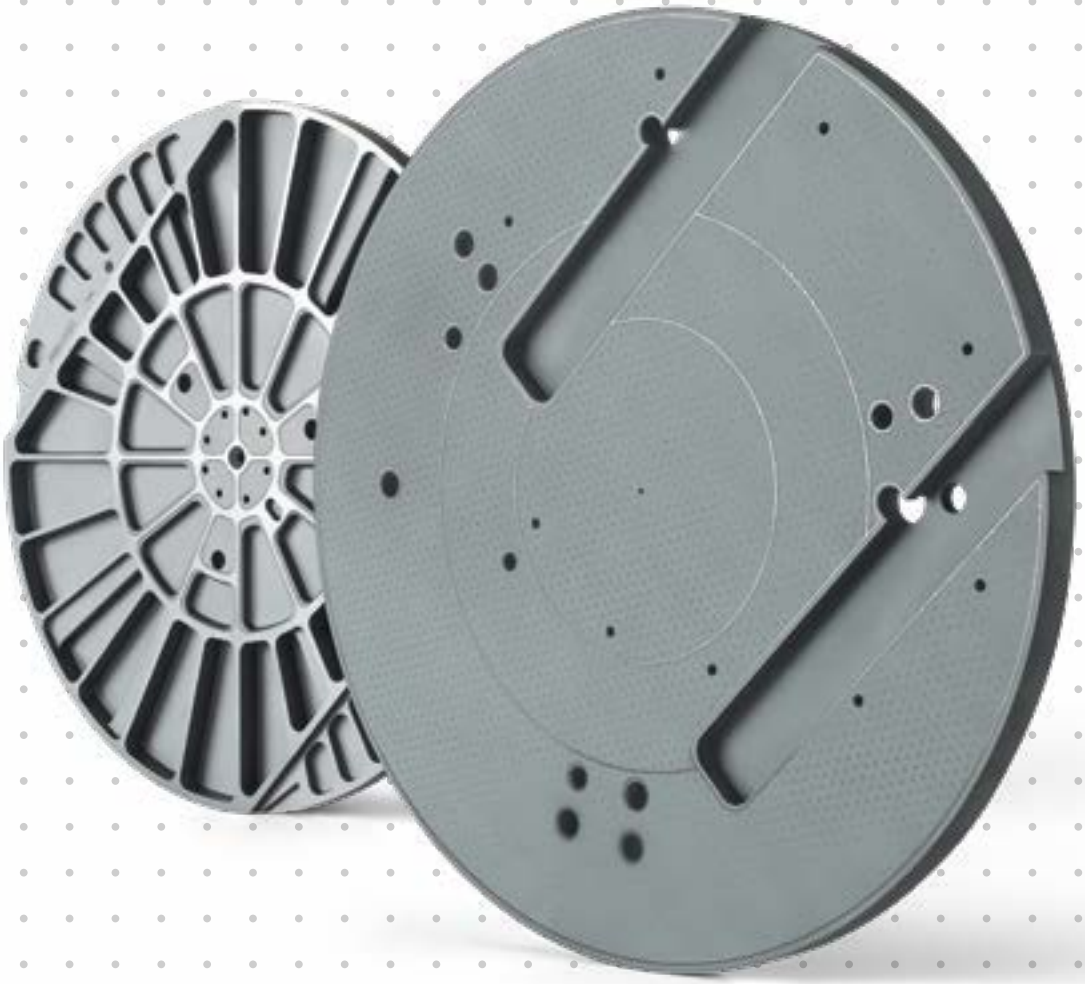
CoorsTek

Vacuum Wafer Chucks



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

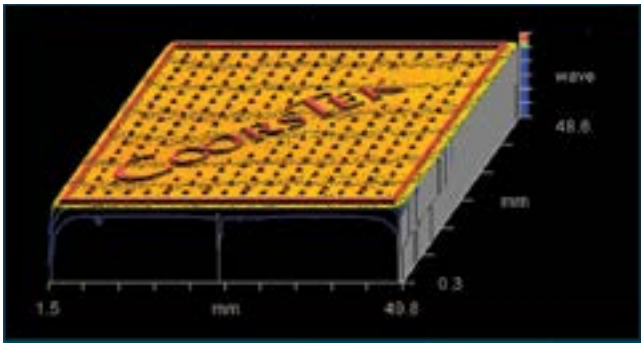
From powder production and basic forming to precision finishing and measurement, CoorsTek produces high-quality, top-performance components.

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) ❷
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/mm²)	Knoop 100 gm	27.4 (2800)	27 (2750)	27 (2750)	14.1 (1440) ❸
Fracture Toughness, Klc	MPa m½	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	❶	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

NOTES

❶ 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.

❷ ASTM-F417

❸ 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.

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

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