

AEROSPACE MATERIAL SPECIFICATION



AMS-C-5541A

Issued JUN 1999
Cancelled JUL 2003

Superseding AMS-C-5541

Chemical Conversion Coatings on Aluminum and Aluminum Alloys AREA MFFP

CANCELLATION NOTICE

This specification has been declared "CANCELLED" by the Aerospace Materials Division, SAE, as of July, 2003, and has been superseded by MIL-C-5541. The requirements of the latest issue of MIL-C-5541 shall be fulfilled whenever reference is made to the cancelled AMS-C-5541. By this action, this document will remain listed in the Numerical Section of the index of Aerospace Materials Specifications noting that it is superseded by MIL-C-5541. Cancelled specifications are available from SAE upon request.

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 © 2003 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: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: custsvc@sae.org
SAE WEB ADDRESS: <http://www.sae.org>

NOTICE

This document has been taken directly from U.S. Military Specification MIL-C-5541E and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards. The initial release of this document is intended to replace MIL-C-5541E. Any part numbers established by the original specification remain unchanged.

The original Military Specification was adopted as an SAE standard under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of government specifications and standards. TSB rules provide for (a) the publication of portions of unrevised government specifications and standards without consensus voting at the SAE Committee level, and (b) the use of the existing government specification or standard format.

Under Department of Defense policies and procedures, any qualification requirements and associated qualified products lists are mandatory for DOD contracts. Any requirement relating to qualified products lists (QPL's) has not been adopted by SAE and is not part of this SAE technical document.

1. SCOPE:

1.1 Scope:

This specification covers the requirements for two classes of chemical conversion coatings formed by the reaction of chemical conversion materials and the surfaces of aluminum and aluminum alloys. This specification is intended specifically to provide components of military weapon systems with maximum corrosion resistance. The coating also provides a surface having better paint adhesion than uncoated aluminum. It is not intended as a general purpose coating for commercial and decorative applications, (see 6.1).

1.2 Classification:

The chemical conversion coatings shall be of the following classes, as specified (see 6.2).

1.2.1 Classes:

Class 1 A - For maximum protection against corrosion, for surfaces to be painted or left unpainted, (see 6.1.1).

Class 3 - For protection against corrosion where lower electrical resistance is required, (see 6.1.2).

2. APPLICABLE DOCUMENTS:

The following publications, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

2.1 U.S. Government Publications:

Available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

QQ-A-250/4 Aluminum Alloy 2024, Plate and Sheet

QQ-A-250/11 Aluminum Alloy 6061, Plate and Sheet

MIL-P-23377 Primer Coating, Epoxy Polyamide, Chemical and Solvent Resistant

MIL-C-81706 Chemical Conversion Materials For Coating Aluminum and Aluminum Alloys

MIL-P-85582 Primer Coatings: Epoxy, Waterborne

FED-STD-141 Paint, Varnish, Lacquer and Related Materials, Methods of Inspection, Sampling and Testing

MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM B 117 Salt Spray (Fog) Testing

2.3 Order of precedence:

In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS:

3.1 Chemical conversion materials:

The materials used to produce a chemical conversion coating shall be approved for the selected class, form and application method in accordance with the qualification requirements of MIL-C-81706 and been accepted for listing on the applicable Qualified Products List (see 6.3). Replenishing chemicals, such as fluorides, added to a bath to maintain its efficiency, shall in no way degrade the performance of the coating being applied.

3.2 Cleaning:

Prior to coating, the base metal shall be mechanically and/or chemically cleaned such that a water break-free surface is obtained after rinsing (see 6.4). Abrasives containing iron such as steel wool, iron oxide, rouge or steel wire are prohibited for all cleaning operations as particles from them may become embedded in the metal and accelerate corrosion of the aluminum and aluminum alloys. Treated parts which have become soiled shall be cleaned with materials which will remove the soil without damaging the base metal, the part, or the conversion coating. If the coating is damaged, the damaged area shall be recleaned and recoated or the part shall be rejected.

3.3 Application:

Unless an application method is specified, the chemical conversion materials shall be applied nonelectrolytically by spray, brush or immersion after all heat treatments and mechanical operations such as forming, perforating, machining, brazing and welding have been completed. Assemblies containing non-aluminum parts which may be attacked, embrittled, or damaged in any way by the conversion coating process shall not be coated as assemblies unless the non-aluminum parts are suitably masked.