requirement specified in figure 2019-4 of method 2019 of MIL-STD-883 at each test condition. The manufacturer should test to shear or until twice the minimum 1.0X shear force is reached.

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3.5.6 Coefficient of linear thermal expansion. The coefficient of linear thermal expansion shall be determined from -65°C to 150°C in accordance with 3.8.9. The coefficient of linear thermal expansion shall be ±10% of the value required in the users material specification or purchase order. This requirement shall apply to the material as it is configured for actual use. This requirement shall not apply to glass supported polymeric films.

3.5.7 Thermal conductivity. The thermal conductivity shall be determined at 121°C ±5°C in accordance with 3.8.10. The thermal conductivity shall be greater than or equal to 1.5 watt/meter-K for type I polymers and greater than or equal to .15 watt/meter-K for type II polymers.

3.5.8 Volume resistivity. The volume resistivity shall be determined in accordance with 3.8.11. The volume resistivity of conductive materials at 25°C, at 60°C, at 150°C, and at 25°C after 1,000 hours at 150°C shall be less than or equal to 5.0 microhm-meter for silver-filled polymers and less than or equal to 15.0 microhm-meter for gold-filled polymers. The volume resistivity of insulative materials shall be greater than or equal to 0.1 teraohm-meter at 25°C and greater than or equal to 1.0 megohm-meter at 125°C.

3.5.9 Dielectric constant. The dielectric constant of insulative polymeric materials shall be determined in accordance with 3.8.12 and shall be less than or equal to 6.0 at both 1 kHz and 1 MHz for this type of polymer but shall be less than or equal to 3.5 at 1 kHz and 1 MHz for materials used for dielectric layers.

3.5.10 Dissipation factor. The dissipation factor of insulative polymers shall be determined in accordance with 3.8.13 and shall be less than or equal to 0.03 at 1 kHz and less than or equal to 0.05 at 1 MHz.

3.5.11 Sequential test environment. The polymeric material shall withstand exposure to the test conditions specified in 3.8.14. After exposure to the complete sequence of environmental conditions, the test specimens shall show no evidence of mechanical degradation. For adhesives the measured bond strength of components shall meet as a minimum the 1.0X requirement specified on figure 2019-4 of method 2019 of MIL-STD-883.

3.5.12 Density. The density of microwave or RF absorbing materials shall be tested in accordance with 3.8.15. The acceptable value shall be that which is within ±10% of the value required on the user's material specification or purchase order.

3.5.13 Mechanical integrity. Particle getter integrity shall be verified after different levels of environmental stress.

* 3.5.13.1 Getter integrity (short term). When tested in accordance with 3.8.16.1 all samples shall pass the criteria for PIND as defined in MIL-STD-883 method 2020.

* 3.5.13.2 Getter integrity (long term). When tested in accordance with 3.8.16.2 all samples shall pass the criteria for PIND as defined in MIL-STD-883, method 2020, both initially and after storage at 150°C for 1,000 hours. The salted particles shall remain attached to the getter material in the original position with no attachment and reattachment when viewed at 30X to 60X magnification.

* 3.5.13.3 Getter integrity (vibration). When tested in accordance with 3.8.16.3 the sample shall pass PIND as defined in MIL-STD-883, method 2020, the salted particles shall remain attached to the getter material in the original position, with no detachment and re-attachment when viewed at 30X to 60X.

* 3.5.14 Operating life. When tested in accordance with 3.8.17, the comparison between initial and post test electrical data shall not indicate parametric shifts, which are unique to the test group containing getter material.

3.8.16 Mechanical integrity.

3.8.16.1 Getter integrity - short term. Samples shall be prepared using hermetically sealed packages representative of the maximum size and type which will incorporate the use of getter material. These samples will contain only "salted" particles and getter material. The getter material shall be applied to the package in the location and approximate volume as specified for a normal production part. The getter material coverage area shall be measured and recorded. The particles to be salted shall consist of the following unless otherwise agreed upon by the user and the qualifying activity.

(1) Solder balls: 3-6 mils in diameter - 2 pieces required.

(2) Aluminum ribbon: Approximate dimensions of 2 mil thick by 5 mil wide by 10 mils long - 1 required. A piece of aluminum wire 2-6 mils in diameter may be substituted for the ribbon.

* (3) Gold wire: 1 mil diameter by 15-20 mils in length - 1 piece required. Getter material application and cure shall take place in the sequence normally followed for production parts. The samples shall be processed through the same environmental conditioning steps as a qualified production part. The samples shall be subjected to PIND test in accordance with MIL-STD-883, method 2020, condition A or B, which shall be repeated three times for a total of four cycles to verify the integrity of the getter material. During all PIND testing the samples shall be mounted on the tester such that the shock pulses integral with the test shall be in the direction most likely to dislodge the particles from the getter material. A minimum of three samples shall be evaluated and all shall pass the defined PIND criteria.

3.8.16.2 Getter integrity - long term. All of the conditions and requirements of 3.8.16.1 apply, except that the samples either newly prepared or as received from the short term test, shall be stored at 150°C for 1,000 hours.

The samples shall then be subjected to mechanical shock in accordance with MIL-STD-883, method 2002, condition B, in the Y_2 direction. Following mechanical shock the samples shall be PIND tested as specified above.

Following PIND, the samples shall be delidded and a visual inspection shall be performed to verify the following:

a. Determine if particles have separated from the getter material or have fallen into the package.

b. Determine if getter coverage has spread or bled out.

c. Check for any evidence of peeling from inside and/or getter becoming separated from package.

3.8.16.3 Vibration. Samples shall be prepared as in 3.8.16.1 except that the lid shall be attached in such a manner that it may be removed for visual inspection. After particle salting and immobilization as in 3.8.16.1, visual inspection shall be done to verify entrapment of the salted particles. Location of the particles in the getter material shall be recorded for future reference.

The lid shall then be reattached to the package securely enough to withstand the testing that follows. After PIND testing in accordance with MIL-STD-883, method 2020, the samples shall be subjected to vibration in accordance with MIL-STD-883, method 2007, condition A or B. At the end of this test, the lids shall be removed from the package by whatever method is required. Location of the "salted" particles in the getter material shall be noted and compared with the location prior to vibration. Particles other than the original "salted" particles shall be ignored. A minimum of three samples shall be submitted for evaluation and all shall pass the defined PIND criteria initially and after vibration.

3.8.17 Operating life test. Ten electrically functioning samples shall be fabricated using hermetically sealed devices which have been processed through the same steps as a normally qualified production part as specified by the user's assembly drawing. If agreed upon by the user and the qualifying activity, standard evaluation circuits may be substituted. All the samples shall meet the PIND test requirements in accordance with MIL-STD-883, method 2020, condition A or B. The samples shall be subjected to the life test in accordance with MIL-STD-883, method 1005, condition A, for 1,000 hours at 125°C. Electrical parameters shall be measured and recorded for the units initially and at the completion of the life test. Data taken from the samples shall be reviewed for evidence of device degradation due to the presence of getter material.

NOTE: Qualification test data may be used to satisfy this requirement with qualifying activity approval.

3.9 Test deviation. Additional, reduced or alternate testing, as may be dictated by the uniqueness of particular material and manufacturing construction techniques can be required or authorized by the qualifying activity provided the manufacturer submits data to support test deviation.

4. SUMMARY. As a minimum, acquisition documents shall specify the following information:

a. Title, number, and revision letter of acquisition specification.

b. Size and number of containers required.

c. Manufacturer's product designation.

d. Request for test data.

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-STD-883E Notice 2	2. DOCUMENT DATE *(YYMMDD)* 980824

3. DOCUMENT TITLE
Test Method Standard Microcircuits

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE *(Include Area Code)* (1) Commercial (2) AUTOVON *(If applicable)*	7. DATE SUBMITTED *(YYMMDD)*

8. PREPARING ACTIVITY

a. NAME Mr. Jeff Bowling	b. TELEPHONE *(Include Area Code)* (1) Commercial (614) 692-0532 (2) AUTOVON 850-0532
c. ADDRESS *(Include Zip Code)* Defense Supply Center Columbus (DSCC-VAS) P.O. Box 3990 Columbus, OH 43216-5000	**IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:** Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340