

Alpha Metals Omega Meter 600SMD Contamination Measurement System



Picture shows the Omega Meter model 600SMD

Description

Model 600SMD

The Alpha Metals Omega Meter is microprocessor controlled ionic contamination test system. It is designed to perform cleanliness testing on printed circuit boards and/or other parts. The Alpha Metals Omega Meter is used to determine the quantity of ionic contamination on a specimen under test, typically a printed circuit board (PCB).

The fabrication of printed circuit boards and the subsequent assembly of printed wiring assemblies includes numerous processes whereby corrosive ionic materials are introduced to the board and assembly package. Examples of corrosive ionic elements include Chemical Etchants, Plating Salts, Chemical Metal Cleaners, Solder Fusing Chemicals, Soldering Fluxes, Human Perspiration and Hand Lotion, Chemical Products, and Environmental Fallout.

Ionic contamination represents one of the most significant factors causing degradation and failure of electronic assemblies. Very small residual quantities of ionic contamination from numerous and varied sources, alone and/or combined, affect reliability and can cause catastrophic failure of components and circuits. Residual ionic contamination can cause surface electrical leakage and chemical, galvanic and electrolytic corrosion.

The key to reducing failures due to ionic contamination is in the cleaning. But how does one determine that a board, component or printed-wiring assembly is, in fact, clean? That is what the Omega Meter is for.

The electrical resistivity of a known volume of an aqueous solution represents the direct measurement of levels of ionic contaminant present in the solution. Quantitative measurements of ionic contamination on parts can be made by measuring the electrical resistivity of a known volume of rinse solution used to extract and remove the ionizable contaminant off the known surface area of a sample being tested. The extract solution must be of an extremely high level of purity.

The Omega Meter System is an automated process of the recommended manual test procedure as outlined in section 4.8.3 of MIL-P-28809, "Military Specifications Printed Wiring Assemblies." A wash solution of 75% by volume of ACS reagent grade isopropyl alcohol and 25% by volume of distilled water is measured into the test cell through a set of D.I. columns to achieve a resistivity exceeding 20 megohm centimeter. Other formulations of alcohol and water including D.I. water alone may be used to comply with special test requirements.

A sample (component or assembly) is submerged into the clean test solution and the solution is agitated to promote removal and solubilization of all ionic residues from the test sample. The change in resistivity is continuously monitored and displayed on the LCD display on the console. Knowing the area of the sample in inches, the volume of solution in millimeters and the resistivity in megohms, the system automatically calculates the contamination that has been added to the solution in "micrograms" of equivalent Sodium Chloride per square inch. When the test is completed, the test parameters are printed along with the total contamination extracted from the test sample.

Contaminated test solution is regenerated through the D.I. columns to obtain the required purity for reuse in subsequent tests. The closed loop Omega Meter System may be used for many months of testing with minimal addition of fresh solution.

Typically the contamination on the PCB would be process residues left over from the fabrication of the circuit board, or left over from the board assembly process. You want to measure this contamination to be sure that your cleaning steps in making the PCB or assembling the PCB are doing a good job and removing the chemical residues due to these processes.

You perform this test by placing the PCB specimen in the "Test Cell" (the large Plexiglass container on the top of the unit). Then the system fills the Test Cell with an isolated volume of IPA/Water test solution (not included). This solution is heated and agitated and removes any contamination on the PCB. The ionic contamination is then determined by monitoring the resistivity of the test solution.

The Omega Meter then provides a printout of the results using the embedded printer located on the front panel.

This type of equipment is normally used in a manufacturing facility to measure printed circuit boards contamination as part of printed circuit board fabrication and/or assembly operations.

Specifications

Manufacturer	Alpha Metals
Model	600SMD
Serial Number	
Test Cell	26 x 26
Voltage	240v AC
Cycle	50/60Hz
Amperage	8 Amps
Electrical Connection	line cord with 220v Plug
Size	38" W x 29" D x 64" H (965mm x 737mm x 1625mm)

Weight	650 lbs (295 Kg)
--------	---------------------

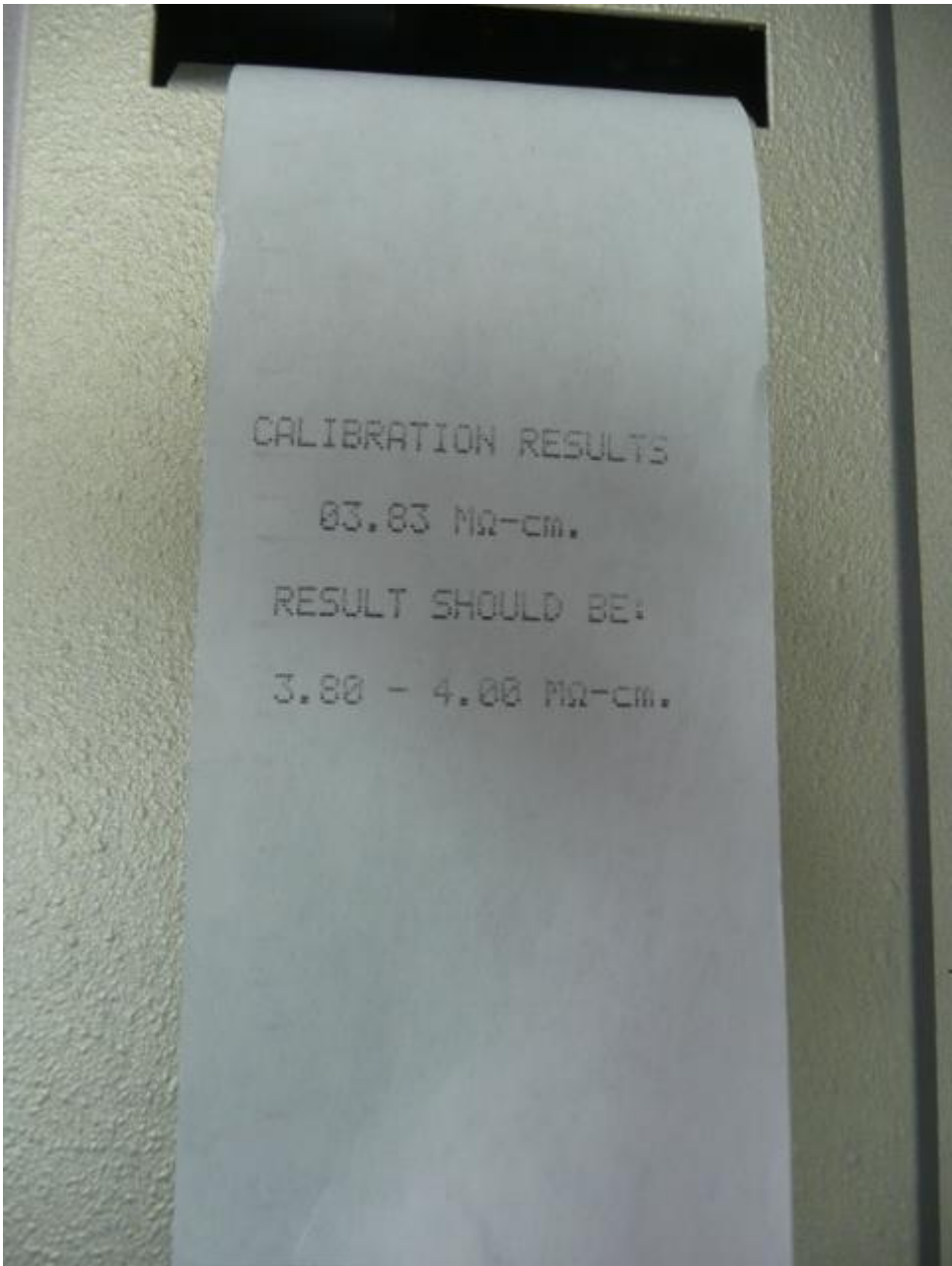
Condition of this Unit

This unit is completely refurbished, is fully operational, and in excellent condition.

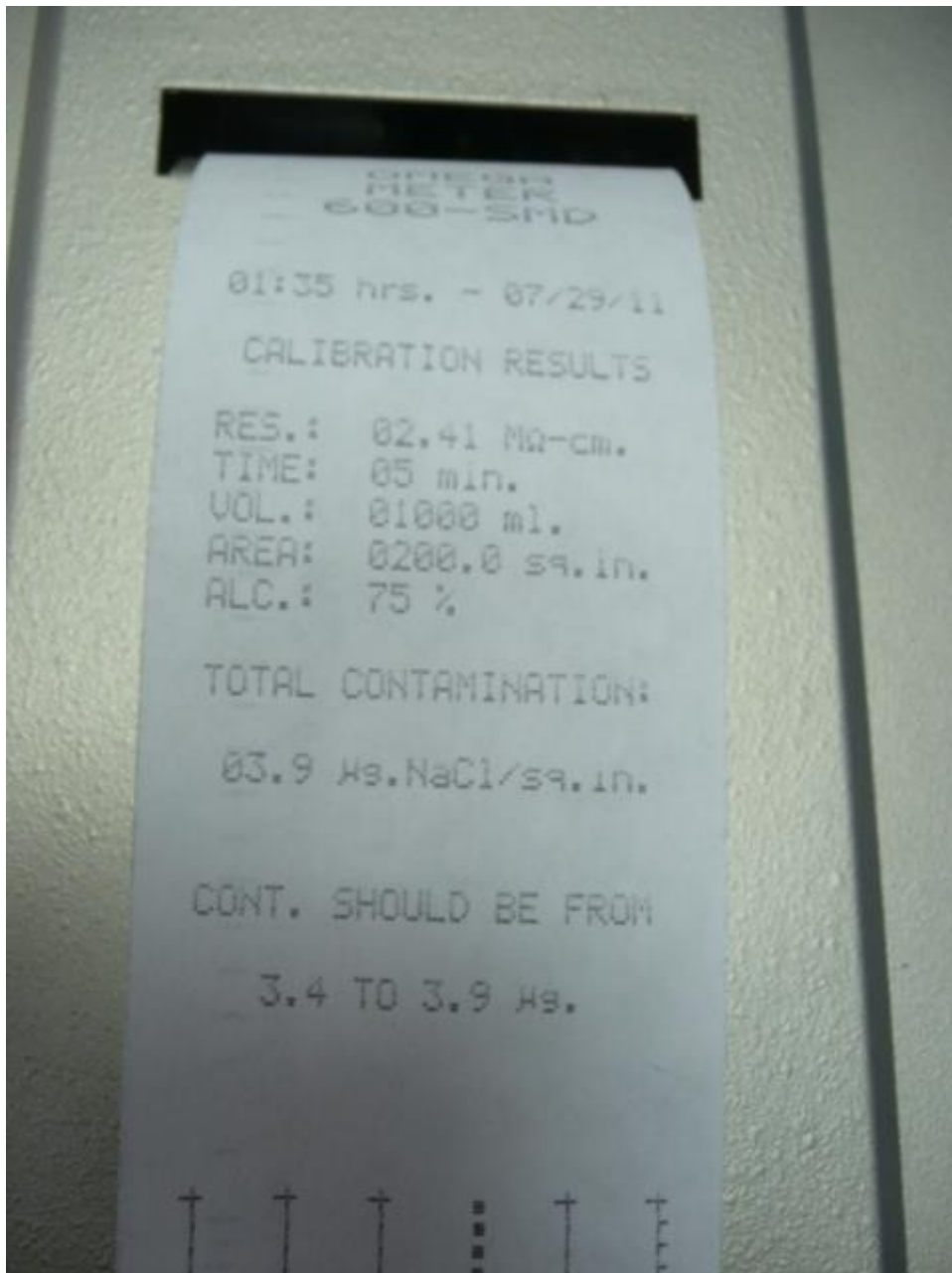
- Brand-new 26" x 26" test cell
- Brand-new set of D.I. columns
- D.I. Column with quick-connect feature
- New lithium-ion batteries for data retention
- Completely serviced and calibrated
- New laminated top
- Completely disassembled and re-painted

Test Results

Following are actual test results conducted on the refurbished unit. Both an Electrical Performance Verification Test and a System / Chemical Performance Test were performed. The system passed both calibration tests.



Electrical Calibration Results



System / Chemical Calibration Results

Included Items

This unit consists of the following items:

1. Alpha Metals Omega Meter 600SMD as pictured
2. 240v AC power cord - attached to the unit
3. 600SMD Manual

Pictures of actual unit



Front View



Left View



Right View



Back View



Front Right View



26"x26"x2" test cell close up



Front Right panel of Omega Meter 600smd



Front panel close up



Front panel lit up while running a test



Quick-Disconnect D.I. Columns mounted in cabinet