

# Statement of Performance

## Furon<sup>®</sup> Q-Valve 1/4" Orifice Cycling Test in Cabot Semi-Sperse<sup>®</sup> 12 Slurry

Furon Q-Valves – Pneumatic with a 1/4" orifice were subjected to an accelerated life test for port-to-port integrity. The cycling test was performed with a Cabot Semi-Sperse 12 Slurry at room temperature by an independent test lab<sup>1</sup>.

### Accelerated Life Test Method

Eight pneumatic 1/4" Q-Valves were assembled in a manifold allowing two parallel flow paths through each set of 4 valves. Each set was cycled at a rate of 12 cycles per minute (2.5 seconds open and 2.5 seconds closed) at room temperature with an actuator pressure of 70-75 psig. One set was opened as the other set was closed to maintain a constant flow through the system, provided by a centrifugal pump. Valves were inspected every workday for leaks.

Samples of the slurry were taken each day to monitor particle size distribution (PSD) and was replaced approximately every 150,000 cycles, or if the PSD was out of specification. The slurry was in specification if the mean particle diameter was between 130 and 180 nm and in the 99th percentile of the distribution was <500 nm, using volume-weighted distribution.

### Valve Integrity Test Method

Prior to each integrity test the valve manifold was extensively flushed with ultra pure water and completely drained. Valves were removed from manifold and actuated to verify proper operation. Valve integrity was determined by measuring valve leakage using a pressure decay/rise test. Nitrogen was used to pressurize the valve port that exposes the diaphragm to the media. The rated pressure of the valves (100 psig) was applied to the outlet port of each valve while in the closed position as seen in the test system in Figure 2. Leak tests were performed at approximately 150k, 300k, 600k, 900k, and 1.2M cycles during the life cycle test.

### Results

The majority of the valves performed without failure up to 1.2 million cycles.

### Summary

Eight pneumatic Furon Q-Valves were subjected to accelerated life tests in Cabot SS-12 slurry. Valve integrity was tested approximately every 300k cycles using a nitrogen pressure decay/rise test. The valves were cycled 1.2 million times with no major leaks. The valves had a low leak rate until the point of valve failure.

Figure 1. Accelerated Life Test Schematic

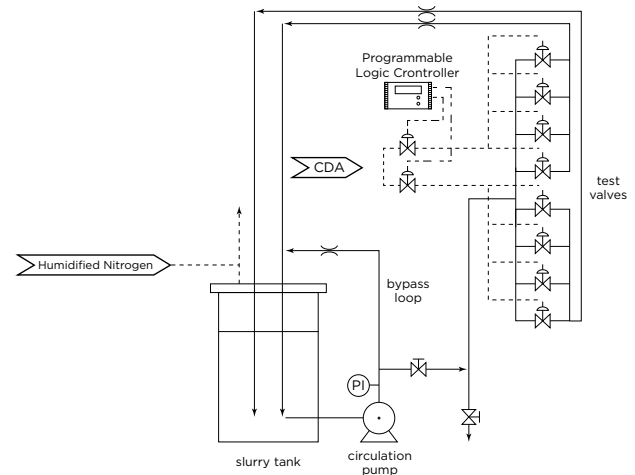
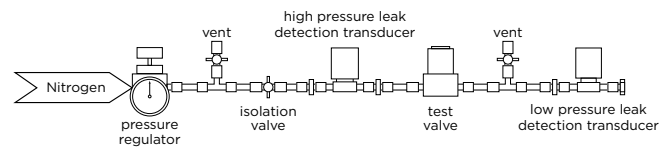


Figure 2. Test System to Measure Valve Leak Rates



### References

<sup>1</sup>CT Associates, Inc., 10777 Hampshire Ave. S., Bloomington, MN 55438.

The data provided here were obtained under defined test conditions. The tests were designed to mimic use or worst case conditions. However, Saint-Gobain Performance Plastics makes no specific claims about the performance of the components in other chemicals or systems.