

UNIFRAX APPLICATION STORY



Product Solution: Fiberfrax® Z Grade Module
Industry: Ferrous
Application: Heat Treatment Furnace Roof
Location: Spain

NOVEMBER 2018

Business Challenge

Steel plants face a continuous challenge to produce large volumes of metal with consistent quality over extended campaigns. The production of certain parts and components require post production processes to enhance their properties. Most carbon steels and carbon alloy steels can be heat treated for the purpose of improving mechanical properties such as tensile and yield strength. This is accomplished due to the heat treatment fundamentally altering the microstructure of the steel.

It is essential that any heat treatment processes operate efficiently in all aspects. However, one of the key areas that benefit the furnace operator is thermal efficiency. Couple this with reduced maintenance and the operational advantages are significant in both the short and long term.

Application

One of the heat treatment furnaces used for the treatment of steel tubes was lined with ceramic fibre grade modules in the roof and part of the side walls. This was carried out by the former company known as Kerlane.

The lining was installed in 1991 and provided good service during its lifetime. A roof lining replacement was required in September 2017 during a scheduled maintenance shutdown. This shutdown required the replacement of the existing module lining with a new Anchor-Loc Module lining supplied by Unifrax.

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“A LINING SOLUTION THAT WILL NOT CAUSE COSTLY SHUTDOWNS”

Solution

The ideal solution for the new low thermal mass lining for the roof (and part of the walls and nosing) was Anchor-Loc Modules. These would meet the furnace operational temperature requirements as well as providing energy saving benefits during start up, soak and cooling down operations.

(Photo-1)



Photo-1 Roof modules being installed

The roof lining consisted of a series of 200mm (8") thick modules manufactured from Fiberfrax Durablanket Z Blanket. These were supplied edge-stacked, incorporating the unique RX2 side fixing internal anchor metalwork, at a density of 190 kg/m³ (12 PCF). The modules were installed in a unidirectional system with a single batten of Fiberfrax Durablanket Z, 25mm x 128 kg/m³ (1" x 8PCF) between rows of modules. This was compressed down to 17/18mm (11/16") during installation.

A layer of Fiberfrax Durablanket SF 128 kg/m³ (8pcf), 25mm (1") thick was used as a back-up behind the modules.

The original drawing produced for the lining/installation was drawn by hand (pre CAD era). This was located in the document archive at our facility in Lorette, France.

The roof area that was lined was 7.7 metres (25' 3") long and 5.9 metres (19' 4") wide. The modules were supplied as square blocks 300 x 300mm (12"x12"). These were cut around the refractory burner blocks. Special nosing modules were also supplied. Installation of the roof lining was carried out successfully.

(Photo-2 and Photo 3)

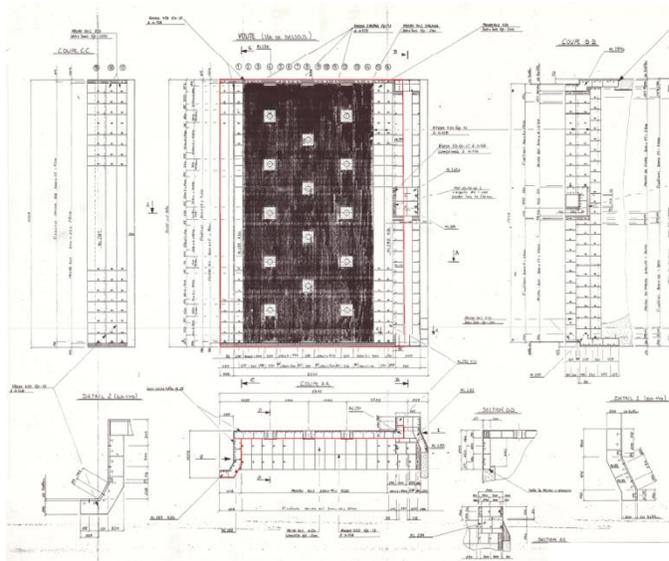


Photo-2 Original lining drawing



Photo-3 Lining after installation

The operating temperature was quoted as 1100 °C, however, based on our experience we have seen elevated temperatures local to the burners – the reason for a Z grade lining. The lining was installed on time and the furnace put back in operation.

(Photo-4)



Photo-4 Lining after firing

Advantages

Unifrax worked closely with the customer and developed an engineered solution based on current best practice using the latest Fiberfrax lining materials and module systems. This was accomplished by providing engineered drawings and project direction for the Anchor-Loc Module installation.

Benefits include a thermally stable lining with increased efficiency. The ease of installation allows for a shorter down time window, allowing the furnace to be put back into service upon completion.

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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