

Anchor-Loc Electric® Ceramic Fiber Module

Product/System Description

Anchor-Loc Electric® ceramic fiber modules combine the proven quality and dependability of Anchor-Loc® modules with the mechanical support features required in furnace designs utilizing electric heating elements.

The Fibermass® manufacturing technique used to fabricate Anchor-Loc Electric ceramic fiber modules utilizes a spun ceramic fiber blanket featuring high tensile strength for superior resistance to mechanical abuse and vibration. 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 Anchor-Loc Electric module is manufactured with ceramic support tubes embedded within the module. Ceramic or alloy "S" hooks are attached to the ceramic tubes during block installation and serve to support and isolate the element.

The Weld-Loc® attachment system, offered as the standard fastener for Anchor-Loc Electric modules, eliminates casing penetrations, making the system compatible with a variety of furnace atmospheres. During installation, the Weld-Loc stud assembly is fused to the furnace casing and a hex nut is torqued on the threaded stud, drawing the module to the casing plate. This system's design permits ease and speed of module installation.

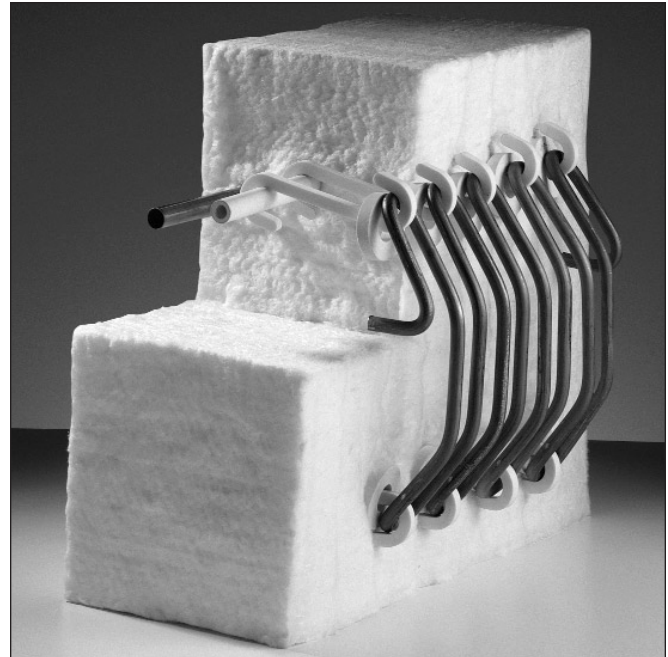
Product Features/Benefits

The Anchor-Loc Electric ceramic fiber module provides many of the features and benefits found in the Anchor-Loc₂ module product line:

- Resistance to thermal shock permits rapid furnace heat-up and cooling cycles.
- Low heat loss and reduced heat storage increases furnace efficiency for lower operating costs.
- Ease and speed of installation provide a fast furnace turn-around, reducing downtime and increasing productivity.

Additional advantages which are provided by the Anchor-Loc Electric system include:

- Flexible placement of element support hardware on the module lining.
- Complete electrical and thermal insulation of the furnace casing from the heating elements.
- Reduced maintenance due to enhanced block tensile strength.
- Enhanced thermal stability of the lining, reducing shrinkage gaps and openings between modules.



Applications

Anchor-Loc Electric modules element systems are compatible with furnace designs featuring air or protective gas atmospheres.

Typical applications include:

- Annealing Furnaces
- Normalizing Furnaces
- Tempering Furnaces
- Draw and Hardening Furnaces
- Brazing Furnaces
- Kilns
- Laboratory Furnaces

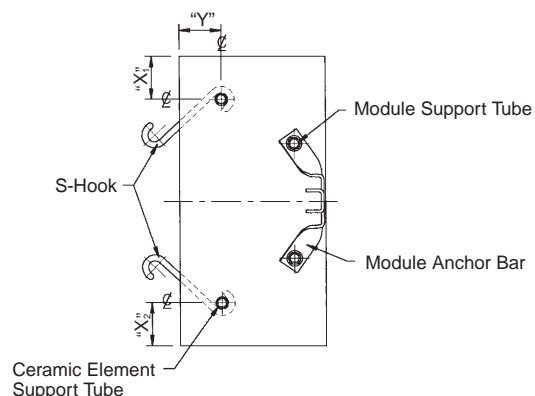
The Unifrax Application Engineering Department will combine the advantages and flexibility of Anchor-Loc Electric ceramic fiber modules with element heating systems to provide a customized design specific to customer requirements. The engineered solution incorporates custom module layout, installation drawings as well as installation support. Contact your local Field Sales Engineer or Fiberfrax Distributor for details.

Anchor-Loc Electric® Design Features

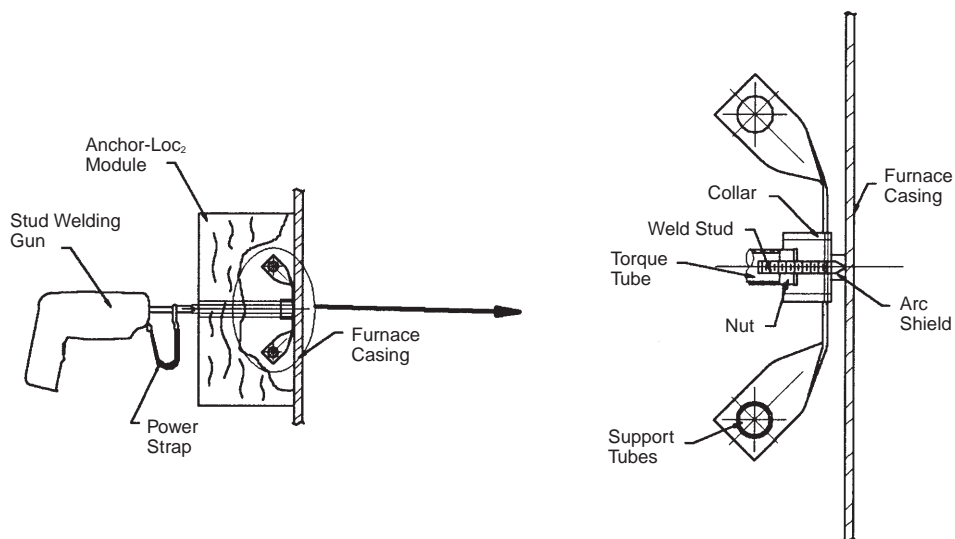
ELECTRIC ELEMENT SYSTEM CONFIGURATIONS

System Component	System Attribute
Element Compatibility	<ul style="list-style-type: none"> – Rod Overbend – Ribbon
Ceramic Support Tube (½" O.D. x ⅜" I.D. x 11½" OBE)	<ul style="list-style-type: none"> – Mullite (70% Al₂O₃, 30% SiO₂) – High Alumina (95% Al₂O₃, 5% SiO₂)
S-Hook (Ceramic or Alloy)	<ul style="list-style-type: none"> – High Alumina (96% Al₂O₃, 4% SiO₂) – 330SS – Inconel 601

ANCHOR-LOC ELECTRIC® MODULE (ELEVATION CROSS-SECTION)



A. Weld-Loc® Attachment System



Typical Product Parameters

Chemical Analysis

Anchor-Loc Electric Ceramic Fiber Module	2200°F	2600°F
Al ₂ O ₃	43-47%	29-31%
SiO ₂	53-57%	53-55%
ZrO ₂	—	15-17%
Trace Elements	<.5%	<.2%

Available Anchor-Loc Electric Ceramic Fiber Modules

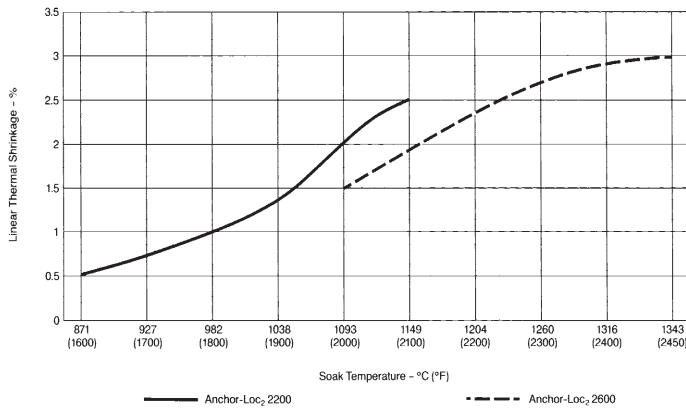
305 mm x 305 mm (12" x 12"), 305 mm x 152.5 mm (12" x 6"),
305 mm x 406.5 mm (12" x 16")

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-Loc Electric Thermal Shrinkage Data*



*Shrinkage test performed at soak temperature for 24 hours

Module Type	Temperature Grade	Recommended Operating Temperature
Anchor-Loc Electric 2200 Ceramic Fiber Module	1260°C (2300°F)	1149°C (2100°F)
Anchor-Loc Electric 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.



Anchor-Loc Electric Ceramic Fiber Modules

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

Hot Face °C (°F)	Insulation Thickness – mm (in) Cold Face Temperature – Degrees	102 (4) °C (°F)	152 (6) °C (°F)	203 (8) °C (°F)	254 (10) °C (°F)
649 (1200)		75 (167)	62 (143)	54 (130)	49 (121)
871 (1600)		111 (232)	89 (192)	76 (169)	68 (155)
1093 (2000)		155 (312)	124 (255)	105 (221)	93 (199)

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

Hot Face °C (°F)	Insulation Thickness – mm (in) Cold Face Temperature – Degrees	102 (4) °C (°F)	152 (6) °C (°F)	203 (8) °C (°F)	254 (10) °C (°F)
649 (1200)		71 (160)	58 (137)	51 (125)	47 (117)
871 (1600)		104 (220)	84 (183)	72 (162)	64 (148)
1093 (2000)		144 (291)	114 (238)	97 (206)	86 (187)

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

Hot Face °C (°F)	Insulation Thickness – mm (in) Cold Face Temperature – Degrees	152 (6) °C (°F)	203 (8) °C (°F)	254 (10) °C (°F)	305 (12) °C (°F)
1149 (2100)		122 (252)	104 (219)	92 (197)	83 (182)
1260 (2300)		139 (283)	118 (245)	104 (220)	94 (202)
1316 (2400)		148 (299)	126 (259)	111 (232)	100 (212)

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

Hot Face °C (°F)	Insulation Thickness – mm (in) Cold Face Temperature – Degrees	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)

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 716-278-3888.

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

