

Application Reference

Fujikin of America, Inc.

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1,000°F - High Temperature



<u>Customer:</u>	Kemira Pigments, Inc. Savannah, GA
<u>Representative:</u>	GPM Equipment Sales, Inc. Marietta, GA
<u>Salesperson:</u>	Jim Semler
<u>Installation Date:</u>	September, 1996
<u>Valve Size:</u>	3" Cosmix, C _v O195
<u>Actuation:</u>	EI-O-Matic ESN-200 PMV P-2000
<u>Process:</u>	97.7% TiCl ₄ vapor 1.3% AlCl ₃ vapor 1% Cl ₂ vapor
<u>Temperature:</u>	450°C (842°F) continuous 530°C (986°F) maximum
<u>Pressure:</u>	15 psig maximum, 8 psig normal
<u>Flow:</u>	176 SCFM

Kemira Inc., one of the world's largest supplier of pigments and titanium dioxide (TiO₂), is currently enjoying the tremendous benefits only a Fujikin ceramic valve can offer. Two 3" Cosmix ceramic valves were supplied to handle TiCl₄ vapor (commonly referred to as "tickle") at 450°C (842°F) normal, 530°C (986°F) maximum. Since the media is highly aggressive - especially at such elevated temperatures - the piping system is fully lined with 2-3 inches of ceramic, making the ID equivalent to that of a 3" pipe, but the OD equivalent to a 6". Hence, a 6" ANSI 150# flange was welded to the cast stainless steel housing to enable use of a 3" valve in an effective 6" piping system.

The elastomeric packing materials were removed from our standard Cosmix valve, and replaced with graphite. With a small modification to the stem, and replacement of the standard CPTFE / Viton® stem-packing with a graphite and carbon stem-packing arrangement, the valve was ready to operate at +1,000°F. Since ceramics are by nature insulating materials, and have an extremely low coefficient of expansion, the varying amounts of expansion pose absolutely no harm to the integrity of the valve's safe and effective operation.

A specially elevated mounting pad and finned coupling had was installed in order to dissipate heat from the Hastelloy C® stem, and to enable the actuator to operate at its nominal temperature limits. This high-temperature (>275°C / 500°F) option is a 25% to 30% adder to the list price of the valve, and delivery is 3-4 weeks (6" and 8" allow 5 weeks) for the modification. This option may be installed in all Cosmix ball valves offered by Fujikin, and the process must be compatible with carbon-based packing materials.