

Anchor-Loc[®]₂ Ceramic Fiber Modules

Introduction

Anchor-Loc[®]₂ ceramic fiber modules extend the successful performance of standard Anchor-Loc folded modules to a product form featuring laminated fiber blanket construction. This product combines advancements in fiber chemistry, manufacturing technology, and attachment hardware design to provide an economical lining system for a wide range of heat processing vessels.

The Fibermass[®] manufacturing technique used to fabricate Anchor-Loc₂ modules bonds layers of refractory ceramic fiber blanket into a strong pliable fiber block. Spun ceramic fiber blankets which feature high tensile strength for improved resistance to mechanical abuse, vibration, and gas velocity are used in the construction of Anchor-Loc₂ Fibermass blocks. A proprietary fiber treatment decreases fiber dusting and irritation while increasing block flexibility, making the module easy to compress into place. Modules are available in two temperature grades based on construction from Durablanket[®] HP-S or Durablanket 2600. The availability of standard or high density blocks in each temperature grade results in a product which meets a wide range of application needs.

In all Anchor-Loc₂ modules, Fibermass blocks are secured to the metallic module anchor with a pair of stainless steel support tubes. Flanges on one end of the support tubes effectively lock the position of the tubes relative to the anchor at the time of installation.

Weld-Loc[®]₂ Ceramic Fiber Modules

The standard Anchor-Loc₂ modules are supplied with the Weld-Loc[®] attachment system for maximum design flexibility and high installation rates.

During installation, the special Weld-Loc stud assembly is fused to the furnace casing and a hex nut is torqued on the weld stud, drawing the module to the casing plate.

Advantages which are offered by the Weld-Loc attachment system include:

- High installation speed
- Ease and simplicity of installation
- Random placement of modules on the casing
- Positive torque test of the weld



Thread Loc[®]₂ Ceramic Fiber Modules

To meet customer specifications or the special design requirements of furnace builders, refineries or petrochemical plants, Anchor-Loc₂ modules are available on special order with the prewelded Thread Loc[®]₂ attachment system.

The Thread Loc₂ attachment system features a fully threaded weld stud and nut to permit block installation on a pre-engineered stud pattern. The Thread Loc₂ attachment system for Anchor-Loc₂ modules offers several advantages:

- Compatibility with mastic coatings, backup insulation, and foil vapor barriers.
- Module design compensates for variations in stud placement.
- Access to the welded fastener for full testing before the module is installed.

Power-Loc[®]₂ Ceramic Fiber Modules

This attachment system provides the advantages of quick, reliable module installation with minimal installation equipment set-up in the MRO (maintenance, repair, and overhaul) market segment.

A hardened steel pin mechanically secures each Power-Loc₂ module to the steel casing plate. The anchor pin is installed with a special Hilti[®] powder actuated fastening tool and powder booster. Advantages which are offered by the Power-Loc₂ ceramic fiber module include:

- High installation speed
- Casing preparation is eliminated
- Permits random placement of modules on the casing
- Ease and simplicity of installation
- Positive mechanical/attachment of modules to the casing plate
- Setup time is reduced

Refer to the product Material Safety Data Sheet (MSDS) for recommended work practices and other product safety information.

Hilti[®] is a trademark of Hilti Tool Corporation.

Typical Product Parameters

Chemical Analysis

Anchor-Loc₂ Modules

	2200°F	2600°F
Al ₂ O ₃	43% - 47%	29% - 31%
SiO ₂	53% - 57%	53% - 55%
ZrO ₂	—	15% - 17%
Na ₂ O	<.5%	—

Available Anchor-Loc₂ Ceramic Fiber Modules

305 mm x 305 mm (12" x 12"), 305 mm x 152.5 mm (12" x 6"),
305 mm x 406 mm (12" x 16"), 2200 Grade Only

Construction

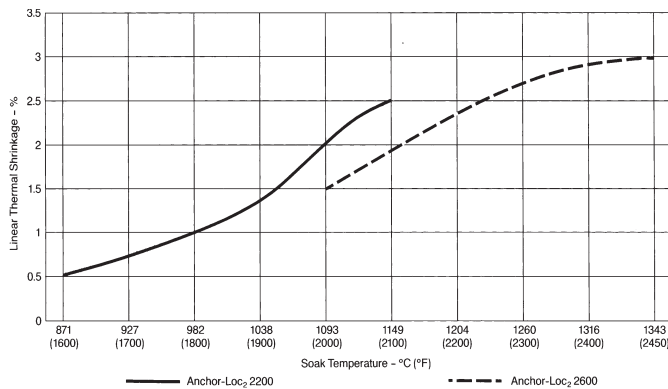
Module Density

Edge Grain Durablanket HP-S	128 kg/m ³ (8 lb/ft ³)
	160 kg/m ³ (10 lb/ft ³)
Edge Grain Durablanket 2600	160 kg/m ³ (10 lb/ft ³)
	192 kg/m ³ (12 lb/ft ³)

Typical Product Properties

Thermal Shrinkage

Anchor-Loc₂ Thermal Shrinkage Data*



*Shrinkage test performed at soak temperature for 24 hours

Module Type	Temperature Grade	Recommended Operating Temperature
Anchor-Loc ₂ 2200 Ceramic Fiber Module	1260°C (2300°F)	1149°C (2100°F)
Anchor-Loc ₂ 2600 Ceramic Fiber Module	1427°C (2600°F)	1343°C (2450°F)

The recommended operating temperature of Fiberfrax products is determined by irreversible linear change criteria, not melting point.

Data are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes.

Product Advantages

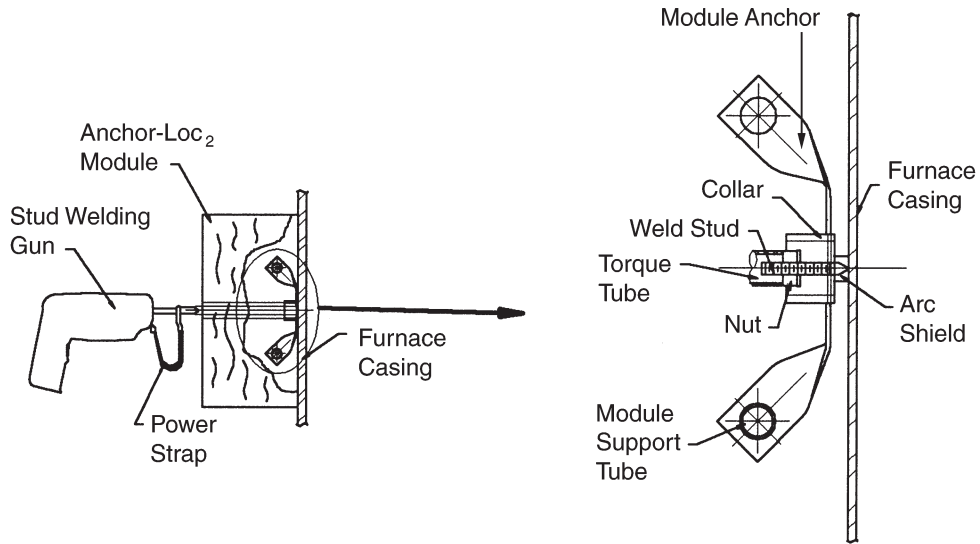
Anchor-Loc₂ ceramic fiber modules offer the same advantages as other Fiberwall furnace linings when compared to refractory construction. They are:

- Faster temperature cycling
- Lower heat storage
- Lower fuel costs
- Increased productivity
- Lower installed cost
- Easier repairs
- Resistance to thermal shock

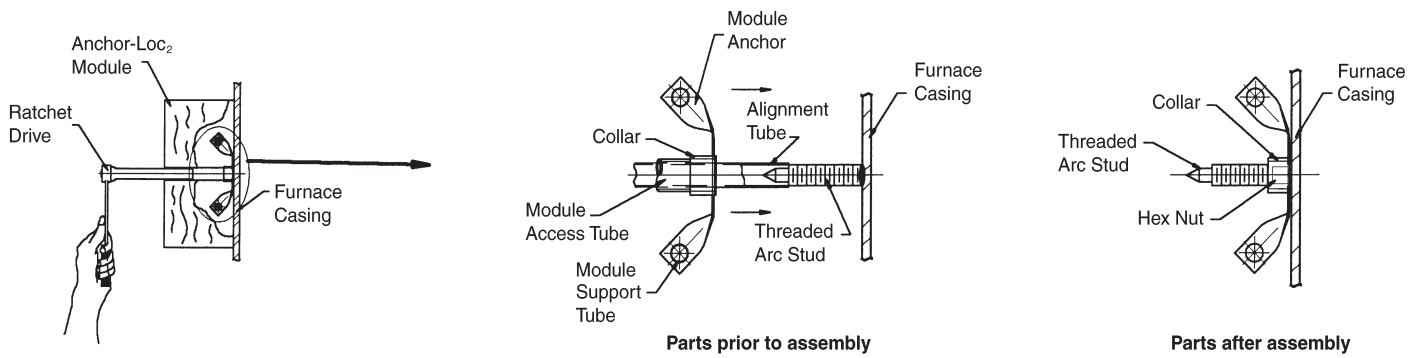
Applications

- Stress relieving furnaces
- Annealing furnaces
- Car bottom heat treating furnaces
- Process heaters
- Reheat furnaces
- Furnace, kiln and boiler linings
- Incineration equipment and stack linings
- Soaking pit covers
- Ladle covers
- Ladle preheaters
- Forge furnaces

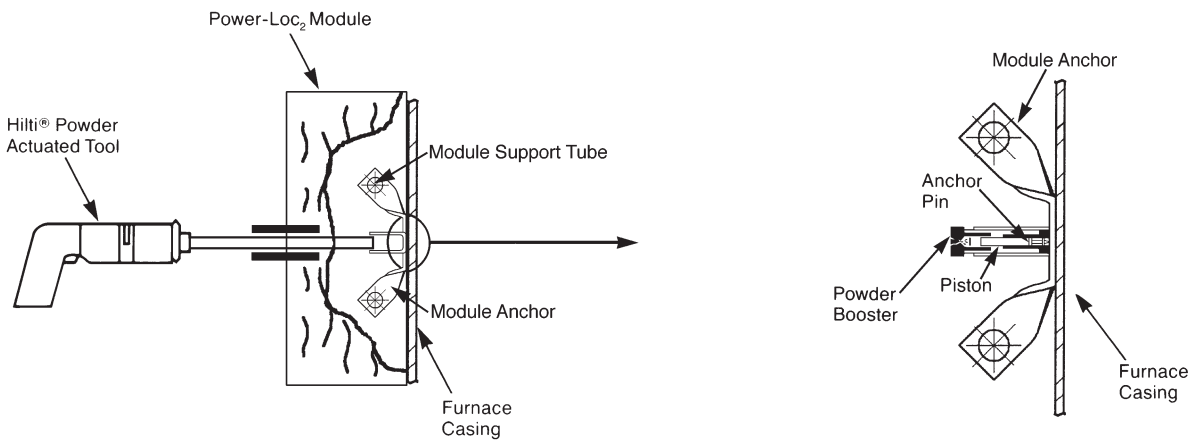
A. Weld-Loc^{®2} Attachment System



B. Thread Loc^{®2} Attachment System



C. Power-Loc^{®2} Attachment System



Anchor-Loc₂ Modules

Anchor-Loc₂ 2200 Modules – 128 kg/m³ (8 lbs/ft³)

Hot Face °C (°F)	Insulation Thickness – mm (in) Cold Face Temperature –	102 (4) °C (°F)	152 (6) °C (°F)	203 (8) °C (°F)	254 (10) °C (°F)
649 (1200)		75 (167)	61 (143)	53 (126)	49 (121)
871 (1600)		111 (232)	88 (192)	76 (169)	68 (155)
1093 (2000)		155 (312)	123 (255)	105 (221)	92 (199)

Anchor-Loc₂ 2200 Modules – 160 kg/m³ (10 lbs/ft³)

Hot Face °C (°F)	Insulation Thickness – mm (in) Cold Face Temperature –	102 (4) °C (°F)	152 (6) °C (°F)	203 (8) °C (°F)	254 (10) °C (°F)
649 (1200)		97 (160)	58 (137)	51 (125)	47 (117)
871 (1600)		104 (220)	83 (183)	72 (162)	64 (148)
1093 (2000)		143 (291)	114 (238)	97 (202)	86 (187)

Anchor-Loc₂ 2600 Modules – 160 kg/m³ (10 lbs/ft³)

Hot Face °C (°F)	Insulation Thickness – mm (in) Cold Face Temperature –	152 (6) °C (°F)	203 (8) °C (°F)	254 (10) °C (°F)	305 (12) °C (°F)
1149 (2100)		122 (252)	103 (219)	91 (197)	83 (182)
1260 (2300)		139 (283)	118 (245)	104 (220)	94 (202)
1316 (2400)		148 (299)	126 (259)	111 (232)	100 (212)

Anchor-Loc₂ 2600 Modules – 192 kg/m³ (12 lbs/ft³)

Hot Face °C (°F)	Insulation Thickness – mm (in) Cold Face Temperature –	152 (6) °C (°F)	203 (8) °C (°F)	254 (10) °C (°F)	305 (12) °C (°F)
1149 (2100)		117 (243)	100 (212)	88 (191)	80 (176)
1260 (2300)		133 (272)	113 (236)	100 (212)	90 (194)
1316 (2400)		141 (287)	120 (248)	106 (223)	95 (204)

All heat flow calculations are based on a surface emissivity factor of .90, an ambient temperature of 27°C (80°F) and zero wind velocity, unless otherwise stated.

All thermal conductivity values for Fiberfrax® materials have been measured in accordance with ASTM Test Procedure C-177. When comparing similar data, it is advisable to check the validity of all thermal conductivity values and ensure the resulting heat flow calculations are based on the same condition factors. Variations in any of these factors will result in significant differences in the calculated data.

For additional information about product performance or to identify the recommended product for your application, please contact the Unifrax Application Engineering Group at 716-278-3899.

