



Industry: Ceramics
Application: Roller Kiln Thermal Barrier
Product Solutions: Superwool Prime Blanket
Location: Europe

August 2021

The Challenge

A leading Ceramic Tile Manufacturer, are currently using Refractory Ceramic Fibre (RCF) 1260°C Blanket applied either side of the Ceraboard® 115 Board on the roof of their Roller Tile Kiln. The RCF blanket is used as a seal, covering the gaps between the kiln roof and the environment, further preventing heat from transferring between firing modules (Figure 2). The blanket is used as a thermal barrier to prevent heat loss and a safety shield for any employees inspecting the kiln roof.

Conscious to reduce the use of RCF with health & safety and regulatory pressures in mind, the performance of Low Biopersistent Fibres (LBP) in the ceramic industry has historically been poor compared to RCF.

LBP Alkaline Earth Silicate (AES) fibres perform poorly in the glass and ceramics industry due to the high levels of sodium oxide and potassium oxide compounds present. The glazes used to coat the ceramic tiles are high in these alkaline pollutants. During firing, these compounds volatilise from the tiles and react with the fibrous insulation. Depending on the chemical composition of the fibre, this can lead to friability, loss of strength and in severe cases melting.

The Manufacturer is considering replacing RCF with LBP fibre. The RCF blanket is in-use from 1-2 years, and the kiln is in continuous operation for 6 months before inspection.

Fibre is replaced if it shows deterioration. There is no approved replacement for Ceraboard 115. Previously AES blankets were trialed to seal the tile kiln roof, however the AES Blanket tested showed inferior performance compared to RCF.

The Manufacturer will convert to AES Blanket when the minimum 6-month performance is achieved. Twelve (12) month life performance would be exceeding their expectations.

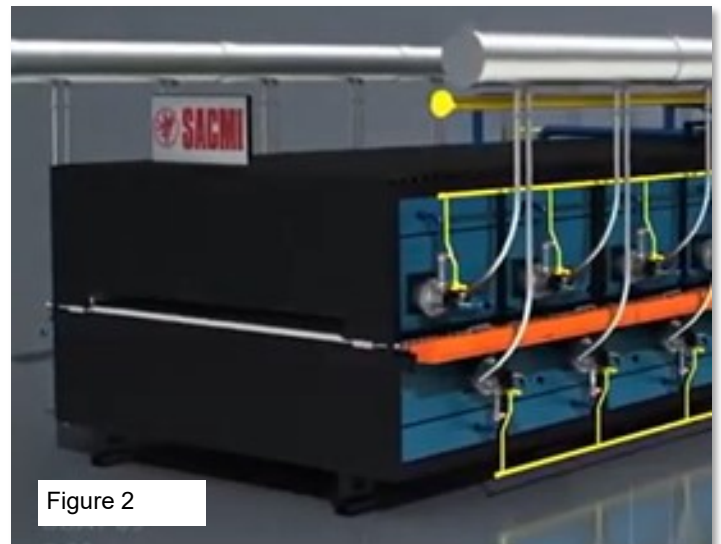


Figure 2

Case Study: Superwool[®] Prime for Roof in Ceramic Tile Kiln

Application Overview

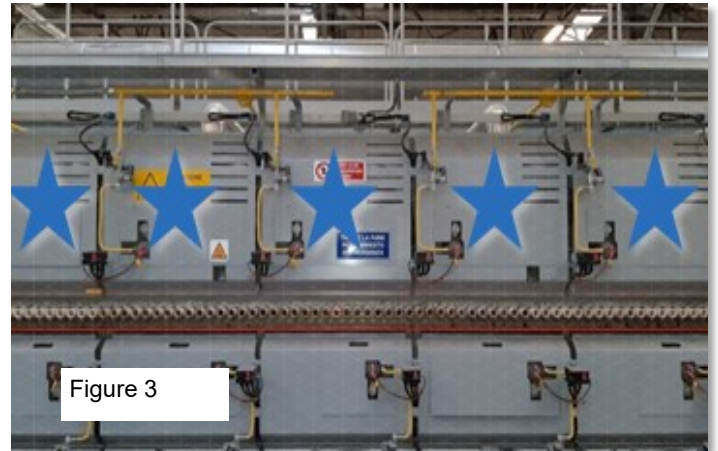
The Ceramic Tile Manufacturer use a SACMI[®] roller tile kiln to produce single-fired, porous stoneware and porcelain wall and floor tiles for household applications. The tile kiln is 120m long, comprising of 57 modules, 2.1m long (Figure 3 illustrated with blue stars). Each module is set at a different temperature; therefore, a temperature profile is created down the length of the kiln comprising of Preheating, Firing, Rapid Cooling and Cooling.

The maximum temperature in the firing zone is 1180°C (2156°F). To provide a barrier between each module and prevent heat-crossover; Ceraboard[®] 115 Board is used as a firewall and is suspended from the roof by metal brackets and ends just above the roller bed so tiles can freely pass through the modules and through the entire kiln.

The Solution

A leading Ceramic Tile Manufacture use a 3rd party installation company to maintain the insulation of the ceramic roller kiln. Morgan Advanced Materials have an excellent partnership with the installation company and discussed the use of Superwool Prime as an alternative for the RCF 1260 blanket.

Superwool Prime Blanket, 25mm thick and a density of 128kg/m³ was installed above one module in the ceramic kiln in August 2021, the first inspection will be December 2021 / January 2022. The installation area was the hottest area of the furnace at 1180°C, but within the maximum use temperature range of Superwool Prime Blanket.



Customer Impact

Depending on the condition of Superwool Prime after the 6-month operation, Morgan Advanced Materials will have further discussions with the Customer to replace RCF blanket in all areas of the furnace.

The primary benefit leading this Ceramic Tile Manufacturer to switch from RCF to an LBP AES fibre are the improved safety for their employees and contractors.

Employees, when working with RCF - install and material disposal - requires employees to wear Personal Protective Equipment (PPE) to limit exposure to RCF fibres. This is mandatory across many European countries, whereas there are no requirements for PPE with use of LBP AES fibres.

Additionally, the company will see reduced disposal costs; RCF requires 'special waste-streams' as this cannot enter landfill whereas LBP AES fibre can.

