



Foamfrax™ High Temperature Insulation Installation Case Study #10

Full Thickness Sidewall High Temperature Insulation In Batch Forge Furnace

*Foamfrax High Temperature Insulation Composite System - 13.2”(335mm)
7”(178mm) Thick Foamfrax Grade I Fiber, 8 PCF (128 kg/m³)
6.2” (157mm) Thick Foamfrax Grade II Fiber, 8 PCF (128 kg/m³)*

Industry: Steel Processing
Location: NE United States
Installation Date: May 2001
Operating Temperature: 2300°F (1260°C)

More Information

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Due to repeated thermal cycling, the insulating firebrick sidewall of this batch forge furnace deteriorated significantly. A new brick bench was installed and Foamfrax High Temperature Insulation was selected for a 4'x25' wall section below the sidewall burners. For full thickness Foamfrax Insulation applications, plastic “spider netting” is adhered to the furnace shell and “V” anchors welded in place through the netting. Note that alloy support plates were welded in place to carry the weight of the plastic refractory burner row above the Foamfrax High Temperature Insulation.

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www.fiberfrax.com

www.isofrax.com

www.insulfrax.com

www.high-temperature-insulation.com

www.refractory-ceramic-fiber.com



Foamfrax Grade I Fiber High Temperature Insulation was then gunned into the spider netting and around the anchors. The impact velocity and homogeneous consistency of Foamfrax High Temperature Insulation allow it to flow/work around the “V” anchors without leaving pockets/voids in the lining system. The Foamfrax Grade I Fiber layer was installed to a 7” (178mm) thickness.



The balance of the wall thickness (6.2”, 158mm) was installed using Foamfrax Grade II Fiber High Temperature Insulation. The transition from Foamfrax Grade I Fiber to Foamfrax Grade II Fiber took place at the machine, where bags of Foamfrax Grade II Fiber were added.



For full thickness applications, the hot face surface must be troweled. A low density (foamy) surface coating of Foamfrax Grade II Fiber High Temperature Insulation was applied, and the hotface troweled smooth.



To control surface cracking of the Foamfrax High Temperature Insulation, score marks were made on a 2’x 2’ (610mm x 610mm) grid using a masonry “groover” trowel, similar to the type commonly used for concrete expansions joints.



Once the score marks were completed, the furnace was available for use.

After the anchors had been welded in place, actual installation of this full-thickness multi-layer, 1350 board foot application of Foamfrax High Temperature Insulation took less than two hours to complete.



This photograph was taken after 3 months of service at 2300°F (1260°C). Controlled cracking did occur at the score marks. The actual cracks were approximately 1/8” wide and extended ¼”-½” into the lining.

Taken cumulatively, this represents less than 1% linear shrinkage for the full thickness composite Foamfrax High Temperature Insulation system.

Following the installation of the composite Foamfrax full thickness High Temperature Insulation lining system, the following customer benefits were realized:

- **Turnkey Installation** - A specially trained Unifrax distributor/contractor was able to supply Foamfrax High Temperature Insulation materials, equipment, and installation as a complete package
- **Monolithic System** - A Foamfrax High Temperature Insulation Full Thickness Lining System provides the customer a lining system without joints and with all the inherent thermal properties of refractory ceramic fiber such as low heat loss and low heat storage.
- **Installation Speed** - Due to the quick installation of Foamfrax High Temperature Insulation, this full thickness installation took less than half a day and the furnace was then available for immediate service.
- **Universal Compatibility** - This monolithic Foamfrax High Temperature Insulation assembly was installed into an existing furnace lining where the product was mated to existing brick, plastic, and ceramic fiber surfaces. Foamfrax High Temperature Insulation provides universal compatibility with a wide range of existing refractory substrates and surrounds.

Foamfrax High Temperature Insulation is an advanced gunnable monolithic insulation system comprised primarily of **Fiberfrax** refractory ceramic fiber. There are several Foamfrax grades available, suitable for application under various conditions and temperatures.

Isofoam High Temperature Insulation is a similar product, comprised primarily of revolutionary **Isofrax** soluble fiber – to meet European Health & Safety regulations for in-vitro solubility of vitreous fibers.

Both advanced high temperature insulation materials are installed in the same manner.

For more information on **Unifrax** advanced foam high temperature insulation systems visit www.foamfrax.com or contact Unifrax I, LLC directly by e-mail: Foamfrax@unifrax.com

Foamfrax™ High Temperature Insulation is a registered product of Unifrax I, LLC

Unifrax I, LLC provides a wide range of woven and non-woven products for high temperature insulation, sealing and filtering applications

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