

# Technical Data

## Yttria Ceramic Coating

### Physical Properties

<u>Property</u>	<u>Typical Result</u>	<u>Measurement Method</u>
Typical Thickness	100—150um	Micrometer Analysis
Etch Rate vs. Quartz	10-1000x slower	Flourine Plasma Etch
Typical Purity	>99.9% Y2O3	Glow Discharge Mass Spectrometry
Porosity	<5%	Image Analysis of Polished Sections
Adhesion Strength to Al2O3	>15 MPa/35-49	ASTM C633
Adhesion Strength to Al (anodized Al)	45-55 MPa	ASTM C633
Particulates >0.3um	<10E5/cm^2	Coated coupon treated w/ ultrasonics; Extraction solution analyzed w/particle counter
Leachable Impurities, transition elements	<5000 x 10E10/cm^2	ICP-MS analysis of leachate
Acid Etch Resistance	350 minutes	10% conc. HCl is placed on coated Al coupon. Time for coating resistance to hit <15 ohms/cm^2 is measured.

### Chemical Purity

	<u>Bulk Composition*</u> ppm	<u>Surface Inorganics</u> (x10 <sup>10</sup> atoms/cm <sup>2</sup> )
Na	<10	3000
Al	<8	10000
Ca	2.7	1000
Mg	1.0	300
Zn	<1	300
Cr	<1	<100
Fe	<2	<100
Ni	<1	<100
Cu	<1	<100
Ti	<1	<100
V	<1	n/a
Mn	<1	n/a
Co	<1	n/a

**Bulk Composition Purity Test:** Glow Discharge Mass Spectroscopy (GDMS) performed on Sprayed coating layer.

**Surface Inorganics Test:** Double-sided yttria coated coupon is leached and the solution is analyzed by ICP-MS.

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