



AEROSPACE MATERIAL SPECIFICATION

AMS2280™

REV. E

Issued 1975-06
Reaffirmed 2000-09
Revised 2025-04

Superseding AMS2280D

Trace Element Control
Nickel Alloy Castings and Powder

RATIONALE

AMS2280E is the result of a Five-Year Review and update of the specification. The revision expands the Scope (see 1.1.) and Title to include powder when specified and clarifies reporting (see 4.1), CEO approval when alternate methods are used (see 3.2 and deleting 4.2 from Revision D), and the trace elements note (see 8.3).

1. SCOPE

1.1 Purpose

This specification establishes testing methods and maximum permissible limits for trace elements in nickel alloy castings and powder materials. It shall apply only when required by the material specification.

1.2 Application

These products have been used typically for limited use to achieve premium-quality material for highly stressed rotating parts, such as turbine blades, where control of trace elements is required to maintain elevated-temperature tensile, stress-rupture, creep, and low-cycle fatigue properties, but usage is not limited to such applications.

1.2.1 It is intended that this specification be invoked only for selected applications by stipulation on drawings, purchase orders, or other documentation supplementing the material specification or in material specifications.

1.3 Classification

This specification covers two classes of trace element control, defined by the elements to be controlled as follows:

Class 1 - Lead, Bismuth, Selenium, Tellurium, and Thallium

Class 2 - Lead, Bismuth, Selenium, Tellurium, Thallium, and Others (see 3.1.2)

Class 3 - Canceled, use Class 1

Class 4 - Canceled, use Class 2

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- 1.3.1 When trace element control is required, the elements to be controlled shall be indicated by this specification number and a suffix number indicating the class. For example, AMS2280-1 indicates that control of lead, bismuth, selenium, tellurium, and thallium is required. If no class is indicated, Class 1 shall apply.

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.

AS7766 Terms Used in Aerospace Metals Specifications

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.

ASTM A751 Chemical Analysis of Steel Products

ASTM E50 Apparatus, Reagents, and Safety Considerations for Chemical Analysis of Metals, Ores, and Related Materials

ASTM E135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials

ASTM E354 Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

ASTM E1184 Determination of Elements by Graphite Furnace Atomic Absorption Spectrometry

ASTM E1361 Correction of Interelement Effects in X-Ray Spectrometric Analysis

ASTM E1473 Chemical Analysis of Nickel, Cobalt, and High-Temperature Alloys

ASTM E1621 Elemental Analysis by Wavelength Dispersive X-Ray Fluorescence Spectrometry

ASTM E1770 Optimization of Electrothermal Atomic Absorption Spectrometric Equipment

ASTM E1834 Analysis of Nickel Alloys by Graphite Furnace Atomic Absorption Spectrometry

ASTM E1835 Analysis of Nickel Alloys by Flame Atomic Absorption Spectrometry

ASTM E2594 Analysis of Nickel Alloys by Inductively Coupled Plasma Atomic Emission Spectrometry (Performance-Based Method)

ASTM E2823 Analysis of Nickel Alloys by Inductively Coupled Plasma Mass Spectrometry (Performance-Based)