

INNOVATIVE SEALING STRIP IMPROVES OPERATION OF CARBON BAKE FURNACE LININGS

Prevention of packing material from entering refractory expansion joints is extremely important in carbon bake furnaces employed for baking anodes used in aluminium reduction cells.

CUSTOMER PAIN

Critical locations for the expansion joints are at the corners of the baking pits, where the head walls and flue walls butt together vertically.

Room for expansion is built into these joints, leaving an open space from top to bottom. But, if any solid material enters this area, expansion of the joint can be restricted and damage to the refractory can result. Before anodes are packed into the pits, these spaces must be sealed to prevent packing material (coke) from entering the joint throughout the duration of the firing cycle.

CONVENTIONAL PRODUCT

Traditionally, there were only two ways to seal this opening while still allowing for proper expansion.

One solution was to fill the crack with a material that would last for the duration of the heating process. The materials used must fill the opening while still remaining flexible enough to allow the refractory to expand.

Another technique for sealing this joint is to cover it with a material that will adhere to each side of the joint and cover the crack, preventing coke passing into the joint for the duration of the firing cycle.

PRODUCT DEVELOPMENT

Pyrotek now offers an alternative product for efficiently sealing pit corners, in the form of Pit Corner Sealing Strip, which is made from an aluminium foil-faced waste wool / cotton blend material, with a minimum of 30% waste wool, and an integral self-adhesive backing.

Many of factors led to the new product development based on Pyrotek's previous key expertise in parallel material advances and applications across the metals process industry.



Pit Sealing Strip material from Pyrotek, Inc.

Several years ago, Keith Pigdon, Branch Manager at Pyrotek Pty Ltd in Geelong, Australia, was involved in helping a major customer find an adequate replacement for previously used ceramic fibre-based materials in sealing pit corners. Several products were evaluated, including a waste wool product, and this alternative proved satisfactory in the application for several years. That material was supplied in 14 ft (4.2m) lengths and was bonded to the refractory using PVA glue.

Subsequently, Keith Pigdon and, Pablo Dorado, Sales Engineer at Pyrotek Pty Ltd plant in Geelong, Victoria, responsible for Portland, worked with George Tsitos, Soundguard General Manager, Pyrotek Sydney and his dedicated manufacturing production team in Australia to further refine a material which could offer

significantly improved properties and performance compared with both previously used products and also the latest alternative. Soundguard has built up a combination of overall expertise in materials, equipment, production technologies and project skills, which can also find applications in high temperature processes.

What is now a next generation product, the new strip was designed and developed with an integral adhesive and peel-off backing, making installation and use much easier and convenient than with former products.

The Pit Corner Sealing Strip is supplied as standard 4.7 in x ~40 in x 0.4 in thick (120 mm wide x 1000 mm long x 10 mm). Custom sizes are also available. The protection paper is peeled from the self-adhesive backing and the installer places the strip across the corner. It is then pressed into the joint with a trowel to adhere the strip to the refractory. These strips are installed in 1 m lengths as a safety measure. In Australia, installation is typically carried out by operators using a hydraulic platform inside the furnace pit, working their way up the pit walls vertically 1 m at a time.

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