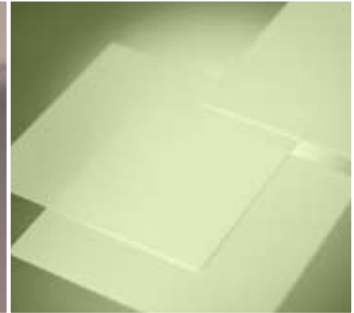


COORSTEK
Amazing Solutions.®



DURASTRATE™

**THICK-FILM
SUBSTRATES**

NEW! DURASTRATE™ THICK-FILM SUBSTRATES FOR SUPERIOR PERFORMANCE AND DURABILITY

Fine-Grained DuraStrate Material Offers Several Advantages Over Traditional Materials

- Over 20% increase in strength
- Advanced thick-film performance
- Consistent thicknesses
- Excellent aged adhesion

This enhanced durability should translate to:

- Improved process yields
- Superior reliability

Setting the Standard – for Over Four Decades!

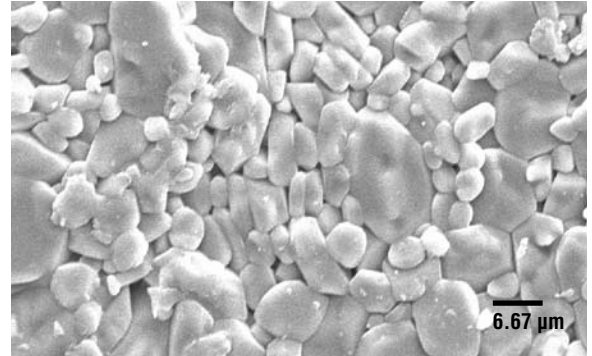
CoorsTek developed the standards for thick-film substrates and continues to lead the market with innovative materials, manufacturing, and secondary processes. Customers rely on us for cost-effective solutions delivered on time.

In-House Advanced Secondary Processes

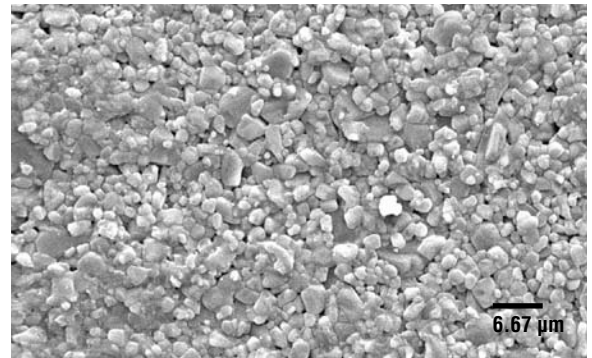
From laser machining, lapping, polishing, and specialized cleaning to screen-printed and high-resolution photo-etched metallization, CoorsTek provides all the advanced services you need to shorten lead times and improve component quality and performance.

Need More Information?

Call us at **+1.970.244.1165** or e-mail thickfilm@coorstek.com for immediate assistance from ceramic substrates experts!



Standard 96% Alumina Substrate Material



DuraStrate™ Fine-Grained Substrate Material

CoorsTek exclusive OpX manufacturing and quality system

Quick-Turn Prototyping and Manufacturing

Material Property	Units	Test Methods	96% Alumina	DuraStrate™ 96% Alumina
Color	–	–	White	White
Nominal Density	g/cm ³ (lb/ft ³)	ASTM-C373	3.75 min. (0.135)	3.81 (0.137)
Hardness	–	ASTM-E18, R45N	82	84.5
Grain Size, average	Micrometers	Intercept Method	4.5	1.5
Water Absorption	%	ASTM-C373	nil	nil
Gas Permeability	–	–	nil	nil
Flexural Strength	Kpsi (MPa)	ASTM-F394	58 (400)	70 (482)
CTE – 25° - 1000° C	1X 10 ⁻⁶ /°C (1X 10 ⁻⁶ /°F)	ASTM-C372	8.3 (4.6)	8.4 (4.7)
Dielectric Strength (60 cycles AC avg. RMS), 0.040"	AC Volts/mil (Kv/mm)	ASTM-D149	460 (18.1)	470 (18.49)
Dielectric Constant, 1 MHz	@25° C	ASTM-D150	9.55	9.55
Loss Tangent, 1 MHz	@25° C	ASTM-D150	0.0004	0.0004
Volume Resistivity, 25° C	ohm-cm or ohm-cm ² /cm	ASTM-D257	> 10 ¹⁴	>4 x 10 ¹⁵

*Data Not available

Note: Engineering data is representative. Property values vary somewhat with method of manufacture, size, and shape of part. Any suggested applications are not made as a representation or warranty that the material will ultimately be suitable for such applications. The customer is ultimately responsible for all design and material suitability decisions. Data contained herein is not to be construed as absolute and does not constitute a representation or warranty for which CoorsTek assumes legal responsibility. Any warranty or representation for which CoorsTek is responsible shall be subject to a separately negotiated agreement. CoorsTek and Amazing Solutions are registered trademarks of CoorsTek, Inc. DuraStrate, and OpX are trademarks of CoorsTek, Inc.

European Union (EU) Directive on Restriction of Hazardous Substances (RoHS): The EU Directive on RoHS specifies that an electronic product or component may not contain a listed substance except as specifically provided in the directive. CoorsTek ceramic substrates meet the requirements of the Directive.