



Flat Panel Display



Advanced Ceramic Components for Flat-Panel Display Manufacturing

Engineered Ceramics Experts

CoorsTek provides high-performance, critical-duty components for Flat Panel Display (FPD) manufacturing from a range of specialized, high-purity engineered ceramics. Our experts help you choose the best design and material for optimal performance and component life.

Why Specify Ceramic Components?

CoorsTek ceramics provide superior performance in severe-service application environments. Benefits include:

- Excellent corrosion resistance in plasma and chemical etching environments — Our PlasmaPure™ high-purity alumina is engineered to outperform standard ceramic materials in corrosive etch applications
- Superior dielectric strength to help prevent electrical arcing during machine operation
- StatSafe™ ESD safe ceramic materials prevent static charge buildup during glass transport
- Longer component life — CoorsTek ceramics outperform engineering plastics in most plasma etch applications
- Thermal stability — Ceramic components are extremely stable in a wide range of operating and idle temperatures

Materials and Manufacturing Experts

With over 50 manufacturing sites across four continents, CoorsTek is the international partner of choice for high-performance semiconductor components. For more information, contact a CoorsTek materials expert today at +82 31 8016 9350.

| PROPERTY | UNITS | TEST | STATSAFE™ ADC | STATSAFE™ ZDC | STATSAFE™ ZDC W | AD-96 | ADO-96 | FG-995 | AD-995 | PLASMAPURE™ AD-998 | AD-999 |
|--------------------------------|---------------------------------|---------------|----------------------------------|----------------------------------|----------------------------------|---------------------|---------------|----------------------|----------------------|-----------------------|------------------------|
| | | | Al ₂ O ₃ | ZrO ₂ | ZrO ₂ | Nom. 96% | Nom. 96% | Nom. 98.5% | Nom. 99.5% | Nom. 99.8% | Nom. 99.9% |
| Density | gm/cc | ASTM-C 20 | 3.85 | 5.75 | 5.91 | 3.72 | 3.81 | 3.80 | 3.90 | 3.93 | 3.94 |
| Color | - | - | Black | Black | White | White | Brown | White | Ivory | Ivory | Ivory |
| Flexural Strength (MOR), 20 °C | MPa (psi X 10 ³) | ASTM-F417 | 300 (43) | 600 (87) | 650 (94) | 358 (52) | 385 (56) | 375 (54) | 379 (55) | 390 (58) | 414 (60) |
| Elastic Modulus, 20 °C | GPa (psi X 10 ⁶) | ASTM-C848 | 370 (54) | 200 (29) | 200 (29) | 303 (44) | 354 (50) | 350 (51) | 370 (54) | 370 (54) | 386 (56) |
| Compressive Strength, 20 °C | MPa (psi X 10 ³) | ASTM-C773 | 2060 (300) | 1200 (174) | 1310 (190) | 2068 (300) | 2450 (375) | 2500 (363) | 2600 (377) | 2700 (390) | 2930 (425) |
| Hardness | GPa | Rockwell 45N | 83 | 82 | 82 | 78 | 81 | 82 | 83 | 83 | 85 |
| Fracture Toughness, K1c | MPa m ^{1/2} | Notched Beam | 4 - 5 | 7 - 9 | 7 - 9 | 4 - 5 | 3 - 4 | 4 - 5 | 4 - 5 | 4 - 5 | 4 - 5 |
| Thermal Conductivity, 20 °C | W/m °K | ASTM-C408 | 25 | 5 | 3.5 | 24.7 | 24.7 | 27.5 | 30.0 | 30.0 | 31.0 |
| CTE, 25-1000 °C | 1X 10 ⁻⁶ /°C | ASTM-C372 | 8 | 9 | 10 | 8.2 | 8.2 | 8.2 | 8.2 | 8.2 | 8.2 |
| Thermal Shock Resistance, ΔTc | °C | NOTE 3 | 200 | 300 | 300 | 250 | 250 | 200 | 200 | 200 | 200 |
| Maximum Use Temperature | °C | NO-LOAD COND. | 500 | 500 | 500 | 1700 | 1700 | 1700 | 1750 | 1750 | 1750 |
| Volume Resistivity, 25 °C | Ohm-cm | ASTM-D1829 | 10 ⁶ -10 ⁷ | 10 ⁶ -10 ⁷ | 10 ⁶ -10 ⁷ | > 10 ¹⁴ | * | > 10 ¹⁴ | > 10 ¹⁴ | > 10 ¹⁴ | > 10 ¹⁴ |
| Volume Resistivity, 500 °C | Ohm-cm | ASTM-D1829 | - | - | - | 4 x 10 ⁹ | * | 2 x 10 ¹⁰ | 2 x 10 ¹⁰ | 1 x 10 ¹¹ | 3.3 x 10 ¹² |
| Volume Resistivity, 1000 °C | Ohm-cm | ASTM-D1829 | - | - | - | 1 x 10 ⁶ | * | 2 x 10 ⁶ | 2 x 10 ⁶ | 3 x 10 ⁶ | 1.1 x 10 ⁷ |

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Critical Components for a Variety of FPD Applications

CoorsTek provides a great variety of thermally stable, corrosion resistant, and high-purity ceramic components for typical FPD applications:

Etch

- Focus, shield, and insulator plates — Single piece and segmented construction
- Ceramic covers
- Buffer plates

CVD

- Insulator shield rings
- Guide bushings and support shafts
- Ceramic liners

Ultra-flat vacuum chucks

- Up to 2.5 meters square
- Low surface contact designs
- Low reflectivity or high transmissivity

Multi-purpose components

- Various pins, screws, plates, frames, & windows
 - Ceramic clamps and bushings
- End effectors/substrate handling components