



**Pyro-Bloc Veneering modules**, R Grade, ZR Grade, C Grade are made Pyro-Log<sup>®</sup> fiber turned edge-grain and slightly compressed with a gauze type wrap.

Pyro-Bloc Veneering Modules are part of the Unisystem family of products. They can be applied over a variety of refractory surfaces using K-Bond<sup>®</sup> mortar. Unikote<sup>®</sup> M or S surface coatings are normally applied over the module hot face to provide thermal stability and chemical attack resistance.

**Kaowool Veneering modules**, HP Grade, ZR Grade, \*Saffil<sup>®</sup> Grade are made from high-temperature grade Kaowool ceramic fibers or Saffil 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. When the furnace is fired, the wrap will burn off and the modules will distend to provide a tight, uniform furnace lining.

Kaowool Veneering modules are part of the Unisystem family of products. They 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.

**Unifelt Veneering modules**, 3000 (HT), 3000 M, XT are made from a blend of high-temperature Kaowool fiber and Saffil 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.

Unifelt veneering modules are part of the Unisystem family of products. They can be applied over a variety of surfaces including refractory castable, monolithic plastics, high-temperature IFB and ceramic fiber modules. K-Bond mortar, a high-temperature air setting mortar is used to attach the Unifelt modules. Unikote S surface coating is then applied over the module hot face to provide greater thermal stability and chemical attack resistance. A typical application would be stack-on-stack design linings over new ceramic fiber weld-on modules.

#### Features

- 12" x 12" (305 mm x 305 mm) blocks of ceramic fiber insulation
- Easily installed over existing refractory surface
- Improves furnace efficiency without replacing a serviceable refractory lining

#### Pyro-Bloc Veneering Modules

- Monolithic, edge-grained ceramic fiber modules
- Maximum temperature rating 2600°F (1427°C)

#### Kaowool Veneering Modules

- Suitable for temperature ranges up to 3000°F (1649°C)
- Excellent insulating properties

#### Unifelt Veneering Modules

- Excellent thermal stability
- Good insulating properties

#### Applications

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

#### 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.

# Pyro-Bloc, Kaowool and Unifelt Veneering Modules

## Product Information

Physical Properties	Pyro-Bloc Grades			Kaowool Grades				Unifelt Grades		
	R	ZR	C	HP	ZR	Chrome	Saffil	3000HT	3000M	3000XT
Color	white	white	blue/green	white	white	blue/green	white	pink	yellow	orange
Density, pcf ( <i>kg/m<sup>3</sup></i> )	8,10,12 <i>(128,160,192)</i>	10,12 <i>(160,192)</i>	12 <i>(192)</i>	8,10 <i>(128,160)</i>	8,10 <i>(128,160)</i>	8,10 <i>(128,160)</i>	6 <i>(96)</i>	7 <i>(112)</i>	7 <i>(112)</i>	9 <i>(144)</i>
Maximum temperature rating, °F (°C)	2400 <i>(1316)</i>	2600 <i>(1427)</i>	2600 <i>(1427)</i>	2400 <i>(1316)</i>	2600 <i>(1427)</i>	2600 <i>(1427)</i>	3000 <i>(1649)</i>	3000 <i>(1649)</i>	3000 <i>(1649)</i>	3100 <i>(1704)</i>
Continuous use limit, up to, °F (°C)	2200 <i>(1204)</i>	2450 <i>(1343)</i>	2500 <i>(1371)</i>	2150 <i>(1177)</i>	2400 <i>(1316)</i>	2450 <i>(1343)</i>	2800 <i>(1538)</i>	2800 <i>(1538)</i>	2800 <i>(1538)</i>	2900 <i>(1593)</i>
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</b> (Nominal, %weight basis, after firing)										
Alumina, Al <sub>2</sub> O <sub>3</sub>	47	37.5	43	46	35	43	95 - 97	72	62	87
Silica, SiO <sub>2</sub>	53	47	54	54	50	54	3 - 5	28	38	13
Zirconia, ZrO <sub>2</sub>	-	15.5	-	-	15	-	-	-	-	-
Chromium oxide, Cr <sub>2</sub> O <sub>3</sub>	-	-	3	-	-	3	-	-	-	-
Loss of Ignition, L.O.I.	trace	trace	trace	-	-	-	-	trace	6	5
Other	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		Unifelt Grades					
Mean temperature	<b>10#</b>	<b>12#</b>	<b>8#</b>	<b>10#</b>	<b>3000HT</b>	<b>3000M</b>	<b>3000XT</b>			
@ 500°F (260°C)	0.52 (0.07)	0.50 (0.07)	0.57 (0.08)	0.55 (0.08)	0.86 (0.12)	0.61 (0.09)	0.87 (0.13)			
@ 1000°F (538°C)	1.04 (0.15)	0.96 (0.14)	1.14 (0.16)	0.99 (0.14)	1.06 (0.15)	1.15 (0.17)	1.01 (0.15)			
@ 1500°F (816°C)	1.81 (0.26)	1.66 (0.24)	1.93 (0.28)	1.66 (0.24)	1.45 (0.21)	2.10 (0.30)	1.31 (0.19)			
@ 2000°F (1093°C)	2.69 (0.39)	2.45 (0.35)	2.82 (0.41)	2.45 (0.35)	2.10 (0.30)	3.62 (0.52)	1.82 (0.26)			

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 Thermal Ceramics office to obtain current information.

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