SAE Aerospace
An SAE International Group

# AEROSPACE MATERIAL SPECIFICATION

SAE AMS5553 | REV. G

Issued 1965-02
Revised 2012-04

Superseding AMS5553F

## Nickel, Sheet and Strip
## Low (0.02 max) Carbon
## Annealed

(Composition similar to UNS N02201)

RATIONALE

AMS5553G removes a withdrawn chemical analysis standard (3.1), extends the applicable thickness range (Table 2), and is a Five Year Review and update of this specification.

1. SCOPE

1.1 Form

This specification covers nickel in the form of sheet and strip.

1.2 Application

These products have been used typically for parts requiring excellent corrosion resistance, and/or strong magnetic properties, but usage is not limited to such applications.

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 724-776-4970 (outside USA), www.sae.org.

AMS2262 Tolerances, Nickel, Nickel Alloy, and Cobalt Alloy Sheet, Strip, and Plate

AMS2269 Chemical Check Analysis Limits, Nickel, Nickel Alloys, and Cobalt Alloys





**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 WEB ADDRESS:** **http://www.sae.org**

**SAE values your input. To provide feedback on this Technical Report, please visit**
**http://www.sae.org/technical/standards/AMS5553G**

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

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 A 480/A 480M Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip

ASTM E 8/E 8M Tension Testing of Metallic Materials

ASTM E 18 Rockwell Hardness of Metallic Materials

ASTM E 384 Knoop and Vickers Hardness of Materials

3. TECHNICAL REQUIREMENTS

3.1 Composition

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

TABLE 1 - COMPOSITION

| Element | min | max |
|---|---|---|
| Nickel | 99.0 | -- |
| Carbon | -- | 0.02 |
| Manganese | -- | 0.35 |
| Silicon | -- | 0.35 |
| Sulfur | -- | 0.010 |
| Cobalt | -- | 1.00 |
| Iron | -- | 0.40 |
| Copper | -- | 0.25 |



3.1.1 Check Analysis

Composition variations shall meet the applicable requirements of AMS2269.

3.2 Condition

Cold rolled, annealed, and, unless annealing is performed in an atmosphere yielding a bright finish, descaled having a surface appearance in accordance with ASTM A 480/A 480M and AS4194 comparable to 3.2.1.1 or 3.2.1.2 as applicable.

3.2.1 Sheet

No. 2D finish.

3.2.2 Strip

No. 1 strip finish.

3.3 Properties

The product shall conform to the following requirements:

3.3.1 Tensile Properties

Shall be as shown in Table 2, determined in accordance with ASTM E 8/E 8M.

TABLE 2A - TENSILE PROPERTIES, INCH/POUND UNITS

| Nominal Thickness Inch | Tensile Strength ksi, min | Yield Strength at 0.2% Offset ksi | Elongation in 2 inches or 4D %, min |
|---|---|---|---|
| 0.001 to 0.010, excl | 45.0 | -- | -- |
| 0.010 to 0.015, incl | 50 | 30.0, max | 30 |
| Over 0.015 to 0.049, incl | 50 | 12.0, min | 30 |
| Over 0.049 to 0.109, incl | 50 | 12.0, min | 35 |
| Over 0.109 to 0.250, incl | 50 | 12.0, min | 40 |

TABLE 2B - TENSILE PROPERTIES, SI UNITS

| Nominal Thickness Millimeters | Tensile Strength MPa, min | Yield Strength at 0.2% Offset MPa | Elongation in 50.8 mm or 4D %, min |
|---|---|---|---|
| 0.03 to 0.25, excl | 310 | -- | -- |
| 0.25 to 0.38, incl | 345 | 207, max | 30 |
| Over 0.38 to 1.24, incl | 345 | 83, min | 30 |
| Over 1.24 to 2.77, incl | 345 | 83, min | 35 |
| Over 2.77 to 6.35, incl | 345 | 83, min | 40 |



3.3.2 Hardness

Shall be not higher than 66 HRB, or equivalent (See 8.2), determined in accordance with ASTM E 18; for thin gages where superficial hardness testing is impractical, microhardness testing in accordance with ASTM E 384 may be used. Product shall not be rejected on the basis of hardness if the tensile properties of 3.3.1 are acceptable, determined on product taken from the same sample as that with nonconforming hardness or from another sample with similar nonconforming hardness.

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 AMS2262.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection

The vendor of the product shall supply all samples for vendor'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

All technical requirements are acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling and Testing

Shall be in accordance with AMS2371.

4.4 Reports

The vendor of the product shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and for tensile properties and hardness 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, AMS5553G, size, and quantity.

4.5 Resampling and Retesting

Shall be in accordance with AMS2371.

5. PREPARATION FOR DELIVERY

5.1 Identification

Shall be in accordance with AMS2807.

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 vendor 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.