

## Ingenio™ APC (Advanced Process Control)

Customer is a leading manufacturer of semiconductor equipments.

### **Business Objective**

Reducing scrap and increasing time between preventive maintenance determines the difference between industry leaders and followers. Enabling our customer with real-time data acquisition and control capabilities to take corrective actions like adjusting recipe parameters equipped them with the potential of delivering superior quality products.

### **System Overview**

Ushustech implemented Advanced Process Control (APC) which resulted in higher productivity resulting from reducing scrap and increasing time between preventive maintenance. **Ingenio™, APC**, the software module basically handles, the FDC and Run-to-run faculties of the advanced process control for Etchers.

Some of the principal features of the system on which our engineers worked:

**Data Acquisition component**, event synchronization component (HSMS component) in the form of Distributed Message Hub which helps in the synchronization of run time with the slow persistent database storage methods.

**Generic Socket based interfaces** for the connected sensors, which aid in rapid application development with very little time needed to add a new sensor type support to the system.

**Post run analysis** modules implementing Data summarization and Multivariate Analysis (PCA/PLS support for process modeling and optimization).

**Statistical Process Control** (for the process alarms and notifications, basic FDC functionality) component.

**Historical charting component.**

**Engineering Work Station Support** for historical processing of data for process optimization.

**Implementation of SEMI standards** E-4 (SECS I), E-5 (SECS II), E-30 (GEM)

**Four-tier architecture** of the GUI separated the domain logic from the GUI and thus made the logic more reusable and testable.

**Support for EPD** (End Point Detection) methodologies and data handling for other sensors and chambers like metrology.

**Event driven system** with specific actions for separate events.

**Auto modeling** to create default data collection plan and subsequent SPC charts for each parameter for each recipe.

**Multivisit handling** – where wafer data summarized at the wafer and lot level

**Simulators for OES** (Optical Emission Spectroscopy) and VIP (V/I Probe) sensors.