



Foresite, Inc.

C3—Critical, Cleanliness, Control



The C3 is unique among electronics cleanliness testers - it remains the only tester on the market that indicates whether a specific, critical area of a PCBA is clean.

How the C3 Works

Simply select the components and/or areas of circuitry that are most sensitive and prone to contamination-related performance and/or reliability issues and test an area that is 0.1 in², or even smaller.

The C3 quickly provides feedback as to whether potentially detrimental residues, frequently from manufacturing processes are present. The programmed test cycle is easily controlled through the color touchscreen display with minimal training required.

Use for Extraction, Testing, or Both

The C3 can be used right in the electronics assembly area. In addition, product site-specific samples extracted by the C3 can be sent to a lab for analysis to identify the contaminants and measure their concentrations.



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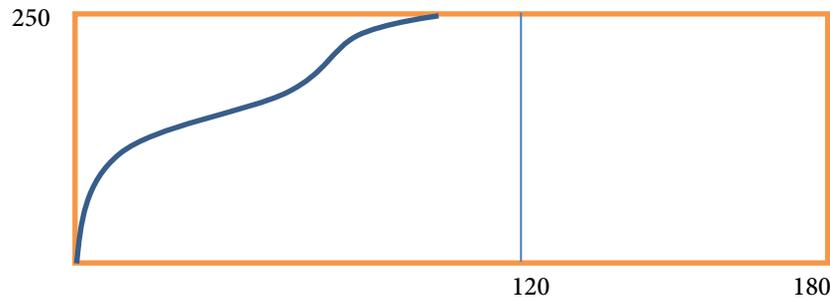




C3 Corrosivity Index™ (C.I.)

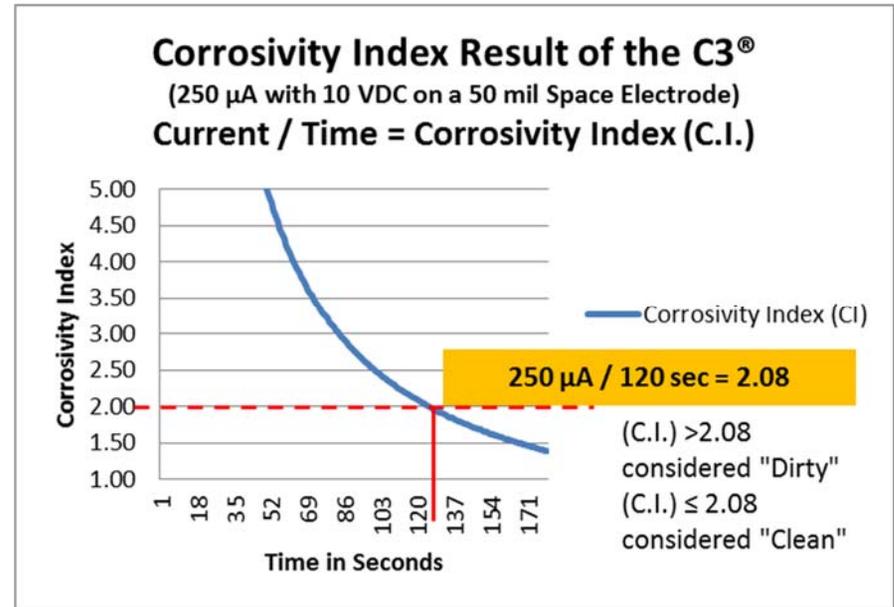
The C.I. is an indicator of the cleanliness of a test site analyzed by the C3. The index is calculated by dividing the maximum current seen during the test by the elapsed time of the test.

Using a programmable current limit setting of 250 μA and a decision time setting of 120 seconds, the C.I. limit is $(250/120)$ 2.08. A C3 test performed with these settings that reaches or exceeds 250 μA before 120 seconds has a C.I. greater than 2.08, resulting in a “dirty” indication. These test parameter settings (250 μA & 120 sec.) produce relatively sensitive C3 tests and are commonly used on higher reliability electronics (e.g. IPC Class II & III).



For the above test, $\text{C.I.} = 250/95 = 2.63$, a failed test.

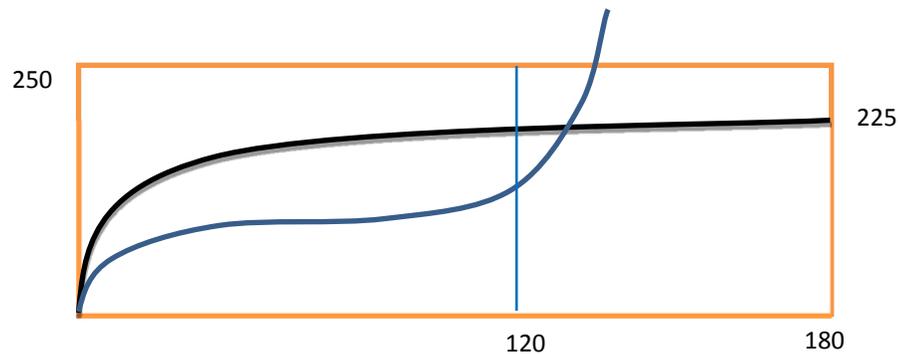
The C.I. graph at right shows the curve of C.I. values when the set current limit (250 μA) is reached, or exceeded, through the range of elapsed test times.





C3 Corrosivity Index™ (C.I.)

The “maximum” current used in a C.I. calculation is limited to the current set point (250 μA in these examples). The C3 test runs until the current exceeds the current set point (limit) or the total test time of 180 seconds is reached.



In this example, two samples pass the test in that the current limit is not reached by the decision time.

Sample A (Blue Line): $\text{C.I.} = 250/135 = 1.85$

Sample B (Black Line): $\text{C.I.} = 225/180 = 1.25$

Another commonly used set of C3 test parameters is 500 μA and 60 seconds. These settings are used on electronics for less demanding applications and environments (e.g. IPC Class I). The C.I. limit when using these settings would be $(500/60) 8.33$.

The C3 Corrosivity Index provides a single test result value that can be plotted over time to track trending in product cleanliness – the lower the C.I. the less likely a tested product site will suffer performance problems due to the presence of a detrimental ionic residue.