



AEROSPACE INFORMATION REPORT

AIR4779™**REV. D**Issued 1994-06
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Superseding AIR4779C

User's Guide to AMS Specifications

RATIONALE

AIR4779D results from a Five-Year Review and update of this specification. The changes are editorial in nature. A few definitions were deleted as they are now in ARP1917.

FOREWORD

SAE has been the source of Aerospace Material Specifications since 1939 when the SAE Aircraft Materials Division issued the original 101 specifications. Aeronautical Material Specifications, as AMS were originally known, were created in response to a recognized need for industry-generated, industry-oriented specifications that would eliminate, or markedly reduce the number of individual company specifications covering the same materials or processes.

AMS specifications continue to be developed by the Aerospace Materials Systems Group (ASMG) under the direction of the SAE Aerospace Council. Commodity committees, with members from aerospace companies, material producers, processors, independents, and government organizations, meet at least twice each year to review and issue new or revised documents. There are now more than 2500 ASMG documents used throughout the world to define, procure, and produce aerospace materials.

An AMS specification is designed to be an enforceable procurement document defining a product or a process, part of the contract between a purchaser and a vendor of products or services. It is necessary that it be complete, precise, unambiguous, and reasonable.

Although AMS specifications are said to be "user's specifications," they are the result of considerable discussion and negotiation between users and producers. An AMS specification has to be a compromise between the needs of the user and the capability of the producer to provide the product economically and reliably.

1. SCOPE

The reader of specifications sometimes needs help understanding the format of an AMS and reasoning behind certain usage of terms. The scope of this AIR is to explain the functions of the various sections of the specifications, why some of the terms in AMS specifications are used, and how the specification system works. After the introduction (Section 3 of this document), the topics are presented in the order they usually appear in specifications.

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Documents

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2. APPLICABLE DOCUMENTS

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and 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.

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.

AMS Index Aerospace Material Specifications Index

ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

3. INTRODUCTORY MATERIAL

3.1 Metal Product Specifications

The underlying philosophy behind most of the metal product specifications is:

If we define the material composition limits, the methods of working and shaping, and the heat treatment of the product, and if we measure and meet selected requirements for certain properties of the product such as: tensile strength and ductility, hardness, grain size, microstructure, surface characteristics, or other properties pertinent to the specific product, then we can be confident that the product is controlled and can be relied upon to have the other important engineering properties within statistically established limits.

Not included are other properties which will be inherent in the product if the specified requirements are met, or which may be of interest to some users, but are not needed to define and control the product.

The details of the requirements differ considerably among the various alloy systems and product forms. The tests designated to measure the selected characteristics are those judged most likely to verify the overall performance of each alloy and product.

3.2 Nonmetallic Product Specifications

Most nonmetallic product specifications depend on definition and measurement of end item performance characteristics, rather than control of the ingredients and methods used to make the product. Otherwise, nonmetallic product specifications are similar to metal specifications. Nonmetallic product specifications define uncured and cured raw materials, as well as finished parts. Included are plastics and rubber, sealants, coatings, fluids, fabrics, ceramics, reference materials, and a variety of other materials not otherwise categorized.

3.3 Process Specifications

These specifications generally define the basic materials, facilities, preparation methods, critical processing steps, control and quality requirements, and end item performance requirements of a process. The specification normally does not provide all of the step by step "how to" details of a process because there are often numerous acceptable ways to meet the requirements of a process. The specification format for process specifications is therefore different from the AMS material specification format to address the unique needs of each process.

3.4 Converted Government Specifications

Another category indicates AMS Specifications that have been adopted from government specifications. These AMS carry a document identification number that relates to the original government specification (e.g., "AMS-QQ-A-200" is based on Federal Standard "QQ-A-200," AMS-H-6875 is based on MIL-H-6875, etc.). The initial publication of such a "converted government specification" contained technical requirements and text that were virtually identical to the original government specification. Subsequent revision, cancellation, supersession, or stabilization of converted government specifications is the responsibility of the designated AMS Committee. For these reasons, the format and styling of a converted government spec can differ radically from other AMS specifications.

4. DOCUMENT IDENTIFIERS

4.1 AMS Number, Revision Letter, Date

The four digit specification number for a new AMS is established by SAE when the specification is ready for initial publication. The number is selected to place the new specification near similar materials and products or processes in the various indexes. The classification system is best illustrated by examining the SAE AMS INDEX.

Specification revisions are identified by the original number with the letter "A" added to indicate the first revision after first release, "B" for the second revision, etc. The date of the initial issue and of the most recent revision are shown below the specification number on the first page.

When parallel specifications, AMS _____ (for the inch-pound system) and MAM _____ (metric system), are issued for the same product, both will have the same specification number but need not have the same revision letter. For metal product specifications, all MAM (metric system) documents have been cancelled and superseded by the AMS specification to which metric equivalent values have been added.

4.2 Title

The first line is the title of the specification. It provides a brief identification of the principal product or process covered. If a specification covers too many product forms for all to be in the title, the most important forms (as identified by the committee responsible for the specification) are shown in the title and the "less important" forms are mentioned in the scope paragraph.

The second, third, and possibly forth lines are subtitles which provide enough information to distinguish the specification from others which have similar titles.

For metal and non-metal AMS's, the second line identifies the alloy, and the third line indicates the condition of the product.

A fourth or fifth line in specifications for metal products shows the UNS (Unified Numbering System) number most similar to the composition of the alloy. However, this number should be considered a reference and not a part of the contractual requirements of the specification. (See 12.3.)

4.3 Scope (Section 1 of an AMS)

This section (1) includes paragraphs identifying forms of product covered, typical applications, classes, grades, or types covered and, if necessary, may include precautions to be observed in handling, processing, or usage of the product.

4.3.1 Form

This paragraph identifies all of the product forms covered by the specification, including those not in the title, and repeating those that are in the title. Examples of product forms include bar, plate, castings, forging stock, forgings, brazing filler, etc.

4.3.2 Application

This paragraph informs the user of typical applications for the product or process and may include important properties intended to help determine if the product or process might be considered for the proposed application.

Although the paragraph offers examples of applications of the product or process, it does not require that users should avoid other applications which may not be similar to the examples.