



## MATERIALS TESTING

Element Baltimore is an internationally accredited, world-renowned, full-service failure analysis testing facility specializing in materials testing in accordance with numerous industry standards including ASTM, IPC and MIL-Specs. If you have technical questions or require help designing a test plan, you will work one-on-one with our technical experts, many who chair industry standards writing committees including ASTM and IPC.

### ENVIRONMENTAL TESTING

Whether you are testing satellite components or solar cells that are intended to function in the most challenging desert setting, there is simply no substitute for environmental testing from Element Baltimore. When your components are expected to work in extreme temperature ranges and weather conditions, environmental testing including altitude, thermal shock / cycling, humidity, UV and other forms of dynamic testing can help you meet client expectations, adhere to regulatory standards and even avoid litigation.

- Accelerated Aging
- Altitude
- Autoclave/Pressure Pot
- Cold Impact
- Conductive Anodic Filament Growth
- Corrosion Resistance
- Electromigration
- Environmental Stress Screening (ESS)
- Field Simulation
- Fluid Resistance
- Fungus Resistance
- Hydrolytic Stability
- Immersion
- Moisture and Insulation Resistance (MIR)
- Outgassing
- Steam Aging
- Surface Insulation Resistance (SIR)
- Temperature/Humidity
- Thermal Aging
- Thermal Cycling
- Thermal Shock
- Thermal Stress
- Tin Whisker Testing
- UV Exposure
- Water Spray
- Water Vapor Transmission
- Xenon Arc Weathering

### ELECTRICAL TESTING

We offer a full range of electronics testing to verify the safe and compliant operation of your electronic components and assemblies under all types of environmental conditions. We have the in-house expertise to supply you with all the information you need — including services that involve active monitoring and in-depth analysis. By accurately measuring everything from contact resistance to dielectric strength, we supply you with the tests and documentation you need to have full confidence in your electronic components.

- Arc Resistance
- Capacitance
- Conductivity
- Contact Resistance
- Continuity
- Data Acquisition
- Dielectric Breakdown/Constant/Strength/Withstanding Voltage (DWV)
- Dissipation Factor
- Electrical Overstress/Properties
- HiPot
- Leakage
- Life Testing
- Resistance/Resistivity

# DELIVERING INNOVATIVE PRODUCT TESTING AND CERTIFICATION SOLUTIONS

## IPC TESTING AND TRAINING

Element Baltimore has a long history of testing and accreditation to various IPC standards and was the first IPC Qualified Test Laboratory for Validation Services. Our staff is heavily involved in industry groups such as the Assembly and Joining Committee, the 7-11 Test Methods Subcommittee, J-STD-004 Flux Specification Task Group, the SIR and Electrochemical Migration Task Group, the Ionic Conductivity task group, and all of the training development groups. We have the resources and experience to discuss, develop, perform, train to, and interpret IPC qualification and conformance to some of these common standards:

- IPC J-STD-001
- IPC J-STD-002
- IPC J-STD-003
- IPC J-STD-004
- IPC J-STD-005
- IPC J-STD-006
- IPC-A-600
- IPC-A-610
- IPC-CC-830
- IPC-4101
- IPC-4103
- IPC-4202
- IPC-4203
- IPC-4204
- IPC-4781
- IPC-6012
- IPC-6013
- IPC-6015
- IPC-6016
- IPC-6018
- IPC-9202
- IPC-9201
- IPC-9701
- IPC-SM-840

## PRINTED CIRCUIT BOARD / ASSEMBLY (PCB/PCA)

Printed circuit boards are the foundation for any printed circuit assembly. Our internationally accredited laboratory is approved for PCB testing to IPC-6012, IPC-6013, IPC-6016, IPC-6018, MIL-PRF-55110, MIL-P-50884, MIL-PRF-31032 or MIL-STD-810. This includes the bare PCB, the finished assembly (PCA), and the raw materials that comprise the PCB and PCA. We have been assessing board quality for over 30 years, in addition to performing full root cause failure analysis. To ensure the conformance of your product, it is recommended to engage in PCB/PCA testing when using a new supplier or changing a step of the manufacturing process.

## ASTM TESTING

With decades of experience as an ASTM testing lab for over 1,000 ASTM test methods, we are ISO 17025 and A2LA accredited. Our experts are members of many different ASTM committees and have participated for more than 20 years. We have contributed to the publication of hundreds of ASTM methods. Our specialty goes well beyond being a standard ASTM testing lab. In addition to testing in direct accordance with ASTM test methods, we offer unique solutions by modifying individual methods to meet the needs of our customers. This includes adapting methods to

accommodate unique samples or requirements, as well as performing methods at non-standard environmental conditions.

## OUTGASSING ANALYSIS

Element Baltimore offers a proprietary approach to outgassing analysis, which includes testing in accordance with ASTM E595. Outgassing analysis is a critical service for customers in the space sector—and involves a combination of technical expertise and effective control design to achieve the desired results. By quantifying the gasses released from specific materials, customers are able to better protect control surfaces and electronic systems. Additionally, we offer TQCM (Temperature controlled Quartz Crystal Microbalance) services and our Outgassing test stands allow for flexibility and customization against the standard methodology in terms of both temperature and vacuum level.

## RTCA DO-160 TESTING AND MIL-STD-810 TESTING

In addition to our ASTM and IPC work, we are equipped and accredited to offer our clients testing to sections 4, 5, 11, 13, and 26 of the RTCA DO-160 standard. The MIL-STD-810 sections 500 through 504, 507, 508 and 512 are also routinely tested by our laboratory.

## CHEMICAL TESTING

Element Baltimore is a world-renowned chemical testing lab with expertise in composition, flammability, ion chromatography and more. To ensure your products' regulatory compliance and correct chemical composition, we are highly skilled at testing products to meet the standards of leading organizations such as ASTM International, UL, IPC and U.S. Department of Defense MIL-STD and/or MIL-SPEC.

- Alloy Composition
- Chemical Resistance
- Cleanliness
- Compatibility
- Composition
- Contamination Analysis
- Corrosion
- Density/Specific Gravity
- Flammability
- Hazardous Substance Analysis
- Heavy Metals/Lead Content
- Ion Chromatography (IC)
- Ionic Impurities
- Porosity
- Resistivity of Solvent Extract (ROSE)
- Restriction of Hazardous Substances (ROHS)
- Viscosity