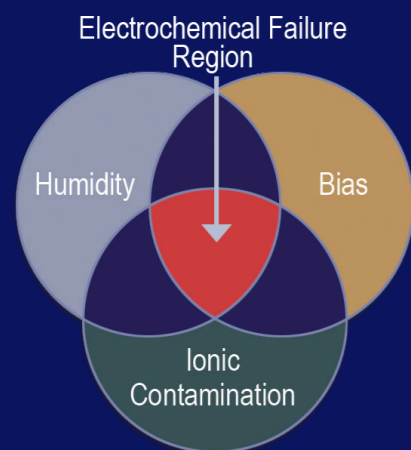## Ionic Contamination Testing

Ionics are bad for electronics.

Ionic species can be mobilised in the presence of moisture based water film and an applied electric field. This can lead to corrosion, and corrosion products, that include dendritic growth, that can result in short circuits and failure.

Ionic Contamination has been proven to contribute to Tin Whiskers.

Ionic Contamination Testing is therefore an essential tool in controlling a production process.

The detection of ionic impurities is critical for several industries where there are stringent regulatory and industrial requirements in the identification of trace ionic contaminants. Detecting and measuring these ionic impurities is a well proven and widely used technique. Standards in use today include: IPC J-STD001 - IPC 6012 - IPC-TM-650 Method 2.3.25 and is an international standard of IEC.

Electrochemical Failure Region

Humidity — Bias — Ionic Contamination

Introducing the award-winning CM range of Contaminometers from GEN3. The world's first ROSE & PICT Ionic Contamination Tester.

Used to measure the amount of ionic contamination, usually referred to as cleanliness levels, in accordance with all international specifications. They are often referred to as ROSE (Resistivity Of Solvent Extracted) or SEC (Solvent Extract Conductivity) testers.

Process Ionic Contamination testing (PICT) is a process control metric instigated by GEN3.

The CM Range:

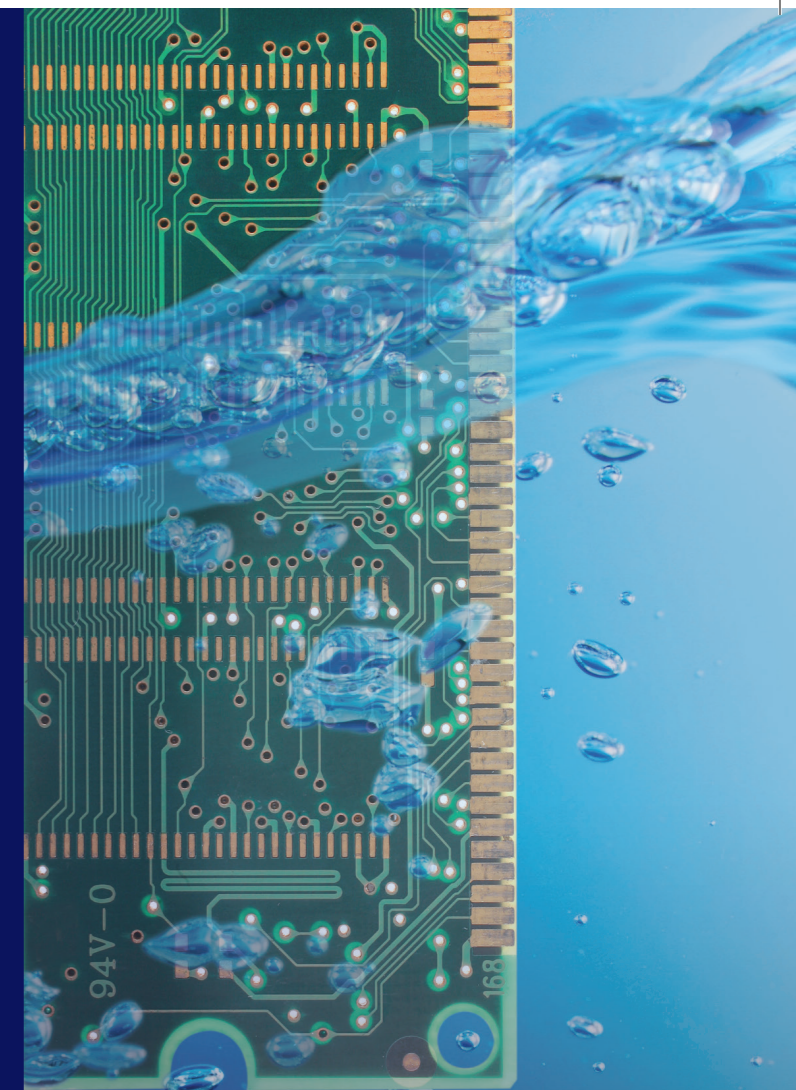CM11

CM22

CM33

CM33L

CM VMC

CM BBT

www.gen3systems.com

Distributor:

GEN3
PRECISION AS STANDARD

CM
CONTAMINOMETER
Ionic Contamination Testers

Reproducibility – 6-Sigma

In a collaborative research study with Robert Bosch presented in the IPC APEX EXPO 2017 Technical Paper and Presentation titled 'Process Control of Ionic Contamination achieving Six-Sigma criteria in the Assembly of Electronic Circuits', the CM range has been proven to meet Six-Sigma criteria, using a verification procedure at different production sites worldwide. Used as a Process Control tool, the CM systems can be used for optimisation of manufacturing techniques and materials, and manufacturing control across different production sites globally, with a high level of certainty.

Data Processing

Contaminometer test data allows for graphical analysis, incorporating a user defined pass/fail limit. Statistical evaluation of up to 50 test results is achievable within the CM software, and test results may also be imported into other software packages for further enhancement or appraisal as required.

Test Operation

The GEN3 Range of Contaminometers is built in a Closed Loop configuration such that the re-generation Filter Column is removed from the test solution circulation circuit during the test phase. This ensures maximum test solution flow rate during the test cycle and more accurate results as filtered test solution is not altering the true contaminated test solution value.

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 housing. 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 ratio of board surface area to test solution volume is very large.

The Contaminometer software has a number of automated features as standard. These include compensation for temperature changes, circuit board volume calculation and removal of the effects of atmospheric absorption of ionic gases.

For over 40 years the Benchmark for Ionic Contamination Testing

CM BBT Bare Board Tester
Optimised to provide the most accurate measurements, the system features a "Narrow & Deep" tank to avoid the unwanted influences of CO_2.
Tank size: 715w x 665h x 30d mm (28.1" x 26.2" x 1.2")
Minimum PCB area: 150cm^2
Maximum PCB size (in Handling Frame):
625w x 645h x 7d mm (24.6" x 25.4" x 0.3")

CM11
The CM11 is the world's smallest and most convenient bench-top system.
Tank size: 250w x 300h x 36d mm (9.8" x 11.8" x 1.4")
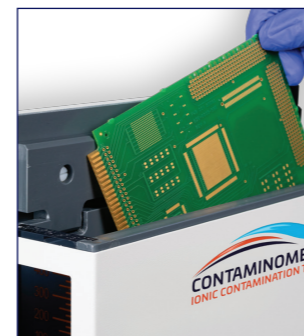Minimum PCB area: 25cm^2

CM22
A free standing system able to cater for larger assemblies whilst maintaining a low surface area to test solution ratio.
Tank size: 250w x 370h x 60d mm (9.8" x 14.6" x 2.4")
Minimum PCB area: 50cm^2
Maximum PCB size (in Handling Frame):
215w x 330h x 33d mm (8.5" x 13" x 1.3")

CM33
Suited to the widest variety of assembly sizes without losing test accuracy.
Tank size: 350w x 520h x 60d mm (13.8" x 20.7" x 2.4")
Minimum PCB area: 100cm^2
Maximum PCB size (in Handling Frame):
310w x 480h x 33d mm (12.2" x 18.9" x 1.3")

CM33L
Equipped with enhanced plumbing to maintain optimum test accuracy.
Tank size: 610w x 640h x 90d mm (24" x 25.2" x 3.5")
Minimum PCB area: 250cm2
Maximum PCB size (in Handling Frame):
570w x 590h x 63d mm (22.4" x 23.2" x 2.5")

CM VMC
The CM VMC utilises a unique Volumetric Measurement Cell (VMC). To test, simply input the circuit length and width, put the item into the tank and push the button – it's as simple as that.
Tank size: 360w x 530h x 65d mm (14.2" x 20.8" x 2.5")
Minimum PCB area: Tank 1 & 3: 100cm2 Tank 2: 150cm^2

CM Features

The CM Contaminometer range from GEN3 utilises a solid gold test-cell, ballistic amplifiers and vigorous pumping systems to ensure superior measurement precision even at very low conductivity values.

PC based software is used to produce graphical test data, a pass/fail analysis and automatic hard copy print out using test methods according to the prevailing standards.

- New Capability to run ROSE test and PICT
- New Software featuring a new user interface for an enhanced user experience
- New Alarms for solution leakage and reduced ventilation
- New Built-in conductivity meter
- Improved automatic temperature and CO_2 compensation to remove any effects of atmospheric pollution from contamination results
- Improved serviceability
- Improved accuracy and stability with redesigned hardware for optimum measurement capability
- The CM Series is Six-Sigma (6σ) verified as a process control tool
- The CM series has proven Gauge R&R (Repeatability and Reliability) of ~2%
- High fluid circulation rate, ensuring fast removal of ionic contaminants from PCBA whilst providing smooth, bubble-free circulation at all times
- Unique CURVE-FITTING Analysis algorithm (Merit of Fit) to predict results of longer tests
- Unique solid gold measuring cell, ballistic amplifier providing a test accuracy of <0.005μS/cm
- Advanced traceability features for tracking boards and their history
- Complete testing cycle of only 3-minutes & full regeneration in typically < 6 minutes

6 SIGMA VERIFIED

GEN3 PRECISION AS STANDARD