

IEST Working Group and Recommended Practice Support



Balazs actively participates in many standards-developing organizations including IEST, by:

- Providing expertise regarding current analytical capabilities
- Identifying gaps in current techniques and methods compared to proposed standards and leading edge technology requirements
- Suggesting new methods and techniques to eliminate roadblocks from advancing standards and technologies

What is IEST?

As stated on the IEST website, <http://www.iest.org>: “The Institute of Environmental Sciences and Technology (IEST), founded in 1953, is a multidisciplinary, international society whose members are internationally recognized for their contributions to the environmental sciences in the areas of contamination control in electronics manufacturing and pharmaceutical processes; design, test and product reliability issues associated with commercial and military systems.

How does Balazs help?

Balazs™ NanoAnalysis currently supports the analytical needs embedded within current recommended practices, often exceeding the reporting limits of the standards. This document focuses on the individual working groups (WG) and recommended practices (RP) that Balazs™ supports to ensure clients are complying with the standards, especially within the CC = contamination control section. In many cases, Balazs™ offers specialized tests beyond those specified yet in the standards to cover leading edge issues where the consensus process has not yet developed RP's.

Recommended Practices

RP-CC-003.4: Analysis of new and used garments. Balazs™ for the laundry water, packaging, residues, end of life cuff studies, since the cuff of the garment is closest to the products. Balazs™ reports ionic, organics NVR contaminants ng/cm², extractable particles, or per IEST 1246E.

RP-CC-004.3: Balazs™ analyzes new wipes and offers wipe tests for surface contamination for organics, inorganics, particle, contamination assessment, to assess cleaning residues, and to assess cleanup post fires, floods, spills, maintenance etc. Dirty surfaces can be wiped clean, but no wipe is perfect, so clean surfaces can be wiped dirty and this needs to be evaluated carefully; especially for high end optics.

RP-CC-005.3: Gloves; new and end of use: Balazs™ tests for ionics, metals, organics, outgassing, and offers smudge tests and contract transfer assessment. Some gloves can have very high level of Zn, Ca, Cl, nitrate, plasticizers etc, and this needs to be controlled for many applications.

RP-CC-006.3: Testing cleanrooms. Many companies test for particle counts and Balazs™ works with users to ID particles, document cleanliness of surfaces, AMC levels.

RP-CC-008.2: Gas-Phase Adsorber Cell Balazs™ tests upstream and downstream of AMC filters to assess removal efficiency versus time for acids, bases, organics, Sox, metals, dopants, refractories and when to replace filters.

RP-CC-012.2: Cleanroom design, materials selection outgassing and leach tests, AMC and SMC monitoring, materials compatibility tests.

RP-CC-016.2: Non-volatile residue to sub-monolayers, and semi-volatile organic compounds to 0.001 ML (0.1ng/cm²) using witness wafers and SEMI MF1982-1103 TD GC-MS methods, that also meet ITRS requirements. FTIR, Raman, SEM/EEDS and other methods can be used for residue ID.

RP-CC-022.2: Electrostatic charge in cleanrooms: Balazs™ analyzes residue on ionizer tip.

RP-CC-025: Swabs; new and used to evaluate surfaces for baselining fab surfaces and cleanups and small parts, areas, o-ring grooves, etc.

RP-CC-026.2: Cleanroom operations. Any changes in cleanroom air flows, exhaust, tools, processes, workflow can perturb parameters and lead to contamination problems. Cross contamination via people, processes and substrate movement must be assessed. Incoming materials must be cleaned, QC'd to avoid contaminants.

RP-CC-027.2: Personnel in cleanrooms. Personnel can contaminate cleanrooms with particles, vapors like silicones and ammonia, biologically active programs. Procedures are needed to avoid cross contamination by personnel via garments, gloves, packaging, boxes, equipment, etc.

RP-CC-028.1: Mini-environments. Balazs™ uses witness wafers for Surface Molecular Acids (SMA), Surface Molecular Bases (SMB), Surface Molecular Organics/Condensables (SMOrgs), Surface Molecular Dopants (SMD), Surface Molecular Metals (SMM). Additionally, we leach boxes and mini-environments, other surfaces for acids and bases, organics, test outgassing, identify particles added to substrates and tests AMC Parameters for mini environments, gloves boxes, storage areas, stockers, etc.

RP-CC-031.3: Balazs™ measures outgassing performance criteria for cleanroom materials, measured in ppmw. We can also test and report in ng/cm²/day, do proximity outgassing onto surfaces/wafers per SEMI MF1982-1103, SEMIE108. For Disk drives, we can test to IDEMA standards, including whole running disk drive. We test whole running devices for outgassing including lasers, motors, actuators, etc.

RP-CC032.1: Packaging Materials for Cleanrooms. Balazs™ offers outgassing, extractable, contact transfer, compatibility, trace metals, organics, ionics testing. We assess parts contamination due to heat sealing bags, contact with gel based shipped or membrane boxes.

RP-CC-035.1: Design considerations for Airborne Molecular Contamination Filtration Systems in Cleanrooms. Methods for baseline AMC analysis testing before and after filters and baseline witness wafers post filters. Comparison with ITRS, other standards. We apply similar test methods for optics, lasers, disk drivers and other AMC sensitive industries.

RP-CC-042.1: Liquid Particle Counters. Many companies count particles and Balazs™ identifies particles by SEM/EDX, FTIR, Raman and other methods to help find particle sources for water, solvents, chemicals, extracts, gases. We also extract and count submicron particle from parts, polymers, surface.

RP-CC-1246E: Product Cleanliness levels and contamination control program.



Working Groups

WG-CC040: Cleaning of Equipment Surfaces in the Cleanroom and Controlled Environments. Balazs™ validates cleaning for residues using, IC, GC-MS, NVR, FTIR, wipes, extracts, outgassing, ICP-MS, SEM/EDX, particle counts.

WG-CC041: Recovery from Disruption to Cleanrooms and Other Controlled Environments due to fires, floods, spills, leaks, power outage, HVAC failures) using AMC and SMC tests, witness wafers, swabs and wipes. Reported per IEST 1246E, or ng/cm², using IC, GC-MS, ICP-MS, etc. Contingency planning and base-lining prior to failures.

WG-CC043: SMC, Surface Molecular Contamination organics, ions, metals, dopants, NVR using IC, ICP-MS, GC-MS, FTIR, Raman on wafers, optics, any surface in critical environments, for SEMI, Disk, FPD, PV, Laser, optoelectronics, aerospace, medical, instrumentation, optics, coating and related industries.

WG-CC0201: Forum on Nanotechnologies. Due to their huge surface areas and small particle sizes, nanotechnologies can in some case be very sensitive to molecular contamination. Balazs™ can ID both composition, catalysts, additives and impurities in nanomaterials including particles, fibers, nanorods, films.