

Statement of Performance

Furon® A2 Pump Ionic TOC and Metallic Surface Extraction

Furon A2 bellows pumps were tested in accordance with the SEMI F57-0314 specification for Polymer Materials and Components Used in Ultrapure Water and Liquid Chemical Distribution Systems at an independent test lab¹.

Test Conditions

A Furon A2 Pump was prepared per SEMI F40-0918. The pump's caps were pre-extracted in UPW for 10 days at 85°C by CT Associates Inc. The water was replaced three times during the extraction period.

The caps were additionally extracted by Balazs NanoAnalysis² in ultrapure water at 85°C for two days with water exchanged two times during the soak. The pump was then pre-cleaned by rinsing ten times with ultrapure water, with a two minute soak for each rinse, per SEMI F40. The pump was filled with UPW until water was at the top of the inlet and outlet, and then sealed with the pre-cleaned cap and leached at 85°C for seven days. The pump was agitated manually for one minute, once per day per SEMI F40. A leach blank was also prepared under identical conditions.

The results of this measurement are presented in the table below and to the right. All data has been normalized based on the wetted surface area of the pump.

Total Organic Carbon		
TOC	≤ 60,000	2340
Surface Extractable Ionic Contamination		
Bromide	≤ 100	*
Chloride	≤ 3,000	*
Fluoride	≤ 60,000	*
Nitrate	≤ 100	*
Nitrite	≤ 100	30.6
Phosphate	≤ 300	*
Sulfate	≤ 300	0.9

Summary

Furon A2 Bellows Pumps were tested for Surface Contamination and were found to be in agreement with the SEMI F57-0314 specification.

References

¹ CT Associates, Inc 7121 Shady Oak Road Eden Prairie, MN 55344

² Balazs NanoAnalysis Air Liquide US L.P. 46409 Landing Parkway

Table Information

" * " indicates the result is below the detection limit of the test
 " NS " indicates no reference value from the standard

Results

Test	Spec (µg/m ²)	Furon A2 Bellows Pump (µg/m ²)
Metallic Surface Extraction		
Aluminum (Al)	≤ 10	0.86
Antimony (Sb)	NS	0.07
Arsenic (As)	NS	*
Barium (Ba)	≤ 15	0.27
Bismuth (Bi)	NS	*
Boron (B)	≤ 30	2.5
Cadmium (Cd)	NS	*
Calcium (Ca)	≤ 20	4.5
Chromium (Cr)	≤ 1	*
Copper (Cu)	≤ 15	0.61
Gallium (Ga)	NS	*
Germanium (Ge)	NS	*
Iron (Fe)	≤ 5	1.6
Lead (Pb)	≤ 1	0.11
Lithium (Li)	≤ 2	*
Magnesium (Mg)	≤ 5	0.54
Manganese (Mn)	≤ 5	*
Mercury (Hg)	NS	*
Molybdenum (Mo)	NS	*
Nickel (Ni)	≤ 1	0.13
Potassium (K)	≤ 15	0.36
Silver (Ag)	NS	*
Sodium (Na)	≤ 15	0.41
Strontium (Sr)	≤ 0.5	*
Tin (Sn)	NS	*
Titanium (Ti)	NS	*
Tungsten (W)	NS	0.05
Vanadium (V)	NS	*
Zinc (Zn)	≤ 10	0.22