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AEROSPACE MATERIAL SPECIFICATION

SAE AMS-STD-182

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Continuous Identification Marking of Nickel and Nickel Base Alloys

NOTICE

This document has been taken directly from U.S. Military Specification Federal Standard No. 182B 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 Federal Standard No. 182B. 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.

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Authority. This standard is issued pursuant to the Federal Property and Administrative Services Act of 1949, as amended, and its application to the purchase of commodities referred to herein is mandatory on all Federal agencies.

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Figure 1. Examples of Table I marking

1. PURPOSE AND SCOPE:

The purpose of this standard is to provide uniform physical item identification marking, in constantly recurring symbols, of nickel and nickel alloy mill products procured and issued for government agencies and their contractors. applicability shall be by specific reference to this standard in specification, contract, or purchase order. shipment and inspection acceptance markings are not within the scope of this standard.

2. DEFINITIONS AND MARKING TERMS:

2.1 Definitions:

Definitions of commodity forms and shapes shall be those in common use the nickel and nickel base alloy industry.

2.2 Marking terms:

Marking terms as used by this standard are defined as indicated herein. The specifications and conditions are those promulgated by the Government or recognized technical societies, such as the American Society for Testing and Materials and the Society of Automotive Engineers, Inc., and which are in common use. The alloy designations and symbols (for identification purposes), are those adopted by the basic producers of nickel and nickel base alloys accepted by the Government and industry.

2.2.1 Producer's name or trademark: Producer's name or trademark used shall be that of the primary producer or the producer who performs the final processing or finishing operation prior to marketing the product.

2.2.2 Alloy designation: The alloy designation for an alloy or material shall be that designation established by the basic producer of the material and which is in common commercial acceptance.

2.2.3 Specification data: The specification data includes the number of the specification (including slash sheet number where applicable), and type, grade, or class to which the material was produced and the condition (finish and temper) of the material, when applicable.

2.2.3.1 Type, grade, or class: Where more than one type, grade, or class of material is provided for in a material specification, it shall be so specified in the contract or order and shall be included in the identification marking. The word "class" and "grade" shall be abbreviated and shown as "-Cl. 1" or "-GR. A," etc., as applicable; type will be shown as "type I," etc., as applicable. A hyphen (-) shall be used to separate the specification number and the type, grade, or class, and a single or double space shall separate the abbreviation for grade or class and the applicable letter designating the grade or class.

2.2.3.2 Condition: Condition is that designation commonly accepted and used to describe the method of processing and temper or heat treatment given the material and generally provided for in the material specification. It may also be used to define the quality or surface condition of a material, and unless specified in product specification or contract, incorporation of such information in the identification marking may be employed at the producer's option.

2.2.3.2.1 Code identification: Some of the (physical) conditions or tempers and quality or surface requirements in common usage for the various products are as follows:

Code identification system for conditions for nickel and nickel base alloys

Code Or Symbol	Condition or temper and surface condition
A	Annealed
AD	As-drawn
*AH	Age hardened (nickel base alloys)
AP	Annealed and pickled
AR	As-rolled
BA	Bright Annealed
BT	Bolt tolerance
CD	Cold drawn
CR	Cold rolled
D	Descaled
DD	Deep drawing (quality)
E	Equalized
EA	Equalized and aged
FH	Full hard (also spring temper)
FQ	Forging quality (ground or turned)
FHT	Full heat treated
G	Ground
H	Hard
1/4H	Quarter hard
1/2H	Half hard
HP	Hot finished
HR	Hot rolled
HSR	Hard, stress relieved
HT	Heat treated
HTQ	High tensile quality
MB	Mineral (shot) blasted
P	Pickled
PF	Press flattened

Code Or Symbol	Condition or temper and surface condition
*PH	Precipitation hardened
RT	Rough turned
SA	Solution annealed
SCH	Schedule (applicable to pipe only)
SE	Stress equalized
SH	Skin hard
SP	Special quality
SQ	Spinning Quality
SR	Stress relieved
ST	Solution treated
X	Categories other than as indicated above

NOTE: Where more than one set of symbols or codes is desirable to adequately describe a product, the symbols shall be separated by a slant (/); example:

(1) Cold drawn, annealed, and pickled - "CD/AP."

(2) Annealed, ground, and pickled - "A/G/P."

2.2.4 Heat number: Heat number is that number assigned by the mill to identify a quantity of metal poured at one time.

3. MARKING REQUIREMENTS AND APPLICATION:

3.1 Marking information:

Physical item identification marking requirements and the application thereof to the nickel and nickel base alloys shall be in accordance with Table I of this standard.

3.2 Legibility and permanency:

Physical item marking on nickel and nickel base alloys shall be such that it shall not rub off or be otherwise effaced by contact incident to normal handling, exposure to the elements, shipment, and storage. However, the marking shall be of such composition that it may be easily removed by the submergence of the marked piece into a mild alkali rinse or other innocuous solution or solvent. Legibility of all markings shall be such as is required for ready readability and the height of characters shall be commensurate with the size of the item(s) being marked.

3.3 Deleterious effect:

Physical item marking of these metals shall be accomplished in a manner which will not adversely affect the machining, forming, welding, or fabrication of the material or produce stresses which would be deleterious to the functioning of the finished product. Also, the marking shall not etch the material. Impression stamping is considered detrimental and shall be used only for ingots, pigs, slabs, billets, and cross sectional surfaces of bars, rods, and tubing or where specified by the procuring agency. As a specific precaution, marking materials applied to nickel and nickel base alloys shall contain not more than trace amounts of lead, phosphorus, sulfur, zinc, or carbon.

4. CHANGES:

When a Federal agency considers that a Federal standard does not provide for its essential needs, written requests for changing or adding to the standard, supported by adequate justification, shall be sent to the Administration. This justification will explain wherein the standard does not provide for essential needs. The request should be sent in duplicate to the General Services Administration, Washington, DC 20406. The Administration will determine the appropriate action to be taken and will notify the agency.

5. CONFLICT WITH REFERENCED SPECIFICATIONS:

Where the requirements stated in this standard conflict with any requirements in a referenced specification, the requirements of this standard shall apply. Nature of conflicts between the standard and the referenced specification shall be submitted in duplicate to General Services Administration, Federal Supply Service, Washington, DC 20406.

Table I. Marking Information. Subject to the limitation of column 3, markings showing the producer's name or trademark, commercial designation, specification data and heat number (see Note 1), shall be marked on each item for sale to Government agencies or their contractors. In addition, other information shall be applied as follows:

1. Sizes, as specified in column 2.

2. Supplier's name or trademark when any of the required marking information is applied by the supplier.

All required information shall be applied in constantly recurring symbols as specified in column 3, except as noted.

TABLE I. Marking Information

(1)	(2)	(3)
Item	Sizes in inches or millimeters: (a) Thickness (b) Diameter/width (c) Wall thickness	Application
Bars, rods, and straightened wire	Not applicable	Printed, stamped, or otherwise permanently marked on

TABLE I. Marking Information (Cont'd)

(1)	(2)	(3)
Item	Sizes in inches or millimeters: (a) Thickness (b) Diameter/width (c) Wall thickness	Application
		all bars 1/2 in (12.7 mm) or more in. width of flat and 1/2 in. (12.7 mm) or more in diameter in constantly recurring symbols at intervals not greater than 3 ft. (900 mm) throughout length. Other sizes shall be securely bundled or boxed. Bundles shall contain two metal or plastic tags, bearing the required identification information, attached to the stock at separate locations. Boxes shall be marked with the required information in addition to tags on the stock.
Plates, sheets, and flat products	(a)	Except as noted, printed, stamped, or otherwise permanently marked on all items in rows of constantly recurring symbols at intervals not greater than throughout the length of product. Printing in adjacent rows shall be alternately staggered. The product shall have at least one row of recurring symbols and additional rows shall be on 6 in. (152.4 mm) centers across the width of the item. When multiple rows are required, one of two or one of three may contain the producer's identification, thickness and heat/ heat treat lot number, with the other required information in the remaining rows.
Tubular products	(b) (c)	Except as noted, printed, stamped, or otherwise

TABLE I. Marking Information (Cont'd)

(1) Item	(2) Sizes in inches or millimeters: (a) Thickness (b) Diameter/width (c) Wall thickness	(3) Application
		permanently marked on all tubular products 1/2 in. (12.7 mm) or more in outside diameter in constantly recurring symbols at intervals not greater than 3 ft (900 mm) throughout length of product. Other sizes shall be securely bundled or boxed. Bundles shall contain two metal or plastic tags, bearing the required identification information, attached to the stock at separate locations. Boxes shall be marked in addition to tags on the stock.
Structural shapes		Structural shapes may be marked with the required identification information near one end of each item, in lieu of the constantly recurring number.
Coiled or spooled wire	(b)	Identification marking shall be applied to the spool flange or to a metal or plastic tag attached to each coil, as applicable.
Coiled tube	(b) (c)	Identification marking shall be applied to a metal or plastic tag attached to each coil.
Coiled flat products	(b) (a)	Identification marking shall be printed, stamped, or otherwise permanently marked in a single row on the outside end of each coil.