

GRI™ Insulation

Technical Data Sheet 4040

GRAFSHIELD™ Insulation Portfolio

- **GRI™ Insulation - High-temperature insulator with 100% bonded carbon fiber**
- GRI™MG and GRI™GG Insulation - GRI™ insulation faced with GRAFOIL® flexible graphite sheet
- GRI™MC and GRI™CC Insulation - GRI™ insulation faced with carbon fiber composite
- GRI™4 Insulation - GRI™ insulation faced with radiant, abrasion resistant, dust-inhibiting graphite coating
- AMW™ and AMW™100 Heat Shields - Proprietary shielding laminates
- GRAFBOARD® Insulation - GRI™ insulation faced with AMW™100 heat shield

Product Overview

GRAFSHIELD™ GRI™ insulation is a rigid and sturdy material made with 100% bonded carbon fiber. This product has been a mainstay in several industries for the processing of high-value materials and parts. GRI™ insulation panels feature outstanding durability, typically providing years of service. The strength-to-weight ratio is such that the product features low thermal mass and easy handling while being strong enough to withstand rapid temperature and pressure fluctuations. Available in a variety of panel sizes as well as customized parts, GRI™ insulation is easily machined and able to hold fine detail.

Applications

- Vacuum furnace insulation
- Inert atmosphere furnace insulation
- Inert atmosphere process equipment insulation
- Semiconductor crystal growth furnace insulation

Sizes*

Inches	Millimeters	Inches	Millimeters	Inches	Millimeters
1 x 24 x 52	25 x 600 x 1300	1.5 x 24 x 52	40 x 600 x 1300	2 x 24 x 52	50 x 600 x 1300
1 x 40 x 60	25 x 1000 x 1500	1.5 x 40 x 60	40 x 1000 x 1500	2 x 40 x 60	50 x 1000 x 1500
1 x 50 x 60	25 x 1250 x 1500	1.5 x 50 x 60	40 x 1250 x 1500	2 x 50 x 60	50 x 1250 x 1500

* Custom sizes and shapes, including cylinders, are available on request

GRI™ Insulation - Typical Properties at Room Temperature**

Characteristic	Unit	WG	AG	Unit	WG	AG
Bulk Density	lbs/ft ³	11.2		g/cm ³	0.18	
Apparent Porosity	%	90		%	90	
Specific Resistance	Ωin	0.027	0.18	μΩm	670	4700
Flexural Strength	psi	150	20	MPa	1.1	0.2
Compressive Strength	psi	150	45	MPa	1.0	0.3
Thermal Conductivity 25°C	BTU-ft/hr ft ² °F	0.22	0.090	W/mK	0.39	0.18
Thermal Conductivity 1500°C in Argon	BTU-ft/hr ft ² °F	0.87	0.27	W/mK	1.5	0.45
Carbon Content	%	99.9		%	99.9	
Ash Content	ppm	1500		ppm	1500	
CTE (RT to 1000°C)	10 ⁻⁶ /°F	1.7	1.9	10 ⁻⁶ /°C	3.0	3.3
CTE (RT to 2000°C)	10 ⁻⁶ /°F	2.0	2.2	10 ⁻⁶ /°C	3.6	4.0

** Properties listed are typical and cannot be used as accept/reject specifications

www.graftech.com | grafshield@graftech.com

United States of America
101 N. Philippi Pike
Anmoore, WV 26323-0120
Ph: +1-800-842-8805
+1-304-624-1253

China
Unit 2104 of International Capital Plaza
1318, Sichuan Road North
Hongkou District, Shanghai China
Ph: +86-21-6325-8018

Italy
Via Forno Allione, 2
1-25040 Malonno, Brescia, Italy
Ph: +39-036-463-0131

France
La Lechere
73264 Aigueblanche Cedex, France
Ph: +33-4-79-41-45-00

Redefining limits

© 2015 GrafTech International Holdings Inc. This information is based on data believed to be reliable but GrafTech makes no warranties, express or implied, as to its accuracy and assumes no liability arising out of its use. The data listed falls within the normal range of product properties but should not be used to establish specification limits or used alone as the basis of design. GrafTech's liability to purchasers is expressly limited to the terms and conditions of sale. GRAFSHIELD, GRI, AMW, and GRAFBOARD are trademarks of GrafTech International Holdings Inc.

1.21.2015