



# AEROSPACE MATERIAL SPECIFICATION

AMS2370™

REV. M

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Superseding AMS2370L

Quality Assurance Sampling and Testing  
Carbon and Low-Alloy Steel Wrought Products and Forging Stock

## RATIONALE

AMS2370M results from a Five-Year Review and update of this specification that revises heat and lot requirements (3.3.1, 3.3.2), updates composition testing and reporting (3.3.3.1.2, 3.3.3.1.4), addresses alternate test methods (3.3.3.2), clarifies reporting requirements (3.3.3.1.4), updates reporting of non-conforming tests (3.3.5.1.1, 3.3.5.3, 3.3.5.4.4), updates fracture toughness sampling (3.3.5.3), and Table 2.

### 1. SCOPE

This specification covers quality assurance sampling and testing procedures used to determine conformance to applicable material specification requirements of wrought carbon and low-alloy steel products and of forging stock.

1.1 Attributes included in detail herein are: composition, tensile properties, macrostructure, and micro-inclusion rating. Other requirements are included in Table 2.

1.2 Quality assurance sampling and testing procedures for forgings are covered in AMS2372.

### 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).

AMS2372 Quality Assurance Sampling and Testing Carbon and Low-Alloy Steel Forgings

AS7766 Terms Used in Aerospace Metals Specifications

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## 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 E8/E8M Tension Testing of Metallic Materials

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

## 2.3 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

### 2.3.1 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-Q-22631 Quality Control of Metal Wrought Products Except Forgings Procured to Non-Governmental Specification

## 2.4 Definitions

Terms used in AMS are defined in AS7766.

## 3. TECHNICAL REQUIREMENTS

### 3.1 General

3.1.1 Omission from this specification of confirmatory tests of certain material properties or attributes controlled by the applicable material specification does not relieve the producer of responsibility for furnishing products that conform in all respects to the applicable material specification.

3.1.2 In event of conflict between requirements specified herein and requirements of a particular material specification, requirements of the material specification shall take precedence.

### 3.2 Responsibility for Tests

The producer of the product shall supply all samples for producer's tests and shall be responsible for the performance of all required tests. Results of such tests shall be reported to the purchaser as required by the applicable material specification.

### 3.3 Detailed Requirements

#### 3.3.1 Heat

A heat shall be all steel melted in a single furnace charge. For consumable electrode remelted steel, a heat shall be all consumable electrode remelted ingots processed from steel originally melted as a single furnace charge.

#### 3.3.2 Lot

A lot shall be a mill form of one shape, condition, and nominal cross-sectional dimensions from a single heat, processed in accordance with 3.3.2.1 or 3.3.2.2.

3.3.2.1 Sequentially heat treated during a 24-hour period in a continuous furnace with no interruption in operations and no change in furnace temperature, charge rate, or racking pattern.

- 3.3.2.1.1 The nominal cross-sectional dimension restriction may be disregarded when multiple sizes are heat treated in a single batch or during an 8-hour period in a continuous furnace operating at a constant speed. In such cases, tensile and macrostructure testing shall be performed on the size having the greatest equivalent round cross-section. The equivalent round cross-section shall be determined by multiplying wall thickness of tubing and thickness or diameter of solids by the shape factors shown in Table 1.

**Table 1 - Shape factors**

Product	Shape Factor
Tubing	2.0
Rounds	1.0
Hexagons	1.1
Squares	1.25
Flats	1.50

- 3.3.2.2 Sequentially heat treated during a 48-hour period in one or a series of batch-type furnace loads provided the loads are processed in the same furnace or same series of furnaces, and at the same power setting, set temperature, soak time, quench parameters, and racking pattern.

### 3.3.3 Sampling and Testing

Shall be in accordance with Table 2 and as follows:

#### 3.3.3.1 Composition

- 3.3.3.1.1 The reported composition of the steel subjected to a single melting operation shall be that of a sample taken immediately before or during the pouring of a heat. Analysis results of the sample shall be within the composition limits established by the material specification, excluding any consideration of product check analysis.

- 3.3.3.1.1.1 If the sample of 3.3.3.1.1 is lost, a new sample shall be taken from the semi-finished or finished product.

- 3.3.3.1.2 For remelted steels, analyses shall be obtained and reported from the remelted ingot or product thereof in accordance with the following sampling.

- 3.3.3.1.2.1 Analysis shall be performed on samples from the extreme ends of each ingot involved with the order. Results from both samples shall fall within the compositional limits established by the material specification, excluding any consideration of product check analysis. The samples shall be obtained after the discards are taken.

- 3.3.3.1.3 The heat analysis may be used for reporting the analyses of those elements governed only by a maximum in the material specification if the analysis is within the compositional limits and the element routinely decreases or remains constant during remelting.

- 3.3.3.1.3.1 Analyses of samples made prior to discard need not be reported.

- 3.3.3.1.4 Producer may test for any element not listed in the material specification's composition table and include analysis in the report. 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.

#### 3.3.3.2 Tensile Specimen Orientation, Location, and Size

Unless otherwise specified, tensile specimens conforming to ASTM E8/E8M shall be cut from the semi-finished or finished product in the direction indicated in the following paragraphs and shall be cut from the locations and to the sizes specified. The sample shall consist of one or more sections of the product selected to represent a specific location or locations with respect to the order of pouring of the selected ingot or ingots and with respect to the location within the ingot.