Garlock

Case Study: Success at Water Reclamation Plant in Semiconductor Industry

INDUSTRY

Semiconductor – Microelectronics Water Reclamation

BACKGROUND

An Engineering and Construction (EPC) firm central to the water processing industry approached Garlock for assistance selecting sealing solutions for a new water reclamation facility at a microelectronics plant. Semiconductor manufacturing consumes significant amounts of water, resulting in large amounts of water and chemical waste, which must be reclaimed and ideally reused in the process. Ideally the solution would be a single high-performance, chemically resistant product able to handle the diverse process chemicals that would also work in low load non-metallic flat face and raised face metallic flanges under various conditions.

CHALLENGES FACED

The reclamation processes involved the handling of a wide range of chemical by-products in the waste stream, including concentrated acid (sulfuric acid and hydrofluoric acid), strong caustics (sodium hydroxide), hydrogen peroxide, alcohols, solvents, and other proprietary chemical blends. Also critical to semiconductor production is ultrapure water (UPW) and potable water systems where purity is critical. Traditionally, multiple gasket types were required to handle the wide variety of chemicals, purity requirements, and types of flange connections (non-metallic and metallic piping). The application of the wrong gasket could result in system upsets, loss of production time, and unsafe conditions.

OPERATING CONDITIONS

Size: 1/2" to 8"

Temperature: Ambient to 250°F

Media: Acidic (sulfuric and hydrofluoric) and alkaline (sodium hydroxide) wastewater, hydrogen peroxide, solvents, spent acids, city potable water, spent ultrapure water, gaseous oxygen, deionized water

Pressure: Atmospheric to 250 psig

SOLUTION AND BENEFITS

Garlock recommended the STRESS SAVER® Style 3522 Gasket, a 100% pure and restructured PTFE gasket, for its resistance to permeation, chemical compatibility with aggressive substances, and unique raised-rib design that ensures superior sealing on non-metallic piping systems. The gasket's reduced contact area design results in low torque requirements, making it effective for both metallic and non-metallic piping systems, including PVDF, PVC, CPVC, and FRP. The STRESS SAVER® is also certified to meet ANSI/CAN/NSF 61 standards for use in potable water systems, simplifying gasket selection across the facility. Since installation, the facility has reported zero gasket-related leaks and no required maintenance. The STRESS SAVER® streamlined the plant's gasketing inventory, eliminated the possibility of misapplication, and enhanced safety and reliability in sealing performance.

For more information, please visit:
http://www.garlock.com

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