



# IPC-TM-650 TEST METHODS MANUAL

## 1.0 Scope

**1.0** This test procedure is designed to measure the level of anionic contaminants on the surface of circuit boards by ion chromatography.

## 2.0 Applicable Documents

**IPC-TP-1043** "Cleaning and Cleanliness Test Program, Phase III, Water Soluble Fluxes, Part 1: B-Z4, Interactions of Water Soluble Fluxes with Metal/Substrates. October, 1992."

**IPC-TP-1044** "Cleaning and Cleanliness Test Program, Phase III, Water Soluble Fluxes, Part 2: B-36, Comparison to Phase 1 Rosin Benchmark", September 1992.

## 3.0 Test Specimens

**3.1** Printed Wiring Board (PWB) for extraction

## 4.0 Apparatus and Material

**4.1** Dionex 4000i (Ion Chromatograph) or equivalent. The system consists of a gradient pump and an anion column (AS4A-SC or equivalent), and a conductivity detector. A system which is operating properly should be capable of 50 ppb or better. The equipment and chemistry should be set up and standardized per manufacturers' instructions.

**4.2** Hot Water Bath capable of holding 80°C ±5°C.

**4.3** Use a clean heat sealable bag, ie. KAPAK® 500 series or equivalent, with less than 250 ppb extractable contaminants. (Specify cleanliness level or manufacturers' part number.)

**4.4** Cleanroom vinyl gloves. (<3ppm of Cl)

**4.5** Hi-purity deionized water 18.3 meg-ohm grade and chloride levels of less than 50 ppb.

**4.6** Hi-purity chemicals for eluent and regenerant preparation.

**4.7** NIST traceable standards

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**4.8** 2-Propanol (IPA), Electronic grade

## 5.0 Procedure

### 5.1 Extraction

**5.1.1** Record area of PWB. General rule on surface area is (length x width x 2) + 10% for a populated PWB.

**5.1.2** Use clean gloves when handling the samples to be tested, and then place each sample in the extraction bag.

**5.1.3** Prepare 75/25 IPA/H<sub>2</sub>O solutions for the extraction.

**5.1.4** Add 100-250 mls of the extraction solution to the extraction bag (enough to cover the PWB).

**5.1.5** Heat seal the extraction bag and place in the 80°C water bath for one hour (cut a vent hole in the bag).

**5.1.6** Measure solution volume after extraction.

**5.1.7** Prepare unprocessed PWB as control.

### 5.2 Standard and Sample Analysis.

**5.2.1** Inject solution into Ion Chromatograph (IC) and calculate against known standards.

**5.2.2** Values from the IC are in the ppb in solution range.

**5.2.3** Standards should be used per mfg. instruction. (Chloride levels of 100 ppb are recommended).

**5.2.4** A calculation to take into account for surface area and evaporation must be done so as to compare all different sizes of circuit boards.

$$\text{ug/cm}^2 = \frac{(\text{ppb value from IC}/1000) \times (\text{final volume}/\text{original volume})}{\text{Surface Area (cm}^2\text{)}}$$