



AEROSPACE MATERIAL SPECIFICATION

AMS5934™/H1000**REV. A**Issued 2015-06
Revised 2024-08

Superseding AMS5934/H1000

(R) Steel, Extra High Toughness,
Corrosion-Resistant, Bars, Wire, Forgings, Rings, and Extrusions
13Cr - 8.0Ni - 2.2Mo - 1.1Al
Vacuum Induction Plus Consumable Electrode Melted
Solution Heat Treated, Precipitation Hardened (H1000)
(Composition similar to UNS S13800)

RATIONALE

AMS5934/H1000A is the result of a Five-Year Review and update of the specification. The revision addresses AS6279 requirements (see 1.1.1 and 3.8), adds a stress-corrosion warning (see 1.2.1), addresses ferrite when ordering (see 3.5.2 and 8.7), updates straightening requirements (see 3.7.1 and 8.7), prohibits unauthorized exceptions (see 1.1, 3.5.3.5, 3.9, 4.3.4, 5.1, and 8.5), revises heat-treatment and stress-relief requirements (see 3.4.1 and 3.4.2), updates tensile test requirements (see 3.5.3.1.1 and 3.5.3.1.2), updated to include only testing and reporting required on a lot basis as heat basis testing is covered in the base specification (see 4.2 and 4.3), permits the use of prior revisions (see 8.4), and address use of material processed to other slash specifications (see 8.6).

1. SCOPE

1.1 Form

This specification covers a corrosion-resistant steel product in the solution and precipitation heat treated (H1000) condition, 12 inches (305 mm) and under in nominal diameter, thickness, or, for hexagons, least distance between parallel sides.

1.1.1 The aged product may be supplied directly by a mill or by another entity performing the functions of a producer as defined in AS6279. The latter would be accomplished by precipitation heat treatment of solution-treated material previously certified to AMS5934. The entity assuming responsibility for the aging operation is designated the producer of AMS5934/H1000.

1.2 Application

These products have been used typically for parts requiring corrosion resistance and high strength up to 600 °F (316 °C) with good ductility and strength in the transverse direction in large section sizes, but usage is not limited to such applications (see 8.3).

1.2.1 Certain design and processing procedures may cause these products to become susceptible to stress-corrosion cracking after heat treatment. ARP1110 recommends practices to minimize such conditions.

SAE Executive Standards Committee 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 revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2024 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, or used for text and data mining, AI training, or similar technologies, 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:

Full document details: SAE AMS5934_H1000A

For more information on this standard, visit
<https://www.sae.org/standards/content/AMS5934/H1000A/>

Documents
Document Sharing Hub

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 of that document 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 +1 724-776-4970 (outside USA), www.sae.org.

AMS2241	Tolerances, Corrosion- and Heat-Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Bars and Wire
AMS2759/3	Heat Treatment, Precipitation-Hardening Corrosion-Resistant, Maraging, and Secondary Hardening Steel Parts
AMS2759/11	Stress Relief of Steel Parts
AMS2761	Heat Treatment of Steel Raw Materials
AMS5934	Steel, Extra High Toughness, Corrosion-Resistant, Bars, Wire, Forgings, Rings, and Extrusions, 13Cr - 8.0Ni - 2.2Mo - 1.1Al, Vacuum Induction Plus Consumable Electrode Melted, Solution Heat Treated, Precipitation-Hardenable
ARP1110	Minimizing Stress Corrosion Cracking in Wrought Forms of Steels, and Corrosion Resistant Steels and Alloys
AS6279	Standard Practice for Production, Distribution, and Procurement of Metal Stock
AS7766	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 A370	Mechanical Testing of Steel Products
-----------	--------------------------------------

2.3 Definitions

Terms used in AMS are defined in AS7766.

3. TECHNICAL REQUIREMENTS

3.1 Composition

Composition shall be in accordance with AMS5934.

3.2 Melting Practice

Melting practice shall be in accordance with AMS5934 as ordered.

3.3 Condition

Product condition shall be in accordance with AMS5934, and the following:

3.3.1 The product shall be supplied in the precipitation hardened (H1000) heat-treat condition.

3.3.2 Bar shall not be cut from plate (see 4.3.3).

3.4 Heat Treatment

Heat treatment shall be in accordance with AMS5934 and the following:

3.4.1 Precipitation Heat Treatment

3.4.1.1 Precipitation heat treatment shall be in accordance with the requirements applicable to either AMS2761, or AMS2759/3 at the producer's option, except acceptance testing and criteria shall be as specified in 3.5.3.1.

3.4.1.2 When product certified as AMS5934 (solution-treated material) is precipitation heat treated to meet AMS5934/H1000 by an entity other than the producer of the original product, the heat treatment source shall be accredited by a recognized industry agency for stainless steel heat treatment acceptable to the purchaser.

3.4.2 Stress-Relief Heat Treatment

3.4.2.1 A stress-relief heat treatment when performed after precipitation heat treatment is optional. When performed, stress relief shall be accomplished by heating to $900\text{ }^{\circ}\text{F} \pm 25\text{ }^{\circ}\text{F}$ ($482\text{ }^{\circ}\text{C} \pm 14\text{ }^{\circ}\text{C}$) and soaking for at least 1 hour plus 1 hour additional for each inch (25 mm) of thickness or fraction thereof greater than 1 inch (25 mm). Heat treatment shall be in accordance with AMS2759/11 or AMS2761. When load thermocouples are used, the soaking time shall be at least 1 hour.

3.4.2.2 Stress relieving as above may be performed after straightening to meet dimensional tolerances of AMS2241 unless prohibited by purchaser or cognizant engineering organization (see 8.7) but must still meet all properties (see 3.5).

3.5 Properties

All products shall conform to the following requirements:

3.5.1 Macrostructure

Macrostructure shall be in accordance with AMS5934.

3.5.2 Microstructure

Microstructure shall be Type 1 unless Type 2 is specified in accordance with AMS5934.

3.5.3 Tensile Properties

Tensile properties shall be in accordance with the following:

3.5.3.1 Bars

Product, 12 inches (305 mm) and under in nominal diameter, thickness or, for hexagons, least distance between parallel sides, shall be as shown in Table 3. Tensile testing shall be performed in accordance with ASTM A370.