AEROSPACE MATERIAL SPECIFICATION

AMS5529™	REV. K

Issued 1954-05
Revised 2019-04

Superseding AMS5529J

Steel, Corrosion Resistant, Sheet and Strip 17Cr - 7.1Ni - 1.1Al Solution Heat Treated and Cold Rolled, Precipitation Hardenable 0.0015 to 0.100 inch (0.038 to 2.54 mm) Nominal Thickness (Composition similar to UNS S17700)

RATIONALE

AMS5529K prohibits unauthorized exceptions (3.6), revises chemical analysis standards (3.1), properties (3.3.3), reports (4.4), and identification (5.1.1), and is a Five-Year Review and update of this specification.

1. SCOPE

1.1 Form

This specification covers a corrosion-resistant steel in the form of sheet and strip 0.0015 to 0.100 inch (0.038 to 2.54 mm) in nominal thickness (see 8.7).

1.2 Application

These products have been used typically for parts such as springs requiring corrosion resistance and high strength up to 600 °F (316 °C), but usage is not limited to such applications.

1.2.1 Strength of these cold-worked products will be impaired if parts are welded during fabrication.

1.2.2 Certain design and processing procedures may cause these products to become susceptible to stress-corrosion cracking; ARP1110 recommends practices to minimize such conditions.

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.

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

SAE values your input. To provide feedback on this Technical Report, please visit
http://standards.sae.org/AMS5529K

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.

AMS2242 Tolerances, Corrosion and Heat Resistant Steel, Iron Alloy, Titanium, and Titanium Alloy Sheet, Strip, and Plate

AMS2248 Chemical Check Analysis Limits, Corrosion and Heat-Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys

AMS2371 Quality Assurance Sampling and Testing, Corrosion and Heat-Resistant Steels and Alloys, Wrought Products and Forging Stock

AMS2807 Identification, Carbon and Low-Alloy Steels, Corrosion and Heat-Resistant Steels and Alloys, Sheet, Strip, Plate, and Aircraft Tubing

ARP1110 Minimizing Stress Corrosion Cracking in Wrought Forms of Steels and Corrosion Resistant Steels and Alloys

ARP1917 Clarification of Terms Used in Aerospace Metals Specifications

AS4194 Sheet and Strip Surface Finish Nomenclature

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

ASTM A480/A480M Flat Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip

ASTM A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products

ASTM E140 Hardness Conversion Tables for Metals Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Superficial Hardness, Knoop Hardness, Scleroscope Hardness, and Leeb Hardness

ASTM E384 Knoop and Vickers Hardness of Materials

3. TECHNICAL REQUIREMENTS

3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with ASTM A751, or by other analytical methods acceptable to purchaser.

Table 1 - Composition

Element	Min	Max
Carbon	--	0.09
Manganese	--	1.00
Silicon	--	1.00
Phosphorus	--	0.040
Sulfur	--	0.030
Chromium	16.00	18.00
Nickel	6.50	7.75
Aluminum	0.75	1.50

3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2248.

3.2 Condition

The product shall be supplied in the following condition:

3.2.1 Sheet and Strip

Solution heat treated, free from continuous carbide network determined by metallographic examination, and, unless solution heat treatment is performed in an atmosphere yielding a bright finish, descaled, and cold-rolled (see 8.2).

3.3 Properties

Product, 0.0015 to 0.100 inch (0.038 to 2.54 mm) in nominal thickness, shall conform to the following requirements; tensile properties and hardness shall be determined in accordance with ASTM A370:

3.3.1 As Cold Rolled (Condition C)

3.3.1.1 Tensile Properties

Shall be as shown in Table 2.

Table 2 - Minimum tensile properties

Property	Value
Tensile Strength	200 ksi (1379 MPa)
Yield Strength at 0.2% Offset	175 ksi (1207 MPa)
Elongation in 2 Inches (50.8 mm)	1%

3.3.1.2 Hardness

Shall be not lower than 41 HRC, or equivalent (see 8.3); for thin gages where superficial hardness testing is impractical, microhardness testing in accordance with ASTM E384 may be used. Product shall not be rejected on the basis of hardness if the tensile properties of 3.3.1.1 are acceptable, determined on specimens taken from the same sample as that with nonconforming hardness or from another sample with similar nonconforming hardness.

3.3.2 After Precipitation Heat Treatment Condition (CH900)

Product, solution heat treated and cold rolled, shall have the following properties after being precipitation heat treated by heating to 900 °F ± 10 °F (482 °C ± 6 °C), holding at heat for 60 minutes, -0, +10, and cooling at a rate equivalent to air cooling.

3.3.2.1 Tensile Properties

Shall be as shown in Table 3.

Table 3 - Minimum tensile properties as precipitation heat treated to CH900 condition

Property	Value
Tensile Strength	240 ksi (1655 MPa)
Yield Strength at 0.2% Offset	230 ksi (1586 MPa)
Elongation in 2 Inches (50.8 mm)	1%

3.3.2.2 Hardness

Shall be not lower than 46 HRC, or equivalent (see 8.3); for thin gages where superficial hardness testing is impractical, microhardness testing in accordance with ASTM E384 may be used. Product shall not be rejected on the basis of hardness if the tensile properties of 3.3.2.1 are acceptable, determined on specimens taken from the same sample as that with nonconforming hardness or from another sample with similar nonconforming hardness.

3.3.3 Mechanical property requirements for product outside of the range covered by 1.1 shall be agreed upon between producer and purchaser.

3.4 Quality

The product, as received by purchaser, shall be uniform in quality and condition, sound, and free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Tolerances

Shall conform to all applicable requirements of AMS2242.

3.6 Exceptions

Any exceptions shall be authorized by purchaser and reported as in 4.4.2.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The producer of the product shall supply all samples for producer's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the product conforms to specified requirements.

4.2 Classification of Tests

4.2.1 Acceptance Tests

The following requirements are acceptance tests and shall be performed on each heat or lot, as applicable.

4.2.1.1 Composition (3.1) of each heat.

4.2.1.2 Tensile properties (3.3.1.1 and 3.3.2.1) of each lot.

4.2.1.3 Hardness (3.3.1.2 and 3.3.2.2) of each lot.

4.2.1.4 Tolerances (3.5) of each lot.

4.2.2 Periodic Tests

Freedom from continuous carbide network (3.2.1) is a periodic test and shall be performed at a frequency selected by the producer unless frequency of testing is specified by purchaser.

4.3 Sampling and Testing

Shall be in accordance with AMS2371.

4.4 Reports

The producer of the product shall furnish with each shipment a report showing the producer's name and country where the metal was melted (e.g., final melt in the case of metal processed by multiple melting operations) and the following results of tests and relevant information: the results of tests for composition of each heat and for tensile properties and hardness as cold rolled, and tensile properties and hardness after precipitation heat treatment of each lot, and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, heat and lot numbers, AMS5529K, size, and quantity.

4.4.1 When the product size is outside the range covered by 1.1, the report shall contain a statement to that effect.

4.4.2 When material produced to this specification is outside the size range stated in 1.1, or has exceptions authorized by purchaser taken to the technical requirements listed in Section 3 (see 5.1.1), the report shall contain a statement "This material is certified as AMS5529K(EXC) because of the following exceptions." and the specific exceptions shall be listed.

4.5 Resampling and Testing

Shall be in accordance with AMS2371.

5. PREPARATION FOR DELIVERY

5.1 Identification

Shall be in accordance with AMS2807.

5.1.1 When technical exceptions are taken (see 4.4.2), the material shall be marked with AMS5529K(EXC).

5.2 Packaging

The product shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the product to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT

A producer shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS

Product not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.

8. NOTES

8.1 Revision Indicator

A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

8.2 For applications that require special control of the surface finish (such as springs), the purchaser may impose an additional requirement for a No. 2B surface finish in accordance with ASTM A480/A480M and AS4194.

8.3 Hardness conversion tables for metals are presented in ASTM E140.

8.4 Terms used in AMS are clarified in ARP1917.

8.5 Dimensions and properties in inch/pound units and the Fahrenheit temperatures are primary; dimensions and properties in SI units and the Celsius temperatures are shown as the approximate equivalents of the primary units and are presented only for information.

8.6 Unless otherwise specified, the material producer shall work to the revision of this specification (AMS5229) in effect on the date of order placement. Unless otherwise specified, material manufactured and certified to the immediately previous revision of this specification (AMS5229) may be procured and used until inventory is depleted.

8.7 Purchase documents should specify not less than the following:

AMS5529K
Product form and size of product desired
Property and acceptance requirements from the cognizant engineering organization applicable to sizes outside the range listed in 1.1
Quantity of product desired

PREPARED BY AMS COMMITTEE “F”