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INTERNATIONAL
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AEROSPACE MATERIAL SPECIFICATION

SAE AMS 2248E

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Superseding AMS 2248D

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

1. SCOPE:

1.1 This specification defines limits of variation for determining acceptability of chemical 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 following publications form a part of this specification to the extent specified herein. The applicable issue of referenced publications shall be the issue in effect on the date of the purchase order.

2.1 ASTM Publications:

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

ASTM E 59 Sampling Steel and Iron for Determination of Chemical Composition

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790
SAE WEB ADDRESS: http://www.sae.org

3. TECHNICAL REQUIREMENTS:

3.1 Analytical Procedures:

Methods of analysis shall be acceptable to purchaser.

3.2 Definitions:

3.2.1 Check (Product or Verification) Analysis: An analysis made by purchaser after the steel or alloy has been worked into semi-finished or finished forms or fabricated into parts, and is either for the purpose of verifying the composition of a heat or lot or to determine variations in the composition within a heat. Acceptance or rejection of a heat or lot of product or batch of parts may be made by a purchaser on the basis of this check analysis.

3.2.2 Variation Limit, Under Minimum or Over Maximum: Given in 3.3 is the amount an individual determination for a specified element may vary under or over the specified composition limit. In no case shall the several determinations of any element in a heat, using the same analytical procedure, vary both above and below the specified range. These variations apply only to product analyses performed by purchaser.

3.3 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
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 (Contined)

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	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