



Designed to Take the Heat

Structural Grade Refractory Products

RATH SG Products are versatile non-asbestos refractories reinforced with continuous ceramic fibers to increase the toughness, reliability and overall performance of the ceramic composite. SG-70 can withstand extreme thermal shock within specified temperature ranges

SG-70 and **SGM-MU** contain continuous fibers for "non-brittle behavior" and can withstand extreme thermal shock within specified temperature ranges. Chemically inert, these composites are durable and machinable.

SINDANYO® H-91 is an asbestos free cement board manufactured from alumina and Portland cements, high temperature fillers and binders and has the additional benefit of dispersible glass fibers as reinforcing agents. The material exhibits excellent strength even at high temperatures up to 700°C.

Marinite™ P is a structural insulation board formed from calcium silicate with inert fibers and reinforcing agents. Marinite P structural insulation is especially well suited to withstand both the temperatures and pressures associated with platen press operations.

These **SG products** are supplied in large sheets/boards and other engineered shapes. They are excellent material choices for structural insulating applications, and are natural replacements for asbestos-cement, silicate/mica/phosphate based materials and monolithic ceramics where superior performance is required.

SG-90A and **SG-99A** are high alumina sheets, which were developed for structural insulation and parting applications. Based on high purity and high alumina content these products are the ideal choice in vacuum furnaces and other special atmosphere heat treating units.

Advantages

- ▲ Non-brittle (SG 50, SG-70, SGM-MU)
- ▲ Contain no asbestos
- ▲ Low shrinkage
- ▲ High dielectric strength
- ▲ Good thermal shock
- ▲ Good reflectivity
- ▲ Good oxidation barrier
- ▲ Good mechanical strength
- ▲ Good electrical resistance
- ▲ Excellent abrasion resistance

Applications

- ▲ Induction furnace components
 - Channel melter components (brass foundry)
 - Coil liners
 - Box plates
 - Coreless induction furnace
 - Components (superalloy casting)
 - Coil support, upper fitting, spacer, and riser blocks
 - Splash and coil shields
 - Crucible hold downs
 - Coil support spacer rings
 - Lower chamber lining
- ▲ Non-ferrous metal holding / transport equipment
 - Aluminum filter homogenizer and purifier
 - Curstbreaker plunger face aluminum holding furnace
- ▲ Element support/spacers
- ▲ Special atmosphere furnaces
- ▲ Specialty furnace components
 - Bottom support for quartz furnaces
 - Low temperature kiln furniture
- ▲ Specialty HT electrical insulation
 - Reflector shields for high intensity lights
 - Electrical resistor grids in locomotive dynamic systems
 - Internal lining for glass tempering furnaces
- ▲ Oven components
- ▲ Compression plate insulation
 - Electric insulators for induction pressing of diamond saw segments
- ▲ HIP application
- ▲ Glass component fabricating and handling equipment
 - Dead plates, set out plates, wear guides, and pusher pads



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Rath Incorporated	UNIT	SG-70	SGM-MU	H-91	Marinite P	SG-90A	SG-99R
Melting Point	°C (°F)	1450 (2642)	> 1900 (> 3452)			> 1900 (> 3452)	> 2000 (> 3632)
Service Temperature	°C (°F)	1300 (2372)	1800 (3272)	700 (1290)	982 (1800)	1500 (2732)	1500 (2732)
Chemical Composition	% Al ₂ O ₃ % SiO ₂ % other	70 20 10	72 28 ---	Alumina & Portland Cement	95% Calcium Silicate	90 10 ---	99 1 ---
Reinforcement Fibers		continuous	continuous	glass	organic and glass	non- continuous	non- continuous
Density (* lower density upon request; 1200 kg/m3)	kg/m ³ (lb/ft ³)	2000 (125)	2270 (142)	1920 (120)	961 (60)	2000 * (125)	2000 * (125)
LOI (@1000°C, 6h)	%	0	0	0	3	0	0
Linear Thermal Shrinkage 24 hours							
@ 350°C (660°F)	%	---	---	0.36	0.8	---	---
@ 650°C (1200°F)	%	---	---	---	1.1	---	---
@ 800°C (1472°F)	%	0.0	0.0	---	5.3	0.0	0.0
@ 1000°C (1832°F)	%	< 1.0	0.5	---	5.5	1.0	1.0
@ 1500°C (2732°F)	%	---	1.0	---	---	4.0	3.0
Thermal Conductivity [W/m-K (BTU-in/ft ² -h-°F)]							
@ 200°C (392°F)	W/m-K	0.60 (4.16)	0.90 (6.24)	0.90 (6.24)	---	0.70 (4.85)	0.70 (4.85)
@ 400°C (752°F)	W/m-K	0.62 (4.23)	0.90 (6.24)	0.90 (6.24)	0.16 (1.13)	0.70 (4.85)	0.70 (4.85)
@ 600°C (1112°F)	W/m-K	0.65 (4.51)	0.90 (6.24)	0.90 (6.24)	0.17 (1.15)	0.70 (4.85)	0.70 (4.85)
@ 800°C (1472°F)	W/m-K	0.68 (4.72)	0.90 (6.24)	0.90 (6.24)	0.17 (1.16)	0.70 (4.85)	0.70 (4.85)
@ 1000°C (1832°F)	W/m-K	0.70 (4.85)	0.90 (6.24)	0.90 (6.24)	0.17 (1.16)	0.70 (4.85)	0.70 (4.85)
Compressive Strength	Mpa (lb/in ²)	90 (13140)	85 (12325)	114 (16675)	20.9 (3050) 5%	24.1 (3500)	24.1 (3500)
Cold Bending Strength (MOR)	Mpa (lb/in ²)	58 (8468)	86 (12556)	13 (1898)	8.2 (1200)	13.8 (2000)	13.8 (2000)
Specific Heat	J/g-°C (BTU/lb-°F)	0.92 (0.22)	0.92 (0.22)	1.05 (0.25)	0.97 (0.23)	0.92 (0.22)	0.92 (0.22)
Failure Mode (as received)		non-brittle	non-brittle	non-brittle	---	---	---
Dielectric Constant		5.5	5.55	2.81	---	---	---
Dielectric Strength	volts/mil	91	91	1.83 Kv/mm	46	---	---
Electrical Receptivity	ohm-cm	0.52 x 10 ¹⁰	1.0 x 10 ¹⁰	---	0.50 x 10 ¹⁰	---	---
Standard Size	in	36 x 48	custom	49 x 37	48 x 48	21 x 24	21 x 24
Standard Thickness	in	1/32, 1/16, 1/8, 3/16, 1/4, 3/8, 1/2, 3/4, 1	custom	5mm – 75mm 0.2" – 2.95"	1/2, 3/4, 1, 1-1/2, 2	1/64, 1/32 1/16, 1/8	1/64, 1/32 1/16, 1/8
Other sizes and thicknesses upon request.							
Available product forms (*shapes upon request)		boards, cylinders*	boards, cylinders*	boards	boards	sheets, cylinders*	sheets, cylinders*