



Case History

Application: Tunnel kiln firing face brick

Operating Temperature: 1920°F - 2100°F

Emisshield® Product Used: Emisshield® ST-3 (US Patent 6,921,431)

The Kiln: This was a 1978-vintage Lingl tunnel kiln having a total length of 162 meters. This kiln has a capacity of 50 million bricks per year. The fireclay refractory coated was in excellent condition, with few spalls and cracks, although the surface was iron stained.

Application of Emisshield®: Any necessary refractory repairs were made to the lining before the refractory was prepared for spraying. Expansion joints were packed with ceramic fiber and all ports were packed with paper. The thermocouples were either removed or masked with paper and tape before spraying. Loose brick and mortar were knocked off the walls and crown. Finally, the construction dust and the small amount of combustion residue adhering to the refractory were brushed off. No sandblasting or other surface preparation was necessary. The coating was applied to the walls, crown and burner blocks with a HVLP sprayer in the 50 meter soak zone only.



Spraying Emisshield® ST-3 on the firing zone walls

C-19, 11/06

Results after applying Emisshield®: The kiln was put into service the day after the spraying was completed. After the kiln had stabilized, the burners were incrementally turned down to achieve the same degree of burning that was experienced before the Emisshield® was applied. The use of the coating resulted in a more even temperature distribution. One product, which had a particularly sensitive conversion temperature, showed a 100% yield in the Emisshield®-coated kiln. It was demonstrated that when increased production was needed, the push rate could be increased from 35 minutes to 30 minutes, a 14% improvement in productivity with no adverse effect on color or physical properties. After several months of production, an energy balance and audit showed that natural gas savings were in the 8-10% range, the greater savings occurring at the higher push rates. It was thought that spraying the preheat section would result in additional savings.



The kiln air-drying after completion of spraying Emisshield® ST-3