



AEROSPACE MATERIAL SPECIFICATION

AMS3880™

REV. D

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Superseding AMS3880C

Crystallized Glass Ceramic

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

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Documents

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1. SCOPE:

- 1.1 Form: This specification covers one type of crystallized glass ceramic in the form of cast and pressed shapes.
- 1.2 Application: Primarily for high-temperature, high-frequency applications in the electronics field, such as radomes, microwave antennas, and antenna covers.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

- 2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods

- 2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM C329 - Specific Gravity of Fired Ceramic Whiteware Materials
ASTM C674 - Flexural Properties of Ceramic Whiteware Materials
ASTM D116 - Testing Vitrified Ceramic Materials for Electrical Applications
ASTM D150 - A-C Loss Characteristics and Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials
ASTM D2520 - Complex Permittivity (Dielectric Constant) of Solid Electrical Insulating Materials at Microwave Frequencies and Temperatures to 1650 C
ASTM E228 - Linear Thermal Expansion of Rigid Solids with a Vitreous Silica Dilatometer
ASTM E384 - Microhardness of Materials

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-749 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Material and Fabrication: The product shall be cast or pressed shapes of a semicrystalline material consisting essentially of fine crystals of cordierite dispersed in a minor proportion of a glassy phase.

3.2 Condition: The product shall be homogeneous in appearance from point to point and from piece to piece. Surfaces shall be smooth and free from microcracks.

3.3 Properties: The product shall conform to the following requirements; tests shall be performed on the product supplied and in accordance with specified ASTM methods:

3.3.1	Modulus of Rupture, (See 4.5.1), min		ASTM C674
	Individual Specimens	18,000 psi (125 MPa)	
	Average of 5 Specimens	20,000 psi (140 MPa)	
3.3.2	Modulus of Elasticity	(15.6 - 19.0) x 10 ⁶ psi (108 - 131 GPa)	ASTM C674
3.3.3	Hardness	663 - 733 HK100 588 - 650 HK500	ASTM E384
3.3.4	Specific Gravity at 25°/25°C (77°/77°F)	2.59 - 2.63	ASTM C329
3.3.5	Mean Linear Coefficient of Thermal Expansion 25° - 300°C (77° - 572°F)	(56 - 59) x 10 ⁻⁷ mm/mm per C deg (31 - 33) x 10 ⁻⁷ in./in. per F deg)	ASTM E228
3.3.6	Pore Volume, max	0.00	ASTM D116
3.3.7	Dielectric Constant (9.375 GHz) At 25°C (77°F) At 500°C (932°F)	5.4 - 5.6 5.3 - 5.7	ASTM D2520
3.3.8	Loss Tangent (9.375 GHz) At 25°C (77°F) At 500°C (932°F)	0.0005 0.002	ASTM D150