POCO GRAPHITE
An Entegris Company

HOT PRESS DIE (HPD)

Premium graphite materials

Overview

Poco Graphite fine-grain materials are used as dies for hot-pressing in powdered metal and ceramic processes. The uniform microstructure of these graphite grades yields consistent surface finish. High strength and low wear rate maximize the useful life of dies, resulting in industry-leading low cost of ownership. High, isotropic thermal conductivity ensures uniform heating, while the inherent lubricity of POCO graphite allows for rapid release with no sticking.

Whether you're pressing diamonds into metal tooling, creating exotic ceramics, or processing advanced composites, POCO graphite dies will enhance the performance and reduce the total cost of your process.

Typical Material Properties

Properties	ACF-10Q	AXF-3Q	AXF-5Q	AXM-5Q
Particle size:	5 µm (200 µin)	5 µm (200 µin)	5 µm (200 µin)	5 µm (200 µin)
Pore size:	0.8 µm (32 µin)	0.8 µm (32 µin)	0.8 µm (32 µin)	0.8 µm (32 µin)
Total porosity: % volume	21%	21%	20%	23%
Open porosity: % of total	75%	77%	80%	85%
Apparent density:	1.77 g/cm³ (0.0637 lb/in³)	1.76 g/cm³ (0.0636 lb/in³)	1.78 g/cm³ (0.0641 lb/in³)	1.73 g/cm³ (0.0623 lb/in³)
Compressive strength:	186 MPa (27,000 psi)	156 MPa (22,600 psi)	138 MPa (20,000 psi)	124 MPa (18,000 psi)
Flexural strength:[1]	97 MPa (14,000 psi)	90 MPa (13,000 psi)	86 MPa (12,500 psi)	69 MPa (10,000 psi)
Tensile strength:[2]	69 MPa (10,000 psi)	63 MPa (9,100 psi)	62 MPa (9000 psi)	48 MPa (7000 psi)
Modulus of elasticity:	11,000 N/mm² (1.6 10^6 psi)	11,000 N/mm² (1.6 10^6 psi)	11,000 N/mm² (1.6 10^6 psi)	10,500 N/mm² (1.5 10^6 psi)
Tensile strain: to failure	0.62%	0.82%	0.95%	0.99%
Shore hardness:	95	80	74	72
Electrical resistivity:	2460 µΩ-cm (970 µΩ-in)	1815 µΩ-cm (715 µΩ-in)	1470 µΩ-cm (580 µΩ-in)	1650 µΩ-cm (650 µΩ-in)
Coefficient of thermal expansion:	8.5 µm/m°C (4.6 µin/in°F)	8.1 µm/m°C (4.4 µin/in°F)	7.9 µm/m°C (4.4 µin/in°F)	7.8 µm/m°C (4.3 µin/in°F)
Thermal conductivity:[3] W/m-K (Btu-ft/hr/ft²°F)	60 (35)	85 (50)	95 (55)	88 (50)
Oxidation threshold:[4]	470°C (880°F)	455°C (850°F)	450°C (840°F)	460°C (860°F)

[1] *Measured using 4-point bend method*

[2] *Estimated at 70% of flexural strength*

[3] *Estimated value*

[4] *Temperature that results in 1% weight loss in 24 hours. Oxidation threshold increases by approximately 100°C if graphite is purified. Test sample size equals 0.5" x 0.5" x 1.0".*

Features

- Uniform microstructure
- Very high compressive strength
- High thermal conductivity
- Inherent lubricity
- Increased thermal expansion (relative to competitive graphite)

Benefits

- Excellent surface finish
- Increased lifetime
- High density component output
- Uniform heat distribution leads to uniform end products
- Exceptional release characteristics
- Maintains press through thermal cycle

For More Information

Please call your Regional Customer Service Center today to learn what POCO can do for you. Visit *www.poco.com* and select the Contact Us link for the center nearest you.

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