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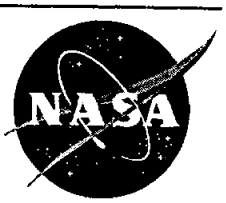
June 6, 2002

PROPYLENE GLYCOL MONOMETHYL ETHER (PGME) 1-METHOXY-2-PROPANOL, SPECIFICATION FOR

SPACEPORT ENGINEERING AND TECHNOLOGY DIRECTORATE

National Aeronautics and
Space Administration

John F. Kennedy Space Center



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Approved:

James R. Heald
Director of Spaceport Engineering and Technology

JOHN F. KENNEDY SPACE CENTER, NASA

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PROPYLENE GLYCOL MONOMETHYL ETHER (PGME), 1-METHOXY-2-PROPANOL, SPECIFICATION FOR

1. SCOPE

This specification establishes the requirements for propylene glycol monomethyl ether (PGME), 1-methoxy-2-propanol.

2. APPLICABLE DOCUMENTS

The following documents form a part of this document to the extent specified herein. When this document is used for procurement, including solicitations, or is added to an existing contract, the specific revision levels, amendments, and approval dates of said documents shall be specified in an attachment to the Solicitation/Statement of Work/Contract.

2.1 Governmental.

2.1.1 Specifications.

National Aeronautics and Space Administration (NASA)

SE-S-0073	Specification, Fluid Procurement and Use Control

(Applications for copies should be addressed to the Scientific & Technical Information Center, Mail Code GP23, Lyndon B. Johnson Space Center, Houston, TX 77058.)

National Institute of Standards and Technology (NIST)

NIST Handbook 44	Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices

(Applications for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402-9325.)

2.1.2 Other Documents.

Code of Federal Regulations (CFR)

29 CFR 1910	U.S. Department of Labor (Occupational Safety and Health Standards)

49 CFR 171 through 180	U.S. Department of Transportation (Hazardous Materials Regulations)

(Application for copies of the Code of Federal Regulations should be addressed to the Superintendent of Documents, Government Printing Office, North Capitol and H Streets N.W., Washington, D.C. 20401.)

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

2.2 Non-Governmental.

American Society for Quality Control (ASQC)

ASQC Z1.4	Sampling Procedures and Tables for Inspection by Attributes

(Applications for copies should be addressed to the American Society for Quality Control, 611 East Wisconsin Ave., Milwaukee, WI 53202-3005.)

American Society for Testing and Materials (ASTM)

ASTM D891	Standard Test Method for Specific Gravity, Apparent, of Liquid Industrial Chemicals
ASTM D1209	Standard Test Method for Color of Clear Liquids (Platinum-Cobalt Scale)
ASTM D2109	Standard Test Method for Nonvolatile Matter in Halogenated Organic Solvents and Their Admixtures
ASTM D5827	Standard Test Method for Analysis of Engine Coolant for Chloride and Other Anions by Ion Chromatography
ASTM E203	Standard Test Method for Water Using Volumetric Karl Fischer Titration

ASTM E260 — Standard Practice for Packed Column Gas Chromatography

(Applications for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Dr., West Conshohocken, PA 19428-2959.)

3. REQUIREMENTS

3.1 Chemical and Physical Properties. - The fluid shall conform to the requirements of table 1 when tested as specified in section 4.

3.2 Shelf Life. - Shelf life is considered to be 18 months (drum) or 6 months (bulk) at ambient conditions unless degradation or discoloration is detected. The fluid shall be tested prior to actual use on flight hardware or flight interface hardware.

3.3 Qualitative. - When examined visually, the fluid shall be a homogeneous, clear liquid that is free of particulate matter.

4. QUALITY ASSURANCE PROVISIONS

4.1 Qualification and Acceptance Tests. - Qualification and acceptance tests shall include all the tests required in this specification.

4.2 Certification. - A certified test report from the supplier shall accompany each lot of material comprising a shipment stating that the material meets all the requirements of this specification. This report shall include the actual test data (e.g., sample analysis report and actual laboratory results) for all requirements of this specification.

4.3 Responsibility for Inspection and Testing. - The supplier shall be responsible for the performance of all inspections and testing specified herein. Suppliers may, with the approval of the procuring agency, use their own facilities or those of a commercial laboratory. The procuring agency reserves the right to perform any of the inspections and testing set forth in this specification, where such are deemed necessary to ensure compliance with specification requirements.

4.3.1 Component and Material Inspection. - The supplier is responsible for ensuring that components and materials are manufactured, examined, and tested in accordance with referenced specifications and standards.

4.3.2 Material Inspection.

4.3.2.1 Inspection Lot. - Containers filled in a 24-hour period from the same source and with the same type of product shall be considered a lot.

4.3.2.2 Sampling. - Sampling for tests shall be performed in accordance with ASQC Z1.4.

4.3.2.3 Examination. - Samples selected in accordance with 4.3.2.2 shall be tested for conformance to the requirements listed in table 1 and 4.4. A result other than that specified shall constitute failure of the test.

Table 1. Requirements and Test Methods

Chemical and Physical Property	Requirement	Test Method (Paragraph)
Free chloride ion, ppm, maximum by weight	1.0	4.4.1
Water content, percent, maximum by weight	0.1	4.4.2
Chemical purity, percent, minimum by weight	99.0	4.4.3
Nonvolatile residue, ppm, maximum by weight	10	4.4.4
Color, maximum	35	4.4.5
Specific gravity	≥0.918 and ≤0.921	4.4.6
Particulate matter	Pass visual inspection	4.4.7

4.4 Test Methods.

4.4.1 Chloride Ions. - The chloride ion content shall be determined in accordance with ASTM D5827 or equivalent method.

4.4.2 Water Content. - The water content shall be determined per ASTM E203 or equivalent method.

4.4.3 Chemical Identification and Purity. - The chemical composition of the fluid shall be determined per ASTM E260 or equivalent test method. A specific column may be required.

4.4.4 Nonvolatile Residue. - The nonvolatile residue of the fluid shall be determined in accordance with ASTM D2109 or equivalent test method.

4.4.5 Color. - The color of the fluid shall be determined in accordance with ASTM D1209 or equivalent test method.

4.4.6 Specific Gravity. – The material shall be tested for specific gravity in accordance with ASTM D891 or equivalent test method.

4.4.7 Particulate Matter. - Particulate contamination of the product shall be determined by visual inspection. There should be no visible particle contamination.

4.5 Inspection of Packaging. - The packing of the containers of the fluid shall be examined to ensure there is no leakage, corrosion, or visible contaminants that could degrade the product or cause it to be inadvertently released from its container.

5. PREPARATION FOR DELIVERY

5.1 Packaging. - This fluid shall be furnished in cans, bottles, pails, drums, or in larger containers (e.g., tankers, portable tanks, or "totes") conforming to 49 CFR 173 in accordance with the manufacturer's commercial practice and this specification. Packaging shall have integrity control seals installed on all outlets after filling.

5.2 Marking. - Each container of material shall include proper warning labels for personnel safety purposes and marking in accordance with 29 CFR 1910. Each container shall be legibly and permanently labeled with the following information:

MATERIAL: Propylene Glycol Monomethyl Ether (PGME) / 1-Methoxy-2-Propanol
SPECIFICATION: KSC-SPEC-P-0025
MANUFACTURER'S NAME AND PRODUCT IDENTIFICATION:
DATE OF MANUFACTURE:
LOT NUMBER:
QUANTITY IN THIS CONTAINER:
PURCHASE ORDER NUMBER:

5.3 Container Inspection and Cleaning. - Containers shall be cleaned as required by the filling contractor to meet the requirements listed in table 1. All container interiors shall be clean and free of contaminants that could alter the properties of the fluid.

5.4 Filling Containers. - Unless otherwise specified, containers shall be filled to the rated capacity of the container leaving at minimum a 3 percent by volume ullage. The weight of the fluid supplied shall be the difference between the filled (gross) weight and the unfilled (tare) weight of the container. The scale must be calibrated for commerce in accordance with NIST Handbook 44.

5.5 Leakage. - Containers and valves shall not leak after being filled and sealed.

5.6 Documentation. - The Material Safety Data Sheet (MSDS) shall be provided by the supplier and permanently retained by the user.

6. NOTES

6.1 Intended Use. - The material described in this specification is intended to be used in the manufacture of an azeotropic mixture in accordance with SE-S-0073 that is to be used in the Space Shuttle Orbiter water-spray boiler system.

6.2 Hazard Potential. - See the MSDS for complete hazard, health, and reactivity information. The National Fire Protection Association hazard ratings follow:

a. Fire: 3

b. Health: 0

c. Reactivity: 0

6.3 Acquisition Requirements. - Acquisition documents must specify:

a. Title, number, and date of this specification

b. Method of shipment and the type and capacity of containers

c. Quantity by weight

d. When a different sampling plan is required (see 4.3.2.2)

e. Packaging requirements (see section 5)

NOTICE. The Government drawings, specifications, and/or data are prepared for the official use by, or on the behalf of, the United States Government. The Government neither warrants these Government drawings, specifications, or other data, nor assumes any responsibility or obligation, for their use for purposes other than the Government project for which they were prepared and/or provided by the Government, or an activity directly related thereto. 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 licensing in any manner the holder or any other person or corporation, nor conveying the right or permission, to manufacture, use, or sell any patented invention that may relate thereto.

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