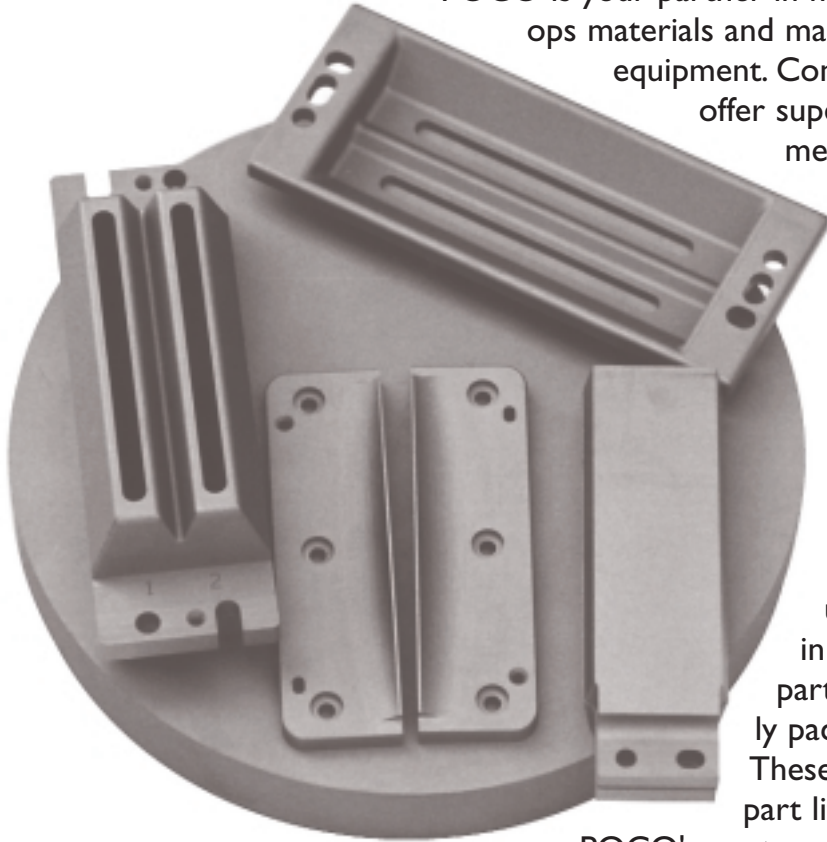


POCO

Moving Technology Forward

IMPLANT MATERIALS AND COMPONENTS

POCO is your partner in moving technology forward. POCO develops materials and manufactures components for ion implant equipment. Components are specifically engineered to offer superior performance in high erosion environments.



Poco's standard material, DFP-3-2, for the implant consumables is now just one of 4 materials that have been developed to meet the requirements for the entire range of implant conditions. These materials have the performance characteristics that promote better control at high and low energies and help reduce cost of ownership.

Poco's family of implant materials have uniform, small-grain structures that result in predictable performance from part to part. POCO materials are isotropic with tightly packed grain structures and high strengths. These materials resist erosion leading to longer part life with reduced particle generation.

POCO's next generation materials offer choices for higher yields and improved reliability that result in fewer chip level defects.

POCO ZEE

ZEE is a hard, wear-resistant material. This next generation ion implant material offers improved performance through the entire range of low to high-energy implants. POCO ZEE is high-purity, isotropic graphite with a true 1-micron grain size. A unique manufacturing process yields a graphite with elevated hardness and strengths that exhibits reduced wear and particle generation even in the highest energy environments.

POCO PyroGraph

Pyrograph is pyrolytically infiltrated graphite. POCO's proprietary process infiltrates the base material to a minimum depth of 0.1 inch throughout the entire surface of the component. This process seals the graphite surface and reduces particle generation in the chamber.

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GRAPHITE

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The manufacturing process begins with a specially formulated graphite. Once a part has been machined, it goes through a purification process that typically results in a purity level of < 2ppm. The final step is a pyrolytic vapor infiltration that produces a hard, uniform surface. Vapor phase processing allows deeper penetration of the pyrolytic carbon into the base material.

DFP-3-2

This is a high strength graphite that has reduced porosity. DFP-3-2 has long been the standard for components that exhibit long life and reduced erosion rates.

SCF-2

An economic alternative to DFP-3-2, this 5-micron material is harder than DFP-3-2 and has high strengths without reduced porosity.

Typical Purified POCO Graphite GDMS Elemental Data Analysis

| ELEMENT | CONCENTRATION (PPM WT) |
|---------|------------------------|
| Na | <0.005* |
| Mg | <0.005* |
| Al | 0.09 |
| Ca | <0.005* |
| Ti | <0.02 |
| V | 0.002 |
| Mn | <0.001* |
| Fe | 0.03 |
| Ni | 0.01 |
| Cu | <0.001* |
| Zn | <0.005* |

*Denotes value below detection limits

Ion Implant Components

POCO's Design Engineering staff translates your designs or drawing into customized parts for your individual application. Our Precision Machining and parts inspection group produces finished components ready for installation into the implant system.

Typical Material Properties

| | ZEE | DFP3-2 | SCF-2 | PYROGRAPH |
|-----------------------------------|----------|----------|----------|-------------|
| Apparent Density (g/cc) | 1.809 | 1.82 | 1.77 | 1.56 |
| Flexural Strength (psi) | 20,842 | 12,000 | 13,500 | 7,750 |
| Compressive Strength (psi) | 37,258 | 20,000 | 25,000 | 14,200 |
| Electrical Resistivity (m-ohm-in) | 1,211 | 600 | 960 | 790 |
| Shore Hardness | 113 | 74 | 91 | 66 |
| CTE (m-in/in/C) | 8.6 | 8.1 | 7.6 | 7.5 |
| Air Flow @ 60 psi cc/min * | 12 | 1 | 50 | 0 |
| Purity | 99.9995% | 99.9995% | 99.9995% | 99.9995% |
| Pyrolytic Carbon | | | | 12% pick-up |

*Test area = 1.25" diameter Sample thickness - .25"

POCO supplies components/materials to OEM's and fabs.