

Advanced Ceramic Vacuum Wafer Chucks

Materials Developed Specifically for Wafer Handling

As a leader in technical ceramics for wafer processing equipment, CoorsTek understands advanced semiconductor manufacturing and constantly develops new materials, designs, and processes to optimize yields and extend product life.



Our ultra-flat ceramic vacuum wafer chucks improve yield management for semiconductor wafer processing. Low-surface-contact configurations minimize risk of back-side particles negatively affecting wafer geometry for precision applications. We offer:

- Ultra-flat capabilities
- Mirror polish
- Exceptionally lightweight
- High stiffness
- Low thermal expansion
- Large size capability – 300mm and beyond
- Extreme wear resistance

High-Purity Materials Expertise

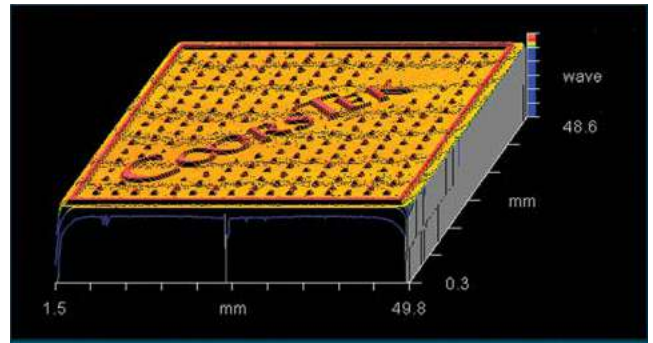
From powder production and basic forming to precision finishing and measurement, CoorsTek produces high-quality, top-performance components.

You'll find our materials:

- Reduce the effect of particulate contamination
- Offer ultra-clean purity
- Minimize wafer contact
- Resist corrosion in aggressive chemical cleaning

Typical applications:

- Lithography
- Inspection
- Wafer cleaning
- Non-vacuum process chambers



Zygo flatness report - one of several tools CoorsTek uses to test and measure precision geometry.

PROPERTY	UNITS	TEST	ULTRASIC™ SiC Direct Sintered	PURESIC™ HR CVD-SiC >99.9995%	PURESIC™ LR CVD-SiC >99.9995%	PLASMAPURE™ ALUMINA Min. 99.8%
Density	gm/cc	ASTM-C 20	3.15	3.21	3.21	3.92
Color	-	-	Black	Black	Black	Ivory
Flexural Strength (MOR), 20 °C	MPa (psi X 10 ³)	ASTM-C1161, 4pt	480 (70)	468 (68)	517 (75)	390 (57) ②
Elastic Modulus, 20 °C	GPa (psi X 10 ⁶)	ASTM-C848	410 (59)	462 (67)	434 (63)	380 (55)
Compressive Strength, 20 °C	MPa (psi X 10 ³)	ASTM-C773	3500 (508)	-	-	2650 (384)
Hardness	GPa (kg/mm ²)	Knoop 100 gm	27.4 (2800)	27 (2750)	27 (2750)	14.1 (1440) ③
Fracture Toughness, K1c	MPa m ^{1/2}	Notched Beam	4	3.5	3.5	4 - 5
Thermal Conductivity, 20 °C	W/m °K	ASTM-C408	150	140	140	31.0
CTE, 20 °C	1X 10 ⁻⁶ /°C	-	2.1	2.1	2.1	6.1
Thermal Shock Resistance, ΔTc	°C	①	300	-	-	200
Maximum use Temperature	°C	NO-LOAD COND.	1600	1600	1600	1750
Volume Resistivity, 25 °C	Ohm-cm	ASTM-D1829	>10 ⁵	>10 ⁵ *	<0.10 *	> 10 ¹⁴
Volume Resistivity, 500 °C	Ohm-cm	ASTM-D1829	>10 ³	-	-	2 x 10 ¹¹
Volume Resistivity, 1000 °C	Ohm-cm	ASTM-D1829	>10 ²	-	-	2 x 10 ⁷

*PureSic resistivity is tailorable to customer needs within the range illustrated by PureSic HR and LR

NOTES

① Thermal Shock Resistance – Tests are run by quenching samples into water from various elevated temperatures. The change in temperature where a sharp decrease in flexural strength is observed is listed as DTC.

② ASTM-F417

③ 1000 gm load

*Ceramic property values vary somewhat with method of manufacture, size, and shape of part.

Close control of values of most properties can be maintained if specified.

Note: The chart is intended to illustrate typical properties. 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 PureSic are registered trademarks of CoorsTek, Inc. UltraSic and PlasmaPure are trademarks of CoorsTek, Inc.



Americas
+1 303 271 7100 tel
+1 855 929 7100 toll free in USA
coorstek.com
info@coorstek.com

Europe
+49 160 530 3768
infoeurope@coorstek.com

Japan
+81 3 5437 8411
japaninfo@coorstek.com

China
+86 21 6232 1125
info_shanghai@coorstek.com

Korea
+82 31 212 9348
koreainfo@coorstek.com