



# AEROSPACE MATERIAL SPECIFICATION

**AMS6356™****REV. K**

Issued 1962-01  
Reaffirmed 1994-04  
Revised 2024-12

Superseding AMS6356J

(R) Steel, Sheet, Strip, and Plate  
0.95Cr - 0.20Mo - (0.30 - 0.35C) (SAE 4132),  
Aircraft Quality  
(Composition similar to UNS G41300)

## RATIONALE

AMS6356 is the result of a Five-Year Review and update of the specification. The revision updates the title to reflect the quality, clarifies composition reporting (see 3.1.2), revises decarburization test requirements (see 3.3.2), updates hardenability (see 3.3.3), clarifies bending (see 3.3.4), addresses updates to AMS2301 (see 4.2.1, 4.4.1, and 4.4.3), and updates the exceptions requirements (see 4.4.2).

### 1. SCOPE

#### 1.1 Form

This specification covers an aircraft-quality, low-alloy steel in the form of sheet, strip, and plate.

#### 1.2 Application

These products have been used typically for heat-treated parts and structures that may require welding during fabrication, but usage is not limited to such applications. Product 0.375 inch (9.52 mm) and under in nominal thickness can be through-hardened to a minimum tensile strength of 180 ksi (1241 MPa) and proportionately lower strength in heavier section thicknesses.

### 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](http://www.sae.org).

AMS2252 Tolerances, Low-Alloy Steel Sheet, Strip, and Plate

AMS2259 Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels

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|         |                                                                                                                                        |
|---------|----------------------------------------------------------------------------------------------------------------------------------------|
| AMS2301 | Steel Cleanliness, Aircraft Quality, Magnetic Particle Inspection Procedure                                                            |
| AMS2370 | Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel 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 |
| 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](http://www.astm.org).

|            |                                                                                                                                                                                               |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ASTM A255  | Determining the Hardenability of Steel                                                                                                                                                        |
| ASTM A370  | Mechanical Testing of Steel Products                                                                                                                                                          |
| ASTM A751  | Chemical Analysis of Steel Products                                                                                                                                                           |
| ASTM E112  | Determining Average Grain Size                                                                                                                                                                |
| 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 E290  | Bend Testing of Material for Ductility                                                                                                                                                        |
| ASTM E1077 | Estimating the Depth of Decarburization of Steel Specimens                                                                                                                                    |

## 2.3 Definitions

Terms used in AMS are defined in AS7766.

## 3. TECHNICAL REQUIREMENTS

### 3.1 Composition

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

**Table 1 - Composition**

| Element    | Min  | Max   |
|------------|------|-------|
| Carbon     | 0.30 | 0.35  |
| Manganese  | 0.40 | 0.60  |
| Silicon    | 0.15 | 0.50  |
| Phosphorus | --   | 0.025 |
| Sulfur     | --   | 0.025 |
| Chromium   | 0.80 | 1.10  |
| Molybdenum | 0.15 | 0.25  |
| Nickel     | --   | 0.25  |
| Copper     | --   | 0.35  |

3.1.1 Aluminum, vanadium, and columbium (niobium) are optional grain refining elements and need not be determined or reported unless used to satisfy the average grain size requirements of 3.3.1.2.

3.1.2 The producer may test for any element not listed in Table 1 and include this analysis in the report of 4.4. Reporting of any element not listed in the composition table is not a basis for rejection unless limits of acceptability are specified by the purchaser.

### 3.1.3 Check Analysis

Composition variations shall meet the applicable requirements of AMS2259.

## 3.2 Condition

The product shall be supplied in the following condition; hardness shall be determined in accordance with ASTM A370:

### 3.2.1 Sheet and Strip

Sheet and strip shall be cold finished, bright or atmosphere annealed, and descaled if necessary; or hot rolled, annealed if necessary, and descaled; having hardness not higher than 95 HRB, or equivalent (see 8.2).

### 3.2.2 Plate

Plate shall be hot rolled, annealed if necessary, and descaled, having hardness not higher than 95 HRB, or equivalent (see 8.2).

3.2.2.1 If allowed by the purchaser, cold rolled, annealed if necessary, and descaled, having hardness not higher than 95 HRB, or equivalent (see 8.2).

3.2.3 If product is ordered spheroidize annealed, the degree of spheroidization shall be as agreed upon by the purchaser and producer.

## 3.3 Properties

The product shall conform to the following requirements; hardness testing shall be performed in accordance with ASTM A370:

### 3.3.1 Average Grain Size

Average grain size shall be determined by either 3.3.1.1 or 3.3.1.2.

3.3.1.1 Average grain size shall be ASTM No. 5 or finer, determined in accordance with ASTM E112.

3.3.1.2 The product of a heat shall be considered to have an ASTM No. 5 or finer austenitic grain size if one or more of the following are determined by heat analysis (see 8.4):

- A total aluminum content of 0.020 to 0.050%.
- An acid soluble aluminum content of 0.015 to 0.050%.
- A vanadium content of 0.02 to 0.08%.
- A columbium (niobium) content of 0.02 to 0.05%.

### 3.3.2 Decarburization

Decarburization shall be evaluated by one of the two methods of 3.3.2.1 or 3.3.2.2.