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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-8739.3,
SOLDERED ELECTRICAL CONNECTIONS**

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MSFC - Form 454 (Rev. October 1992)

Multiprogram/Project Common-Use Document QD01		
Title: MSFC Tailoring Guide for NASA-STD-8739.3, Soldered Electrical Connections	Document No.: MSFC-STD-2903	Revision: B
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DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline	-	2/5/99	Initial Release
Revision	A	4/18/05	Updated document per NASA Headquarters Rules Review. Reformatted document to new template. 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 ASNI/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	B	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 the MSFC tailoring requirements for NASA-STD-8739.3. 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 NASA-STD-8739.3, Soldered Electrical Connections, December 1997. 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 Systems 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-8739.3	Soldered Electrical Connections

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)

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

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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
PTH	Plated-Thru-Hole
PWB	Printed Wiring Board
SR&QA	Safety, Reliability, and Quality Assurance

4. GENERAL REQUIREMENTS

None.

5. DETAILED REQUIREMENTS

The following exceptions to NASA-STD-8739.3 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 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.

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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 6.3, 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-RQMT2918, 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 6.13.6)

5.9 Add items 6 and 7 to paragraph 6.13, Solvents and Cleaners as shown below:

a. 6.13.6 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.

b. 6.13.7 Trichlorotrifluoroethane (MII,-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 Replace paragraph 8.2.4 with the following: "Swage type terminals that are mounted in a PTH shall be secured to the PWB by an elliptical funnel swage to permit complete filling of the PTH with solder. (See Figure 8-4.)"

5.11 Replace paragraph 11.2.4.a with the following: "Functional PTH's on double-sided PWB's shall require the use of a filler wire as an interfacial connection".

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5.12 Replace paragraph 13.6.2.c.1 with the following: "Separation of conductor pattern from substrate except lifting of pads after PTH soldering shall be acceptable if the pad is not lifted more than .001 inch half-way to the hole."

6. NOTES

This document replaces MSFC-STD-2903 dated April 18, 2005.

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202 -

DR060PRO

PACKAGE NO. 10443R

DOCUMENTATION RELEASE LIST
 GEORGE C. MARSHALL SPACE FLIGHT CENTER

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C	DOCUMENT	DRL DRL	TITLE	CCBD NO.	PCN	PC	EFFECTIVITY
H	NUMBER	DSH REV					
*	MSFC-STD-2903	202 -	MSFC TAILORING GUIDE FOR NASA-STD-8739.3, SOLDERED ELECTRICAL CONNECTIONS	000-00-0000	0000000	ZA	NONE

CHG	CHG	CHG	RESPONSIBLE	RESPONSIBLE	ACTION	DESCRIPTION
NO.	REV	NOTICE	ENGINEER	ORGANIZATION	DATE	
			MARK STRICKLAND	CR30	02/12/99	BASELINE RELEASE
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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	-			

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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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