

AEROSPACE MATERIAL SPECIFICATION

SAE AMS3175

REV. A

Issued 2008-06
Revised 2011-04

Superseding AMS3175

Non-Chromated Surface Pretreatment Prior to Painting

RATIONALE

This revision intended to correct editorial and formatting errors from initial specification, and to clarify the paragraph numbering system.

1. SCOPE

1.1 Form

This specification establishes the performance requirements for non-chromated materials used for surface preparation of metallic surfaces prior to applying organic coatings.

1.2 Application

Pretreatment materials qualified to this specification may be used on metallic surfaces that are subsequently painted. These include, but are not limited to, external and internal aircraft surfaces, off-aircraft part surfaces, and aircraft surfaces undergoing touch-up/repairs.

1.3 Classification

Pretreatment materials shall be qualified by Type, Class and Grade as defined below. The pretreatment material is to be tested and evaluated in conjunction with either MIL-PRF-23377 or MIL-PRF-85582 industry qualified primers.

Type 1: Suitable for spray application

Type 2: Suitable for immersion application

Type 3:* Suitable for manual or hand application (i.e., brush, wipe, or other touch up methods)

*NOTE: If Product is already qualified to a Type 1 or Type 2 and there is no formula change for the Type 3, limited testing per Table 4 is permitted.

Class C: Qualified for use with primers that contain hexavalent chromium

Class N: Qualified for use with primers that are free from: barium, hexavalent chromium, cadmium, arsenic, copper, nickel, mercury, or lead

Grade I: 0 to 250 g/L (0 to 2.1 lb/gal) Volatile Organic Content (VOC)

Grade II: 251 to 780 g/L (2.11 to 6.55 lb/gal) Volatile Organic Content (VOC)

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2011 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)

Tel: +1 724-776-4970 (outside USA)

Fax: 724-776-0790

Email: CustomerService@sae.org

<http://www.sae.org>

SAE WEB ADDRESS:

SAE values your input. To provide feedback on this Technical Report, please visit <http://www.sae.org/technical/standards/AMS3175A>

1.4 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.

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 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 724-776-4970 (outside USA), www.sae.org.

AMS2825	Material Safety Data Sheets
AMS4035	Aluminum Alloy, Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn (2024-0), Annealed
AMS4037	Aluminum Alloy, Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn (2024; -T3 Flat Sheet, -T351 Plate), Solution Heat Treated
AMS4041	Aluminum Alloy, Alclad Sheet and Plate, 4.4Cu - 1.5Mg - 0.60Mn, Alclad 2024 and 1-1/2% Alclad 2024, -T3 Flat Sheet; 1-1/2% Alclad 2024-T351 Plate
AMS4045	Aluminum Alloy Sheet and Plate, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr, 7075: (-T6 Sheet, -T651 Plate), Solution and Precipitation Heat Treated
AMS4049	Aluminum Alloy, Sheet and Plate, Alclad, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (Alclad 7075; -T6 Sheet -T651 Plate), Solution and Precipitation Heat Treated
AMS4911	Titanium Alloy, Sheet, Strip, and Plate, 6Al - 4V, Annealed
AS5505	Requirements for Accreditation of Testing Laboratories for Organic Coatings
AS9100	Quality Management Systems - Aerospace – Requirements
ARP1917	Clarification of Terms used in Aerospace Metals Specifications

2.2 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 B 117	Standard Practice for Operating Salt Spray Apparatus
ASTM D 522	Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings
ASTM D 740	Standard Specification for Methyl Ethyl Ketone
ASTM D 1200	Standard Test Method for Viscosity by Ford Viscosity Cup

ASTM D 1849	Standard Test Method for Package Stability of Paint
ASTM D 1974	Standard Practice for Methods of Closing, Sealing and Reinforcing Fiberboard Boxes
ASTM D 3335	Standard Test Method for Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy
ASTM D 3359	Standard Test Method for Measuring Adhesion by Tape Test
ASTM D 3960	Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
ASTM D 6905	Standard Test Method for Impact Flexibility of Organic Coatings

2.3 U.S. Government Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, <http://assist.daps.dla.mil/quicksearch/>.

FED-STD-141D	Federal Test Method Standards
FED-STD-595/17925	Miscellaneous, Gloss (para 4.5.1 e)
29 CFR 1910-1200	Occupational Safety & Health Standards, Toxic and Hazardous Substances
MIL-PRF-23377	Primer Coatings: Epoxy, High-Solids
MIL-PRF-85285	Coating: Polyurethane, Aircraft and Support Equipment
MIL-PRF-85570	Cleaning Compounds, Aircraft, Exterior
MIL-PRF-85582	Primer Coatings; Epoxy, Waterborne
MIL-C-8507	Coating, Wash Primer (Pretreatment) for Metals, Applications of (for Aeronautical Use)
MIL-C-8514 (ASG)	Coating Compound, Metal Pretreatment, Resin-Acid

2.4 ISO Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org and International Organization for Standardization, 1, rue de Varembé, Case postale 56, CH-1211 Genève 20, Switzerland, Tel: +41-22-749-01-11, www.iso.org.

ISO 1513	1992 Paints and Varnishes - Examination and preparation of samples for testing
ISO 17025	General Requirements for the Competence of Testing and Calibration Laboratories

2.5 PRI Publications

Available from Performance Review Institute, 161 Thorn Hill Road, Warrendale, PA 15086-7527, Tel: 724-772-1616, www.pri-network.org.

PD 2000	Procedures for an Industry Qualified Product Management Process
PRI-QPL-AMS3175	Products Qualified under AMS3175

3. TECHNICAL REQUIREMENTS

3.1 Materials

Composition of the products is not specified, except for the following:

3.1.1 Composition

When tested in accordance with ASTM D 3335, or equivalent, no component of the pretreatment material shall contain arsenic, cadmium, chromium, copper, nickel, lead or mercury metals or compounds in excess of 0.05% by weight.

3.1.2 Toxicity

Manufacturers of components shall use best efforts to ensure that any materials supplied under this specification, when used for their intended purpose in accordance with the precautions as identified on instruction sheets, shipping containers and on the MSDS, shall have no adverse effect on health of personnel. An MSDS which meets the requirements of 29 CFR 1910.1200 shall be prepared and submitted in accordance with AMS2825.

3.2 Shelf Life

Shelf life shall be a minimum of 12 months from the date of packaging when stored in the original unopened containers at a temperature between 40 °F (4.4 °C) and 95 °F (35 °C). Manufacturer's repackaged material (i.e., touch-up and repair kits) must be labeled with original date of package where shelf life of original date of package is retained.

3.3 Pretreatment Material Property Requirements

Pretreatment material and physical requirements are summarized in Table 1, with additional information in following paragraph.

TABLE 1 - PHYSICAL REQUIREMENTS

Property	Requirement	Conditioning	Test Method
Quality	3.3.1	As received in original container	ISO 1513
Storage Stability	3.3.2	As received in original container	
Accelerated Storage Stability	3.3.3	As received in original container	4.8.1
Admixed Product Properties	3.3.4	--	--
VOC content	3.3.4.1 (per Grade in 1.3)	Mixed, prepared for application	4.8.2
Viscosity	3.3.4.2	Mixed, prepared for application	
Pot Life **	3.3.4.3	Mixed, prepared for application	4.8.3
Drying Time	3.3.4.4	Applied on test panels	4.8.4
Adhesion	3.3.5	--	--
Wet Tape	3.3.5.1 - No delamination or peel and a rating of 4A.		4.8.5
Cross-Hatch	3.3.5.2 - No delamination or peel and a rating of 4B.		4.8.6
Aged Cross-Hatch	3.3.5.3 - No delamination or peel and a rating of 4B.		4.8.7
Flexibility	3.3.6 - No flexibility loss caused by the surface treatment		4.8.8
Corrosion Resistance	3.3.7	--	--
Neutral Salt Spray	3.3.7.1 - Class C and Class N; No blisters or undercutting from the scribe. Class C: no discoloration in the scribe and no pitting in the scribe Class N: discoloration and some corrosion products allowed in the scribe but no pitting	Class C: 2000 hours Class N: 2000 hours	4.8.9.1
Filiform Corrosion	3.3.7.2 - The top coated primer coatings shall not exhibit filiform corrosion extending beyond 1/4 inch from the scribe, and the majority of the filaments shall be less than 1/8 inch in length	Expose to HCl, 1000 hours @ 102 °F and 80% RH	4.8.9.2

** NOTE: Mixing and Pot Life references are only applicable to multi-component systems and powders.