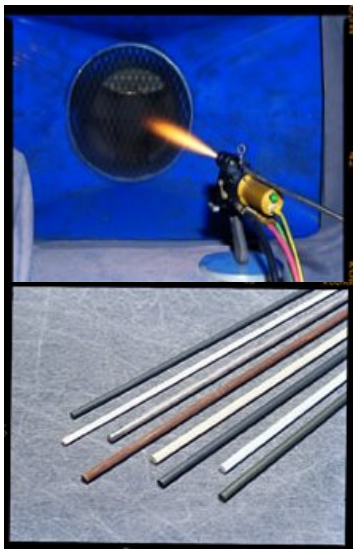


FLUIDIZED-BED BOILER TUBE COATING SYSTEM.

INDUSTRY
Power Generation
(Fluidized Bed Boilers)

PRODUCT
Rokide Ceramic Coatings

MATERIAL
Rokide C
(Chrome Oxide)

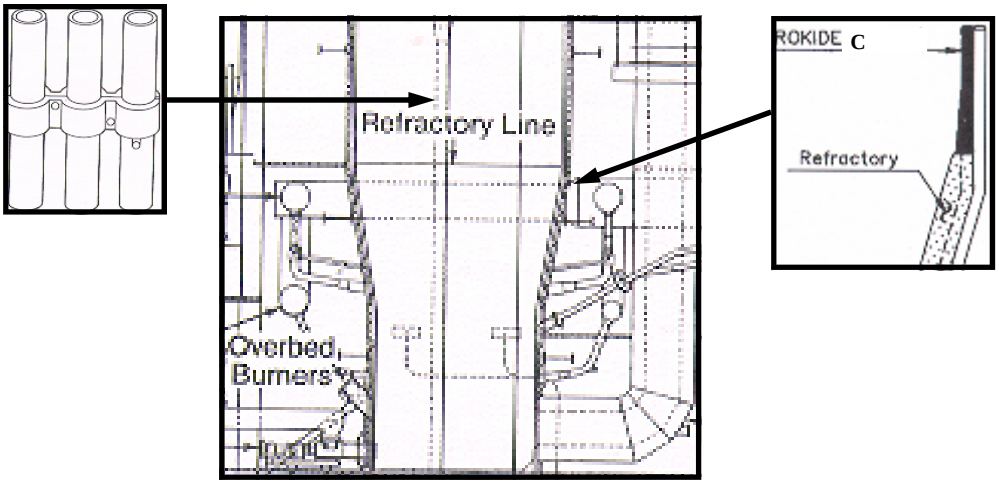
INTRODUCTION

In recent years there has been a marked increase in the installation and use of fluidized-bed boilers. Reduced construction time and the ability to design output to match feed stock availability have been major reasons for use of this design concept.
Early on, some installations experienced severe erosion of the waterwall tubes in an area just above the refractory shelf. The cause was attributed to the turbulence resulting from the cascading of the bed material and products of combustion on the walls of the boiler (see figure below).

The problem was addressed by the O.E.M.s and one of the solutions investigated was the use of metal and/or ceramic coatings. The initial field results proved promising. The next step involved testing of coatings applied by various coating systems. As a result of this testing, ROKIDE C was proven to be the coating of choice. Additional testing by a major power company confirmed the initial results.

OPERATING RESULTS

The first fluidized-bed boiler was coated in May 1990. Locations throughout the United States and Canada are now being protected by ROKIDE C coatings. The success of these coatings has encouraged locations with multiple boilers to schedule ROKIDE Installations on their unprotected equipment. Field reports indicate that limited wear is experienced on units protected by ROKIDE C . In one case, only .001" erosion was measured after nearly a year in service.



Circulating Fluidized Bed Boiler schematic

COATING PROCEDURE

The surfaces to be coated are pressure blasted using aluminum oxide abrasive to assure maximum adherence of the ceramic coating. The next step in the coating process is to apply a nickel chrome (80/20) undercoat with the ROKIDE spray unit. The undercoat provides increased bond strength and minimizes the problems associated with the differential in thermal expansion between the metal substrate and the ceramic coating. Spraying the ROKIDE C coating is the final application process.

continued on back

ROKIDE SPRAY SYSTEM ADVANTAGES

The ROKIDE spray system is unique because it utilizes ceramic oxide rods. The rods are melted in a patented spray unit which projects the fully molten particles onto the substrate. The ROKIDE particles cannot leave the spray unit fully molten. These particles have high kinetic energy and high thermal mass, so they remain molten until they reach the substrate. ROKIDE coatings, therefore have higher particle-to-particle cohesive bonding.

The ROKIDE system also costs less to purchase, install, operate, and maintain. This process requires no water or inert gases. Maintenance can be done in-house and does not normally require outside technical assistance. Because of the minimal support needs of the ROKIDE system, on-site coating operations can be setup with relative ease.

CONCLUSIONS

The importance of boiler availability has forced operators to search for materials and methods to prevent unplanned outages. ROKIDE ceramic coatings are a viable solution to the tube wear problem in fluidized-bed boilers. The application process is as important as the material used in solving wear problems.

BACKGROUND

To solve wear and corrosion problems in difficult application environments, SAINT-GOBAIN GRAINS AND POWDERS has years of experience in many fluid handling (pump) applications in other industries.
ROKIDE is frequently specified as a wear and corrosion solution to extend the life of pump parts in many industries.
In the ROKIDE process, ceramic rods are melted, atomized and sprayed at high velocity 550 ft/sc (170m/sc) on the surface to be protected.
ROKIDE forms an extremely hard, flexible and chemically inert coating that can be used as sprayed or finish ground to a specified tolerance.

Providing Global Solutions To Your Wear Problems Solutions

Our companies are solution-oriented. We assess your problem, present realistic options, and engineer wear systems that are appropriate for your operating environment. Our expertise in material science, our computer design technology, our unique shaping capabilities, and our expertise in attachment techniques give us the technical edge when it comes to solving wear problems. No matter where you are in the world, our full line of products and technical support are as close as your nearest Coating Solutions representative. Our sales offices are located throughout Europe, North and South America, Asia, India and Australia.

Materials

- Thermal Spray Powders
- *Rokide Rods*
- *Flexible Cord*
- *TUF COTE*
- Hardfacing Powders
- Anticorrosion wires

Equipment

- Rokide Ceramic Spray Systems
- Master-jet Spray Equipment

Applications

- Powdered Metal Reaction Barriers
- Mechanical Parts
- Wire Drawing Capstans
- Pumps, Valves
- Thermal Barrier for Power Generation
- Anti-Corrosion Coatings

Market Served

- Powdered Metal
- Petrochemical
- Wire Manufacturing
- Aerospace
- Hot Metal Extrusion
- Land Based Gas Turbine
- Pulp & Paper Manufacturing
- Chemical Processing
- Environmental Industries
- Glass bottle manufacturing

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