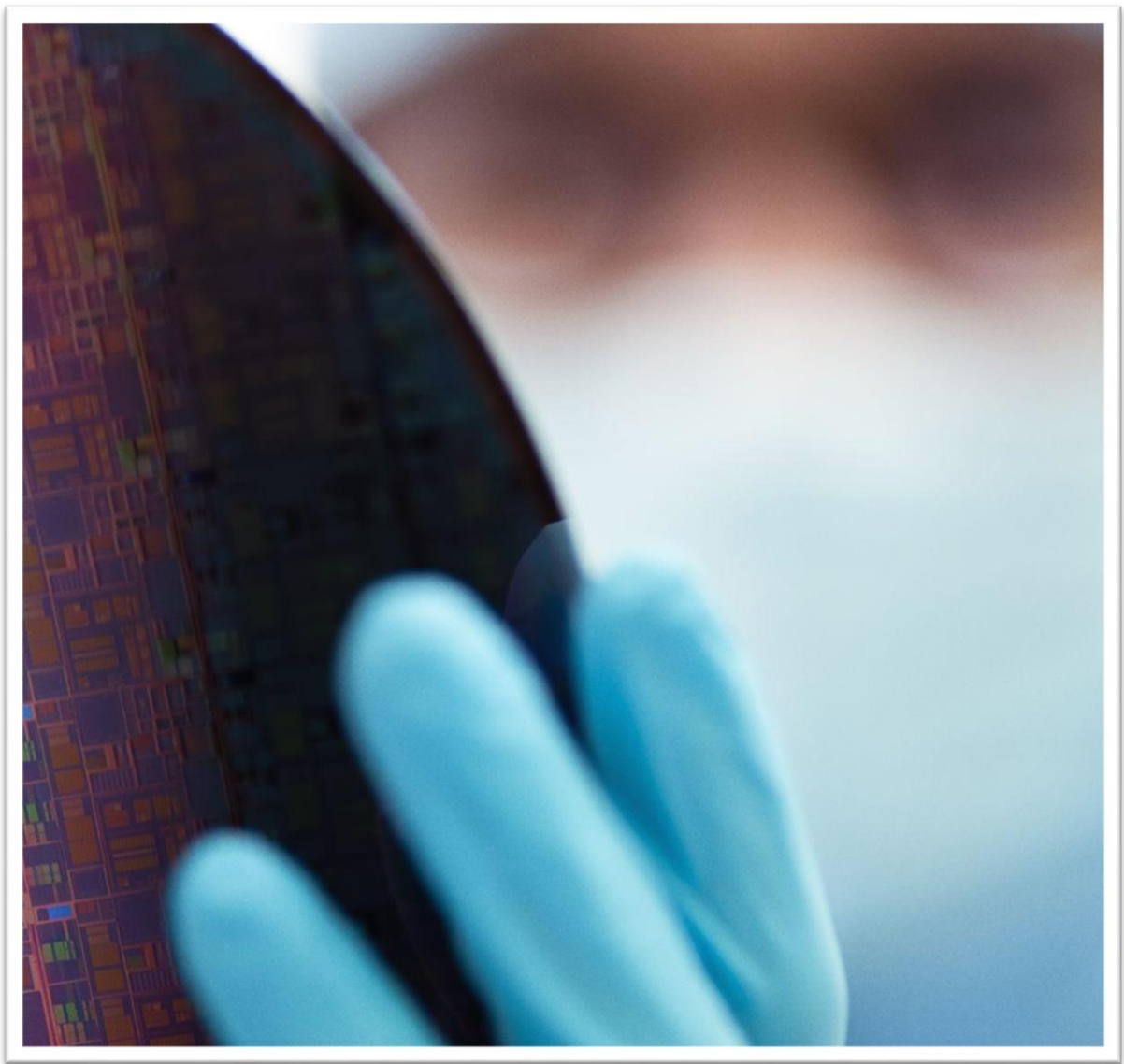
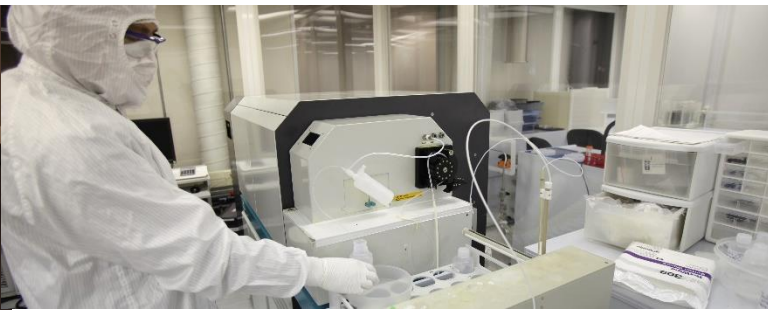


Consulting Services





Balazs™ NanoAnalysis offers Consulting Services to support your clean manufacturing goals. Our experts provide remote and onsite consulting. As an independent consultant, **Balazs™** will help you resolve contamination escalations, design experiments, and develop a long-term cleanliness approach for sustainable clean manufacturing.

Consulting Services

Our subject matter experts have many years of experience with expertise in a variety of subjects, such as:

- Airborne Molecular Contamination
- Chemical bath sampling
- Cleanroom consumables qualification
- Cleanroom environment monitoring
- Contamination troubleshooting
- Defect identification and quantification
- Gap Analysis of cleanroom operation
- Gas canister and cylinder sampling
- Material characterization and selection
- Precursor analysis and qualification
- Process tool cleanliness and parts testing
- Surface Molecular Contamination
- UPW sampling

Training and Development Seminars

We offer a comprehensive agenda for new and experienced engineers, to complement our consulting services. The seminars are an effective and efficient way for your teams to gain expert knowledge and to ensure everyone in your company is on the same page for contamination control. **Balazs™** University offers three topics that each have 5 or more sessions and many case studies.



- Clean Manufacturing for Optimum Yield
- Metrology and Defect Characterization
- Troubleshooting Contamination Sources

Clean Manufacturing

Clean manufacturing is being in control of (i) incoming materials, (ii) processes, and (iii) the surrounding environment.

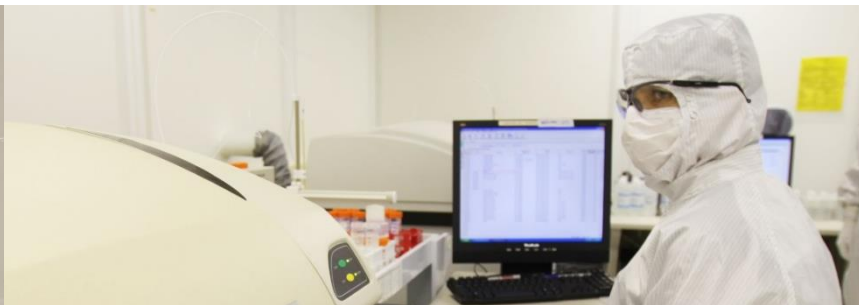


Clean Manufacturing is critical to production yield in the semiconductor industry and the criticality is increasing daily with more complex devices. IC device performance failures are frequently caused by contamination. The contamination sources are not just confined to your plant but extends throughout product supply chain.



“Clean Manufacturing may not matter now, but it will catch up to you when it is most inconvenient”

Balazs™ offers consultation to guide you through our comprehensive Clean Manufacturing programs to identify cross-contamination pathways. We offer contamination mapping and monitoring of your cleanroom operation and processes, we can verify your process tool component cleanliness, and troubleshoot to determine the contamination root source. An onsite Gap Analysis can be tailored to fit your site's needs.



Gap Analysis: An Onsite Contamination Risk Assessment

A Gap Analysis helps to understand the root causes of contamination. It reveals and recognizes deficiencies or symptoms of culture, systems, and training concerns.

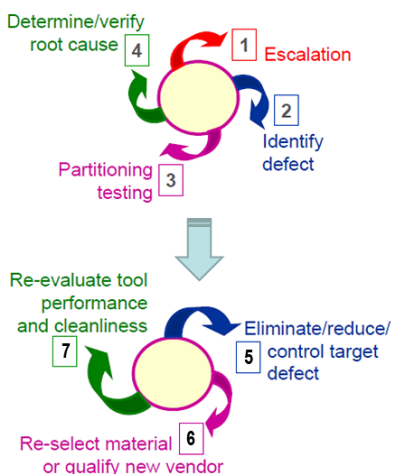
- Identifies under-reporting of problems
- Improve the robustness of processes
- Helps to build a contamination-free operation culture of doing it right when no one is looking or checking

We offer 2 Levels of Gap Analyses

Audit Level 1: A Walk-Through audit and a Risk Assessment will identify gaps in your Clean Manufacturing process, protocols and documentation, and evaluate facility cleanliness.

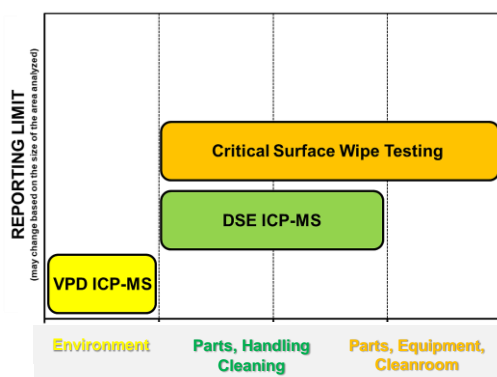
Audit Level 2: This is a Full Audit that includes a Level 1 audit plus a quantitative contamination baseline mapping of the cleanroom environment and production and equipment surfaces.

Our consultants can guide you through the troubleshooting steps 1-7. We will develop an analytical test plan to determine the root source and cause of the contamination after an onsite Gap Analysis.



Critical Wipe

Critical Wipe is a valuable predictive monitor to reduce metal contamination excursions during product manufacturing.



Critical Wipes can quantitatively map surface metal contamination in a facility and inside process tools and equipment. This data is valuable to improve process operation, handling, and to develop Best Practices.

People	Process/Equipment	Facility																								
<table border="1"> <thead> <tr> <th>Element</th> <th>RL</th> </tr> </thead> <tbody> <tr> <td>Sodium (Na)</td> <td>10 Total ng/wipe</td> </tr> <tr> <td>Potassium (K)</td> <td>50 Total ng/wipe</td> </tr> </tbody> </table>	Element	RL	Sodium (Na)	10 Total ng/wipe	Potassium (K)	50 Total ng/wipe	<table border="1"> <thead> <tr> <th>Element</th> <th>RL</th> </tr> </thead> <tbody> <tr> <td>Nickel (Ni)</td> <td>10 Total ng/wipe</td> </tr> <tr> <td>Iron (Fe)</td> <td>50 Total ng/wipe</td> </tr> <tr> <td>Copper (Cu)</td> <td>10 Total ng/wipe</td> </tr> <tr> <td>Chromium (Cr)</td> <td>10 Total ng/wipe</td> </tr> <tr> <td>Aluminum (Al)</td> <td>10 Total ng/wipe</td> </tr> </tbody> </table>	Element	RL	Nickel (Ni)	10 Total ng/wipe	Iron (Fe)	50 Total ng/wipe	Copper (Cu)	10 Total ng/wipe	Chromium (Cr)	10 Total ng/wipe	Aluminum (Al)	10 Total ng/wipe	<table border="1"> <thead> <tr> <th>Element</th> <th>RL</th> </tr> </thead> <tbody> <tr> <td>Magnesium (Mg)</td> <td>10 Total ng/wipe</td> </tr> <tr> <td>Calcium (Ca)</td> <td>50 Total ng/wipe</td> </tr> </tbody> </table> <p>Contaminants Galvanized steel, Fe, Ni, Zn People, Na Gypsum = CaSO₄, Ca/MgCO₃, Na/KCl, FeS₂ Dirt = SiO₂ (quartz), CaCO₃ (limestone), Na, K, Mg, P, S, Fe, and Mn</p>	Element	RL	Magnesium (Mg)	10 Total ng/wipe	Calcium (Ca)	50 Total ng/wipe
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Balazs™ provides hands-on Critical Wipe training for a variety of surface contamination applications.



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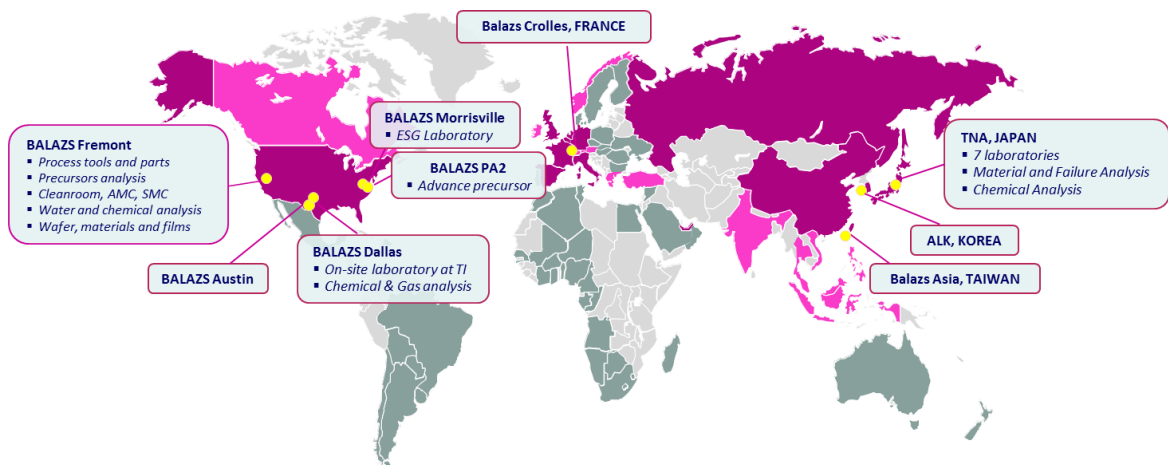
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The World leader in gases, technologies and services for Industry and Health. Air Liquide is present in 80 countries with approximately 68,000 employees and serves more than 3 million customers and patients