



Designation: E1086 – 22

Standard Test Method for Analysis of Austenitic Stainless Steel by Spark Atomic Emission Spectrometry¹

This standard is issued under the fixed designation E1086; 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.

1. Scope

1.1 This test method² covers the analysis of austenitic stainless steel by spark atomic emission spectrometry for the following elements in the ranges shown

Element	Composition Range, %
Chromium	17.0 to 23.0
Nickel	7.5 to 13.0
Molybdenum	0.01 to 3.0
Manganese	0.01 to 2.0
Silicon	0.01 to 0.90
Copper	0.01 to 0.30
Carbon	0.005 to 0.25
Phosphorus	0.003 to 0.15
Sulfur	0.003 to 0.065

1.2 This test method is designed for the analysis of chill-cast disks or inspection testing of stainless steel samples that have a flat surface of at least 13 mm (0.5 in.) in diameter. The samples must be sufficiently massive to prevent overheating during the discharge and of a similar metallurgical condition and composition as the reference materials.

1.3 One or more of the reference materials must closely approximate the composition of the specimen. The technique of analyzing reference materials with unknowns and performing the indicated mathematical corrections (typically referred to as type standardization) may also be used to correct for interference effects and to compensate for errors resulting from instrument drift. A variety of such systems are commonly used. Any of these that will achieve analytical accuracy equivalent to that reported for this test method are acceptable.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

¹ This test method is under the jurisdiction of ASTM Committee E01 on Analytical Chemistry for Metals, Ores, and Related Materials and is the direct responsibility of Subcommittee E01.01 on Iron, Steel, and Ferroalloys.

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² Supporting data have been filed at ASTM International Headquarters and may be obtained by requesting Research Report RR:E02-1023. Contact ASTM Customer Service at service@astm.org.

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:³

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

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

E305 Practice for Establishing and Controlling Spark Atomic Emission Spectrochemical Analytical Curves

E406 Practice for Using Controlled Atmospheres in Atomic Emission Spectrometry

E1060 Practice for Interlaboratory Testing of Spectrochemical Methods of Analysis (Withdrawn 1997)⁴

E1329 Practice for Verification and Use of Control Charts in Spectrochemical Analysis (Withdrawn 2019)⁴

E1806 Practice for Sampling Steel and Iron for Determination of Chemical Composition

2.2 Other ASTM Documents:

MNL 7 Manual on Presentation of Data and Control Chart Analysis⁵

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology E135.

4. Summary of Test Method

4.1 A controlled discharge is produced between the flat surface of the specimen and the counter electrode. The radiant

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ The last approved version of this historical standard is referenced on www.astm.org.

⁵ ASTM Manual Series, ASTM International, 9th edition, 2018.