

Advanced Metallized Ceramics for Electronic Applications

- **Excellent Metallized-Seal Strength and Hermeticity**
- **Proven in Worldwide Applications**
- **Consistent Performance with all Common Braze Alloys**
- **High Volume Production Capacity and Large Part-Size Capability**

CoorsTek supplies custom refractory-metallized aluminum oxide ceramics for use in power grid tubes, vacuum interrupters, and similar applications where metal to ceramic joints of exceptional strength and hermeticity are required.

CoorsTek specializes in molybdenum thick film metallization on AD-94 and FG-995 ceramic. In addition, we metallize AD-995, AD-999, and sapphire in specialized applications. We utilize either low-stress nickel sulfamate or electroless nickel boron as our preferred deposition over the refractory metallization. This results in a system that is easily brazed with copper-silver, pure copper, and all alloys in between. Gold, copper, and tin plating are available upon request.

CoorsTek also offers hydrogen brazing of sub-assemblies. We can process small components as well as large cylinders up to 14" in diameter and 20" long.

80 Years of Ceramic Design and Manufacturing Experience

CoorsTek is the largest U.S. manufacturer of advanced ceramics. Our engineering staff will help you choose ceramics and metals with optimum properties for your application and work with you to design cost-effective components. CoorsTek has more than a million square feet of manufacturing space, including complete in-house prototyping service. Our forming and finishing facilities include some of the most versatile and precise equipment available.

Committed to Quality

CoorsTek is an ISO 9001 registered facility. We provide ship-to-stock product to many Fortune 500 companies. CoorsTek has complete online Statistical Process Control and component traceability.



COORSTEK
Amazing Solutions.

For expert engineering and design assistance, call CoorsTek at 303-278-4000.

CoorsTek Standard Metallizing System

Molybdenum Manganese Thick Film:	500-1500 μ " (13-38 μ m)
Nickel Plating:	100-400 μ " (2.5-10 μ m)
Tensile Strength, Kovar Cup Method:	>20,000 psi, avg. (138N/mm ²)
Helium Leak Rate:	<10 ⁻⁹ cc/sec

Material Properties

Properties	Units	Test	AD-94	FG-995	AD-995
Dielectric Strength	ac-kv/mm	ASTM D116	8.3	8.7	8.7
Dielectric Loss	25°C @ 1MHz	ASTM D250	.0004	.0002	.0002
Volume Resistivity	25°C ohm-cm	ASTM D1829	>10 ¹⁴	>10 ¹⁴	>10 ¹⁴

Metallizing Design Recommendations

- **Dimensions:** Dimensions should be specified as being over or under metallization. Common dimensional tolerances over metallizing and plating are +/- .0025" (.06mm) or greater. Tolerances of +/- .001 (.25mm) over metallizing and plating can be achieved with special grinding and coating techniques.
- **Metallizing Boundaries:** End coated ceramics require an overlap of .020" (.5mm) maximum onto inside and outside chamfer and walls. Pattern screen-print metallization designs require a minimum pullback from ceramic edges of .010" (.25mm) or greater. Dimensions of screen-printed metallizing patterns should be toleranced +/- .010" (.25mm) or greater. Typical tolerances on width and location of ID and OD bands are +/- .020" (.5mm) or greater.

Ceramic Design Recommendations

- **Edge Breaks:** Break outside edges .002" min. (radius or chamfer) to minimize chipping and stresses. Inside edge breaks are normally sharp. Utilization of a "green" formed chamfer rather than a ground chamfer or radius will minimize cost. However, a much larger tolerance on size of chamfer is required. Contact your CoorsTek representative for information.
- **Wall Thickness:** Avoid very thin walls or webs or differential wall thickness to minimize cracking.
- **Glaze:** Glaze will pull back from ends of ceramic .025" minimum. Dimensions should be specified as being over or under glaze.
- **Design of Mating Components:** Avoid tension or bending loads. Ceramic is strongest in compression.
- **Typical As-Fired Tolerances:** +/- 1%, or +/- .005, whichever is greater.
- **Typical Ground Tolerances:**
 Surface (face) Grind (OAL): +/- .003" to +/- .001"
 OD/ID Grind: +/- .005" to +/- .001"
 Steps, Angles, Slots: +/- .005" to +/- .002", +/- 1°

Note: Grinding always increases manufacturing costs when compared to designing "as-fired" components.



The information set forth herein is offered for comparison only and is not to be construed as absolute engineering data or constituting a warranty or representation for which we assume legal responsibility.

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