



# AEROSPACE MATERIAL SPECIFICATION

**AMS4016™****REV. N**

Issued 1939-12  
Reaffirmed 2018-09  
Revised 2024-04

Superseding AMS4016M

Aluminum Alloy, Sheet and Plate,  
2.5Mg - 0.25Cr (5052-H32),  
Strain Hardened, Quarter-Hard, and Stabilized  
(Composition similar to UNS A95052)

## RATIONALE

AMS4016N results from a Five-Year Review and update of this specification with changes to prohibit unauthorized exceptions (see 3.3.3, 3.6, 4.4.1, 5.1.1, and 8.5), update Form (see 1.1), Applicable Documents (see Section 2), and Ordering Information (see 8.6), relocate Definitions (see 2.4), and allow the use of the immediate prior specification revision (see 8.4).

## 1. SCOPE

### 1.1 Form

This specification covers an aluminum alloy in the form of sheet and plate 0.017 to 2.000 inches (0.43 to 50.80 mm), inclusive, in nominal thickness (see 8.6).

### 1.2 Application

These products have been used typically for parts requiring moderate strength, good formability, good welding and resistance spot welding characteristics, and good resistance to corrosion, 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 +1 724-776-4970 (outside USA), [www.sae.org](http://www.sae.org).

**AMS2355** Quality Assurance, Sampling and Testing, Aluminum Alloys and Magnesium Alloy, Wrought Products (Except Forging Stock), and Rolled, Forged, or Flash Welded Rings

**AS7766** Terms Used in Aerospace Metals Specifications

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](mailto:CustomerService@sae.org)  
<http://www.sae.org>

**SAE WEB ADDRESS:**

**For more information on this standard, visit**  
<https://www.sae.org/standards/content/AMS4016N>

## 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 B660 Packaging/Packing of Aluminum and Magnesium Products

ASTM B666/B666M Identification Marking of Aluminum and Magnesium Products

## 2.3 ANSI Accredited Publications

Copies of these documents are available online at <https://webstore.ansi.org/>.

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products

ANSI H35.2M Dimensional Tolerances for Aluminum Mill Products (Metric)

## 2.4 Definitions

Terms used in AMS are defined in AS7766.

# 3. TECHNICAL REQUIREMENTS

## 3.1 Composition

Shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS2355.

**Table 1 - Composition**

| Element               | Min       | Max  |
|-----------------------|-----------|------|
| Silicon               | --        | 0.25 |
| Iron                  | --        | 0.40 |
| Copper                | --        | 0.10 |
| Manganese             | --        | 0.10 |
| Magnesium             | 2.2       | 2.8  |
| Chromium              | 0.15      | 0.35 |
| Zinc                  | --        | 0.10 |
| Other Elements, each  | --        | 0.05 |
| Other Elements, total | --        | 0.15 |
| Aluminum              | remainder |      |

## 3.2 Condition

Strain hardened, quarter-hard, and stabilized (see 8.2).

## 3.3 Properties

The product shall conform to the following requirements, determined in accordance with AMS2355 on the mill-produced size.

### 3.3.1 Tensile Properties

Shall be as specified in Table 2.

**Table 2A - Tensile properties, inch/pound units**

| Nominal Thickness<br>Inches | Tensile<br>Strength<br>ksi | Yield Strength<br>at 0.2% Offset<br>ksi, min | Elongation in<br>2 Inches or 4D<br>%, min |
|-----------------------------|----------------------------|----------------------------------------------|-------------------------------------------|
| 0.017 to 0.019, incl        | 31.0 to 38.0               | 23.0                                         | 4                                         |
| Over 0.019 to 0.050, incl   | 31.0 to 38.0               | 23.0                                         | 5                                         |
| Over 0.050 to 0.113, incl   | 31.0 to 38.0               | 23.0                                         | 7                                         |
| Over 0.113 to 0.249, incl   | 31.0 to 38.0               | 23.0                                         | 9                                         |
| Over 0.249 to 0.499, incl   | 31.0 to 38.0               | 23.0                                         | 11                                        |
| Over 0.499 to 2.000, incl   | 31.0 to 38.0               | 23.0                                         | 12                                        |

**Table 2B - Tensile properties, SI units**

| Nominal Thickness<br>Millimeters | Tensile<br>Strength<br>MPa | Yield Strength<br>at 0.2% Offset<br>MPa, min | Elongation in<br>50.8 mm or 4D<br>%, min |
|----------------------------------|----------------------------|----------------------------------------------|------------------------------------------|
| 0.43 to 0.48, incl               | 214 to 262                 | 159                                          | 4                                        |
| Over 0.48 to 1.27, incl          | 214 to 262                 | 159                                          | 5                                        |
| Over 1.27 to 2.87, incl          | 214 to 262                 | 159                                          | 7                                        |
| Over 2.87 to 6.32, incl          | 214 to 262                 | 159                                          | 9                                        |
| Over 6.32 to 12.67, incl         | 214 to 262                 | 159                                          | 11                                       |
| Over 12.67 to 50.80, incl        | 214 to 262                 | 159                                          | 12                                       |

### 3.3.2 Bending

The product shall withstand, without cracking, bending at room temperature through an angle of 180 degrees around a diameter equal to the bend factor shown in Table 3 times the nominal thickness of the product with axis of bend parallel to the direction of rolling.

**Table 3 - Bending parameters**

| Nominal Thickness<br>Inches | Nominal Thickness<br>Millimeters | Bend<br>Factor |
|-----------------------------|----------------------------------|----------------|
| Up to 0.019, incl           | Up to 0.48, incl                 | 0              |
| Over 0.019 to 0.050, incl   | Over 0.48 to 1.27, incl          | 1              |
| Over 0.050 to 0.113, incl   | Over 1.27 to 2.87, incl          | 2              |
| Over 0.113 to 0.249, incl   | Over 2.87 to 6.32, incl          | 3              |

3.3.3 Mechanical property requirements for plate outside the thickness range of 1.1 shall be as agreed upon by the purchaser and producer and reported per 4.4.1 (see 8.6).

### 3.4 Quality

The product, as received by the 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 ANSI H35.2 or ANSI H35.2M.

### 3.6 Exceptions

Any exceptions shall be authorized by the purchaser and reported as in 4.4.1

#### 4. QUALITY ASSURANCE PROVISIONS

##### 4.1 Responsibility for Inspection

The producer of the product shall supply all samples for the producer's tests and shall be responsible for the performance of all required tests. The 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

Composition (see 3.1), tensile properties (see 3.3.1), and tolerances (see 3.5) are acceptance tests and, except for composition, shall be performed on each lot.

###### 4.2.2 Periodic Tests

Bending (see 3.3.2) is a periodic test and shall be performed at a frequency selected by the producer unless frequency of testing is specified by the purchaser.

##### 4.3 Sampling and Testing

Shall be in accordance with AMS2355.

##### 4.4 Reports

The producer of the product shall furnish with each shipment a report stating that the product conforms to the composition and tolerances and showing the numerical results of tests on each inspection lot to determine conformance to the other acceptance test requirements. This report shall include the purchase order number, inspection lot number(s), AMS4016N, size, and quantity. The report shall also identify the producer, the product form, and the size of the mill product.

4.4.1 When material produced to this specification is beyond the sizes allowed in the scope or tables, or exceptions authorized by the purchaser are taken to the technical requirements listed in Section 3 (see 5.1.1), the report shall contain a statement "This material is certified as AMS4016N(EXC) because of the following exceptions:" and the specific exceptions shall be listed.

##### 4.5 Resampling and Retesting

Shall be in accordance with AMS2355.

#### 5. PREPARATION FOR DELIVERY

##### 5.1 Identification

Shall be in accordance with ASTM B666/B666M.

5.1.1 When technical exceptions are taken (see 4.4.1), the material shall be marked with AMS4016(EXC).

##### 5.2 Packaging

5.2.1 Flat sheet, plate, and circles 12 inches (305 mm) or over in nominal diameter shall be protected during shipment and storage by interleaving with paper sheets.

5.2.2 The product shall be prepared for shipment in accordance with ASTM B660 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.