

# Improvement in Kiln Insulation

## Improvement in Kiln Insulation using PCPF Wall Blocks

Generally used insulation in ceramic industries is Ceramic Fiber. However, there are many drawbacks associated with it, such as –

- It shrinks on prolonged use at higher temperature
- Loses its insulation properties after 2 – 3 years, as it starts absorbing moisture
- It develops huge gaps in-between the insulation, adding to the heat losses
- The broken pieces of fiber fall on the product, damaging the product quality
- Kiln undergoes maintenance every now and then
- Most important of all, its non – precautionary use may lead to increased chances of diseases like cancer
- In European countries, there is legislation on using the ceramic fiber – it is considered as Category – 1 B Carcinogenic and needs to carry a Danger sign on its packing.

It is recommended to insulate the Kiln Walls using 'Pre-Cast Pre-Fired (PCPF) Hollow Wall Blocks. Its technical parameters are as follows.

As all the industries Steel, Cement, Non metal, petroleum, all engineering industries progressed in more and more sophisticated, their requirement for precision and durability increased. The need for better, stronger, stable at extreme conditions of pressure or temperature or abrasion material increased.

The conventional Pressed Refractory fired at high temperature were found wanting in such critical situation. Newer system of manufacturing, newer material stronger and fired at low temperature for the ease of Transportation and movement, far more stable were found. The unique ability to be formed in any shape you want, gave the designer a vastly improved area of working. These are pre cast, and pre fired to the precision required. The use of Hydraulic and Ceramic bonding simultaneous make these a unique material.

Historically, all the kilns were lined by pressed, standard sized bricks in all the cases in 9" or 12" series. So the wall thickness in all the kilns and furnaces were either 12-18 or 24 inches thick, irrespective of its requirement. Anything less than 9" long was not available and hence they will use only this. Material like The Ceramic Fibre, the ULTRALITE, the Vermiculite got discovered in the last ten to twenty years.

Using this complete knowledge now the wall thickness can be made much lighter keeping the hot face of say 4.5" instead of 9" and design such blocks with cavity which will hold much superior insulating material like ULTRALITE etc.

This reduces the weight of the wall drastically. Keeping the solid part as required gave this wall a lasting life - Far more than a complete wall of ceramic fibre wall. Some pictures are shown in the attached email. The comparison between a solid brick wall, ceramic fibre wall and PCPF wall block is given here to highlight the energy efficiency of these wall blocks.

The fact remains that the new blocks will give far more stability at high temperature while keeping the fuel efficiency improved.

1 M <sup>3</sup> Weight Comparison								
PCPF Block			Fiber			HFK		
Weight	1024 kg	(32 pcs)	Weight	250 kg	(11 pcs)	Weight	936 kg	(468 pcs)
Cost	80,000.00		Cost	8,800.00		Cost	32,760.00	
Per Kg Cost	78.125			35.20			35.00	

