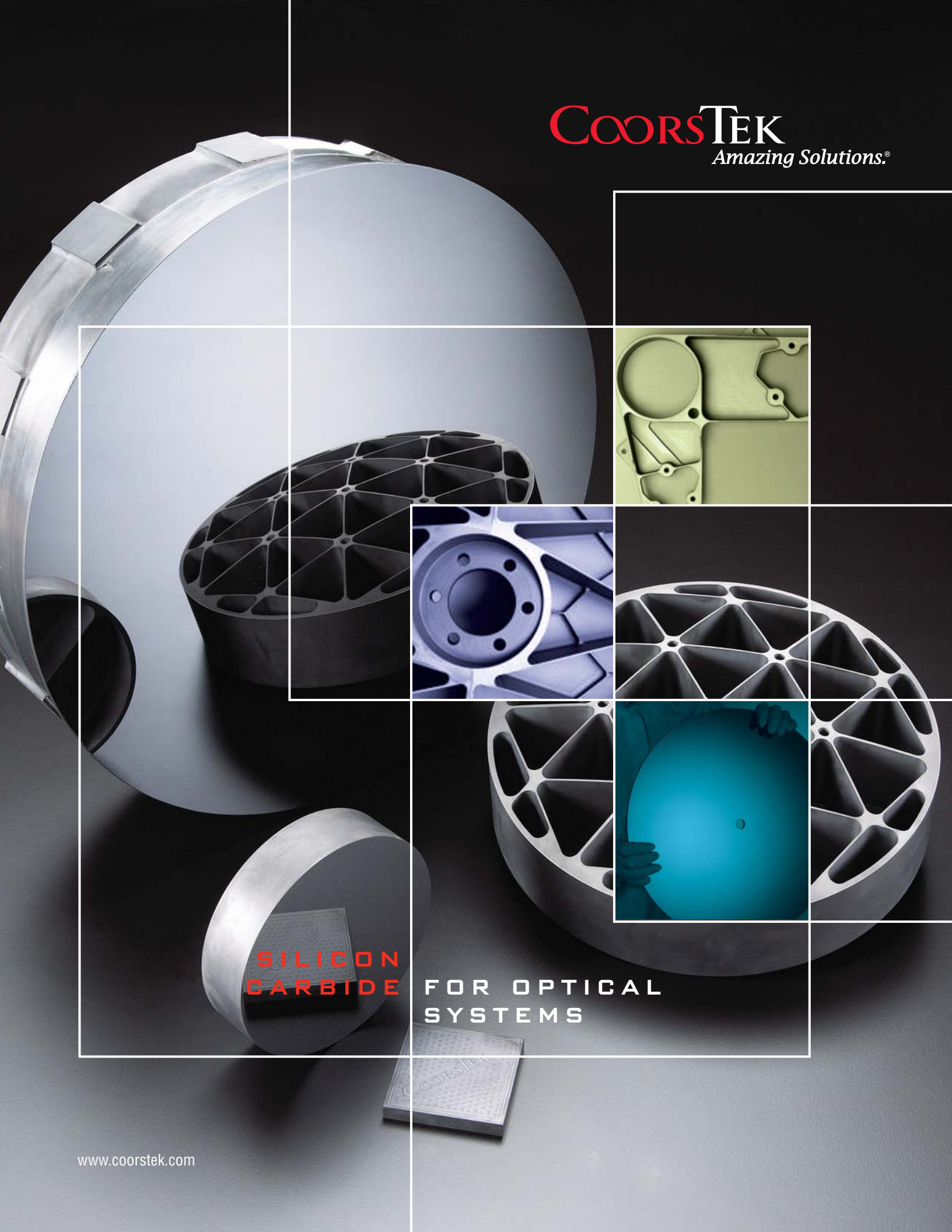


COORSTEK
Amazing Solutions.®



**SILICON
CARBIDE**

**FOR OPTICAL
SYSTEMS**

ULTRASiC™ DIRECT SINTERED AND PURESiC™ CVD SILICON CARBIDE FOR OPTICAL APPLICATIONS

Materials Engineered Specifically for Optical Systems

CoorsTek silicon carbides are engineered and optimized for applications demanding high stiffness, low mass, and thermal stability. Our SiC materials are ideally suited for mirrors and structural components for ground or space-based optical systems. Silicon carbide optical systems are engineered to exhibit low complexity, low mass, and athermal designs thereby providing enhanced system performance and reliability – all while lowering system cost.

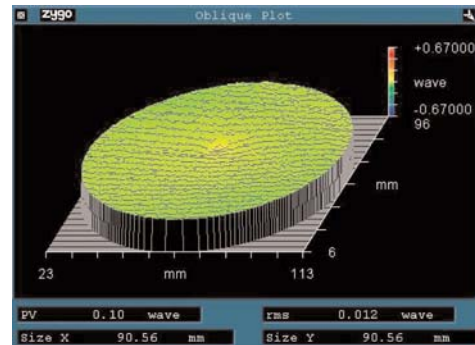
UltraSiC™ Single Phase Silicon Carbide

Optimized with a single-phase polycrystalline structure for ultra-stable and predictable material properties over wide temperature ranges, its low thermal expansion and high thermal conductivity allow for exceptionally stable optical figures in both transient and steady-state environments. In addition, this material's high elastic modulus and low density allow for one of the highest stiffness-to-weight ratios of any optical substrate.

PureSiC™ CVD Silicon Carbide is chemical-vapor-deposited, ultra-high-purity material. Used for thin monolithic mirrors or as an optical cladding for UltraSiC material, it is polishable to under 3Å RMS.

High-Precision Manufacturing

Whether you need one or one hundred components, CoorsTek precisely forms, machines, polishes, assembles, and tests SiC optical components for a variety of



This Zygo® Oblique Plot illustrates the exceptional flatness achieved on a CoorsTek silicon carbide optical component

visible and infrared applications in dedicated, quick-turn manufacturing facilities. CoorsTek high-precision silicon carbide components feature wave front errors and surface roughness equal to or better than traditional substrates. Most typical optical coatings are compatible with our silicon carbide substrates.

Hands-On Engineering and Service Professionals

CoorsTek offers expert application engineering including 3D modeling, FEA analysis, materials testing, prototyping, and material selection for any optical component specification.

Materials and Manufacturing Experts – Ready to Assist!

Call us today at **+1.503.693.2178** or send an e-mail to sicoptics@coorstek.com for world-class engineering and material assistance on your next project.



CoorsTek exclusive OpX manufacturing and quality system



Quick-Turn Prototyping and Manufacturing

Property	Units	Test	UltraSiC™ (Direct Sintered SiC)	PureSiC™ (CVD Silicon Carbide)
Density	gm/cc	ASTM-C 20	3.15	3.21
Crystal Size, Average	MICRONS	THIN-SECTION	5	3 - 10
Flexural Strength (MOR), 20° C	MPa (psi X 10 ³)	ASTM-F417	480 (70)	517 (75)
Elastic Modulus, 20° C	GPa (psi X 10 ⁴)	ASTM-C848	410 (59)	434 (63)
Poisson's Ratio, 20° C	–	ASTM-C848	0.21	0.21
Compressive Strength, 20° C	MPa (psi X 10 ³)	ASTM-C773	3500 (507)	*
Hardness	GPa (kg/mm ²)	KNOOP 1000 gm	27.5 (2800)	27 (2750)
Fracture Toughness, K _{IC}	MPa m ^{1/2}	Notched Beam	4 - 5	3.5
Thermal Conductivity, 20° C	W/m K	ASTM-C408	175	*
CTE, 25-1000° C	1X 10 ⁻⁶ /°C	ASTM-C372	4.4	4.6
CTE @ 20° C	1X 10 ⁻⁶ /°C	–	2.1	*

* Not available

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. This data is not to be construed as absolute and does not constitute a warranty for which we assume legal responsibility.

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