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SYSTEM  
IDENTIFICATION  
U.S. STANDARD UNITS**

MSFC-SPEC-2491  
REVISION B  
EFFECTIVE DATE: August 28, 2017

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

EM40

MSFC TECHNICAL STANDARD

**AQUEOUS CLEANER  
SPECIFICATION**

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<b>MSFC Technical Standard EM40</b>		
<b>Title: Aqueous Cleaner Specification</b>	<b>Document No.: MSFC-SPEC-2491</b>	<b>Revision: B</b>
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### DOCUMENT HISTORY LOG

Status (Baseline/ Revision/ Canceled)	Document Revision	Effective Date	Description
Baseline		8/15/1995	BASELINE INITIAL RELEASE
CHG 1	SCN 001	SB3-01-5391 SM3-01-5544	Remove MSFC-QPL-2491 from MSFC-SPEC-2491. The QPL will be baselined as a stand alone doc.
Revision	A	2/4/2014	Revision A release was authorized by the MSFC Technical Standards Document Control Board (DCB) through the Multiprogram Document Management System (MPDMS). Update specification in entirety with changes to correct pH solution requirement, change supplier name and update to new format.
Revision	B	8/28/2017	Revised title to include "Specification" as type of Standard. Removed MSFC-QPL-2491 from MSFC-SPEC-2491; Updated document number and title in section 2.2; Changed MSDS to SDS. Updated information in section 6.5., Updated Para.6.2 for remove QPL and referenced Para. 6.5. Para. 6.5 changed Organic to Aqueous

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## **1.0 SCOPE**

This specification established the requirements for an environmentally compliant hand wipe cleaner. This specification has been approved by the George C. Marshall Space Flight Center (MSFC) and is available for use by MSFC and associated contractors.

## **2.0 APPLICABLE DOCUMENTS**

### **2.1 GOVERNMENT DOCUMENTS**

The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or requests for proposals shall apply.

#### **STANDARDS**

##### **MILITARY**

MIL-STD-129            Department of Defense Standard Practice, Military Marking for Shipment and Storage

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity as directed by contracting officer.)

### **2.2 NON-GOVERNMENT DOCUMENTS**

The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on the date of invitation for bids or request for proposals shall apply.

#### **STANDARDS**

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D501-03   Standard Test Methods of Sampling and Chemical Analysis of Alkaline Detergents

## **3.0 REQUIREMENTS**

### **3.1 MATERIAL**

The cleaner shall be aqueous based and shall meet the requirements of this specification.

### **3.2. PHYSICAL PROPERTIES**

Physical properties of the cleaner shall be in accordance with Table I.

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**TABLE I. CLEANER REQUIREMENTS**

Property	Requirement	Test Paragraph
Active Na <sub>2</sub> O (Sodium Oxide)	(Full Strength) 0.85 to 1.25% wt	4.7.1.1
Total Na <sub>2</sub> O (Sodium Oxide)	(Full Strength) 1.05 – 1.45% wt	4.7.1.2
Specific Gravity @ 25C	(Full Strength) 1.03 – 1.04	4.7.1.3
Aluminum Safety	No sign of white rust or blushing	4.7.1.4
pH (1%) @ 25C	10.9 +/- 0.3	4.7.1.5

### **3.3 APPEARANCE**

The cleaner shall be visually inspected with the unaided eye (corrective lenses permitted). The cleaner shall be a clear green liquid, free of foreign material.

### **3.4 SHELF LIFE AND STORAGE**

The cleaner shall be stored at 40°F to 120°F in the original sealed containers in a closed and vented facility away from direct sun or rain (see 5.3). The storage life under these conditions shall be 12 months from date manufacture.

### **3.5 TOXIC PRODUCTS AND SAFETY**

The Vendor shall furnish a Safety Data Sheet (SDS) to the procuring activity.

### **3.6 SHELF LIFE EXTENSION REQUIREMENTS (APPLICABLE TO THE PROCURING ACTIVITY ONLY)**

Extending the shelf life of this material is not permitted.

## **4.0 VERIFICATION**

### **4.1 IN-PROCESS MATERIAL (APPLICABLE TO USERS)**

When the vendor container is opened at the user's site, the material is regarded as in-process material. In-process material can be used up to its certified shelf life provided that normal precautions are taken for handling and storage, including those precautions cited below.

- a. When in-process material is not in use, the material's container shall be closed immediately in a manner as closely as possible to its original state. Opening of containers for inspection of contents shall be limited to less than ten (10) minutes.
- b. Said container shall be stored in a safety approved location within a vented facility, away from direct sun or rain.
- c. For a given work station, opened containers shall be used to exhaustion before another vendor container of the material is opened for use at the station.

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- d. If the integrity of in-process material is at any time suspect (e.g. not free flowing or failure of visual inspection criteria), then the material in question shall be discarded.

#### **4.2 GENERAL PROVISIONS**

The vendor shall provide and maintain a quality control system in accordance with the requirements of the purchase document. Vendors shall only submit those materials which meet the requirements of this specification.

#### **4.3 RESPONSIBILITY FOR INSPECTION AND TEST**

##### **4.3.1 Vendor**

The vendor is responsible for the performance of all inspection and test requirements as specified herein. Unless otherwise indicated, the vendor may utilize his own or any other inspection facilities and services acceptable to the procuring activity. Records of the examination and tests shall be transported to the procuring activity with the material.

The vendor shall notify the procuring activity of any changes in formulation or procedures used in product manufacture.

##### **4.3.2 Procuring Activity**

The procuring activity is responsible for verifying acceptability of the vendor test data or vendor certifications of selected acceptance tests.

#### **4.4 QUALIFICATION TESTS (SEE ALSO 6.3.1)**

Qualification testing shall consist of all examinations and tests specified in Table II and III and any other tests as deemed necessary by the MSFC Materials and Processes Laboratory. The test data shall be submitted to the procuring activity. The lots subjected to the qualification tests shall be representative of the manufactured lot from the proposed production facility.

#### **4.5 QUALITY CONFORMANCE TESTS (SEE ALSO 6.3.2)**

##### **4.5.1 Vendor Tests**

The following tests specified in Table II are inspection tests for this specification which are to be performed by the vendor and reported to the procuring activity along with certifications of compliance to the requirements below.

**TABLE II. VENDOR TESTS**

<b>Examination or Test</b>	<b>Requirement Paragraph</b>	<b>Examination or Test Paragraph</b>
Active Na <sub>2</sub> O	3.2	4.7.1.1
Total Na <sub>2</sub> O	3.2	4.7.1.2
Specific Gravity	3.2	4.7.1.3
pH	3.2	4.7.1.5

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## 4.5.2 Vendor Certifications

The vendor shall supply certifications of compliance for the tests in Table III.

**TABLE III. CERTIFICATION REQUIREMENTS**

Examination or Test	Requirement Paragraph	Examination or Test Paragraph
Aluminum Safety	3.2	4.7.1.4
Appearance	3.3	3.3

## 4.6 SAMPLING

A sample of sufficient size to perform the required tests shall be randomly selected from each lot.

## 4.7 TEST METHODS

The following test methods and procedures shall be used. Unless otherwise specified in the test or procedure description, all weights, volumes, and temperatures shall be measured to the nearest specified unit or decimal. When a referenced document provides the test method description, that document applies only to the extent of specifying the method.

**NOTE:** Unless otherwise specified within this specification, reagent grade chemicals shall be used for chemical reactions in the conduct of all tests defined in this specification. Solvents and indicators may be commercial nonreagent grade materials unless otherwise specified with this specification.

### 4.7.1 Properties Tests

#### 4.7.1.1 Active Na<sub>2</sub>O

Active Na<sub>2</sub>O (Sodium Oxide) shall be determined per ASTM D501.

#### 4.7.1.2 Total Na<sub>2</sub>O

Total Na<sub>2</sub>O (Sodium Oxide) shall be determined per ASTM D501.

#### 4.7.1.3 Specific Gravity

Specific gravity shall be determined using a gravimetric method at 25°C +/-1°C.

#### 4.7.1.4 Aluminum Safety

Concentrated cleaner shall be tested on an unclad 2024 specimen (any temper between 65°F and 140°F for five minutes minimum.

#### 4.7.1.5 pH

pH shall be determined using suitable equipment on cleaner formulations that are 1% solutions of the product form being procured. To perform the pH tests, mix 1 part cleaner to 99 +/- 5 parts Deionized water.



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#### **4.8 REJECTION**

Failure to meet any requirements of this specification is cause for rejection.

### **5.0 PACKAGING**

#### **5.1 PACKAGING AND PACKING**

Packaging and packing of the cleaner material shall be in accordance with standard commercial practice in conformance to federal and state regulations applicable to the type of material. Containers in the same shipment shall be of the same size and of such construction and materials that the cleaner material will be adequately protected against loss or contamination.

#### **5.2 MARKING**

Each container shall be marked for identification and shipment in accordance with MIL-STD-129 and shall include the following:

- a. Specification number and revision level
- b. Manufacturer's name, lot identification, and material identification
- c. Purchase document number
- d. Date of manufacture
- e. Storage temperature range.

#### **5.3 STORAGE**

After receipt of the material, the procuring activity is responsible for storage.

### **6.0 NOTES**

#### **6.1 INTENDED USE**

The material shall be used as a cleaner for flight or associated hardware.

#### **6.2 ORDERING DATA**

Purchase documents should specify the following:

- a. Title, number, and revision letter of this specification
- b. Types and quantity of material required

This specification requires procurement from vendors who are listed in Para. 6.5.

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### **6.3 DEFINITIONS**

#### **6.3.1 Qualification Tests**

Qualification tests are those tests necessary to qualify a supplier as an approved source. Once the material is qualified, these tests need not be repeated, provided the formulation or process of manufacturer does not change.

#### **6.3.2 Quality Conformance Tests**

Quality conformance tests are those tests performed on each lot of material to verify compliance with specification requirements.

#### **6.3.3 Lot**

A lot shall consist of all material manufactured in the same production shift, from the same raw materials and by the same manufacturing process and submitted for acceptance at one time.

### **6.4 MODIFICATIONS OR CHANGES**

Recommendations for modifications or changes to the requirements specified herein shall be submitted in writing to the Materials and Processes Laboratory at MSFC for consideration.

### **6.5 TYPICAL MATERIAL**

This list has been prepared for use by and or for the government to be used in the procurement of products covered by the subject specification; and such listing of product is not intended to and does not connote endorsement of the product by the government. All products listed herein have been qualified according to the requirements for the products specified in the latest effective issue of the applicable specification. This list is subject to change without notice; a revision or amendment will be issued as necessary. The listing of a product does not release the supplier from compliance with the specification requirements. Use of the information shown herein for advertising or publicity purposes is forbidden.

The activity responsible for this qualified products list is the Materials and Processes Laboratory, George C. Marshall Space Flight Center.

- MSFC DESIGNATION: Aqueous Cleaner Specification
- MANUFACTURER'S DESIGNATION: Prime USBI-ANAL-277-94
- TEST OR QUALIFICATION REFERENCE: DuBois Chemical, Inc
- MANUFACTURER'S NAME AND ADDRESS: 3630 East Kemper Road  
Sharonville, OH 45241-2011

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