Aluminum

Customer Success Story

Industry	Aluminum
Application	Aluminum Melter Roof
Location	Northwest US
NUTEC Products	**MaxBlock MacroModule** Panels
Operating Temperature	2100°F (1150°C)
Installation Technique	Compressed Ceramic Fiber Products

NUTEC

Processing molten aluminum is a highly demanding application for refractory materials.

Molten metal contact and fluxing agents can significantly reduce the lifespan of standard refractories. To avoid costly and unexpected downtime, aluminum producers require refractory systems that are durable and easy to replace and maintain.

Learn more at nutec.com

The Challenge

Aluminum melters typically use hard refractory materials in molten aluminum sections designed for years of service. Non-contact sections of melters, however, are often insulated with fiber-based materials due to their lightweight structure, resistance to thermal shock, and superior energy efficiency compared to dense, hard refractories.

Despite these advantages, fiber linings in non-contact areas can face temperature spikes and chemical exposure, which may compromise their longevity.

Fig. 1 **NUTEC** engineers and fabricates **MacroModule** structural steel and expanded metal to fit each unique application

NUTEC Inc.

11830 Mt Holly-Huntersville Rd
Huntersville, NC 28078
USA

1 (704) 946-2427
info@nutec.com

The Solution

Re-insulating an existing melter roof is a labor-intensive and costly process. It requires a complete melter shutdown, removal of the old fiber insulation, re-installation, and a controlled restart to prevent thermal shock to the hard refractory. This process involves significant downtime and high installation costs.

To address these challenges, **NUTEC** created the **MacroModule System**—a fiber-lined panel solution that minimizes downtime and ensures reliable performance.

Considering these concerns, **NUTEC** has developed expertise in providing their **MacroModule System**.

Key Features of MacroModules:

- **Precision Manufacturing:** Panels are factory-insulated using high-quality fiber materials compressed onto an expanded metal support structure, meeting strict specifications for density and dimensions.
- **Ease of Replacement:** Panels can be quickly removed and replaced, minimizing interruptions to melter operations.
- **Cost-Effectiveness:** In applications where the structural steel remains intact, replacement kits with pre-fabricated fiber linings can be stocked and attached when needed, reducing material costs and replacement timelines.

Fig. 2 For special geometries, custom shapes are fabricated and installed to provide the best possible design

NUTEC Inc.
11830 Mt Holly-Huntersville Rd
Huntersville, NC 28078
USA
1 (704) 946-2427
info@nutec.com

Results and Benefits

The results and end-user benefits of using **MacroModules** in this application are minimized melter downtime and decreased removal and replacement costs. A significant benefit is the ability to have a replacement spare in stock for immediate installation when needed.

The quality of **MacroModules** is assured upon shipment. Relying on the skill of field installation to provide a quality fiber lining is not a variable when **MacroModules** are used.

Fig. 3 This melter roof was constructed in three sections to facilitate shipment and assembly

The Takeaway

NUTEC's experienced sales and application engineers ensure every **MacroModule System** is custom-designed to meet the specific needs of each aluminum melter. This tailored approach optimizes maintenance schedules, reduces costs, and aligns with production demands, giving users a robust and efficient solution for refractory insulation.

NUTEC Inc.

11830 Mt Holly-Huntersville Rd
Huntersville, NC 28078
USA

1 (704) 946-2427
info@nutec.com