Kalrez® Spectrum™

From DuPont Performance Elastomers

Dow AgroSciences switches to O-rings of Kalrez® Spectrum™ 6375 and gains greatly extended seal lifetime

Kalrez® Spectrum™ 6375 perfluoroelastomer O-rings fitted to filling machine valves (seen here), processing aggressive solvents, surfactants and concentrated herbicides at Dow AgroSciences plant in France, provide at least 2 months operating lifetime, compared with seals of PTFE that fail in 24 hours.

By switching from O-rings of PTFE to DuPont Performance Elastomers Kalrez® Spectrum™ 6375 perfluoroelastomer parts at its plant in Drusenheim, France, Dow AgroSciences S.A. has seen seal lifetime increase from an average of one day to two months, leading to greater availability of its filling machines, major improvements in safety and reliability, reduced maintenance, and cost savings, reports Michel Blondel, mechanical maintenance leader at the plant (seen here).

Dow AgroSciences S.A., of Drusenheim, France, a global leader in pest management and biotechnology products, has recently extended the lifetime of dynamic and static seals fitted to its product filling line from one day to an average of *two months*, an improvement of some 6,000%, by replacing O-ring seals of PTFE with DuPont Performance Elastomers Kalrez® Spectrum™ 6375 perfluoroelastomer parts.

In a different application at the same plant, seals of FEP/FKM, fitted to the piston rod of a Type SRC Alfa Laval valve, failed regularly after only 8 hours operation. These seals have now been replaced by Kalrez® perfluoroelastomer parts. The result? Operating lifetime has now increased from 8 hours to between *8-12 months!*

The problem

The filling line at Dow AgroSciences plant in France processes aggressive solvents, surfactants and concentrated herbicides at temperatures ranging from 10 to 45°C, and pressures from 1.5 to 3.5 bars Eff. Filling machine valves on the line were fitted with dynamic PTFE O-ring seals, while the machine hoses were equipped with static O-rings, also of PTFE.

Michel Blondel, mechanical maintenance leader at the plant, explains the problem. "Each time we performed a clean-in-place procedure at 80°C, or made a product change on the filler, the PTFE seals became mechanically damaged. This meant we had to change the PTFE O-rings on a daily basis, since seal lifetime never extended beyond 24 hours before replacement."

The cost to Dow AgroSciences in extra performance time and maintenance had become unacceptable, and the company sought a much more resilient sealing material that would withstand frequent cleaning and product changes, and offer greatly extended seal lifetime.

Material chosen and why

In conjunction with one of our Kalrez® Authorized Distributors, Michel Blondel installed dynamic and static O-rings of Kalrez® Spectrum™ 6375 perfluoroelastomer to replace the PTFE seals, with dramatic and immediate improvement. Even more dramatic seal lifetime gains – from 8 hours to as much as 12 months – have been experienced by replacing FEP/FKM valve seals with Kalrez® perfluoroelastomer parts in another area of the plant, Mr. Blondel reports.

Kalrez® Spectrum™ 6375 is designed specifically for the chemical process industry. It provides outstanding performance in an extremely wide range of chemicals including acids, bases, amines and steam. The innovative patented curing system allows for continuous upper service temperatures of up to 275°C in applications such as mechanical seals, valves, flanges and pumps where elastomeric sealing is critical.

In addition, Kalrez® is a thermoset perfluoroelastomer and offers excellent elastic properties and resistance to mechanical damage, unlike PTFE which is a thermoplastic and appears to lack the necessary resilience to withstand mechanical shock in a process application such as this.

Benefits gained

Since switching to custom O-rings of Kalrez® Spectrum™ 6375, Dow AgroSciences S.A. reports an average seal lifetime of two months. That's an increase of approximately 6,000% over the previously fitted PTFE seals.

"Kalrez® Spectrum™ 6375 allows us to increase the operating uptime of our filling machines and to improve overall reliability of our packing line. We have also significantly reduced the time spent in O-ring replacement," says Michel Blondel.

He also reports cost savings as a result of major improvements in safety and reliability, and in reduced maintenance.

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