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MSFC-STD-2903
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George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

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MULTIPROGRAM/PROJECT COMMON-USE DOCUMENT

MSFC TAILORING GUIDE FOR NASA-STD-8739.3, SOLDERED ELECTRICAL CONNECTIONS

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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.

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.

CONTENTS

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).

Document Number	Title
MSFC-RQMT-2918	Requirements for Electrostatic Discharge Control

2.2 NASA

Document Number	Title
NASA-STD-8739.3	Soldered Electrical Connections

2.3 Military Standards.

Document Number	Title
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.

Document Number	Title
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

Document Number	Title
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
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.

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".

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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			MSFC-SPEC-1870		202	-			
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			MSFC-SPEC-2083		202	-			
			MSFC-SPEC-2223		202	-			
			MSFC-SPEC-2489		206	-			
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			MSFC-SPEC-2497		211	-			
			MSFC-SPEC-250		202	-			
			MSFC-SPEC-445		202	-			
			MSFC-SPEC-504		202	-			
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			MSFC-SPEC-560		202	-			
			MSFC-SPEC-626		202	-			
			MSFC-SPEC-684		202	-			
			MSFC-SPEC-708		202	-			
			MSFC-SPEC-766		202	-			
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			MSFC-STD-246		202	-			
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			MSFC-STD-2905		202	-			
			MSFC-STD-2906		202	-			
			MSFC-STD-2907		202	-			
			MSFC-STD-366		202	-			
			MSFC-STD-383		202	-			
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			MSFC-STD-506		203	-			
			MSFC-STD-531		202	-			
			MSFC-STD-557		202	-			
			MSFC-STD-561		203	-			
			MSFC-STD-781		202	-			

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