



Introducing the award-winning CM+ range of Contaminometers™ from Gen3 Systems. 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 Systems.

# GEN<sup>3</sup> SYSTEMS



The CM+ Range:

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CM11+

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CM22+

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CM33+

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CM33L+

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CM60

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CMBBT+

**CM+  
CONTAMINOMETERS™**



## Ionic Contamination Testing

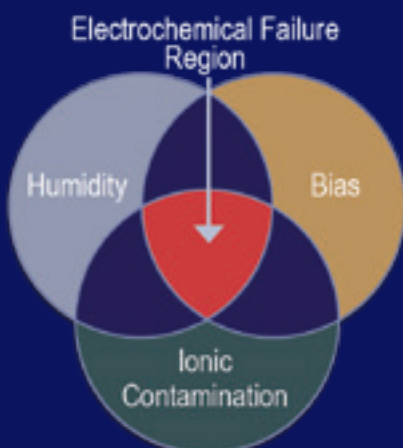
Ionic's are bad for electronics.

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.



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## Reproducibility – Six-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 6-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 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

## CMBBT+ Bare Board Tester

Optimised to provide the most accurate measurements, the system features a "Narrow & Deep" tank to avoid the unwanted influences of CO<sub>2</sub>.

**Tank size: 715 x 665 x 30 mm (28" x 26" x 1.2")**

**Minimum PCB area: 150cm<sup>2</sup>**

**Maximum PCB size (in Handling Frame):**

**645 x 645 x 7 mm (25" x 25" x 0.3")**



## CM11+

The CM11+ is the worlds smallest and most convenient bench-top system.

**Tank size: 250 x 300 x 36 mm (10" x 12" x 1.4")**

**Minimum PCB area: 25cm<sup>2</sup>**



## CM22+

A free standing system able to cater for larger assemblies whilst maintaining a low surface area to test solution ratio.

**Tank size: 250 x 350 x 60 mm (10" x 14" x 2.4")**

**Minimum PCB area: 50cm<sup>2</sup>**

**Maximum PCB size (in Handling Frame):**

**330 x 225 x 33 mm (13" x 9" x 1.3")**



## CM33+

Suited to the widest variety of assembly sizes without losing test accuracy.

**Tank size: 500 x 350 x 60 mm (19.7" x 13.8" x 2.4")**

**Minimum PCB area: 100cm<sup>2</sup>**

**Maximum PCB size (in Handling Frame): 480x 325 x 33 mm**

**(19" x 12.8" x 1.3")**



## CM33L+

Equipped with enhanced plumbing to maintain optimum test accuracy.

**Tank size: 610 x 610 x 90 mm (24" x 24" x 3.6")**

**Minimum PCB area: 250cm<sup>2</sup>**

**Maximum PCB size (in Handling Frame):**

**590 x 585 x 63 mm (23.2" x 23" x 2.5")**

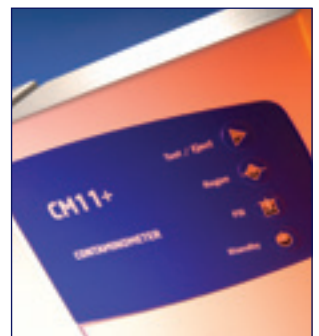


## CM60

The CM60 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: 500 x 350 x 60 mm (19.7" x 13.8" x 2.4")**

**Minimum PCB area: Tank 1 & 3: 100cm<sup>2</sup> Tank 2: 150cm<sup>2</sup>**



# CM+ Features

The CM+ Contaminometer range from Gen3 Systems utilise 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.

- Complete testing cycle within only 3 minutes
- Six-Sigma ( $6\sigma$ ) verified as a process control tool
- 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  $<0.005\text{mS/cm}$
- Accurate measurement, even when the proportion of test solution to surface area under test are huge
- $\text{CO}_2$  compensation function, to remove any effects of atmospheric pollution from contamination results
- Automatic temperature compensation
- Full regeneration in typically  $< 6$  minutes
- New range of PCB/Component handling frames, with integrated draining system
- Measures in accordance with all international and MIL specifications old and new
- All CM+ systems have proven Gauge R&R (Repeatability and Reliability) of  $\sim 2\%$
- The CM+ Series systems provide far superior Accuracy, Sensitivity, Linearity, Precision and Repeatability





[www.gen3systems.com](http://www.gen3systems.com)

Distributor:



A BRITISH  
MANUFACTURER

Gen3 Systems Limited

B2, Armstrong Mall, Southwood Business Park, Farnborough, Hampshire, GU14 0NR. UK  
Telephone: +44 (0)12 5252 1500 • Fax: +44 (0)12 5252 1515 • Email: [sales@gen3systems.com](mailto:sales@gen3systems.com)

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