



Solid ceramic ball valve saves \$18,000, reduces down-time

99.9% alumina valve effective in abrasive fluid application

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A control valve of 99% solid alumina lasted six times longer than any valve previously installed in a lime recovery operation at the Weyerhaeuser Paper Co. in Longview, Wash. The valve controls the highly abrasive slurry, or "mud", discharged from the white liquor echo filter. The discharged slurry is stored and then sent to a lime kiln as part of the recovery process.

The slurry contains sodium hydroxide, sodium polysulfide, and calcium carbonate. It is 62.6% solids, has a specific gravity of 1.3, a pH of 13 and an operating temperature approaching 190°F.

Valves previously used for the application typically lasted about 12 weeks. Replacing the control valve meant taking the entire filter off line. It took two to three hours to change out the valve. Because the process had to be shut down and started up again the entire operation could take a total of 8 to 10 hours.

Corrosion and abrasion resistance

The first ceramic valve installed was 99% alumina. It lasted 18 months in service before a small crack appeared, apparently caused by chemical attack. Because the valve carried a two-year warranty, the supplier provided a new valve. This time the valve was made of 99.9%, high-purity alumina. It has been in service for nine months.

Alumina ceramic resists corrosion and has outstanding wear resistance because



Ceramic valve of 99% alumina lasted 18 months in service before evidencing corrosion shown. Valve of 99.9% alumina is projected to last even longer.

it has a hardness next to diamond and is superior to metals and stellite materials in wear resistance. Alumina ceramics are inert to oxidation, and are not corroded by most chemical agents.

The valve's body, ball, end sockets and stem are solid ceramic. They are contained by a metal housing. The metal clamping of the housing uses the compressive strength of the material to hold the components together as a single body. This eliminates problems associated with different metal and ceramic expansion rates.

The 99% alumina valve costs about 3 times as much as a stainless steel valve. For the lime recovery application the valve lasted so much longer that the cost was justified. During the 18 months that the 99% alumina valve lasted, the valves previously used would have been replaced nine times. A quick calculation indicates a cost sav-

ings of about \$18,000.

Besides valve costs, less frequent change-outs meant a tremendous saving resulting from less down-time. Any required valve inspections can be performed during regularly scheduled down-times.

The 99.9% alumina valve is about 20-30% more expensive than the 99% alumina valve. But again, it is anticipated that the increased cost will be justified by longer service life of the purer alumina valve.

Because they hold up so well against the abrasiveness of the lime slurry, the solid ceramic valves are now being used elsewhere in the mill, including for flow control through the green liquor filter downstream in the process.

Fine ceramic rotary control valves - Fujikin of America, Inc., Little Ferry, NJ