



## Case History

**Application:** Tunnel kiln firing high purity, high alumina refractory brick

**Operating Temperature:** 2770°F Maximum

**Emisshield® Product Used:** Emisshield® ST-2 (US Patent 6,921,431)

**The Kiln:** This tunnel kiln is at least fifty years old and has been in continuous use since its construction. The preheat zone was lined with super duty fireclay brick and the burning zone was lined with high duty silica brick. The refractory products fired in this kiln include phosphate bonded bauxite brick and high purity high alumina brick. Firing temperatures range from 2500°F to 2770°F. This kiln is gas fired.

**Application of Emisshield®:** Any loose materials adhering to the refractory brick were brushed off then the entire lining to be coated was vacuumed to remove loose particulate. Any friable bricks of broken refractory were also removed to provide a substrate of good integrity. Emisshield® ST-2 was applied to the refractory by spraying with a HVLP sprayer. The application of the coating was confined to the preheat and burning zones of the kiln.

**Results after applying Emisshield®:** The kiln was put back into service immediately following the application of the Emisshield®. It was immediately noticed that the brick in the coated furnace were being fired 30°F to 60°F hotter at the pre-coating burner settings. The burners were turned down to return the firing temperature of the ware to the desired level. In the first month of operation, the average gas usage per day dropped from 476 MCF to 371 MCF, a 22.1% savings. Monitoring gas usage in subsequent months showed that at slower push rates, the fuel savings was not as great as the months with higher push rates. The monthly fuel savings in the first year of service, as measured in MCF/MT of production ranged from 8% to 26%, and averaged 16%. Since this kiln is of an older design and does not benefit from more modern kiln technologies, it was not unusual that brick in the center of the hacks on each car were frequently under-burned. After the coating was applied, under-burning was virtually eliminated. In addition, the kiln atmosphere was noticeably cleaner. The Emisshield® coating provided even radiative heating that more completely combusted fuel.

C16, rev.1-4/06