

## UNIFRAX APPLICATION STORY



**Product Solution:** Fiberfrax® MX Grade Modules  
**Industry:** Ferrous  
**Application:** Galvanising Line – Furnace Roof  
**Location:** Costa Rica

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### Business Challenge

The combination of strength and formability, in addition to the abundance of iron ore, make steel one of civilisation's most important raw materials. The one weakness is its tendency to rust. For this reason, most (low-alloy) steel is painted, plated, or otherwise treated so the steel itself is not exposed to air and moisture. Galvanizing is an effective, low-cost way to improve the durability of bare steel, resulting in a surface finish that is more durable than paint alone, yet accepts paint as an additional layer of protection.

This continuous hot-dip coating process begins by cleaning the steel in a process unit that typically uses an alkaline liquid combined with brushing, rinsing, and drying. Then, the steel passes into the heating or annealing furnace to soften it and impart the desired strength and formability.

### Application

Part of the galvanising process employs the use of a Non-Oxidising Furnace (NOF). This typically has a high operating temperature, for this application the temperature was 1400 °C maximum. The OEM Company (based in France) responsible for the design and implementation of the continuous galvanising line were required to revamp the lining within the roof section of the furnace. This zone contains the burners and is a challenging environment, both thermally and physically. The client (based in Costa Rica) was looking for an effective low thermal mass lining for the furnace roof section. The roof area is where most heat losses are encountered. An Anchor-Loc® Module lining system was chosen as the ideal solution. This could provide the balance between thermal efficiency and service life with the added advantage of a simple installation technique.

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## Solution

Application Engineering designed a furnace lining based on proven Fiberfrax MX Grade Anchor-Loc® Modules. These modules have been used extensively in this type of application. They provide a balance between the physical demands of the environment and the need for a thermally efficient lining system. (Photo-1)

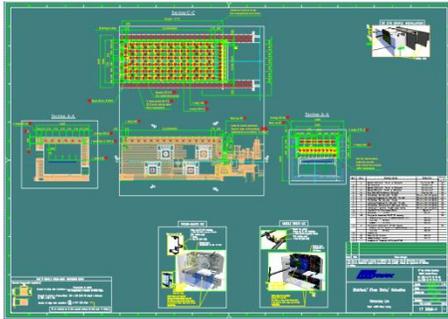


Photo-1 Lining drawing developed by Unifrax

The area lined was the arch with two nosing sections and a back wall. The lining consisted of a series of 300mm thick modules manufactured in Fiberfrax MX Grade. This is a special grade based on AZS (alumina-zirconia-silica) ceramic fibre chemistry and is unique to Unifrax. The RX2 type modules were supplied edge-stacked at a density of 210 kg/m<sup>3</sup>. The modules were installed in a unidirectional system with a single batten of MX Blanket, 25mm x 128 kg/m<sup>3</sup> between rows of modules. This was compressed down to 19mm during installation. A layer of Fiberfrax Durablanket SF (aluminium foil faced), 13mm thick was used as a back-up layer behind the modules. The walls were refractory brick lined.

(Photo-2 and Photo-3)



Photo-2 Special L Shape Modules



Photo-3 Modules during installation of the arch section

The arch area that was lined was rectangular, 4.715 metres long and 2.000 metres wide. The modules were supplied as square blocks 300 x 300mm. Special L shaped nosing modules were also incorporated into the lining. These were designed and supplied by Unifrax. Installation of the arch lining was carried out successfully and the unit returned safely to service. (Photo-4)



Photo-4 Special L shaped corner modules

Installation of the arch lining was carried out successfully and the unit returned to service on schedule. (Photo-5)



Photo-5 Completed lining after operation

## Customer Advantages

The Unifrax Application Engineering team worked closely with the client. The result was an engineered lining solution that met all of the application criteria. This was achieved by providing engineered drawings and project direction for the Fiberfrax MX grade Module installation.

The benefits enjoyed by the client were the fast installation of a proven lining system that combines thermal efficiency with good service life. The client is pleased with this solution and is looking to replace the brick walls with a module lining from Unifrax.

## About Unifrax

Unifrax is a global leader in high-performance specialty products used by many industries in a diverse group of industrial applications. Our products provide substantial improvement in thermal performance, save thousands of dollars in energy costs and can help reduce your operations environmental footprint.

## Contact Us

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