Z-Blok®

THE Z-Blok® MODULE SYSTEM

An engineered solution

THORPE

The **THORPE** Group of Companies

THE STRONGEST, MOST FLEXIBLE AND MOST RELIABLE CERAMIC FIBER MODULE SYSTEM AVAILABLE

Z-Blok®

- Large 24" x 24" format reduces joints and shrinkage.
- Strongest anchoring and attachment system.
- Custom designed lining includes:
  - furnace analysis
  - special shapes
  - engineering drawings
- Most flexible regarding special shapes and sizes.
- Lowest overall life cycle costs.

THORPE'S 3 KEYS TO RELIABILITY

1 PRODUCT INTEGRITY

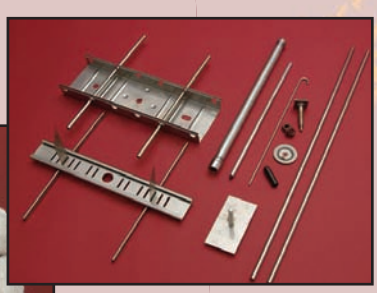
2 ENGINEERED SYSTEM

3 INSTALLATION ORIENTED

1 PRODUCT INTEGRITY

Pioneering design helps maintain fiber integrity while the engineered hardware maximizes stability and reliability.

THE Z-Blok® MODULE COMPONENTS



REFRACTORY CERAMIC FIBER

- Formed from a continuous length of top quality ceramic blanket.
- Blanket is accordion-folded, placed in compression and banded.

LARGE FORMAT MODULE

- Recommended 24" x 24" module design reduces joints and shrinkage.
- Large format design lowers overall costs for installation and operation.

HARDWARE

- Proprietary stainless steel attachment hardware is installed within 1.25" of module cold face.
- Internal hardware is designed to match steel shell configuration for an engineered installation.

ENGINEERED SYSTEM

Module shapes and sizes are engineered to meet furnace conditions and produce a complete system that optimizes performance and reliability.

A FURNACE ANALYSIS

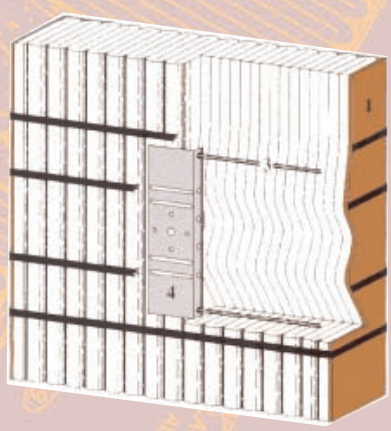
FURNACE VARIABLES	DESIGN CONSIDERATIONS
FURNACE ENVIRONMENT	■ Temperature (up to 3000°F) ■ Velocity ■ Chemical attack ■ Pressure
GEOMETRY	■ Transitions ■ Bullnose ■ Custom designs
PENETRATIONS	■ Burner tiles ■ Peepholes/doors ■ Support castings
MOVEMENT	■ Dynamic tube movement ■ Vibrations

B CUSTOM DESIGN

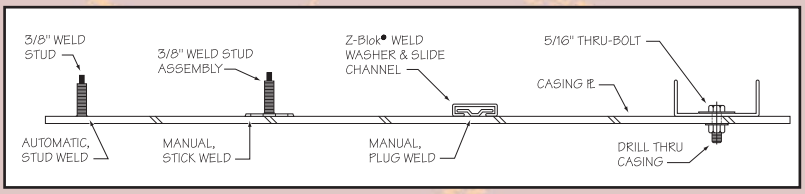
Based on furnace variables, size and shape — every Z-Blok® lining is custom designed including special shapes and engineering drawings

C Z-Blok® MODULE DESIGN SPECIFICATIONS

- **Size variables:** Thickness x width x length.
- **Module densities:** Typically 8, 9, 9.3, 10.7, and 12 PCF.
- **Material temperature ratings:** Standards include 2300°F and 2600°F, Special designs available up to 3000°F.



D ATTACHMENT SPECIFICATIONS



INSTALLATION ORIENTED

To ensure the customer receives a world-class lining, Thorpe competencies range from complete turnkey installations to quick turnarounds for engineered linings.

- **Responsiveness:** Relative to the customer need, Thorpe will provide a turnkey, installed package or work with the end user or contractor to design the lining and meet the turnaround schedule.
- **Rapid Installation:** Installation is facilitated by the engineered approach, including the identification of modules according to the detailed installation drawings.
- **Flexibility:** Whether the furnace requires a complete rebuild or a patch in an existing lining, the Z-Blok® system can be designed for the job to minimize installation time.

Who is Thorpe?

Thorpe Corporation, based in Houston, Texas, is engaged in supplying and servicing the industrial markets' refractory and insulation needs. One company of Thorpe Corporation fabricates and distributes industrial insulation and refractory products. In addition, other Thorpe Corporation companies have experience in engineering and installing complete refractory solutions.

Why is Thorpe the industry pioneer?

Thorpe pioneered the use of refractory fiber modules in petrochemical heaters with its 1976 introduction of the patented Z-Blok® module — the first module of its kind to be used in petrochemical applications above 1800F°.

How is Thorpe different from other module suppliers?

Thorpe takes a detailed engineering approach to each and every customer application. A thorough review of the specifications and design conditions allows Thorpe to select the best materials and design a custom lining that offers the customer the lowest overall life-cycle cost.

What are accessory products?

Thorpe works with the customer to incorporate a number of accessories in the engineered lining, including state-of-the-art burner tile, custom peep holes and door openings, and state-of-the-art tube penetration HotSeals™. These accessory products become part of the engineered lining to maximize efficiencies and provide the lowest life-cycle cost.

Why Thorpe?

Thorpe has numerous competencies and is in the unique position to offer 3 Keys of Reliability.

1. **Product Integrity**, including a superior folded module system using the best fiber and hardware components available.
2. **Engineering Capability**, designing a complete system that addresses the furnace conditions and optimizes performance.
3. **Installation Expertise**, offering services ranging from complete turnkey packages to field assistance to meet every customer's need.

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