GRAFCELL®
FUEL CELL COMPONENTS

FFP SERIES

TECHNICAL BULLETIN 425

Manufactured from expanded natural graphite, GRAFCELL® Flow Field Plate (FFP) components retain a continuous graphitic phase. This unique phase continuity, combined with an extremely low contact resistance, provides superior electrical and thermal properties in comparison to both synthetic graphite composite and metallic fuel cell components. The thermal diffusivity of GRAFCELL FFP SERIES products is 8-12 times higher than composite materials and 33 times higher than stainless steel.

GRAFCELL FFP SERIES products have played a critical role in improving fuel cell power density and performance for over 10 years. With over two million kilometers of proven road experience car and bus applications annually, GRAFCELL FFP SERIES continuous phase flow field plates have replaced synthetic graphite as the premier material for PEM fuel cells.

Grade, Dimension and Coating Options

What types of GRAFCELL FFP components are available?

	FFP-100 SERIES	FFP-200 SERIES	FFP-300 SERIES
Fine Feature Formability	Better	Best	Good
Tensile Strength	Best	Better	Good
Minimum Web Thickness	100 µ	200 µ	300 µ
Thickness +/- 0.1 mm (0.004")	0.6-3 mm (0.024 - 0.118")		>3 mm (0.118")
Width +/- 1.0 mm (0.039")	Maximum Width: 254 mm (10")		
Length +/- 1.0 mm (0.039")	Maximum Length: 600 mm (23.62")		
Able to be Machined	Yes	Yes	Yes
Able to be Molded	Yes	Yes	Yes

Typical[1] Properties

What are the performance characteristics of GRAFCELL natural graphite FFP components?

- Nominal Density: 1.5 g/cc
- Thermal Conductivity (x-y): 275 W/m-K
- Thermal Conductivity (z): 5 W/m-K
- Electrical Resistivity (x-y)[2]: 7 µΩm
- Electrical Resistivity (z)[2]: 300 µΩm
- Coefficient of Thermal Expansion (x-y): 1-5 µm/m-K
- Coefficient of Thermal Expansion (z): 10 µm/m-K
- Tensile Strength: 30-50 MPa
- Flexural Strength: 50-70 Mpa
- Permeability (1 atm, 15 psi limit): <1 cc/min
- Tg: 125°C
- Contact Resistance: 8 µΩcm^2
- Thermal Diffusivity: 1.2 cm^2/sec

[1] Properties listed are typical and cannot be used as accept/reject specifications.
[2] ASTM C611. 4-Point Resistivity Test. The resistance of thin perforated flexible graphite at 0.4 MPa between gold platens.

For additional information, contact the GrafTech Sales Office: +1 (800) 253-8003 (Toll-Free in USA), +1 (216) 529-3777 (International), +1 (216) 529-3922 (Fax)

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