MSFC-SPEC-2491
July 1995

National Aeronautics and
Space Administration

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

CLEANER, AQUEOUS

Prepared by
Materials & Processes Laboratory
George C. Marshall Space Flight Center

Release Date: ____/____/____	Marshall Space Flight Center **SPECIFICATION/DOCUMENT CHANGE INSTRUCTION** Spec./Doc. No. MSFC-SPEC-2491	Page 1 of 1 Copy No.:

Change No./Date	SCN/DCN No./Date	CCBD No./Date	Replacement Page Instructions
			BASELINE INITIAL RELEASE
	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.

8-15-95 VJ RELEASE

11-27-95 VJ RELEASE

MSFC-Form 4140 (Revised September 1990)

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Release Date: ____/____/____	Marshall Space Flight Center **SPECIFICATION/DOCUMENT CHANGE INSTRUCTION** Spec./Doc. No. MSFC-SPEC-2491	Page 1 of 1 Copy No.:

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			BASELINE INITIAL RELEASE

8-15-95 VS RELEASE

MSFC-Form 4140 (Revised September 1990)

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Prepared by	EH33 Organization	7/24/95 Date
Approved by	EH31 Organization	7/24/95 Date
Approved by	EH01 Organization	7/25/95 Date

STRESS

MATERIALS

GEORGE C. MARSHALL SPACE FLIGHT CENTER
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
SPECIFICATION

CLEANER, AQUEOUS

This specification has been approved by the George C. Marshall Space Flight Center (MSFC) and is available for use by MSFC and associated contractors.

1.0 SCOPE

This specification establishes the requirements for an environmentally compliant hand wipe cleaner. Refer to MSFC-QPL-2491 for a list of qualified materials which conform to these specification requirements.

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 request for proposals shall apply.

SPECIFICATIONS

NASA

MSFC-QPL-2491	Qualified Products List, Products Qualified Under George C. Marshall Space Flight Center Specification MSFC-SPEC-2491, Cleaner, Aqueous
SE-S-0073	National Space Transportation System Specification, Fluid Procurement and Use Control

STANDARDS

MIL-STD-129	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 or as directed by the 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 date of invitation for bids or request for proposals shall apply.

STANDARDS

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 501 Sampling and Chemical Analysis of Alkaline Detergents, Standard Test Method for

ASTM D 1193 Reagent Water, Standard Test Method for

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.)

3.0 REQUIREMENTS

3.1 MATERIAL

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

3.2 REQUIREMENTS

The cleaner shall meet the requirements specified in Table I.

TABLE I. Cleaner Requirements

Property	Requirement	Test Paragraph
Active Na_2O (Sodium Oxide)	(Full Strength) 0.85 to 1.25% wt (Diluted 1:10) 0.09 to 0.13% wt	4.7.1.1
Total Na_2O (Sodium Oxide)	(Full Strength) 1.05-1.45% wt (Diluted 1:10) 0.11-0.15% wt	4.7.1.2
Specific Gravity	(Full Strength) 1.03-1.04 (Diluted 1:10) 1.00-1.01	4.7.1.3
Aluminum Safety	No sign of white rust or blushing	4.7.1.4
Appearance	Clear green liquid, free of foreign material	4.7.1.5
pH	(Full Strength) 10.9 +/-0.3 (Diluted 1:10) 9.5 +/-0.5	4.7.1.6
Dilution	No separation or settling for a minimum of one hour	4.7.1.7

3.3 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 of manufacture.

3.4 TOXIC PRODUCTS AND SAFETY

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

3.5 SHELF LIFE EXTENSION REQUIREMENTS (APPLICABLE TO THE PROCURING ACTIVITY ONLY)

Extending the shelf life of this material is not permitted.

4.0 QUALITY ASSURANCE PROVISIONS

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.

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 Tables 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

Examination or Test	Requirement Paragraph	Examination or Test Paragraph
Active Na_2O	3.2	4.7.1.1
Total Na_2O	3.2	4.7.1.2
Specific Gravity	3.2	4.7.1.3
pH	3.2	4.7.1.6

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	3.2	4.7.1.5
Dilution	3.2	4.7.1.7

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 within this specification.

4.7.1 Test Requirements

4.7.1.1 Active Na_2O

Active Na_2O (Sodium Oxide) shall be determined per ASTM D 501.

4.7.1.2 Total Na_2O

Total Na_2O (Sodium Oxide) shall be determined per ASTM D 501.

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 Appearance

Visual inspection of material sample with the unaided eye (corrective lenses permitted).

4.7.1.6 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 100 +/- 5 parts water.

4.7.1.7 Dilution

1 part +/- 10% of concentrated cleaner shall be diluted to 10 parts +/-10 % (by volume) using type IV water per ASTM D 1193 or grade A water per SE-S-0073.

4.8 REJECTION

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

5.0 PREPARATION FOR DELIVERY

5.1 PACKAGING AND PACKING

Packaging and packing of the cleaner material shall be in accordance with standard commercial practice and 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 on the QPL for this specification.

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

Prime Cleaner (Formula # 03360) manufactured by Diversey DuBois International, Inc. is typical of the material covered by this specification.

NOTICE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever, and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

CUSTODIAN:

NASA-George C. Marshall
Space Flight Center

PREPARING ACTIVITY:

NASA-George C. Marshall
Space Flight Center

PACKAGE NO. 9414R

DOCUMENTATION RELEASE LIST
GEORGE C. MARSHALL SPACE FLIGHT CENTER

MSFC CODE IDENT 14981
ISSUE DATE NOV 27 2000

CH	DOCUMENT NUMBER	DRL DSH	DRL REV	TITLE	CCBD NO.	PCN	PC	EFFECTIVITY
*	MSFC-SPEC-2491	202	-	CLEANER, AQUEOUS	000-00-0000	83001	ZA	1

CHG NO.	CHG REV	CHG NOTICE	RESPONSIBLE ENGINEER	RESPONSIBLE ORGANIZATION	ACTION DATE	DESCRIPTION
			R. A. MCFARLAND	EH43	08/15/95	BASELINE RELEASE
*	1	SCN001	GREG BOWEN	MP41	11/27/00	UPDATE MSFC-SPEC-2491 BY REMOVING AND BASELINING THE QPL AS A STAND ALONE DOC. AUTHORIZED BY SB3-01-5391 AND SM3-01-5544.

CHECKER

DON HAMILTON
11/22/00

(FINAL)

PACKAGE NO. 10443R

DOCUMENTATION RELEASE LIST
GEORGE C. MARSHALL SPACE FLIGHT CENTER

MSFC CODE IDENT 14981/339B2
ISSUE DATE FEB 22 2007

C H	DOCUMENT NUMBER	DRL DSH	DRL REV	TITLE	CCBD NO.	PCN	PC	EFFECTIVITY
*	MSFC-SPEC-2491	203	-	CLEANER, AQUEOUS	000-00-0000	0000000	ZA	NONE

CHG NO.	CHG REV	CHG NOTICE	RESPONSIBLE ENGINEER	RESPONSIBLE ORGANIZATION	ACTION DATE	DESCRIPTION
			R. A. MCFARLAND	EH43	08/15/95	BASELINE RELEASE
1		SCN001	GREG BOWEN	MP41	11/27/00	UPDATE MSFC-SPEC-2491 BY REMOVING AND BASELINING THE QPL AS A STAND ALONE DOC. AUTHORIZED BY SB3-01-5391 AND SM3-01-5544.
* 2		SCN000	EUGENA GOGGANS	EO03	02/22/07	DOCUMENT RELEASED THRU PDS. NO LONGER TRACKED IN ICMS.

CHECKER

N/A
02/15/07

(FINAL)

PACKAGE NO: 10443R

PROGRAM/PROJECT: MULTI LAST UPDATED: 02/22/07

NOMENCLATURE: MSFC-STD- GOING TO NONE EFFECTIVITY

ECR NO:	PCN:	CCBD NO:	DATE PREPARED:
E003-0000	0000000	000-00-0000	02/22/07
		SB3-00-0000	

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	-			

PACKAGE NO: 10443R

DWG SIZE	DRAWING NUMBER	DWG REV	EPL/DRL/DDS NUMBER	DWG REV	EPL DSH	EPL REV	EO DASH NUMBER	EO REV	PART NUMBER
			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	-			

SUBMITTED BY ENGINEERING AREA:	BASIC CHANGE	PARTIAL	COMPLETE	CLOSES ACTION
EO03	X		X	EO03

PREPARED BY:
EUGENA GOGGANS
12/19/06

SUBMITTED BY:

CONCURRENCE:

TRANSMITTAL DATES
TO RELEASE DESK 02/22/07 10:00
TO MSFC DOC REP 02/22/07 00:00

REMARKS:

13105

DOCUMENT INPUT RECORD

I. TO BE COMPLETED UPON SUBMITTAL OF DATA

1. APPROVED PROJECT:	2. DOCUMENT/ DRAWING NO.:	3. CONTROL NUMBER:	4. DOCUMENT RELEASE DATE:	5. SUBMITTAL DATE:
SRB/RSRM	MSFC-SPEC-2491	DPRS # 9414R	11/29/2000	11/28/2000

6. DOCUMENT/DRAWING TITLE:	7. REPORT TYPE:
Cleaner, Aqueous	Specification

8. CONTRACT NO./PERFORMING ACTIVITY:	9. DRD NUMBER:	10. DPD / DRL / IDRD NUMBER:
		SM3-01-5541

11. DISPOSITION AUTHORITY (official records only):	12. SUBMITTAL AUTHORITY:	13. RELEASING AUTHORITY:
	MP41/M. Harris	SM3-01-5541 ED34/D. DeWeese

14. SPECIAL INSTRUCTIONS:
Same distribution

15. CONTRACTOR/SUBMITTING ORGANIZATION, ADDRESS AND PHONE NUMBER:	16. ORIGINATING NASA CENTER:
MSFC	MSFC
	17. OFFICE OF PRIMARY RESPONSIBILITY: M&P

18. KEYWORDS:	19. NUMBER OF PAGES:	20. SECURITY CLASSIFICATION OF REPORT:
	4 CB	Unclassified

II. TO BE COMPLETED FOR ENGINEERING DRAWINGS

21. REVISION:	22. ENG. ORDER:	23. PARTS LIST:	24. CCBD:

III. TO BE COMPLETED FOR REPORTS, SPECIFICATIONS, ETC.

25. REVISION:	26. CHANGE:	27. VOLUME:	28. BOOK:	29. PART:	30. SECTION:
Basic	1				

31. ISSUE:	32. ANNEX:	33. SCN:	34. DCN:	35. AMENDMENT:
		001		

36. APPENDIX:	37. ADDENDUM:	38. CCBD:	39. CODE ID:	40. IRN:

IV. EXPORT AND DISTRIBUTION RESTRICTIONS

- ☐ Privacy Act (see MWI 1382.1)
- ☐ Proprietary (see MPD 2210.1)
- ☐ Patent (see MPG 2220.1)
- ☐ ITAR (see MPG 2220.1)
- ☐ EAR (see MPG 2220.1)
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- ☐ ACI (see MPG 1600.1)

V. ORIGINATING ORGANIZATION APPROVAL

41. NAME:	42. SIGNATURE:	43. ORG. CODE:	44. PHONE NUMBER:	45. DATE:
Mary JoHarris	Mary Jo Harris	MP41	544-2729	11/29/00

VI. TO BE COMPLETED BY MSFC DOCUMENTATION REPOSITORY

46. RECEIVED BY:	47. DATE RECEIVED:	48. WORK ORDER:
Hope Rayburn	11-30-00	02-00319

MSFC DOCUMENTATION REPOSITORY - DOCUMENT INPUT RECORD

I. GENERAL INFORMATION

1. APPROVED PROJECT:	2. DOCUMENT/ DRAWING NUMBER:	3. CONTROL NUMBER:	4. RELEASE DATE:	5. SUBMITTAL DATE:
Shuttle Reusable Solid Rocket Motor, Solid Rocket Booster	MSFC-SPEC-2491		08/15/1995	08/07/2003

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Cleaner, Aqueous	Specification

8. CONTRACT NUMBER / PERFORMING ACTIVITY:	9. DRD NUMBER:	10. DPD / DRL / IDRD NUMBER:

11. DISPOSITION AUTHORITY (Check One):	12. SUBMITTAL AUTHORITY:	13. RELEASING AUTHORITY:
☒ Official Record - NRRS 8/1/2/A ☒ Reference Copy - NRRS 8/5/A/3 (destroy when no longer needed)	C. Darrell DeWeese	Gail H. Gordon

M.A.

14. SPECIAL INSTRUCTIONS:

15. CONTRACTOR/SUBMITTING ORGANIZATION, ADDRESS AND PHONE NUMBER:	16. ORIGINATING NASA CENTER: MSFC 17. OFFICE OF PRIMARY RESPONSIBILITY: Materials, Processes, and Manufacturing Department

18. PROGRAMMATIC CODE (5 DIGITS): 376-50; 376-60	19. NUMBER OF PAGES:

II. ENGINEERING DRAWINGS

20. REVISION:	21. ENGINEERING ORDER:	22. PARTS LIST:	23. CCBD:

III. REPORTS, SPECIFICATIONS, ETC.

24. REVISION:	25. CHANGE:	26. VOLUME:	27. BOOK:	28. PART:	29. SECTION:

30. ISSUE:	31. ANNEX:	32. SCN:	33. DCN:	34. AMENDMENT:

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- ☐ EAR (see MPG 2220.1)
- ☐ Other ACI (see NPG 1620.1 and MPG 1600.1) _____
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ED34	(256) 544-5120	C. Darrell DeWeese	C. Darrell DeWeese

VI. TO BE COMPLETED BY MSFC DOCUMENTATION REPOSITORY

44. RECEIVED BY:	45. DATE RECEIVED:	46. WORK ORDER:
Tammy Wise	10-15-03	