



GRI™ Insulation

Technical Data Sheet 4040

GRAFSHIELD™ Insulation Portfolio

- **GRI™ Insulation - High-temperature insulator with 100% bonded carbon fiber**
- GRI™G and GRI™GG Insulation - GRI™ insulation faced with GRAFOIL® flexible graphite sheet
- GRI™C and GRI™CC Insulation - GRI™ insulation faced with carbon fiber composite
- AMW™ & 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 growing 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
Minimum Process Temperature***	°F	3360		°C	1850	

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

*** Proper use of this product above the reported process temperature is possible in some cases. Please consult with GrafTech Application Engineering to determine whether this is possible for your application.

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