

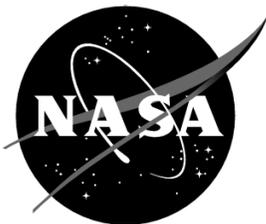
# Process Specification for Flame Retardant Treatment of Fabrics and Webbing

Engineering Directorate

Structural Engineering Division



October 2011



National Aeronautics and  
Space Administration

**Lyndon B. Johnson Space Center**  
Houston, Texas

Verify correct version before use.

# Process Specification for Flame Retardant Treatment of Fabrics and Webbing

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REVISIONS		
VERSION	CHANGES	DATE
--	Original version	5/1/2003
A	Added new Scotchgard product formulation. Scotchgard 4101W or Scotchgard 4101 may be used.	7/25/2005
B	Added <i>Structural Engineering Division</i> emblem to cover page; updated signature page; removed Scotchgard P/N 4101W from applicable sections; any Scotchgard Fabric and Upholstery Protector part number(s) compliant with Scotchgard 4101 can be used as a replacement.	10/12/2011

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## 1.0 SCOPE

This process specification establishes requirements for the application of flame retardant coatings to fabrics and webbings.

## 2.0 APPLICABILITY

This process specification applies to flame retardant treatments for fabrics and webbings used in both flight and non-flight hardware. This process specification covers the use of ammonium dihydrogen phosphate solution and Scotchgard 4101. Any Scotchgard Fabric and Upholstery Protector part number(s) compliant with Scotchgard 4101 can be used as a replacement.

## 3.0 USAGE

This process specification shall be called out on the engineering drawing by using a drawing note that identifies the surface(s) to be coated. One example of a standard callout is:

<b>APPLY FLAME RETARDANT TREATMENT TO ALL SURFACES OF FABRIC PER NASA/JSC PRC-4005</b>
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The materials used for the flame retardant coating are not required to be listed in the drawing's parts list.

## 3.1 WORK INSTRUCTIONS

Work instructions shall be generated for implementing this process specification. The work instructions shall contain sufficient detail to ensure that the manufacturing process produces consistent, repeatable products that comply with this specification.

## 4.0 REFERENCES

NASA-STD-6001 Flammability, Offgassing, and Compatibility Requirements and Test Procedures

## **5.0 MATERIAL REQUIREMENTS**

The ammonium dihydrogen phosphate and Scotchgard Fabric and Upholstery Protector shall be used within the shelf life that is listed for each product. The ammonium dihydrogen phosphate is GFS Chemicals P/N 13231 or P/N 13232. The most commonly used Scotchgard Fabric and Upholstery Protector is P/N 4101, a 3M product. Scotchgard 4101 has been screened at White Sands Test Facility for flammability and toxicity. Any Scotchgard Fabric and Upholstery Protector part number compliant with Scotchgard 4101 can be used as a replacement. A materials and processes engineer shall be consulted to verify compliance between Scotchgard 4101 and other Scotchgard Fabric and Upholstery Protector part number(s).

## **6.0 PROCESS REQUIREMENTS**

### **6.1 PRE-TREATMENT PREPARATION**

The surfaces of the fabric or webbing to be chemically treated shall be clean and dry prior to beginning the flame treatment process.

### **6.2 FLAME RETARDANT TREATMENT PROCESS SUMMARY**

The fabric or webbing to be treated is immersed in an ammonium dihydrogen phosphate solution (6-7 oz by weight with 1 gallon deionized water) for 30 minutes. Do not rinse. Allow material to dry for a minimum of 24 hours. Apply 2 coats of the Scotchgard Fabric and Upholstery Protector to each side of the fabric or webbing.

## **7.0 PROCESS QUALIFICATION**

The flame retardant treatment process described in section 6.2 has already been qualified for flammability resistance. Any new formulation must be qualified such that it will pass the NASA-STD-6001 Test 1 flammability test.

## **8.0 PROCESS VERIFICATION**

When visually examined in its finished form, the appearance of the flame retardant coating shall be uniform and free of contamination, crystalline residue, streaking or other surface irregularities.

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## **9.0 TRAINING AND CERTIFICATION OF PERSONNEL**

All flame retardant treatment operations shall be performed by personnel who have received on-the-job training for this process. No formal qualification or certification of employees is required.

## **10.0 DEFINITIONS**

Flame retardant      The condition of a fabric or webbing that has been treated in order to reduce its flammability.