



AEROSPACE MATERIAL SPECIFICATION

AMS3025™

REV. E

Issued 1980-04
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Superseding AMS3025D

Polyalkylene Glycol Heat Treat Quenchant

RATIONALE

AMS3205E results from a limited scope ballot to revise Viscosity (Table 1).

1. SCOPE

1.1 Form

This specification covers two types of polyalkylene glycol in the form of a liquid.

1.2 Application

This product has been used typically as a quenching medium for solution heat treatment of aluminum alloys to minimize distortion and reduce residual stresses.

1.3 Safety - Hazardous Materials

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

1.4 Classification

Quenchants covered by this specification are classified as:

Type 1 - Single Polymer

Type 2 - Multiple Polymer

1.4.1 The type supplied shall be as specified on the purchase order.

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Documents
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2. APPLICABLE DOCUMENTS

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been cancelled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

- AMS2770 Heat Treatment of Wrought Aluminum Alloy Parts
- AMS2772 Heat Treatment of Aluminum Alloy Raw Materials
- ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

2.2 ANSI Accredited Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

- ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products
- ANSI H 35.2M Dimensional Tolerances for Aluminum Mill Products (Metric)
- ANSI Z400.1 Material Safety Data Sheets – Preparation

2.3 ASME Publications

Available from ASME, P.O. Box 2900, 22 Law Drive, Fairfield, NJ 07007-2900, Tel: 800-843-2763 (U.S./Canada), 001-800-843-2763 (Mexico), 973-882-1170 (outside North America), www.asme.org.

- ASME B46.1 Surface Texture (Surface Roughness, Waviness, and Lay)

2.4 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

- ASTM B557 Tension Testing Wrought and Cast Aluminum and Magnesium Alloy Products
- ASTM B557M Tension Testing Wrought and Cast Aluminum and Magnesium Alloy Products (Metric)
- ASTM D445 Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
- ASTM D1218 Refractive Index and Refractive Dispersion of Hydrocarbon Liquids
- ASTM D1298 Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
- ASTM D4057 Manual Sampling of Petroleum and Petroleum Products
- ASTM D6200 Determination of Cooling Characteristics of Quench Oils by Cooling Curve Analysis

- ASTM D6482 Determination of Cooling Characteristics of Aqueous Polymer Quenchants by Cooling Curve Analysis with Agitation (Tensi Method)
- ASTM D6549 Determination of Cooling Characteristics of Aqueous Polymer Quenchants by Cooling Curve Analysis with Agitation (Drayton Unit)
- ASTM D6666 Evaluation of Aqueous Polymer Quenchants
- ASTM E203 Water Using Volumetric Karl Fischer Titration

3. TECHNICAL REQUIREMENTS

3.1 Material

Shall be polyalkylene glycol and shall meet the requirements of 3.2 and 3.3.

3.2 Properties

Quenchant shall conform to the following requirements; tests shall be performed in accordance with specified test methods on quenchant supplied both in concentrated form and at the dilution specified in Table 1.

Table 1 - Properties

	Paragraph/Test	Value	Test Method
3.2.1	Condition: As-received in concentrated form:		
3.2.1.1	Water Content (Chemically Combined, By Weight)		ASTM E203
	Type 1	45-48%	
	Type 2	57-63%	
3.2.1.2	Specific Gravity		ASTM D1298
	Type 1	1.094 ± 0.005	
	Type 2	1.080 ± 0.025	
3.2.1.3	Refractive Index at 68 °F (20 °C)		ASTM D1218
	Type 1	1.4140 ± 0.0050	
	Type 2	1.3910 ± 0.0050	
3.2.1.4	Viscosity at 104 °F (40 °C)		ASTM D445
	Type 1	520 cSt ± 70 cSt	
	Type 2	280 cSt ± 40 cSt	
3.2.2	Condition: Diluted to 20% ± 0.50% by Volume, with Water		
3.2.2.1	Viscosity at 104 °F (40 °C)		4.4.1.1
	Type 1	5.1 cSt ± 0.5 cSt	
	Type 2	4.2 cSt ± 0.5 cSt	
3.2.2.2	Separation Temperature		4.4.1.2
	Type 1	165 °F ± 5 °F (74 °C ± 3 °C)	
	Type 2	165 °F ± 5 °F (74 °C ± 3 °C)	