



AEROSPACE STANDARD

AS7766™

Issued

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Terms Used in Aerospace Metals Specifications

RATIONALE

This SAE Aerospace Standard has terms that are technical requirements and terms that are for information only. This standard is to be used in place of ARP1917.

1. SCOPE

1.1 Purpose

This SAE Aerospace Standard (AS) defines and clarifies terms used in aerospace materials and process specifications, standards, and recommended practices.

1.2 Application

Terms stated herein are technical requirements, unless otherwise indicated ("For information only. This term is not a technical requirement."). The terms stated herein are not intended to supersede those terms for which definition or clarification is already provided in standards that call out AS7765 or ARP1917.

2. REFERENCES

2.1 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.

2.1.1 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.

AMS2300	Steel Cleanliness, Premium Aircraft-Quality, Magnetic Particle Inspection Procedure
AMS2301	Steel Cleanliness, Aircraft Quality, Magnetic Particle Inspection Procedure
AMS2303	Steel Cleanliness, Aircraft Quality, Martensitic Corrosion-Resistant Steels, Magnetic Particle Inspection Procedure
AMS2304	Steel Cleanliness, Special Aircraft-Quality, Magnetic Particle Inspection Procedure

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Full document details: SAE AS7766

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<https://www.sae.org/standards/content/AS7766>

Documents

Document Sharing Hub

2.1.2 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 E29 Using Significant Digits in Test Data to Determine Conformance with Specifications

ASTM E45 Determining the Inclusion Content of Steel

3. DEFINITIONS AND TERMS

Unless noted as “for information only,” all terms are technical requirements.

AGITATION: When used in process specifications such as plating and heat treating, intentionally induced movement of parts or material, or intentionally induced circulation of the fluid media around parts or material.

AIRCRAFT QUALITY STEEL: See “STEEL QUALITY.”

ACCEPTABLE TO PURCHASER, COGNIZANT ENGINEERING ORGANIZATION, or COGNIZANT QUALITY ORGANIZATION: Does not require prior written approval from purchaser, cognizant engineering, or quality organization, but allows producer or processor to decide and purchaser the right to disapprove the decision. Producer or processor may choose an option unless purchaser selects another option prior to producer or processor performing the action described. This language is commonly used where the producer or processor has multiple potential purchasers when sales are made through distributors.

AGREED UPON BY PURCHASER or COGNIZANT ENGINEERING ORGANIZATION or COGNIZANT QUALITY ORGANIZATION AND PRODUCER or PROCESSOR: Requires concurrence of both purchaser and producer or processor. Such concurrence is typically documented by issuance and acceptance of a purchase order that may include reference to documents containing this language that are specified by the cognizant engineering or quality organization.

AIR COOL: When used in air or atmosphere heat treatment descriptions or specifications without numerical values or limits on cooling rate, the product being heat treated shall be removed from the furnace or hot zone at the end of the specified heat treatment time and shall be cooled in air or atmosphere to a temperature below that of metallurgical significance.

AIR COOL, RATE EQUIVALENT TO: When used in vacuum heat treatment descriptions or specifications without numerical values or limits on cooling rate, cooling shall be as for “GAS FAN COOL” except positive gas pressure is not allowed unless the statement is modified by the words “or faster” or equivalent language.

ANNUALLY: Every 12 months. See “TIME INTERVALS AND EXTENSIONS.”

AS CAST: Castings or ingots that have had gates and risers removed, and cleaned free of mold material, but have not been subject to subsequent heat treatment or metallurgical working operations.

AUTHORIZED BY or APPROVED BY, PURCHASER or COGNIZANT ENGINEERING ORGANIZATION or COGNIZANT QUALITY ORGANIZATION: Requires prior written approval from the purchaser, cognizant engineering organization, or cognizant quality organization, as applicable, for the specific issue requiring authorization. Testing or technical evaluation by the organization or department may be required before authorization or approval occurs.

BAR, ROD, AND WIRE: A solid shape of material (other than sheet, strip, plate, hand forgings, and extruded profiles) whose longitudinal orientation is the largest as-produced dimension and has been dimensionally reduced during the final working operation in at least two axes perpendicular to the longitudinal direction by pressing, extruding, forging, rolling, or drawing and finished in accordance with standard industry practices to the producer-certified size and shape. Some shapes such as flat rounds may be finished by sizing in a single direction. Dimensional limits that distinguish bar from rod and wire vary by alloy family and are established by the applicable AMS specification. Material cut from plate to sizes meeting a similar dimension or shape are still considered plate, not bar, rod, or wire.

BEST COMMERCIAL PRACTICE: A term used to describe the workmanship of metal products that meet the commonly recognized industry quality standard for a particular alloy, surface condition, product form, heat treat condition and, most importantly—the method of fabrication. For information only. This term is not a technical requirement.

BILLET: Hot worked, semi-finished stock intended for subsequent hot or cold working into finished or semi-finished product.

BIWEEKLY: Every 14 calendar days. See "TIME INTERVALS AND EXTENSIONS."

BIMONTHLY: Every 2 months. See "TIME INTERVALS AND EXTENSIONS."

CAPABLE OF: A term applied to certain requirements which need not be verified by the producer or processor unless a specific test method and test frequency is required. If subsequent testing by the purchaser or its designee establishes that the material does not meet the requirement, the material may be rejected. The recommended practice for AMS specifications is to require periodic testing at the frequency determined by the producer or processing unless the purchaser requires a specific testing frequency.

CAGE CODE: The Commercial and Government Entity (CAGE) code is the five character identification number assigned to an organization by the United States of America Defense Logistics Information Service. A similar North American Treaty Organization (NATO) CAGE system exists. The CAGE code system allows traceability of an organization throughout its lifetime even if its name and/or location changes. The CAGE code on a legacy drawing or specification can be used to locate the organization now responsible for the drawing or specification.

CAST LOT: See "HEAT LOT." This term is more common among aluminum specifications.

CERTIFICATION: A formal written document attesting that a specific operation or product meets standards and/or requirements specified within the applicable document.

CERTIFIED or QUALIFIED OPERATOR: A person who is authorized to perform a specific operation after having fulfilled the pre-established requirements. The scope and detail of the authorizing organization and the requirements are described in the relevant specification.

CLEANLINESS: When referring to the internal cleanliness of steel, this term is used to describe the type and amount of nonmetallic inclusions in steel. The following are examples of documents that define material cleanliness: For information only. This term is not a technical requirement.

ASTM E45
AMS2300
AMS2301
AMS2303
AMS2304

COGNIZANT ENGINEERING ORGANIZATION (CEO) or COGNIZANT QUALITY ORGANIZATION (CQO): The engineering or quality organization responsible for the design of the part, or the designee of this engineering or quality organization if cognizant engineering or quality responsibility is specifically granted to the designee in writing. The cognizant organization is commonly called the "design authority." The organization that creates a specification or engineering drawing may include its CAGE code in the document for identification purposes; however, the use of the CAGE code is not limited to design authorities.

COIL: A length of wire, small diameter rod, strip, or sheet which is wound on a cylindrical mandrel for either subsequent processing or use.

COLD FINISHING: Process by which the final material dimensions and/or surface characteristics are produced without heating the material. Size reducing operations such as turning, burnishing, grinding, polishing, and cold work may be used for minor size reduction and dimensional tolerance achievement. Prior to cold finishing, the product may have been either cold worked or hot worked.

COLD WORKING: Process by which material is deformed by metallurgical working operations performed without heating the material.

COMMERCIAL PACKAGING: Packaging meeting common carrier rules and regulations in order to provide safe delivery to destination.

COMMERCIALLY FLAT: Sheet or plate produced within tolerances customarily expected considering the material involved and the method of production employed.

CONTRACTOR: The party accepting a contract except when it is referenced in government specifications (see "GOVERNMENT CONTRACTOR"). This term is no longer used in AMS specifications. For information only. This term is not a technical requirement.

COUPON: A piece of material taken to be made into a specimen for evaluation of one or more characteristics or properties. (See "SPECIMEN.")

DAILY: Every calendar day that an action is performed or required to be performed. See "TIME INTERVALS AND EXTENSIONS."

DIE FORGING: A forging shaped by working stock in a closed die.

DISTRIBUTOR: A business that sells metal stock or other items produced by a different entity. The same business operates as a "PRODUCER" when it performs the functions of a "PRODUCER."

DOUBLE MELT or DOUBLE MELTING: A multiple melt practice where all of the constituents are completely melted and refined to make a primary electrode or ingot(s), and the primary electrode or ingot(s) is prepared for and completely melted and refined again to create the final electrode or ingot(s) for subsequent use. So-called "consolidation melts" where the starting constituents, including any scrap, are not completely melted do not qualify as an initial melt.

DOUBLE PLATING: A resumption of the plating process after the surface has dried. This does not apply to removing parts from the process solution (and drying) for in-process thickness/dimensional checks.

DRAWN SHAPE: A shape produced by deformation of metal pulled through a die.

EXTRUDED SHAPE: A shape produced by deformation of metal pressed through a die.

ESSENTIALLY FREE FROM: Refers to the presence or absence of a detectable condition or quantity of a constituent that is not sufficient to cause a detrimental effect on the product. There is no specific maximum limit to the condition or constituent. Usage is discouraged in AMS specifications but may be necessary where information about the condition or constituent is desired, but quantification of the condition or constituent, and justification of control limits, are not necessary.

EQUIVALENT or EQUIVALENCE: An alternative is acceptable. Alternatives may have definitions or restrictions regarding equivalency in the document. If not, purchaser may require that equivalency be supported with objective evidence if the referenced document does not explain or require equivalency methods. Purchaser shall state in writing that equivalency is not acceptable in order to require the specified method only.

FINISH MACHINED: A part surface that has been machined to the final dimensions. Holes to be drilled at assembly may be excluded.

FLASH or FLASH PLATE (PLATING): When used in plating (not to be confused with a strike plate), is a very thin final coating, from conventional plating baths.

FLASH (FORGING): Excess material pushed out between portions of the dies during the forging process. The forging producer normally trims this excess off prior to shipment.

FOIL: See "SHEET."

FORGING: Metal product produced by imparting compressive plastic deformation on material by the use of various types of hammers, presses, ring rolling machines, and radial forging machines. Deformation applied in this manner typically produces a wrought structure. This product is exclusive of bulk commodity products such as bar, plate, sheet, tubing, etc.

FORGING STOCK: Ingot, billet, rod, bar, or other section suitable for forging.