



AUTOCAL



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Glossary

Baseline Temperature Run: Mission run with SensorWafer to collect baseline data. AutoCal uses this data to compute the optimal offsets.

Marker Run: Mission run with SensorWafer ON THE TOOL where one unit is added to a single (marker) zone offset. The data from this run is used to determine the appropriate wafer loading orientation for Baseline and Validation runs.

Marker Zone: Plate zone identified by a Marker Run (by adding 1 unit to a single zone offset ON THE TOOL). Marker Zone should be in the 12 o'clock (noon) position when displayed in OnView, for reliable AutoCal results.

Model Installer: Program that installs Tracks, Plates, Recipes and Wafer Flow data for use in AutoCal.

Recipe: A set of parameters associated with a Plate. Includes the AutoCal Model for this type of Plate.

Run a Mission: Program a SensorWafer in OnView to collect data from Plates.

SensorWafer: Wireless metrology system on a production grade silicon wafer.

TOOL: Refers to the physical resist coating track in your Fab.

Wafer Flow: A sequence of Bake steps (Plate/Recipe combinations) for which sensor data will be collected in a single mission.

.WFR or "wafer file": A proprietary temperature data file generated by OnView from data downloaded from a SensorWafer.

Welcome to AutoCal™

About AutoCal DYNAMIC OPTIMIZATION ENGINE

Critical Dimension (CD) variations during semiconductor manufacturing can directly impact final device performance and can reduce overall manufacturing yield. Consequently, active wafer-to-wafer and within-wafer CD control becomes a necessity, as the semiconductor industry continues to move to smaller CDs and larger substrates.

The proliferation of chemically amplified resists in the lithography process has elevated the Post-Exposure Bake (PEB) step to one of the primary drivers of CD control. In an attempt to improve CD uniformity, track OEMs have designed multi-zone and/or multi-controller hot plates. The performance of the lithography module can often be significantly improved through proper calibration of these advanced PEB plates. The challenge now has become how to accurately measure, monitor and calibrate the thermal dose of these PEB plates.

OnWafer's BakeTemp™ SensorWafers™, in combination with the advanced AutoCal Dynamic Optimization Engine, provide the metrology and calibration power to meet this challenge.

Temperature uniformity of the PEB plate is intimately related to the CD uniformity of the PEB process. Therefore, enhanced temperature uniformity will often result in significant improvements in CD uniformity.

- ➔ *AutoCal's powerful model-based calibration method provides a cost-effective calibration solution, yielding unprecedented across-Fab PEB plate performance.*
- ➔ *AutoCal leverages the accuracy and ease of use of BakeTemp SensorWafers to capture a real picture of the photoresist processing zone.*

AutoCal Dynamic Optimization Engine Improves TOOL Performance in the Post-Exposure Bake Process

The AutoCal Dynamic Optimization Engine is an advanced software application that generates optimized hot plate control offsets, to achieve substantial improvements in:

- ➔ *Within-plate thermal uniformity*
- ➔ *Plate-to-plate matching*
- ➔ *Critical Dimension (CD) uniformity (indirectly)*
- ➔ *Consistency of PEB results over time*

Benefits of Using AutoCal – Improved TOOL Performance Through Fast, Cost-Effective Calibration

AutoCal provides fast, accurate TOOL calibration, using a customized, model-based approach. This unique approach offers the following benefits:

- ➔ **FAST:** *Calibration of four plates at a single temperature can be completed within 1 hour of TOOL time, for most plates.*
- ➔ **NON-INVASIVE:** *The SensorWafer can be loaded with standard transfer robotics from the Cassette/FOUP. Consequently, accurate PEB plate calibration can be achieved without opening up the TOOL, significantly reducing TOOL down-time.*
- ➔ **ACCURATE:** *The AutoCal process significantly improves within-plate and plate-to-plate uniformity.*
- ➔ **CUSTOMIZED:** *AutoCal uses plate-specific thermal Bake Plate models to optimize the TOOL quickly and accurately. AutoCal can be tailored to specific equipment using customized Bake Plate models.*
- ➔ **SUPPORT:** *OnWafer offers personal support during installation and operation, and custom solutions to optimize AutoCal performance on your TOOL.*