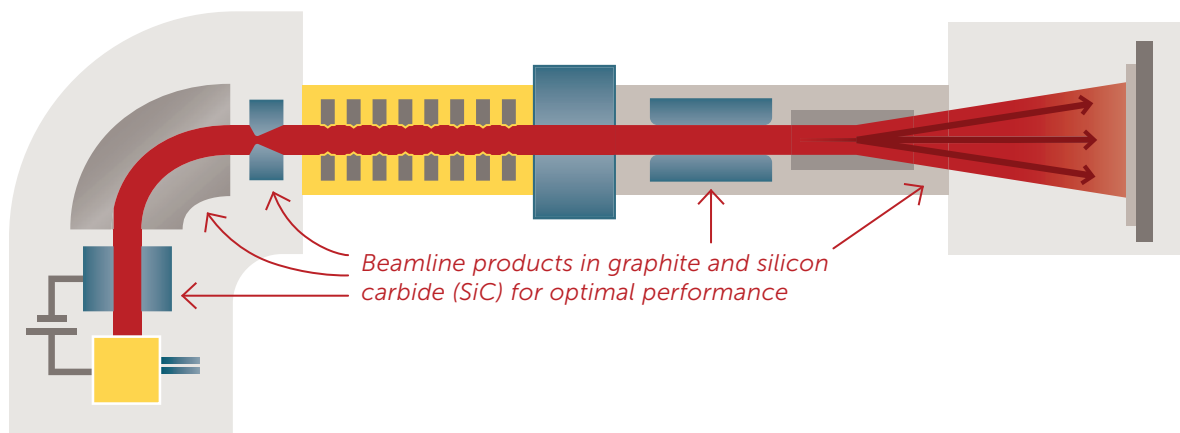


POCO® Premium Graphite

Material advantage in ion implantation

Reduce particle generation, improve dimensional stability, and extend component life across the ion beamline.

In next-generation ion implantation, beamline materials must withstand higher ion bombardment, tighter dimensional tolerances, and stricter contamination control than conventional graphite systems were designed to support. Conventional graphite and vitreous impregnated graphite can struggle with uneven erosion, particle generation, thermal distortion, and inconsistent wear behavior under advanced implant conditions. POCO® Premium Graphite is purpose-built to overcome these limitations through engineered microstructure control, isotropic uniformity, ultra-high purity, and precision machinability. The result is a graphite material platform designed to outperform conventional and impregnated graphite by improving dimensional stability, reducing particle risk, extending component life, and supporting more consistent beamline performance for next generation advanced implant nodes.



CORE ENGINEERING ADVANTAGES

- **Isotropic Uniformity:** Properties are consistent across the X, Y, and Z axes, helping minimize warping, bowing, and uneven expansion under severe thermal gradients.
- **Sub-Micron to Fine Particle Structures:** Dense grain structures down to 1 μm provide strong resistance to high-energy ion sputtering, high-current operation, and chemical erosion.
- **Ultra-High Purity (<5 ppm Ash):** Advanced proprietary purification removes trace metallic contaminants, ensuring that stray elements do not co-implant into silicon wafers.
- **Precision Beam Geometries:** High material strength supports precision machining of sharp slit edges, thin walls, and complex beamline geometries with reduced risk of chipping.

PERFORMANCE COMPARISON: POCO® VS. CONVENTIONAL GRAPHITE

OPERATIONAL THREAT	CONVENTIONAL GRAPHITE	POCO® PREMIUM GRAPHITE	IMPLANTATION BENEFIT
Beam Bombardment	Fast, uneven erosion rates	Slow, uniform wear behavior	Fewer tool recalibrations
Extreme Heating	Parts warp along extrusion grain	Improved stability across all axes	More stable aperture alignment
Complex Machining	Flakes and chips at narrow slots	Maintains razor-sharp, crisp edges	Highly precise beam shaping
Material Porosity	Non-uniform pore size and distribution	Uniform, controlled pore structure	More consistent wear and reduced particle generation

THE ION IMPLANT GRADE LINEUP

ZEE Grade (ZEE-2) – The Highest Hardness

Specifications: Grain Size: 1 µm
Shore Hardness: 96 – 108

Best Used For: Extraction electrodes, acceleration grids, near-wafer components, and high-erosion beamline parts.

SCE Grade – The Erosion-Resistant Performer

Specifications: Grain Size: 3 µm
Shore Hardness: 96 – 106

Best Used For: Acceleration grids, beam-path apertures, and high-wear target components.

SCF Grade – Near Beam Performer

Specifications: Grain Size: <5 µm
Shore Hardness: 91

Best Used For: Acceleration grids and beam-defining apertures.

HPD Grade – The Versatile Workhorse

Specifications: Grain Size: 5 µm
Shore Hardness: 91

Best Used For: Liners, shields, and near-beam-path components.



DFP Series – Thermal Stability

Specifications: Grain Size: 4 – 5 µm
Shore Hardness: 74 – 84

Best Used For: Non-beam interacting parts, source liners, and shielding plates.

PLS Grade – The Structural Backbone

Specifications: Grain Size: 10 µm
Shore Hardness: 50 – 70

Best Used For: Non-beam-interacting parts, large structural components, covers, and shielding blocks.

ENHANCED SURFACE MODIFICATION

- Ultra-Purification:** Available across configurations to help reduce mobile metal contamination that can contribute to device-level electrical failures.
- Textured Surface:** Laser-machined textures increase surface area and create engineered pockets that help capture loose particles.
- Coating Solutions:** Pyrolytic carbon coating can further reduce particle generation on graphite components; because the coating and substrate are carbon-based, thermal expansion mismatch is minimized, supporting strong adhesion and reduced delamination risk at elevated temperatures.
- SiC Skin Material:** Converted not deposited, SiC skin layer will provide higher surface roughness that enables to capture loose particles in the beamline, reduces erosion and particle generation and supports cleaner, longer lasting ion beamline component performance.

POCO IMPLANT GRAPHITE FAMILY

		SHORE HARDNESS	
		<100	>80
PARTICLE SIZE	1	ZEE Highest Hardness, Super Fine Grain For 2 nm node , beam interacting parts	SFG Medium Hardness, Super Fine Grain For mainstream nodes >14 nm , near beam interacting and away from the beam parts
	3	SCE Highest Hardness, Super Fine Grain For advanced nodes <7 nm , beam interacting and near beam interacting parts	SCF High Hardness, Fine Grain For advanced nodes <7 nm , beam interacting and near beam interacting parts
	5		HPD High Hardness, Fine Grain For mainstream nodes >14 nm , beam interacting and near beam interacting parts
	10		DFP Medium Hardness, Fine Grain For all nodes , away from the beam parts
			PLS Medium Hardness, Fine Grain For all nodes , away from the beam parts

FOR MORE INFORMATION

Please call our Customer Service Center today to learn what our premium graphite and silicon carbide solutions can do for you. Visit poco.entegris.com/contact-us for the location nearest you.

TERMS AND CONDITIONS OF SALE

All purchases are subject to Poco Graphite's Terms and Conditions of Sale. To view and print this information, visit poco.entegris.com/terms-and-conditions.



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