scia systems

scia Trim 200

PRECISE SURFACE CORRECTION

Features & Benefits

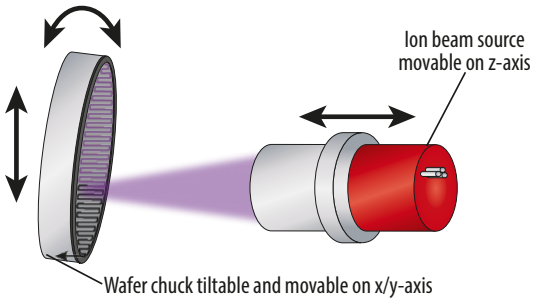
- Significant yield improvement
- Film thickness homogeneity to be adjusted down to atom level of 0.1 nm
- No edge exclusion with electrostatic chuck
- Sub-nanometer removal with zero base etch function
- Processing of film and wafer materials without restrictions
- Throughput and maintenance optimized design for low production costs
- Processing of wafers with photoresist masks due to good wafer cooling

Applications

- Frequency trimming of bulk acoustic wave (BAW) or surface acoustic wave (SAW) filters
- Thickness trimming of silicon on insulator (SOI), quartz, lithium tantalate (LT) or lithium niobate (LN) wafers
- Film thickness error or step height correction in thin film head (TFH) manufacturing
- Dimensional correction of MEMS structures

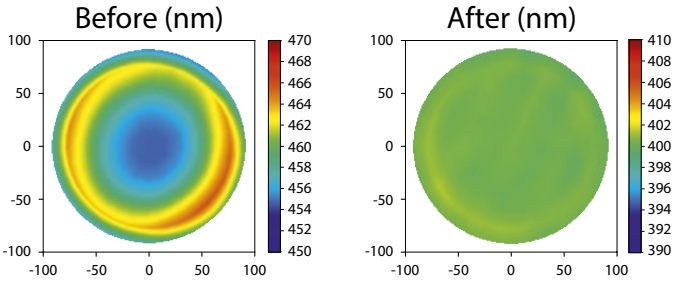
Principle

- Ion Beam Trimming (IBT)
  - Focused broad ion beam scans across wafer surface in vertical setup for low contamination
  - Local material removal is controlled by adjusting the dwell time



Application Example

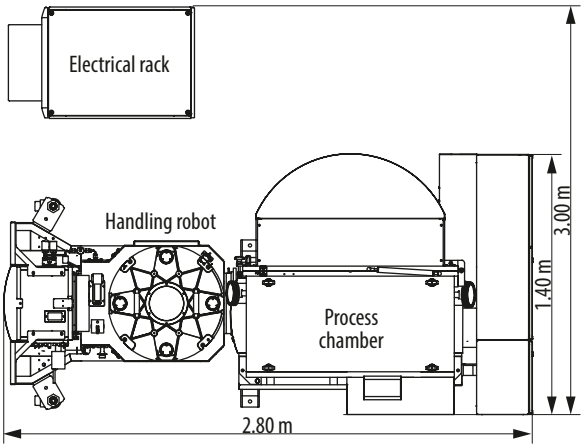
- Ion beam trimming of piezoelectric AlN on a 200 mm wafer
  - Standard deviation: Pre: 3.4 nm Post: 0.3 nm
    Improvement factor: 11.3
  - Average thickness: Pre: 459.3 nm Post: 400.4 nm
    Removal: 58.9 nm
  - Process time: 8:17 (min:sec)



Pre (left) and post (right) ion beam trimming results

Technical Data

Substrate size (up to)	200 mm dia., all standard wafer sizes possible
Substrate holder	Water-cooled, helium backside cooling contact, electrostatic clamping without edge exclusion
Axes performance	Max. velocity 0.5 m/s, max. acceleration 15 m/s^2
Ion beam source	37 mm circular RF source (RF37-i) with 7 ...15 mm (FWHM) or 80 mm circular RF source (RF80-i) with 12 ... 20 mm (FWHM)
Neutralizer	Hot filament neutralizer (N-Fil) or RF plasma bridge neutralizer (N-RF)
Typical removal rate	SiO_2: 6 x 10^{-3} mm^3/s (RF37-i), 11 x 10^{-3} mm^3/s (RF80-i)
Film variation after IBT	< 0.5 nm RMS (dependent on input quality)
Throughput	15 Wafer/h (50 nm Si on 150 mm wafer)
Base pressure	< 1 x 10^{-6} mbar
System dimensions (W x D x H)	2.80 m x 1.40 m x 2.20 m, for single chamber with cassette handling (without electrical rack and pumps)
Configurations	Single chamber with single substrate load lock or cassette handling, Cluster system with 2 process chambers and cassette handling
Software interfaces	SECS II / GEM, OPC



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