



# AEROSPACE MATERIAL SPECIFICATION

**AMS4321™****REV. B**

|            |         |
|------------|---------|
| Issued     | 1987-01 |
| Revised    | 1993-01 |
| Reaffirmed | 2010-05 |
| Stabilized | 2016-05 |

Superseding AMS4321A

Aluminum Alloy Forgings  
7.7Zn - 2.5Mg - 1.5Cu - 0.16Cr (7049-01)  
High Temperature Annealed

UNS A97049

## RATIONALE

AMS4321B stabilizes this document because it contains mature technology that is not expected to change and thus no further revisions are anticipated.

## STABILIZED NOTICE

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## 1. SCOPE:

### 1.1 Form:

This specification covers an aluminum alloy in the form of die forgings, hand forgings, and forging stock.

### 1.2 Application:

These products have been used typically for parts to be machined prior to final heat treatment requiring a combination of dimensional stability and accentuation of ultrasonic response, and to achieve maximum mechanical properties with high resistance to stress-corrosion cracking after solution and precipitation heat treatment to T73 temper, but usage is not limited to such applications.

## 2. APPLICABLE DOCUMENTS:

The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

### 2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

|          |                                                                                                                                                                 |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AMS 2201 | Tolerances, Aluminum and Aluminum Alloy Bar, Rod, Wire, and Forging Stock, Rolled or Cold Finished                                                              |
| MAM 2201 | Tolerances, Metric, Aluminum and Aluminum Alloy Bar, Rod, Wire, and Forging Stock, Rolled, Drawn, or Cold Finished                                              |
| AMS 2355 | Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings |

## 2.1 (Continued):

|          |                                                                                                                                                                                    |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MAM 2355 | Quality Assurance Sampling and Testing, Aluminum Alloys and Magnesium Alloys, Wrought Products, Except Forging Stock, and Rolled, Forged, or Flash Welded Rings, Metric (SI) Units |
| AMS 2770 | Heat Treatment, Wrought Aluminum Alloy Parts                                                                                                                                       |
| AMS 2808 | Identification, Forgings                                                                                                                                                           |

## 2.2 ASTM Publications:

Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

|            |                                                                                          |
|------------|------------------------------------------------------------------------------------------|
| ASTM B 594 | Ultrasonic Inspection of Aluminum-Alloy Wrought Products for Aerospace Applications      |
| ASTM B 660 | Packaging/Packing of Aluminum and Magnesium Products                                     |
| ASTM G 34  | Exfoliation Corrosion Susceptibility in 2XXX and 7XXX Series Aluminum Alloys (EXCO Test) |

## 2.3 U.S. Government Publications:

Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

|            |                                   |
|------------|-----------------------------------|
| MIL-H-6088 | Heat Treatment of Aluminum Alloys |
|------------|-----------------------------------|

## 3. TECHNICAL REQUIREMENTS:

### 3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined in accordance with AMS 2355 or MAM 2355.

TABLE 1 - Composition

| Element                 | min       | max  |
|-------------------------|-----------|------|
| Zinc                    | 7.2       | 8.2  |
| Magnesium               | 2.0       | 2.9  |
| Copper                  | 1.2       | 1.9  |
| Chromium                | 0.10      | 0.22 |
| Iron                    | --        | 0.35 |
| Silicon                 | --        | 0.25 |
| Manganese               | --        | 0.20 |
| Titanium                | --        | 0.10 |
| Other Impurities, each  | --        | 0.05 |
| Other Impurities, total | --        | 0.15 |
| Aluminum                | remainder |      |

### 3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Forgings: High temperature annealed (at solution heat treat temperature) in accordance with MIL-H-6088 except that forgings shall be ambient air cooled to room temperature.

3.2.2 Forging Stock: As ordered by the forging manufacturer.

### 3.3 Properties:

The product shall conform to the following requirements, determined in accordance with AMS 2355 or MAM 2355:

3.3.1 Forgings: In the temper condition supplied.

3.3.1.1 Conductivity within any one forging shall not vary more than 3% IACS [International Annealed Copper Standard (1.7 MS/m)].

3.3.2 Forgings: After being solution and precipitation heat treated in accordance with AMS 2770 to the T73 temper.

3.3.2.1 Tensile Properties: Shall be as follows:

3.3.2.1.1 Die Forgings: