

## Veneering Modules



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SDS Code 201, 252

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### Features

- Temperature ranges up to 3000°F (1649°C)
- 12" x 12" blocks of ceramic fiber insulation
- Easily installed over existing refractory surface
- Improves furnace efficiency without replacing a serviceable refractory lining
- Monolithic, edge-grained ceramic fiber modules
- Excellent insulating properties
- Excellent thermal stability
- Good insulating properties

### Product Description

Pyro-Bloc® Veneering modules, R, ZR, and C grades are made of Pyro-Log® fiber turned edge-grain and slightly compressed with a gauze type wrap.

Kaowool® Veneering modules, HP, ZR, C and polycrystalline Denka Veneering Modules are made from high temperature grade ceramic fibers or high alumina fibers. The modules are fabricated into 12" x 12" (305 mm x 305 mm) blocks using fiber strips turned edge-grain and slightly compressed with a gauze-type wrap.

Unifelt Veneering modules, 3000 (HT), 3000 M, XT are made from a blend of high temperature Cerafiber and high alumina fiber. The modules are fabricated into blocks, 12" by 12" (305 mm x 305 mm) using pre-cut Unifelt boards turned edge-grain and glued together.

### Applications

- Forge furnace
- Crucible furnace
- Rotary hearth furnace
- Holding furnace
- Heat treating furnace
- Pusher reheat furnace
- Ceramic kiln

### Installation of Veneering modules

Veneering Modules can be applied over a variety of refractory surfaces using K-Bond® mortar. Unikote® M or S surface coatings are normally applied over the module hot face to provide thermal stability and chemical attack resistance

### Standard Sizes

All modules are available in 12" x 12" (305 mm x 305 mm).

All modules are available in 2", 3" and 4" (51 mm, 76 mm and 102 mm) thicknesses.

## Veneering Modules



Properties	Pyro-Bloc Grades		Kaowool and Denka Grades				Unifelt Grades		
	R	ZR	C	HP	ZR	C	Denka	3000HT	3000XT
Color	white	white	blue	white	white	blue	white	pink	orange
Density, pcf (kg/m <sup>3</sup> )	8,10,12 (128,160,192)	10,12 (160,192)	12 (192)	8,10 (128,160)	8,10 (128,160)	8,10 (128,160)	8, 9.3 (128, 149)	7 (112)	9 (144)
Continuous use limit, up to °F (°C)	2200 (1204)	2450 (1343)	2500 (1371)	2150 (1177)	2400 (1316)	2450 (1343)	2700 (1482)	2800 (1538)	2900 (1593)
Maximum temp. rating, °F (°C)	2400 (1316)	2600 (1427)	2600 (1427)	2400 (1316)	2600 (1427)	2600 (1427)	2800 (1538)	3000 (1649)	3100 (1704)
Permanent Linear Shrinkage, %, 24 hours									
@ 2200°F (1204°C)	-	-	-	-	-	-	-	1.1	-
@ 2400°F (1316°C)	-	-	-	-	-	-	-	1.4	0.8
@ 2600°F (1427°C)	-	-	-	-	-	-	-	1.7	1.2
@ 2800°F (1538°C)	-	-	-	-	-	-	-	-	1.8
<b>Chemical Analysis, % weight basis, after firing</b>									
Alumina, Al <sub>2</sub> O <sub>3</sub>	47	37.5	43	46	35	43	72	72	87
Silica, SiO <sub>2</sub>	53	47	54	54	50	54	28	28	13
Zirconia, ZrO <sub>2</sub>	-	15.5	-	-	15	-	-	-	-
Chromium oxide, Cr <sub>2</sub> O <sub>3</sub>	-	-	3	-	-	3	-	-	-
Loss on ignition, L.O.I.	trace	trace	trace	-	-	-	-	5	5
Other	trace	trace	trace	trace	trace	trace	trace	trace	trace
<b>Thermal Conductivity, BTU·in./hr·ft<sup>2</sup>·°F (W/m·K), ASTM C201</b>									
	Pyro-Bloc Grades		Kaowool Grades		Denka	Unifelt Grades			
	10 pcf (160 kg/m <sup>3</sup> )	12 pcf (192 kg/m <sup>3</sup> )	8 pcf (128 kg/m <sup>3</sup> )	10 pcf (160 kg/m <sup>3</sup> )	9.3 pcf (149 kg/m <sup>3</sup> )	3000HT	3000XT		
@ 500°F (260°C)	0.52 (0.07)	0.50 (0.07)	0.57 (0.08)	0.55 (0.08)	0.74 (0.11)	0.86 (0.12)	0.87 (0.13)		
@ 1000°F (538°C)	1.04 (0.15)	0.96 (0.14)	1.14 (0.16)	0.99 (0.14)	1.31 (0.19)	1.06 (0.15)	1.01 (0.15)		
@ 1500°F (816°C)	1.81 (0.26)	1.66 (0.24)	1.93 (0.28)	1.66 (0.24)	2.36 (0.34)	1.45 (0.21)	1.31 (0.19)		
@ 2000°F (1093°C)	2.69 (0.39)	2.45 (0.35)	2.82 (0.41)	2.45 (0.35)	3.66 (0.53)	2.10 (0.30)	1.82 (0.26)		
@ 2500°F (1371°C)	-	-	-	-	5.05 (0.73)	-	-		
@ 2700°F (1482°C)	-	-	-	-	5.61 (0.81)	-	-		

The values given herein are typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Therefore, the data contained herein should not be used for specification purposes. Check with your Morgan Thermal Ceramics office to obtain current information.