



Standard Specification for Alumina Ceramics for Electrical and Electronic Applications¹

This standard is issued under the fixed designation D2442; 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 specification covers the requirements for fabricated alumina parts suitable for electronic and electrical applications and ceramic-to-metal seals as used in electron devices. This standard specifies limits and methods of test for electrical, mechanical, thermal, and general properties of the bodies used for these fabricated parts, regardless of part geometry.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:²

- C20** Test Methods for Apparent Porosity, Water Absorption, Apparent Specific Gravity, and Bulk Density of Burned Refractory Brick and Shapes by Boiling Water
- C108** Symbols for Heat Transmission
- C242** Terminology of Ceramic Whitewares and Related Products
- C408** Test Method for Thermal Conductivity of Whiteware Ceramics
- C573** Methods for Chemical Analysis of Fireclay and High-Alumina Refractories (Withdrawn 1995)³
- C623** Test Method for Young's Modulus, Shear Modulus, and Poisson's Ratio for Glass and Glass-Ceramics by Resonance
- D116** Test Methods for Vitrified Ceramic Materials for Electrical Applications
- D149** Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies

- D150** Test Methods for AC Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulation
- D257** Test Methods for DC Resistance or Conductance of Insulating Materials
- D618** Practice for Conditioning Plastics for Testing
- D1711** Terminology Relating to Electrical Insulation
- D1829** Test Method for Electrical Resistance of Ceramic Materials at Elevated Temperatures (Withdrawn 2001)³
- D2149** Test Method for Permittivity (Dielectric Constant) And Dissipation Factor Of Solid Dielectrics At Frequencies To 10 MHz And Temperatures To 500°C
- D2520** Test Methods for Complex Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials at Microwave Frequencies and Temperatures to 1650°C
- E6** Terminology Relating to Methods of Mechanical Testing
- E12** Terminology Relating to Density and Specific Gravity of Solids, Liquids, and Gases (Withdrawn 1996)³
- E122** Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process
- E165** Practice for Liquid Penetrant Examination for General Industry
- E228** Test Method for Linear Thermal Expansion of Solid Materials With a Push-Rod Dilatometer
- F19** Test Method for Tension and Vacuum Testing Metalized Ceramic Seals
- F77** Test Method for Apparent Density of Ceramics for Electron Device and Semiconductor Application (Withdrawn 2001)³
- F109** Terminology Relating to Surface Imperfections on Ceramics
- F134** Test Methods for Determining Hermeticity of Electron Devices with a Helium Mass Spectrometer Leak Detector (Withdrawn 1996)³
- F417** Test Method for Flexural Strength (Modulus of Rupture) of Electronic-Grade Ceramics (Withdrawn 2001)³

2.2 Other Standards:

- MIL-STD-105** Sampling Procedures and Tables for Inspection by Attributes⁴

¹ This specification is under the jurisdiction of Committee C21 on Electrical and Electronic Insulating Materials.

Current edition approved Nov. 1, 2016. Published November 2016. Originally approved in 1965. Last previous edition approved in 2012 as D2442 – 75 (2012). DOI: 10.1520/D2442-75R16.

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.

³ The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.