

# METROBOOST



## Boosting Metrology and Lithography Performance

**M**etroCal™ is a patterned polysilicon wafer for system calibration and periodic monitoring of Critical Dimension (CD) metrology tools in semiconductor manufacturing. MetroCal is available in 200 mm and 300 mm wafer sizes.

With more than 1000 different targets in each exposure field, MetroCal offers all the essential structures you need **on a single substrate** with the form factor of the product wafer.

### *Calibration Applications:*

With MetroCal, it is easier to setup your CD-SEM system. As a portable artifact, it can be shared among tools in a facility for consistent performance and recipe sharing. Availability of nearly identical copies of the same wafer in different facilities becomes particularly useful for fleet matching.

### *Calibration Items:*

MetroCal is a versatile wafer. It is designed not only for scale calibration, but also for calibration of all other facets of automated CD metrology tool operation.

- SEM scale calibration for various magnifications
- Stage calibration, X and Y scale plus skew
- Stage map (XY)
- Stage center (SEM center, wafer center)
- SEM image aspect ratio and skew
- Zoom center
- Beam shift (Scan shift)
- SEM center to optical microscope offset
- Optical microscope image
- Wafer rotation (Prealigner)
- Beam incidence angle
- Stigmation

### *Monitoring Applications:*

MetroCal has targets suitable for monitoring CD-SEM, focused ion beam, scatterometry CD, and overlay metrology tools.

All targets are labeled for ease of use. Special structures consisting of intricate shapes optimized for pattern recognition are placed near all monitoring targets.

Special wafer processing developed for MetroCal has resulted in a leaky gate oxide which reduces charging effects observed in static precision tests by up to 50% compared to product wafers. Features have vertical sidewalls for very narrow apparent beam width. Lines exhibit linear growth rate with repeated measurements.

Scatterometry CD targets are designed with pattern recognition templates for easy comparison with CD-SEM measurements. All eighteen horizontal and vertical targets for 0.12 micron nominal width and line/space ratios ranging from 5:1 to 1:5 are printed. Two sets of targets are available in 50 and 100 micron square sizes.

There is even a set of overlay monitor targets with predefined offsets printed on the mask. The single layer targets have proved useful for SPC monitoring of measurement linearity, TIS, and TIS variability.

Documentation shipped with each wafer includes feature functions, drawings, labels, and locations within field.

For more information contact:

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