# AEROSPACE MATERIAL SPECIFICATION

| AMS2248™ | REV. H |
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Superseding AMS2248G

## Chemical Check Analysis Limits, Corrosion- and Heat-Resistant Steels and Alloys, Maraging and Other Highly Alloyed Steels, and Iron Alloys

RATIONALE

AMS2248H revises check analysis limits for silicon (Table 1) and is a Five-Year Review and update of this specification.

AMS2248H has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

1.1 This specification defines limits of variation for determining acceptability of composition of cast and wrought corrosion and heat-resistant steels and alloys, maraging and other highly alloyed steels, and iron alloy parts and materials acquired from a producer.

1.1.1 Check limits for elements or for ranges of elements not listed herein shall be as specified in the applicable material specification or as agreed upon by purchaser and producer.

1.2 Application

1.2.1 When specifically referenced in the material specification, the purchaser may apply check analysis limits to determine the acceptability of parts and materials at purchaser's final acceptance or verification testing operation.

1.2.2 Check analysis limits are not for producer's use at producer's acceptance testing.

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 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.

ASTM E1806 Sampling Steel and Iron for Determination of Chemical Composition





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https://www.sae.org/standards/content/AMS2248H/

## 3. TECHNICAL REQUIREMENTS

### 3.1 Analytical Procedures

Referee analysis shall be by any method acceptable to purchaser and producer.

### 3.2 Check Analysis Limits

Shall be as shown in Table 1.

***Table 1 - Check analysis variation limits***

| Element | Upper Limit or Max of Specified Range, % | Variation Under min | Variation Over max |
|---|---|---|---|
| Carbon | Up to 0.010, incl | 0.002 | 0.002 |
| | Over 0.010 to 0.030, incl | 0.005 | 0.005 |
| | Over 0.030 to 0.20, incl | 0.01 | 0.01 |
| | Over 0.20 to 0.60, incl | 0.02 | 0.02 |
| | Over 0.60 to 1.20, incl | 0.03 | 0.03 |
| Manganese | Up to 1.00, incl | 0.03 | 0.03 |
| | Over 1.00 to 3.00, incl | 0.04 | 0.04 |
| | Over 3.00 to 6.00, incl | 0.05 | 0.05 |
| | Over 6.00 to 10.00, incl | 0.06 | 0.06 |
| | Over 10.00 to 15.00, incl | 0.10 | 0.10 |
| | Over 15.00 to 20.00, incl | 0.15 | 0.15 |
| Silicon | Up to 1.00, incl | 0.05 | 0.05 |
| | Over 1.00 to 3.00, incl | 0.10 | 0.10 |
| | Over 3.00 to 7.00, incl | 0.15 | 0.15 |
| Phosphorus | Up to 0.040, incl | 0.005 | 0.005 |
| | Over 0.040 to 0.20, incl | 0.010 | 0.010 |
| Sulfur | Up to 0.040, incl | 0.005 | 0.005 |
| | Over 0.040 to 0.20, incl | 0.010 | 0.010 |
| | Over 0.20 to 0.50, incl | 0.020 | 0.020 |
| Chromium | Up to 0.90, incl | 0.03 | 0.03 |
| | Over 0.90 to 2.10, incl | 0.05 | 0.05 |
| | Over 2.10 to 10.00, incl | 0.10 | 0.10 |
| | Over 10.00 to 15.00, incl | 0.15 | 0.15 |
| | Over 15.00 to 20.00, incl | 0.20 | 0.20 |
| | Over 20.00 to 30.00, incl | 0.25 | 0.25 |
| Nickel | Up to 1.00, incl | 0.03 | 0.03 |
| | Over 1.00 to 5.00, incl | 0.07 | 0.07 |
| | Over 5.00 to 10.00, incl | 0.10 | 0.10 |
| | Over 10.00 to 20.00, incl | 0.15 | 0.15 |
| | Over 20.00 to 30.00, incl | 0.20 | 0.20 |
| | Over 30.00 to 40.00, incl | 0.25 | 0.25 |
| | Over 40.00 | 0.30 | 0.30 |

***Table 1 - Check analysis variation limits (continued)***

| Element | Upper Limit or Max of Specified Range, % | Variation Under min | Variation Over max |
|---|---|---|---|
| Cobalt | Over 0.05 to 0.50, incl | 0.01 | 0.01 |
| | Over 0.50 to 2.00, incl | 0.02 | 0.02 |
| | Over 2.00 to 5.00, incl | 0.05 | 0.05 |
| | Over 5.00 to 10.00, incl | 0.10 | 0.10 |
| | Over 10.00 to 15.00, incl | 0.15 | 0.15 |
| | Over 15.00 to 22.00, incl | 0.20 | 0.20 |
| | Over 22.00 to 30.00, incl | 0.25 | 0.25 |
| Molybdenum | Over 0.20 to 0.60, incl | 0.03 | 0.03 |
| | Over 0.60 to 2.00, incl | 0.05 | 0.05 |
| | Over 2.00 to 7.00, incl | 0.10 | 0.10 |
| | Over 7.00 to 15.00, incl | 0.15 | 0.15 |
| | Over 15.00 to 30.00, incl | 0.20 | 0.20 |
| Tungsten | Up to 1.00, incl | 0.03 | 0.03 |
| | Over 1.00 to 2.00, incl | 0.05 | 0.05 |
| | Over 2.00 to 5.00, incl | 0.07 | 0.07 |
| | Over 5.00 to 10.00, incl | 0.10 | 0.10 |
| | Over 10.00 to 20.00, incl | 0.15 | 0.15 |
| Columbium (Niobium) | Up to 1.50, incl | 0.05 | 0.05 |
| | Over 1.50 to 5.00, incl | 0.10 | 0.10 |
| | Over 5.00 | 0.15 | 0.15 |
| Titanium | Up to 1.00, incl | 0.05 | 0.05 |
| | Over 1.00 to 3.00, incl | 0.07 | 0.07 |
| | Over 3.00 | 0.10 | 0.10 |
| Tantalum | Up to 0.10, incl | 0.02 | 0.02 |
| Aluminum | Up to 0.15, incl | 0.005 | 0.01 |
| | Over 0.15 to 0.50, incl | 0.05 | 0.05 |
| | Over 0.50 to 2.00, incl | 0.10 | 0.10 |
| | Over 2.00 to 5.00, incl | 0.20 | 0.20 |
| | Over 5.00 to 10.00, incl | 0.35 | 0.35 |
| Nitrogen | Up to 0.02, incl | 0.005 | 0.005 |
| | Over 0.02 to 0.19, incl | 0.01 | 0.01 |
| | Over 0.19 to 0.25, incl | 0.02 | 0.02 |
| | Over 0.25 to 0.35, incl | 0.03 | 0.03 |
| | Over 0.35 to 0.45, incl | 0.04 | 0.04 |
| Boron | 0.001 to 0.010, incl | 0.0004 | 0.001 |
| | Over 0.01 to 0.12, incl | 0.005 | 0.01 |
| Selenium | All | 0.03 | 0.03 |
| Iron | Up to 1.00, incl | 0.03 | 0.03 |
| | Over 1.00 to 2.50, incl | 0.05 | 0.05 |
| | Over 2.50 to 5.00, incl | 0.07 | 0.07 |
| | Over 5.00 to 10.00, incl | 0.10 | 0.10 |
| | Over 10.00 to 15.00, incl | 0.15 | 0.15 |
| | Over 15.00 to 30.00, incl | 0.25 | 0.25 |

***Table 1 - Check analysis variation limits (continued)***

| Element | Upper Limit or Max of Specified Range, % | Variation Under min | Variation Over max |
|---|---|---|---|
| Copper | Up to 0.50, incl | 0.03 | 0.03 |
| | Over 0.50 to 1.00, incl | 0.05 | 0.05 |
| | Over 1.00 to 3.00, incl | 0.10 | 0.10 |
| | Over 3.00 to 5.00, incl | 0.15 | 0.15 |
| | Over 5.00 to 10.00, incl | 0.20 | 0.20 |
| Vanadium | Up to 0.50, incl | 0.03 | 0.03 |
| | Over 0.50 to 1.50, incl | 0.05 | 0.05 |
| Zirconium | Up to 0.10, incl | 0.000 | 0.02 |
| | Over 0.10 | 0.05 | 0.05 |
| Tin | Up to 0.05, incl | 0.005 | 0.01 |
| Oxygen | Up to 0.010, incl | -- | 0.005 |

## 4. QUALITY ASSURANCE PROVISIONS

### 4.1 Sampling

For the purpose of determining conformance to the material specification composition requirement, each heat or lot in a shipment shall be considered separately. All samples shall be taken from product in the condition in which it is received except that all protective surface treatments shall be removed before sampling finished parts. Sample material shall be free from scale, grease, dirt, and other foreign materials, and shall be taken in a manner to prevent alteration of the chemical composition of the sample. If finished parts are too hard for machining, they may be tempered in a protective atmosphere prior to sampling. Sampling shall be in accordance with ASTM E1806, insofar as practical.

## 5. PREPARATION FOR DELIVERY

Not applicable.

## 6. ACKNOWLEDGMENT

Not applicable.

## 7. REJECTIONS

Not applicable.

## 8. NOTES

### 8.1 Revision Indicator

A change bar (l) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this document. An (R) symbol to the left of the document title indicates a complete revision of the document, including technical revisions. Change bars and (R) are not used in original publications, nor in documents that contain editorial changes only.

8.2 In the analysis of finished parts, check limits do not apply to elements whose percentage can be varied by fabricating techniques employed by purchaser (for example, carbon in steel) unless sample is taken in a manner which excludes such changes.