Cleanliness Equivalency Value

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The leading manufacturer of cleaning and cleanliness testing products.

The benchmark standard for evaluating board cleanliness is the Resistivity of Solvent Extract (R.O.S.E.) test developed in the early 1970's. Over time, several manufacturers developed machines to automate the cleanliness testing procedure. There are a small number of ionic contamination testers specifically cited in military standards. Of these machines, there are two technologies:

Static
Dynamic

It was determined by the military that there were differences in the levels of sensitivity among the various machines. The manual R.O.S.E. test criteria stated that the pass/fail level was 10 micrograms of sodium per in2. The military determined the R.O.S.E test's 10 was equal to another machine's 14 (that machine was more sensitive than the manual R.O.S.E. test).

The Naval Air Weapons Center (NAWC) developed equivalency factors for machines developed to test boards for cleanliness. These equivalency factors made their way into military specifications such as MIL-P-28809, WS6536, MIL-2000, MIL-2000A, and MIL-P-55110.

We know these equivalency factors as follows:

Machine	Technology	Military Equivalency Factor	Pass/Fail Limit
Manual R.O.S.E. Test	Static/Unheated	1.0	10 micrograms of sodium per in2
Zero-Ion	Dynamic Unheated	3.7	37 micrograms of sodium per in2
Ionograph	Dynamic/Heated	2.0	20 micrograms of sodium per in2
Omega-Meter	Static/Heated	1.4	14 micrograms of sodium per in2

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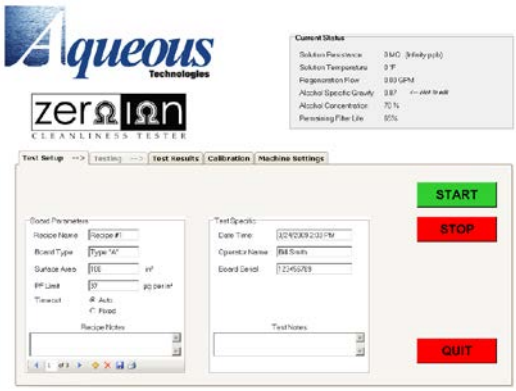

The assigned equivalency values indicate that the Zero-Ion is the most sensitive of all of the cleanliness testers evaluated by the NAWC. The NAWC's testing was done on an unheated ZI-100A Zero-Ion Ionic Contamination Tester.

The Zero-Ion is more sensitive than other systems because of two reasons: Dynamic Technology and Spray Under Immersion.

The Zero-Ion is a dynamic-based technology. This means that the test solution is continually re-deionized during the test. The continual re-deionization process assures a high degree of solvent sensitivity during the test. In addition, the Zero-Ion utilizes an aggressive spray under immersion "jet" pattern to dislodge contamination from under components.

Unlike other systems which require heated test solution, the Zero-Ion performs all tests without the need for heat. Eliminating heat increases equipment safety (test solution is flammable), reduces power costs, eliminates wash solution heat-up time, and reduces test solution evaporation.

The Zero-Ion Ionic Contamination Tester meets industrial cleanliness specifications including MIL-STD-2000A, MIL-P-28809, IPC-TM-650, ANSI/J-STD-001B.