



Designation: E 34 – 94 (Reapproved 1998)

Standard Test Methods for Chemical Analysis of Aluminum and Aluminum-Base Alloys¹

This standard is issued under the fixed designation E 34; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 These test methods cover the chemical analysis of aluminum and aluminum-base alloys having compositions within the following limits:

Beryllium, ppm	0.3 to 100
Bismuth, %	0.02 to 1.0
Boron, %	0.005 to 0.060
Cadmium, %	0.001 to 0.50
Chromium, %	0.01 to 1.0
Copper, %	0.01 to 20.0
Gallium, %	0.001 to 0.05
Iron, %	0.01 to 3.0
Lead, %	0.01 to 1.0
Lithium, %	0.001 to 4.0
Magnesium, %	0.002 to 12.0
Manganese, %	0.005 to 2.0
Nickel, %	0.01 to 4.0
Silicon, %	0.05 to 20.0
Tin, %	0.03 to 1.0
Titanium, %	0.002 to 0.30
Vanadium, %	0.002 to 0.16
Zinc, %	0.003 to 12.0
Zirconium, %	0.01 to 0.30

1.2 The analytical procedures appear in the following order:

	Sections
Beryllium by Argon Plasma Optical Emission Spectroscopy	283 to 292
Beryllium by the Morin (Fluorometric) Test Method	8-19
Bismuth by the Thiourea (Photometric) Method	1a
Bismuth and Lead by the Atomic Absorption Test Method	188 to 198
Boron by the Carmine (Photometric) Test Method	30 to 38
Cadmium by the Atomic Absorption Test Method	167 to 177
Chromium:	
Diphenylcarbazide (Photometric) Test Method	39 to 47
Persulfate Oxidation (Titrimetric) Test Method	1b
Chromium by the Atomic Absorption Test Method	199 to 209
Copper and Lead by the Electrolytic (Gravimetric) Test Method	1c
Copper and Zinc by the Atomic Absorption Test Method	210 to 220
Copper by the Electrolytic (Gravimetric) Test Method	303 to 311

Copper by the Neocuproine (Photometric) Test Method	Sections 1a
Gallium by the Ion Exchange-Atomic Absorption Test Method	312 to 323
Iron by the 1,10-Phenanthroline (Photometric) Method	73 to 81
Iron and Manganese by the Atomic Absorption Method	221 to 231
Lithium by the Atomic Absorption Test Method	324 to 334
Magnesium:	
Pyrophosphate (Gravimetric) Method	1b
Ethylenediamine Tetraacetate (Titrimetric) Test Method	88 to 93
Magnesium by the Atomic Absorption Test Method	232 to 242
Manganese by the Periodate (Photometric) Test Method	293 to 302
Nickel:	
Dimethylglyoxime (Photometric) Test Method	1a
Dimethylglyoxime (Gravimetric) Test Method	1b
Nickel by the Atomic Absorption Test Method	243 to 253
Silicon:	
Molybdisilicic Acid (Photometric) Test Method	118 to 127
Sodium Hydroxide-Perchloric Acid (Gravimetric) Method	128 to 133
Tin by the Iodate (Titrimetric) Test Method	134 to 140
Titanium by the Chromotropic Acid (Photometric) Test Method	141 to 150
Titanium by the Diantipyrilmethane Photometric Test Method	254 to 263
Vanadium by an Extraction-Photometric Test Method using <i>N</i> -Benzoyl- <i>N</i> -Phenylhydroxylamine	264 to 273
Zinc:	
Ammonium Mercuric Thiocyanate or the Zinc Oxide (Gravimetric) Test Method	1b
Ethylenediamine Tetraacetate (Titrimetric) Test Method	1d
Ion Exchange-EDTA Titrimetric Test Method	274 to 282
Zirconium by the Arsenazo III (Photometric) Method	178 to 187

1.3 The values stated in SI units are to be regarded as the standard.

1.4 *This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Specific hazard statements are given throughout these test methods.*

2. Referenced Documents

2.1 ASTM Standards:

E 29 Practice for Using Significant Digits in Test Data to

¹ These test methods are under the jurisdiction of ASTM Committee E-1 on Analytical Chemistry for Metals, Ores, and Related Materials and are the direct responsibility of Subcommittee E01.04 on Aluminum and Magnesium.

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^{1a} Discontinued as of Feb. 25, 1983.

^{1b} Discontinued as of May 29, 1981.

^{1c} Discontinued as of Oct. 25, 1985.

^{1d} Discontinued as of March 25, 1983.