Cosmix Valve Replaces Zirconia; Quadruples Service Life

Dino L. Tsapatsaris, Fujikin of America

Millennium Inorganic Chemicals is the world's second-largest producer of titanium dioxide (after acquiring the TiO_2 assets of Rhône-Poulenc), a white pigment which is a critical ingredient used in coatings, paints, plastics, rubber, and other applications. It is also the largest merchant seller of titanium tetrachloride ($TiCl_4$) which is used as the raw material in titanium metal production and in other manufacturing processes.

The chloride-process rutile plant located in Ashtabula, Ohio could not get more than 4~6 months service in a waste acid level control service. This process consisted of 20%~30% suspended solids in a hydrochloric acid / ferric chloride solution at 70°F~150°F and 40 psig differential pressure.

A competitive zirconia ceramic round-ported ball valve with Monel® trim would offer only 4~6 months of service in this process before requiring repair or complete replacement. A considerable amount of stem wear was apparent only weeks after installation, which resulted in reduced control accuracy. A more serious effect of the stem wear was the cracking and chipping at the ball stem-slot, rendering the valve inoperable and causing the process line to be completely shut down for emergency repair. Expensive replacement parts with lead-times in excess of six months prompted Millennium to seek an alternative solution to this problem.

A standard 2" solid 99.5% alumina ceramic Cosmix ball valve with a C_v 25 equal-percent characteristic trim, Hastelloy-C® stem, and Viton® O-Rings was shipped ex-local stock and installed in May 1998. The valve assembly carried a 24-month comprehensive warranty that covered corrosion, abrasion, and/or faulty workmanship.

Three months after installation, a modification to the pump to increase the flow in the line required a valve with a higher capacity. As all replacement parts in the Cosmix valve are fully interchangeable, a new larger capacity trim ball with a C_v 50 was shipped via next-day courier to allow the valve to accommodate this increased flow requirement. The line needed to be isolated for less than half an hour while this retrofit was performed and the valve inspected.

To date, the valve is still in service - having provided an increased level of control accuracy for over 21 months. No corrosion or stem wear was visible three months after installation, when the valve was dismantled and retrofitted with a new ball.

Fujikin of America, Inc
4 Alsan Way, Little Ferry, NJ 07643
Tel: 201-641-1119, Fax: 201-641-1137
www.fujikin.com