



TechBrief

Liqui-Cel Membrane Contactor Field Analysis

Over the last year Membrana - Charlotte has evaluated the effects of long term field use on membrane properties. Several of our customers in the semiconductor industry have participated in this study. In this evaluation, we removed contactors from service and returned them to our research and development center for evaluation.

We selected contactors installed in DI quality water systems operating at 25°C or below with two to three years of continuous operation for the study. All of the contactors were run through an extensive series of tests designed to verify the contactor's integrity. The tests included: pressurized leak tests, performance tests and a complete membrane analysis with an autopsy.

Leak Test

In order to measure and identify any fiber or seal leaks in the contactor, the shell side of the contactor was pressurized in a custom designed stand. In this test, the end caps were removed and the shell side of the contactor was pressurized with water. This test identified the location and rate of any leaks in the contactor.

Performance Test

The current contactor oxygen removal performance was measured and compared to performance data collected on the contactor when it was manufactured.

Fiber Analysis

The contactor was then autopsied. Fiber samples were collected on the inner most part of the membrane bundle, the center of the bundle and the outer most point of the bundle. Tensile properties, membrane resistance to air flow and the shape ratio of the fiber were measured for each sample. Again, the results of the tests were compared to the quality data collected on the membrane when it was manufactured.

Summary of Results

In each of these tests, no statistical differences could be detected in the membrane contactor's mechanical or morphological characteristics. These tests indicate that the Liqui-Cel Membrane Contactor can be operated in a 25°C deionized water system for a minimum of two-three years without the risk of failure or performance decline.

The contactors we selected for this evaluation have been in service for up to three years, other systems have been operating with the same contactors without incident for over four years. In future years, we will autopsy contactors that have been in service for longer periods of time. These contactors will be run through a similar battery of tests in an effort to quantitatively determine the useful life of the membrane contactor.

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