

# SiN Thin Films in Semiconductor

Stress SiN, passivation & etch mask

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Full version includes more chapters & cases.

## Ch1 Overview & Deposition Methods

PECVD / LPCVD / ALD comparison; stress-SiN vs. stoichiometric SiN.

## Ch2 PECVD Stress-SiN Principles

Gas ratio ( $\text{SiH}_4/\text{NH}_3/\text{N}_2$ ), RF power, temperature vs. stress; tensile / compressive tuning.

## Ch3 Passivation Applications

Al-line & Cu-interconnect protection; moisture barrier,  $\text{Na}^+$  blocking & reliability.

## Ch4 Etch Mask & Hard Mask

SiN as etch-stop / hard mask selectivity vs.  $\text{SiO}_2$  / photoresist.

## Ch5 Challenges in Advanced Nodes

3D sidewall passivation, ALD conformality, stress engineering in HKMG.

## Ch6 Troubleshooting

Particle, peeling, stress drift, non-uniformity, pinhole – flow & fixes.

Appendix: parameter quick-reference, typical recipe structure, FAQ, and further reading.