Accelerating Fab Integration of Metal Containing Resists

Jason Stowers

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Creating Resists Designed for EUV Lithography

- Small Uniform Building Blocks
- Metal Oxide Resist
- High Etch Selectivity
- High EUV Absorbance
Baseline Performance

- $E_{\text{size}} @ 16\text{nm HP}: \sim 37 \text{mJ/cm}^2$
  - $E_{\text{Lmax}}: 29\%$
  - Resist thickness $\sim 18$nm

- Formulation scaled to multi-gallon batches for integration learning and process development
  - Multiple track/fab installs complete

- Integrated in IMEC iN7 Metal 2 Block Layer
  - Negative tone imaging
  - Process simplification
Integration Simplification

- New material properties of the resist enable simplification of standard stacks and etch
Integration Simplification

• Metal oxide composition enables simplification of standard stacks and etch

![Diagram showing simplified etch process with metal oxide composition]
Metal Containing Resists for Fab Acceptance

• Intentional Metal: Sn
  – Track
  – Etch

• Unintentional Metals: Impurities
  – Developed ICP-MS methods to eliminate mass interferences from Sn
    • Enabling Lower Detection Limits
    • Example: isotope overlap between $^{112}\text{Sn}$ and $^{112}\text{Cd}$
  – Demonstrated multiple large batches with no detectable trace metals
THANK YOU!

... and to all of our partners