Fab & Tool OPTIMA™ Solves the Contamination Mystery

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Background
Balazs™ has been providing a wide range of analytical services to the semiconductor industry for over 30 years. Using a variety of methods and laboratories, manufacturers generally rely upon their own understanding of the problems or the additional support of an external laboratory in order to resolve the issue. Analytical methods are selected based on a familiar method or the equipment available through the laboratory. This approach often involves unnecessary analytical cost and lengthy investigations to resolve issues.

Increased Capability and Expertise
Over the past 5 years, Balazs has made strategic acquisitions in both equipment and personnel in order to offer a complete range of analytical services, in addition to the expertise to assess virtually any contamination issue. With a wide range of equipment and testing services available on-site in our Fremont, CA, Dallas, TX, and Fishkill, NY, laboratories, Balazs is a valuable analytical resource. Additionally, the expertise of the Balazs staff is a powerful resource to assess issues as they surface. Chances are Balazs staff members have addressed and resolved the problem previously.

Fab & Tool OPTIMA- Packaging the Knowledge
Fab & Tool OPTIMA™ (OPTImization for MAnufacturing) sums up the package that Balazs is able to offer. It provides an overall strategy to identify and eliminate microcontamination throughout the fab while considering the custom environments of each location. Balazs aims to 'solve the microcontamination mysteries' that occur in every manufacturing facility. By implementing an analytical program suited for your facility, you can expect the elimination of current contamination sources and rapid identification and resolution to future process excursions.

Creating a contamination-free environment and resolving excursions quickly will increase production ramp time, increase yields and reduce downtime for manufacturers. OPTIMA is applicable to IC processing, tool design and manufacturing, and any other high-tech industry concerned with contamination. By working with each facet of possible contamination contributors, Balazs enhances the synergy that exists between tool manufacturers, facility engineers and the engineers on the production floor.

Contamination Sources
Innumerable contamination sources exist in manufacturing areas. By identifying and eliminating known contributors, reduced risk for production failures is attained.

OPTIMA encompasses the evaluation of the existing environment to determine their contribution to cleanroom contamination.

Outside Air	Piping
Incoming Water	Tiles
Process Chemicals	Filters
Process Gases	Sealants
Tools	Packaging Materials
Parts	Personnel
Components	Consumables
Chemical Reactions in Cleanroom Air	

Table 1: Examples of contamination sources

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Sample Types

The growth and expansion of Balazs expertise that has taken place over the past 5 years provides a unique ability to analyze a variety of sample types. This versatility not only simplifies sample collection and handling, but it allows Balazs to use varying methods in order to confirm the results.

Gaseous Samples	Wafers
Liquid Samples	Tiles
Assemblies	Filters
Gloves	Sealants
Lenses	Packaging Materials

Table 2: Examples of sample types

Fab & Tool OPTIMA- Key Components

OPTIMA is summarized into 3 main components, each providing a specific function to lead to a manufacturing facility reaching its manufacturing peak quickly and producing optimum yields with reduced downtime.

Baseline Evaluations

The key to identifying unwanted trends in contaminants is to understand the baseline levels. Once baselines are established, increases in contaminants can be identified and rectified before production issues are encountered. Baseline evaluations are beneficial for:

- Airborne Molecular Contamination (AMC)
- Equipment Environments (i.e. Steppers, Implanters, etc.)
- Organics
- Ultrapure Water (UPW)

Reduce Contamination

Initial baseline levels are not necessarily perfect. Reducing contamination using Balazs as an information resource typically results in dramatic decreases in baseline levels and immediate improvement in contamination throughout the facility. Analyses investigate the levels of:

- Particles
- Metals
- Anions
- Cations
- Organics

Material and Component Optimization

Based on research and evaluations of materials used in the cleanroom facility, Balazs assists in selection of materials being considered for use. This evaluation applies to:

- Equipment Design
- Equipment Materials
- Consumables
- Material Compatibility

Using the baseline studies and historical contamination issues, Balazs develops a customized Certificate of Cleanliness (CoC) that is accepted bb the fab and the equipment provider to ensure potential contamination is identified before entering the fab.

Results

OPTIMA is focused on the same goal each manufacturer is reaching for: contamination-free environments. While 'contamination-free' may be realistically impossible, each step toward it provides notable increases in manufacturing capabilities.

Working with the cleanroom and the multitude of suppliers who provide goods that enter the cleanroom creates an environment that is a win-win to each party. The results often lead to the product differentiation each player is seeking.