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Space Administration

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MSFC-STD-2906
REVISION C
EFFECTIVE DATE: June 21, 2006

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

QD01

**MULTIPROGRAM/PROJECT COMMON-USE
DOCUMENT**

**MSFC TAILORING GUIDE FOR NASA-STD-8739.1,
WORKMANSHIP STANDARD FOR STAKING AND
CONFORMAL COATING OF PRINTED WIRING
BOARDS AND ELECTRONIC ASSEMBLIES**

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MSFC - Form 454 (Rev. October 1992)

Multiprogram/Project Common-Use Document QD01		
Title: MSFC Tailoring Guide for NASA-STD-8739.1, Workmanship Standard for Staking and Conformal Coating of Printed Wiring Boards and Electronic Assemblies	Document No.: MSFC-STD-2906	Revision: C
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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		02/05/99	Initial release.
Revision	A	04/02/01	Reformatted document to new template. Replaced NAS 5300.4(3J-1) with NASA-STD-8739.1. Replaced MIL-STD-1686 with ANSI/ESD S20.20-1999.
Revision	B	04/18/05	Updated document per NASA Headquarters Rules Review. Updated "SCOPE" to reflect changes due to reorganizations of the Safety & Mission Assurance (S&MA) and Engineering Directorates. Updated "APPLICABLE DOCUMENTS" to remove canceled, or add replacement documents. Replaced MIL-STD-1686 with ANSI/ESD S20.20-1999. Deleted MIL-C-85447 since it has been canceled without replacement. Replaced O-T-620 with ASTM D4126, which supersedes O-T-620.
Revision	C	06/21/06	Updated "Training Resources" information in paragraph 5.6.

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Multiprogram/Project Common-Use Document QD01		
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FOREWORD

This standard sets forth MSFC tailoring requirements for NASA-STD-8739.1. These requirements shall be invoked by drawings and specifications for flight hardware and critical support equipment.

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1. SCOPE

1.1 Scope. This tailoring guide sets forth the Marshall Space Flight Center (MSFC) exceptions to the use of MSFC Tailoring Guide for NASA-STD-8739.1, Workmanship Standard for Staking and Conformal Coating of Printed Wiring Boards and Electronic Assemblies, dated August 1999. This tailoring guide was prepared jointly by the Safety, Reliability & Quality Assurance (SR & QA) Policy and Assessment Department and the Electrical, Electronic, and Electromechanical (EEE) Parts, Packaging & Assembly Branch of the Instrument & Payload System Department. This guide shall be used on contracts and for in-house work.

2. APPLICABLE DOCUMENTS

2.1 Marshall Space Flight Center (MSFC).

<u>Document Number</u>	<u>Title</u>
MSFC-RQMT-2918	Requirements for Electrostatic Discharge Control

2.2 NASA

<u>Document Number</u>	<u>Title</u>
NASA-STD-8739.1	Workmanship Standard for Staking and Conformal Coating of Printed Wiring Boards and Electronic Assemblies

2.3 Military Standards

<u>Document Number</u>	<u>Title</u>
MIL-C-81302	Cleaning Compound, Solvent, Trichlorotrifluoroethane
MIL-T-81533	Trichloroethane 1, 1, 1 (Methyl Chloroform) Inhibited, Vapor Degreasing

2.4 American National Standards Institute.

<u>Document Number</u>	<u>Title</u>
ANSI/ESD S20.20-1999	ESD Association Standard for the Development of an Electrostatic Discharge Control Program for –Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)

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2.5 American Society for Testing and Materials

<u>Document Number</u>	<u>Title</u>
ASTM D4126	Vapor-Degreasing Grade and General Solvent Grade 1, 1, 1–Trichloroethane

3. DEFINITIONS

3.1 Acronyms used in this standard. The acronyms used in this standard are defined as follows:

ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
EEE	Electrical, Electronic, and Electromechanical
ESD	Electrostatic Discharge
MSFC	Marshall Space Flight Center
SR&QA	Safety, Reliability, and Quality Assurance

4. GENERAL REQUIREMENTS

None.

5. DETAILED REQUIREMENTS

The following exceptions to NASA-STD-8739.1 shall apply.

- 5.1 In paragraph 5.2.1, change the vision test frequency to every 3 years.
- 5.2 Exclude paragraph 5.3, Certification Levels.
- 5.3 In paragraph 5.4.3.a, exclude “Level B”.
- 5.4 Exclude paragraph 5.6.2 and replace with the following: “Recertification shall include demonstration of proficiency. Demonstration of proficiency shall be accomplished by

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retraining/retest, sample preparation/inspection, or a documented audit of actual work performed. The recertification procedure shall be documented by the supplier.”

5.5 Modify paragraph 5.6.3.d to require recertification every three years.

5.6 Replace paragraph 5.7 titled “Training Resources” with the following: “Training shall be obtained from a school approved by a technical advisor and the MSFC Certifying Officer. Contact the MSFC Certifying Officer within the Safety and Mission Assurance (S&MA) organization for an approved training school.”

5.7 Replace paragraph 6.4, Electrostatic Discharge Requirements, with the following: “The supplier shall implement an electrostatic discharge (ESD) Control Program. ESD requirements shall be in accordance with ANSI/ESD S20.20-1999 or other approved ESD control procedures. This program shall define the ESD control requirements for any activity that tests, inspects, services, manufacturers, installs, packages, labels or otherwise processes ESD sensitive parts or assemblies. All personnel who handle static-sensitive parts and assemblies shall have been trained in the proper procedures and in the use of appropriate protective equipment to prevent ESD damage. ESD requirements for MSFC in-house work shall be in compliance with MSFC-RQMT-2918, Requirements for Electrostatic Discharge Control.”

5.8 Add the following to bottom portion of Table 6-1, Solvents and Cleaners:

Cleaners	Specification/Note
Terpene or hydrocarbon bench cleaners	(See 6.10.6)

5.9 Add items 6 and 7 to paragraph 6.10 as shown below:

6. Terpene or hydrocarbon bench cleaners such as BioAct EC7-M, Axarel 36, or KNI-2000 shall be acceptable provided other compatible solvents are used to remove their residue. Other bench cleaners may be used if data supporting their cleaning capability is submitted to the NASA procuring organization and they are approved prior to use.

7. Trichlorotrifluoroethane (MIL-C-81302, Type II) and 1,1,1-Trichloroethane (MIL-T-81533 and ASTM D4126) may be used until supplies on-hand are depleted and if allowed by regulation.

5.10 Add the following to 9.2 as item 7: **Staking of Horizontal Cylindrical Sleeved Parts.** The preferred method of staking horizontal cylindrical sleeved parts (i.e., glass bodied diodes,

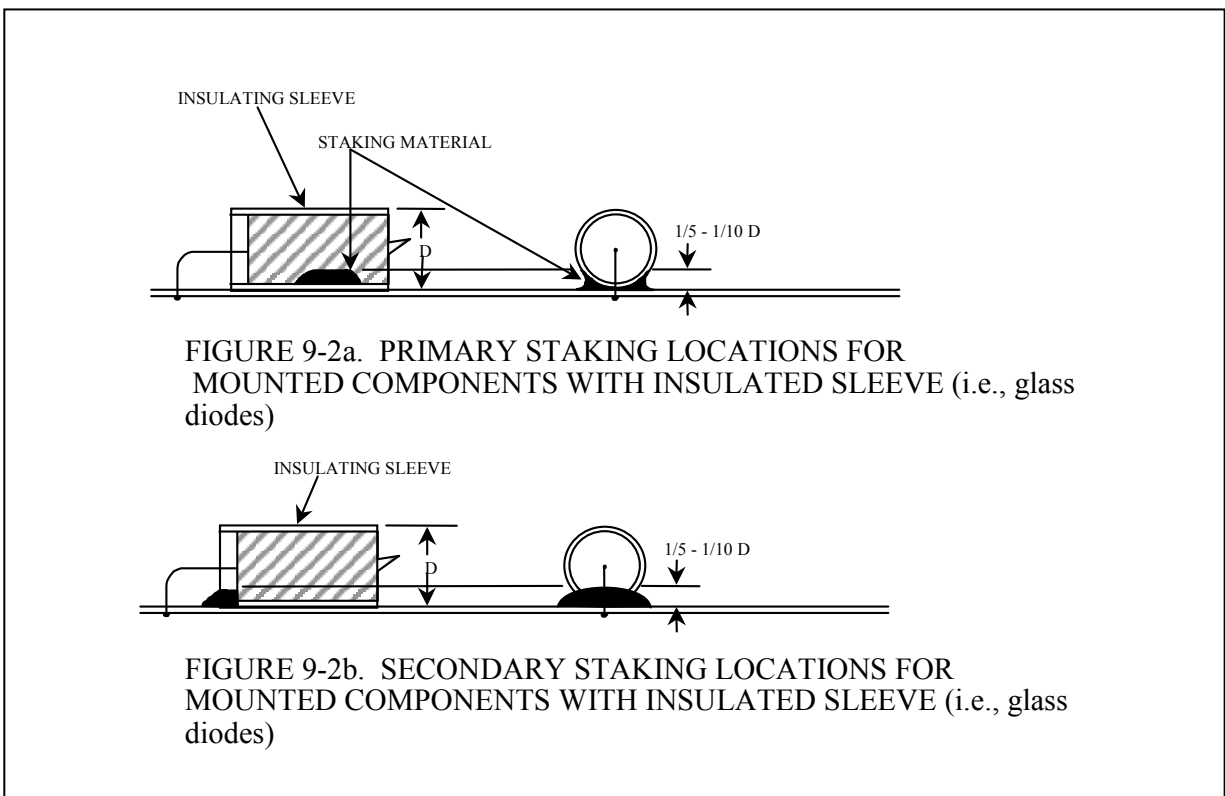
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tantalum capacitors) shall be to apply a fillet longitudinally on both sides of the part as shown in Figure 9-2a. If this is not possible, then apply as directed below (in priority order):

- a. apply a fillet longitudinally on one side of part only.
- b. apply a fillet to both ends as shown in Figure 9-2b.

NOTE: If a loose insulating sleeve (i.e., not heat shrink) is used, then bond the sleeve to the part on at least one end.

5.11 Exclude Figure 9-2 and replace with the figures below:



6. NOTES

This document replaces MSFC-STD-2906 dated April 18, 2005.

FILE NO. MSFC-STD-2906 202 -

DR060PR0

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DOCUMENTATION RELEASE LIST
GEORGE C. MARSHALL SPACE FLIGHT CENTERMSFC CODE IDENT 14981/339B2
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C H	DOCUMENT NUMBER	DRL DRL DSH REV	TITLE	CCBD NO.	PCN	PC	EFFECTIVITY
*	MSFC-STD-2906	202 -	MSFC TAILORING GUIDE FOR NAS 5300.4 (3J-1), WORKMANSHIP STANDARD FOR STAKING AND CONFORMAL COATING OF PRINTED WIRING BOARDS AND ELECTRONIC ASSEMBLIES	000-00-0000	0000000	ZA	NONE

CHG NO.	CHG REV	CHG NOTICE	RESPONSIBLE ENGINEER	RESPONSIBLE ORGANIZATION	ACTION DATE	DESCRIPTION
			MARK STRICKLAND	CR30	02/12/99	BASELINE RELEASE
*	1	DCN000	EUGENA GOGGANS	EO03	02/22/07	DOCUMENT RELEASED THRU PDS. NO LONGER TRACKED IN ICMS.

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ECR NO:	PCN:	CCBD NO:	DATE PREPARED:
EO03-0000	0000000	000-00-0000 SB3-00-0000	02/22/07

DWG SIZE	DRAWING NUMBER	DWG REV	EPL/DRL/DDS NUMBER	DWG REV	EPL DSH	EPL REV	EO DASH NUMBER	EO REV	PART NUMBER
			MSFC-HDBK-1453		202	-			
			MSFC-HDBK-1674		202	-			
			MSFC-HDBK-2221		203	-			
			MSFC-HDBK-505		202	-			
			MSFC-HDBK-670		202	-			
			MSFC-MNL-1951		209	-			
			MSFC-PROC-1301		202	-			
			MSFC-PROC-1721		202	-			
			MSFC-PROC-1831		202	-			
			MSFC-PROC-1832		202	-			
			MSFC-PROC-404		202	-			
			MSFC-PROC-547		202	-			
			MSFC-QPL-1918		204	-			
			MSFC-RQMT-1282		202	-			
			MSFC-SPEC-1198		202	-			
			MSFC-SPEC-1238		202	-			
			MSFC-SPEC-1443		202	-			
			MSFC-SPEC-164		202	-			
			MSFC-SPEC-1870		202	-			
			MSFC-SPEC-1918		203	-			
			MSFC-SPEC-1919		206	-			
			MSFC-SPEC-2083		202	-			
			MSFC-SPEC-2223		202	-			
			MSFC-SPEC-2489		206	-			
			MSFC-SPEC-2490		205	-			
			MSFC-SPEC-2491		203	-			
			MSFC-SPEC-2492		203	-			
			MSFC-SPEC-2497		211	-			
			MSFC-SPEC-250		202	-			
			MSFC-SPEC-445		202	-			
			MSFC-SPEC-504		202	-			
			MSFC-SPEC-521		202	-			
			MSFC-SPEC-548		202	-			
			MSFC-SPEC-560		202	-			
			MSFC-SPEC-626		202	-			
			MSFC-SPEC-684		202	-			
			MSFC-SPEC-708		202	-			
			MSFC-SPEC-766		202	-			
			MSFC-STD-1249		202	-			
			MSFC-STD-1800		202	-			
			MSFC-STD-246		202	-			
			MSFC-STD-2594		203	-			

DOCUMENTATION PACKAGE/ROUTING REPORT

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			MSFC-STD-2903		202	-			
			MSFC-STD-2904		202	-			
			MSFC-STD-2905		202	-			
			MSFC-STD-2906		202	-			
			MSFC-STD-2907		202	-			
			MSFC-STD-366		202	-			
			MSFC-STD-383		202	-			
			MSFC-STD-486		202	-			
			MSFC-STD-506		203	-			
			MSFC-STD-531		202	-			
			MSFC-STD-557		202	-			
			MSFC-STD-561		203	-			
			MSFC-STD-781		202	-			

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EO03		X		X		EO03

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EUGENA GOGGANS
12/19/06

SUBMITTED BY:

CONCURRENCE:

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TO RELEASE DESK 02/22/07 10:00
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REMARKS:

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