



Standard Specification for Additive Manufacturing Nickel Alloy (UNS N06625) with Powder Bed Fusion¹

This standard is issued under the fixed designation F3056; 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.

^{ε1} NOTE—In Tables 1 and 2, Columbium was changed to Niobium editorially in November 2014.

1. Scope

1.1 This specification covers additively manufactured UNS N06625 components using full-melt powder bed fusion such as electron beam melting and laser melting. The components produced by these processes are used typically in applications that require mechanical properties similar to machined forgings and wrought products. Components manufactured to this specification are often, but not necessarily, post processed via machining, grinding, electrical discharge machining (EDM), polishing, and so forth to achieve desired surface finish and critical dimensions.

1.2 This specification is intended for the use of purchasers or producers, or both, of additively manufactured UNS N06625 components for defining the requirements and ensuring component properties.

1.3 Users are advised to use this specification as a basis for obtaining components that will meet the minimum acceptance requirements established and revised by consensus of the members of the committee.

1.4 User requirements considered more stringent may be met by the addition to the purchase order of one or more supplementary requirements, which may include, but are not limited to, those listed in Supplementary Requirements S1–S16.

1.5 *Units*—The values stated in SI units are to be regarded as the standard. No other units of measurement are included in this standard.

1.6 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

- B213** Test Methods for Flow Rate of Metal Powders Using the Hall Flowmeter Funnel
- B214** Test Method for Sieve Analysis of Metal Powders
- B243** Terminology of Powder Metallurgy
- B311** Test Method for Density of Powder Metallurgy (PM) Materials Containing Less Than Two Percent Porosity
- B769** Test Method for Shear Testing of Aluminum Alloys
- B880** Specification for General Requirements for Chemical Check Analysis Limits for Nickel, Nickel Alloys and Cobalt Alloys
- B964** Test Methods for Flow Rate of Metal Powders Using the Carney Funnel
- D3951** Practice for Commercial Packaging
- E3** Guide for Preparation of Metallographic Specimens
- E8/E8M** Test Methods for Tension Testing of Metallic Materials
- E9** Test Methods of Compression Testing of Metallic Materials at Room Temperature
- E10** Test Method for Brinell Hardness of Metallic Materials
- E11** Specification for Woven Wire Test Sieve Cloth and Test Sieves
- E18** Test Methods for Rockwell Hardness of Metallic Materials
- E21** Test Methods for Elevated Temperature Tension Tests of Metallic Materials
- E23** Test Methods for Notched Bar Impact Testing of Metallic Materials
- E29** Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
- E238** Test Method for Pin-Type Bearing Test of Metallic Materials
- E354** Test Methods for Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys

¹ This test method is under the jurisdiction of ASTM Committee F42 on Additive Manufacturing Technologies and is the direct responsibility of Subcommittee F42.05 on Materials and Processes.

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² 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.