Process Control – Made Simple

The CM Series (CONTAMINOMETER) has been revised, improved and simplified.

ROSE (Resistivity Of Solvent Extracted) or SEC (Solvent Extract Conductivity) testing, commonly referred to as "Cleanliness Testing" has, for over 40 years, been acknowledged as an important Quality Assurance and Process Control tool in the manufacture of electronic circuit boards, components and assemblies.

New CM 22 Features

- Solid gold measuring cell, ballistic amplifier giving a test accuracy of <0.005µS/cm
- Unique Curvefitting Analysis that permits <5 minute test time
- Accurate measurement even when the proportion of Test Solution to Surface Area under test are huge
- Automatic temperature compensation for each test
- Meets the requirements of all international and military specifications
    - o IPC-J-STD 001& IPC-TM-650
    - o MIL-STD 2000
    - o MIL-P-28809
    - o DEF standard 00-10/3
    - o IEC specifications

Data Processing

Unique Curvefitting Analysis - The analysis of the contamination test data uses a complex curvefitting routine that gives an accurate indication of the total amount of ionic contamination on the circuit. The graphical display of test results features auto-ranging of curves in equivalent contamination units of µg/cm^2 NaCl equivalence. Contamination is plotted against time and the curve is automatically extrapolated producing meaningful data even for a short test.

Contamination Test Curves
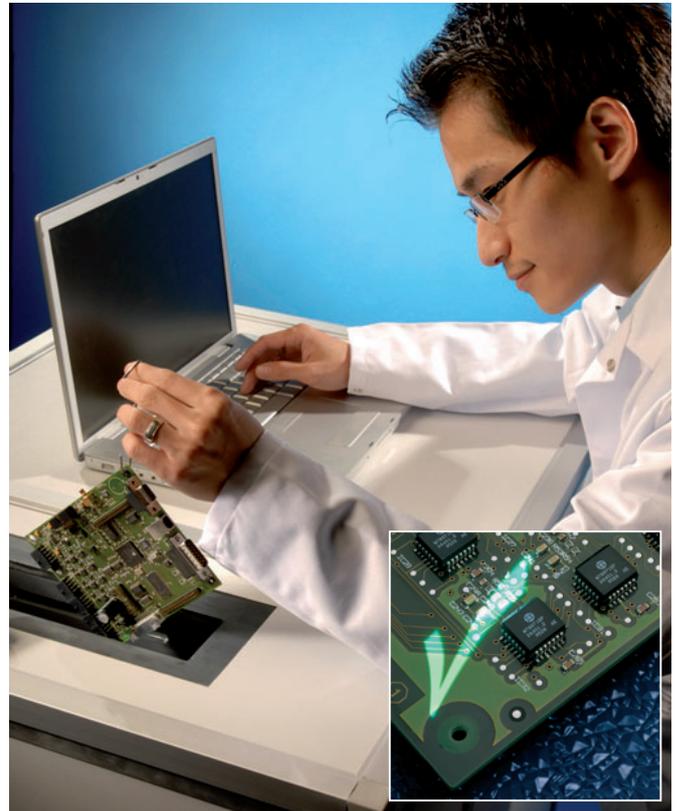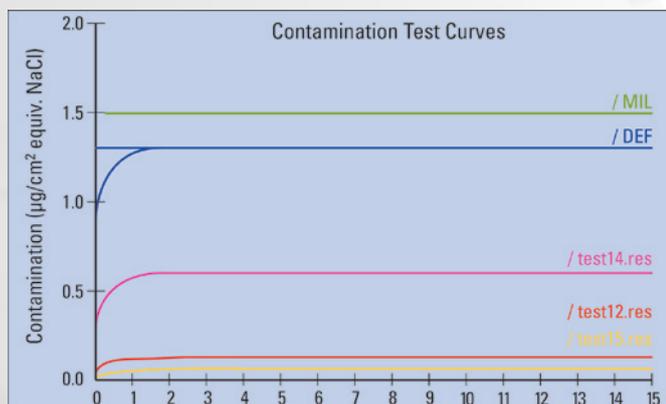
The test data are analysed graphically including pass/fail analysis. Statistical evaluation of up to 50 test results is incorporated in the Contaminometer software but test results may also be imported into other software packages for further enhancement or appraisal as required.
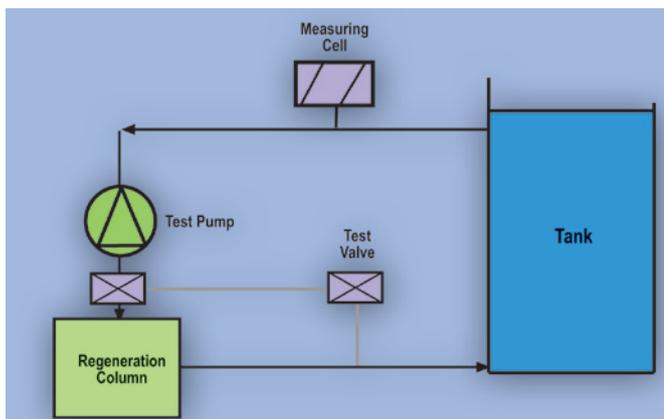
Test Operation

The solution is re-purified automatically each time a new test is run using a special regeneration, or de-ionising, cartridge that is easy to exchange. Electronic control is by a low voltage system enclosed in a separated cabinet.

The CM Series utilise a solid gold measuring cell, ballistic amplifier and a vigorous pumping system to achieve superior measurement accuracy of <0.005µS/cm even at very low conductivity values.

The CM Systems have been designed to avoid polarisation effects between electrodes as might occur when using DC test currents. Equally error signals, caused by both DC and AC currents, are eliminated and high accuracy is ensured even at low conductivity values. This permits our equipment to measure accurately even when the proportion of Test solution to Surface Area under test are huge.

Cleanliness Testing — CM 22 CONTAMINOMETER

ENGINEERING RELIABILITY IN ELECTRONICS

Automatic temperature compensation is incorporated in the electronic control system, the method of temperature measurement being by a thermistor positioned in the test cell. The Contaminometer software uses a complex algorithm to automatically compensate for ambient temperature, circuit volume and atmospheric absorption of iogenic gases. Temperature is monitored and all measurements are related to the international standard of 20°C (68°F).

CM11+ and CM22 system circuit

Components of the Contaminometer

All components of the Contaminometers have been carefully chosen to ensure high quality and excellent reliability. The hydraulics of each instrument is thoroughly tested and a special grade polymer is used for both the tanks and the piping in contact with the CM Test Solution. This solution is a mixture of reagent grade 2-propanol and ultra-pure deionised water mixed at either 50% or 75% as required by the applicable standard.

Software Features

The user-friendly software runs under Windows® and gives on-screen instructions to guide the operator through the test cycle. The software can display up to 20 test results in a 2 dimensional or 3 dimensional representation, which can be rotated for ease of analysing the results. The software is designed to enable the easy export of test results into other word processing and SPC software.

Technical Specifications CM22

Maximum PCB Size:	250 x 350 x 60 mm(10" x 14" x 2.3")
Measurement Range:	0.01 - 30µg/cm^2 NaCl equivalence (auto-ranging)
Sensitivity:	<0.25% of measurement range
Precision and Repeatability:	Better than ±2% of range for maximum PCB surface area
Solution:	50% or 75% v/v reagent grade 2-propanol in de-ionised water
Maximum Liquid Volume:	7.5 litres [Tank Volume: 5.25L]
Power Supply:	100-240 VAC 50/60 Hz
Weight:	Approx 40 Kg
Computer requirements:	Any suitable PC with Windows® XP or later.

The New CM Series (CONTAMINOMETER) range now comprise:

CM11+	A Bench-top system
CM22	A free-standing system using a large capacity test chamber
CM33	A free-standing system for larger boards or assemblies
CM66	The new and updated version of our CM60

Ionic Contamination Testing

Ionic contamination testing is required as ionic residues remaining from both the PCB manufacturing process and the soldering process may affect the reliability of a finished assembly. In a humid environment, ionic contaminants can cause problems such as shorting between conductors by electrolytic dendrite growth, corrosion that erodes the conductors themselves or loss of insulation resistance. It is therefore important to monitor the level of ionic contamination, giving an indication of the cleanliness and thereby the expected reliability of an assembly.

Ionic contamination is measured by immersing a sample in a test solution of 2-propanol and de-ionised water to dissolve the contaminants. The dissolved ionic substances cause a change in conductivity of the test solution; this change is precisely measured and converted into a contamination value expressed as µg/cm2 NaCl equivalence.

Soldering & Cleaning Control

Since the adoption of no clean or low solids fluxes, controlled atmosphere soldering systems and now lead-free processes, ionic contamination monitoring has become an essential process control parameter in the production environment. The Contaminometers are exceptional measurement instruments for SPC (Statistical Process Control) of the soldering and assembly processes even if you don't clean. Testing a number of samples per hour or per day, any changes in ionic contamination level will be detected, rapidly alerting the operator to a process variation or fault affecting the contamination level and thus quality of the boards. The test results are immediately documented by a hard copy with graphical data presentation. Statistical analyses can be made instantly.