



# AEROSPACE MATERIAL SPECIFICATION

**AMS4403™****REV. B**

Issued 2006-08  
Reaffirmed 2011-11  
Revised 2023-12

Superseding AMS4403A

Aluminum Alloy, Die Forgings  
7.5Zn - 1.6Cu - 1.5Mg - 0.12Zr (7085-T7452)  
Solution Heat Treated, Compression Stress-Relieved, and Overaged  
(Composition similar to UNS A97085)

## RATIONALE

AMS4403B results from a Five-Year Review and update of this specification with changes to update general agreement wording to prohibit unauthorized exceptions (see 3.3.2, 3.6, and 8.4), relocated Definitions (see 2.4), update Form (see 1.1), Applicable Documents (see Section 2), Acceptance Tests (see 4.2.1), and Ordering Information (see 8.5), and update language allowing the use of the immediate prior specification revision (see 8.3).

### 1. SCOPE

#### 1.1 Form

This specification covers an aluminum alloy in the form of die forgings 1.000 to 12.000 inches (25 to 305 mm), inclusive, in nominal thickness at the time of heat treatment and of forging stock of any size. (see 8.5)

#### 1.2 Application

These forgings have been used typically for machined structural parts subject to warpage during machining and requiring high strength and resistance to stress-corrosion cracking, but usage is not limited to such application.

### 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

AMS2808                      Identification, Forgings

AMS2772                      Heat Treatment of Aluminum Alloy Raw Materials

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**SAE WEB ADDRESS:**

Full document details: SAE AMS4403B

For more information on this standard, visit  
<https://www.sae.org/standards/content/AMS4403B>

Documents  
Document Sharing Hub

AS7766 Terms Used in Aerospace Metals Specifications

## 2.2 ANSI Accredited Publications

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

ANSI H35.1/H35.1M Standard Alloy and Temper Designation System for Aluminum

ANSI H35.2 Dimensional Tolerances for Aluminum Mill Products

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

## 2.3 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 B594 Ultrasonic Inspection of Aluminum-Alloy Wrought Products

ASTM B645 Linear-Elastic Plane-Strain Fracture Toughness Testing of Aluminum Alloys

ASTM B660 Packaging/Packing of Aluminum and Magnesium Products

ASTM E399 Linear-Elastic Plane-Strain Fracture Toughness of Metallic Materials

ASTM E1417/E1417M Liquid Penetrant Testing

ASTM G47 Determining Susceptibility to Stress-Corrosion cracking of 2XXX and 7XXX Aluminum Alloy Products

## 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               | --        | 0.06 |
| Iron                  | --        | 0.08 |
| Copper                | 1.3       | 2.0  |
| Manganese             | --        | 0.04 |
| Magnesium             | 1.2       | 1.8  |
| Chromium              | --        | 0.04 |
| Zinc                  | 7.0       | 8.0  |
| Titanium              | --        | 0.06 |
| Zirconium             | 0.08      | 0.15 |
| Other Elements, each  | --        | 0.05 |
| Other Elements, total | --        | 0.15 |
| Aluminum              | remainder |      |

### 3.2 Condition

#### 3.2.1 Die Forgings

Solution heat treated in accordance with AMS2772, stress-relieved by compressing to produce a 1 to 5% permanent set, and overaged to the T7452 temper (refer to ANSI H35.1/H35/1M). Solution heat-treat and artificial age practices are proprietary.

#### 3.2.2 Forging Stock

As ordered by the forging manufacturer and shall comply with the composition requirements of Table 1. Material shall be free of conditions that are detrimental to the finished product.

### 3.3 Properties

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

#### 3.3.1 Die Forgings

##### 3.3.1.1 Tensile Properties

Shall be as follows:

##### 3.3.1.1.1 With Grain Flow (Longitudinal)

Specimens, machined from forgings or from prolongations on such forgings, with axis of specimen in area of gage length varying not more than 15 degrees from parallel to the forging flow lines, shall have the properties shown in Table 2.

**Table 2A - Minimum tensile properties, inch/pound units**

| Nominal Thickness at<br>Time of Heat Treatment<br>Inches | Tensile<br>Strength<br>ksi | Yield Strength<br>at 0.2% Offset<br>ksi | Elongation<br>in 4D<br>% |
|----------------------------------------------------------|----------------------------|-----------------------------------------|--------------------------|
| 1.000 to 2.000, incl                                     | 72.0                       | 65.0                                    | 10                       |
| 2.001 to 4.000, incl                                     | 72.0                       | 65.0                                    | 9                        |
| 4.001 to 6.000, incl                                     | 72.0                       | 65.0                                    | 9                        |
| 6.001 to 8.000, incl                                     | 72.0                       | 65.0                                    | 8                        |
| 8.001 to 10.000, incl                                    | 72.0                       | 65.0                                    | 7                        |
| 10.001 to 12.000, incl                                   | 72.0                       | 65.0                                    | 7                        |

**Table 2B - Minimum tensile properties, SI units**

| Nominal Thickness at<br>Time of Heat Treatment<br>Millimeters | Tensile<br>Strength<br>MPa | Yield Strength<br>at 0.2% Offset<br>MPa | Elongation<br>in 4D<br>% |
|---------------------------------------------------------------|----------------------------|-----------------------------------------|--------------------------|
| 25 to 51, incl                                                | 496                        | 448                                     | 10                       |
| Over 51 to 102, incl                                          | 496                        | 448                                     | 9                        |
| Over 102 to 152, incl                                         | 496                        | 448                                     | 9                        |
| Over 152 to 203, incl                                         | 496                        | 448                                     | 8                        |
| Over 203 to 254, incl                                         | 496                        | 448                                     | 7                        |
| Over 254 to 305, incl                                         | 496                        | 448                                     | 7                        |

##### 3.3.1.1.2 Across Grain Flow (Long Transverse)

Specimens, machined from forgings or from prolongations on such forgings, with axis of specimen in area of gage length varying not more than 15 degrees from perpendicular to the forging flow lines, shall have properties shown in Table 3.