Ceramic ball and body of rotary control valve are still in like-new condition after months of service with extremely erosive slurry

Ceramic ball valve controls erosive slurry without obvious wear

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New Solutions to Plant Problems

Problem: The Pensacola, FL plant of Armstrong World Industries, one of the world's largest manufacturers of acoustic ceiling board and tiles, was dissatisfied with a ball valve that had a maximum service life of six months. The air-operated valve controls the flow of an extremely erosive slurry that is pumped from a holding tank. The horizontal centrifugal pump of HC-250 alloy has survived the erosive slurry for over ten years, but a new valve had to be installed two or three times each year due to excessive wear and leakage.

The valve was examined for wear every six weeks as part of the plant's preventive maintenance program, but sometimes failed and had to be replaced in the interim. The cost of replacing several valves a year, plus occasional unscheduled downtime, was unacceptable.

Solution: In September 1983, a rotary control valve specially designed for extremely corrosive, abrasive and erosive service was installed in the slurry line. All critical wetted parts of the valve are cast alumina ceramic (Al_2O_3), a material next to diamond in hardness and almost impervious to wear, and resistant to strong acids and alkalis. Shaft materials include ceramic, stainless steel, Hastelloy® alloy, alloy 20 and titanium. The ceramic ball, body and end sections, which include tapped holes for pipe flanges, are completely encased in a steel housing for maximum strength and protection. The valve was awarded Top Honors for control valves in the 1984 CHEMICAL PROCESSING Vaaler competition.

The valve is rated for pressures to 150 psi and temperatures to 400°F It is available in eight sizes from ½ through 8", and with a choice of manual and pneumatic actuators for on-off and throttling.

Results: The 2" ceramic rotary control valve and pneumatic actuator have been trouble-free since they were installed in September, 1983. The award-winning valve has been inspected every six weeks and is still without visible signs of wear by the erosive slurry. The cost of the valve was repaid within the first year, and the indefinite projected service life will provide additional savings.

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