

## Pyro-Fold™, Pyro-Stack™, Unibloc® , Z-Blok® Modules



### Product Description

Pyro-Fold M module is designed for high-temperature furnace linings that require corrosion barriers, vapor barriers or just a pre-laid stud pattern. Pyro-Fold M modules are manufactured in three grades of ceramic fiber blanket: HP (Cerablanket), ZR (Cerachem), and CR (Cerachrome). The available combinations of blanket grades, densities, and sizes allow Pyro-Fold M modules to be used in many different types of industrial furnaces. The modules are held to the steel casing by stainless steel studs that are pre-welded to the furnace shell. The Pyro-Fold M module uses a 316 stainless steel internal support system that was specially designed to allow for quick and reliable installation over coated shells, backup linings and vapor barriers. Pyro-Fold M modules come pre-compressed with restraint banding and an internal support system. Studs, nuts, and installation tools must be ordered separately.

Pyro-Fold Y modules are manufactured from a high-purity blend of raw materials which are used to produce either the HP grade (alumina-silica) or ZR grade (aluminazirconia-silica) ceramic fibers. The Pyro-Fold Y Module utilizes a specially designed 316 SS internal support system and the industry standard Pyro-Bloc stud system. The Pyro-Fold Y Module uses the proven center-fire, one-step weld system which eliminates the need for pre-laid stud patterns. This allows for the fastest installation of any module system now available in the marketplace. The Pyro-Fold Y Module comes complete with internal support system and stud already in place.

Pyro-Stack modules are made from Denka blankets that are pre-compressed to a specific density and banded. Pyro-Stack modules are cut blanket segments stacked edge-grain rather

than continuous folded. These modules come with the same internal hardware as traditionally offered in the Pyro-Bloc Y and M modules.

Unibloc modules are manufactured in three grades: HP (Cerablanket), ZR (Cerachem), and CR (Cerachrome). Unibloc Modules are extremely versatile because they can be installed with or without a pre-laid stud pattern using a number of positive mechanical attachment systems

Z-Blok II modules are manufactured in HP (Cerablanket), ZR (Cerachem), and CR (Cerachrome) ceramic fiber grades. Z-Blok II is a folded ceramic fiber blanket module used in lining industrial furnaces. Z-Blok II has a C-Channel that runs parallel to the module folds. This C-Channel is typically attached to the steel casing with a welded stud and nut. A variety of additional attachment options are available.

### Features

- Accordion-style construction
- Adaptable to coated casings, backup blanket
- Fast and easy to install and make field modifications
- Variety of attachment systems
- Available in a wide range of sizes, densities, and blanket types
- Extremely fast, efficient installation
- Installed with or without pre-laid stud pattern
- Protected anchor components

### Applications

- Annealing furnaces
- Heat treating furnaces
- Steam flood generators
- Preheating furnaces
- Process heaters
- Ethylene furnaces
- Reformers
- Forge furnaces
- Crude oil heaters
- Steam flood units
- Ammonia reformers
- Tunnel kilns
- Homogenizing furnaces
- Heat treating furnaces
- Shuttle kilns
- Periodic kilns
- Homogenizing furnaces
- Fume incinerators
- Gas turbine exhaust duct work
- Pyrolysis heaters

## Pyro-Fold™, Pyro-Stack™, Unibloc®, Z-Blok® Modules

Main Properties				
	HP Grade	ZR Grade	CR Grade	Denka
Colour	white	white	blue/green	White
Density pcf (kg/m <sup>3</sup> )	8 9.3 10.7 (128 149 171)	8 9.3 10.7 (128 149 171)	9.3 10.7 (149 171)	2 3 4
Thickness, in (mm)	4-12 (102 – 305)	4-12 (102 – 305)	4-12 (102 – 305)	2, 3, 4 (51, 76, 102)
Maximum Temperature Rating, °F (°C)	2400 (1316)	2600 (1427)	2600 (1427)	2800 (1538)
Melting Point, °F (°C)	3200 (1760)	3200 (1760)	3200 (1760)	2700 (1482)
Continuous Use Limit, °F (°C)	2200 (1204)	2450 (1343)	2500 (1371)	

Typical Chemical Analysis (%) weight basis after firing				
Alumina, Al <sub>2</sub> O <sub>3</sub>	46	35	43	72
Silica, SiO <sub>2</sub>	54	50	54	28
Zirconia, ZrO <sub>2</sub>	-	15	-	-
Chromia, Cr <sub>2</sub> O <sub>3</sub>	-	-	3	-
Other	trace	trace	trace	trace

Thermal Conductivity, BTU•in/hr•ft <sup>2</sup> •°F (w/mk), ASTM C201:				
@ mean temp:	<u>9.3 pcf (149 kg/m<sup>3</sup>)</u>			<u>7</u>
500°F (260°C)	0.52 (0.07)			0.43 (0.06)
1000°F (538°C)	1.00 (0.14)			0.88 (0.13)
1500°F (816°C)	1.66 (0.24)			1.64 (0.24)
2000°F (1093°C)	2.45 (0.35)			2.57 (0.37)

### Installation

The use limits of Unibloc, Pyro-Fold, and Z-Blok Modules should be used only as a guide when considering modular lining installations. For assistance in adapting these guidelines and recommendations concerning the type of fiber material to fabricate modules to meet your specific furnace lining requirements, call your nearest Morgan Thermal Ceramics representative.

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.

### Pyro-Fold Y Module Installation

Pyro-Fold Y Modules are installed by the instant action of our industry standard Pyro-Bloc stud and stud gun. In one easy step the module is positioned against the furnace shell, securely welded\*, and tightened into place in less than three seconds. This unique process self-checks and quality tests each and every weld for absolute integrity. The Pyro-Fold Y Module installation procedure eliminates the need for a time consuming stud layout and prewelding of anchors or brackets. The Pyro-Fold Y Module is easy to cut and fit in the field for special shape requirements.