Technical report: M35G

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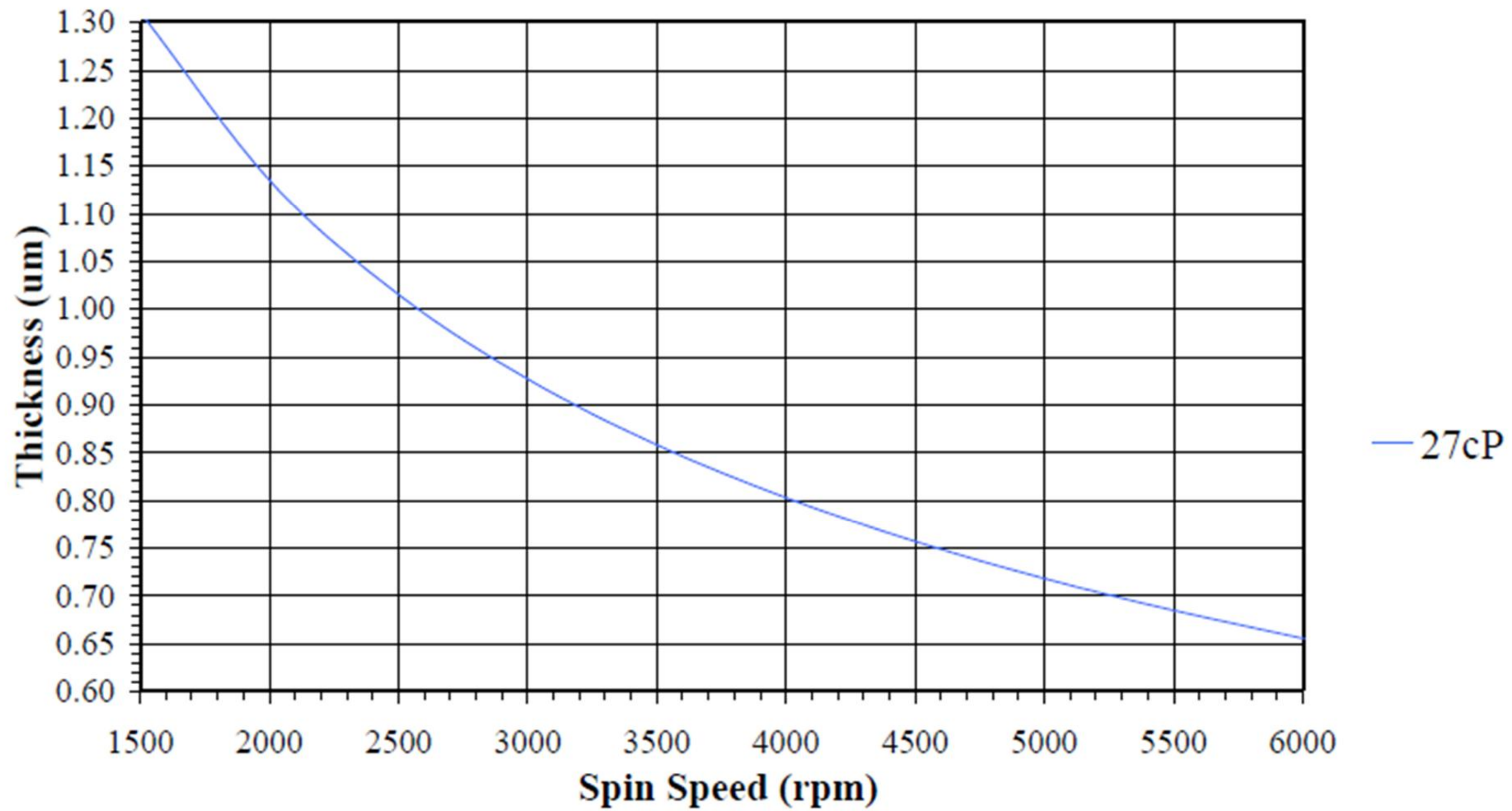
Introduction

- DANCHIP is looking for a non- critical KrF grade with following requirements:
  - Film thickness: 1.0 – 1.2um
  - Stable performance
  - Good adhesion with multiple substrates (Si, oxide, metal)
  - Application: Dry Etch

- JSR is proposing the HVM grade M35G_27cP that is widely being used in Europe.

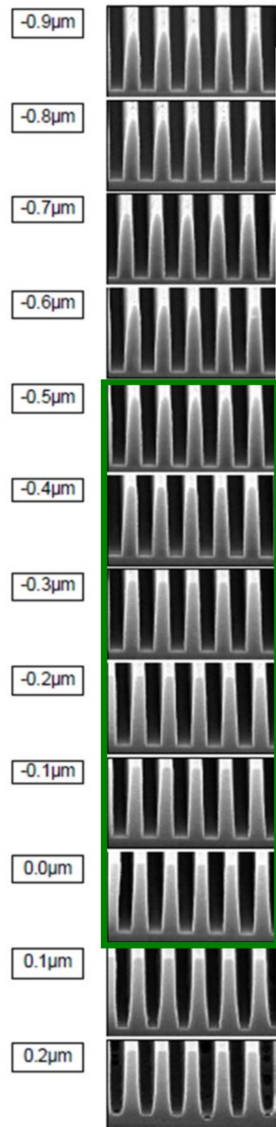
Spin Speed Curve KRF M35G-27cP

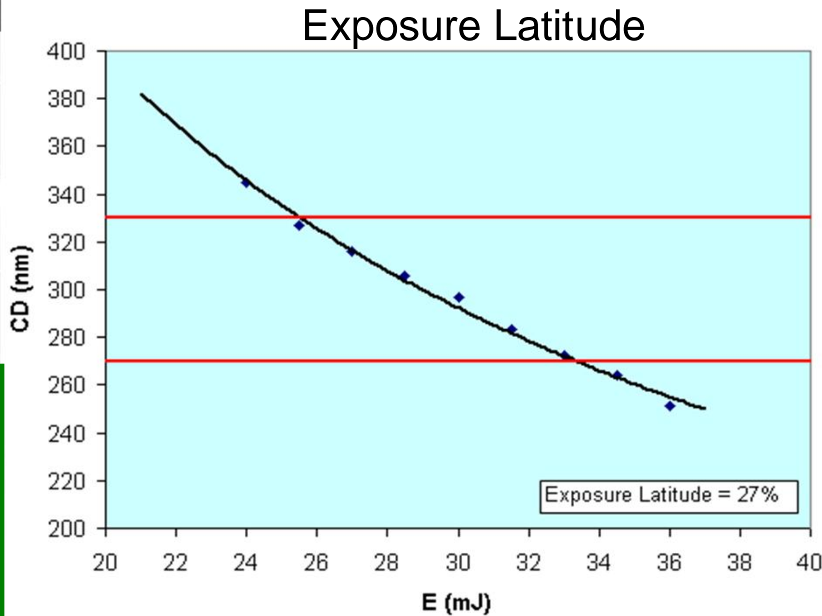


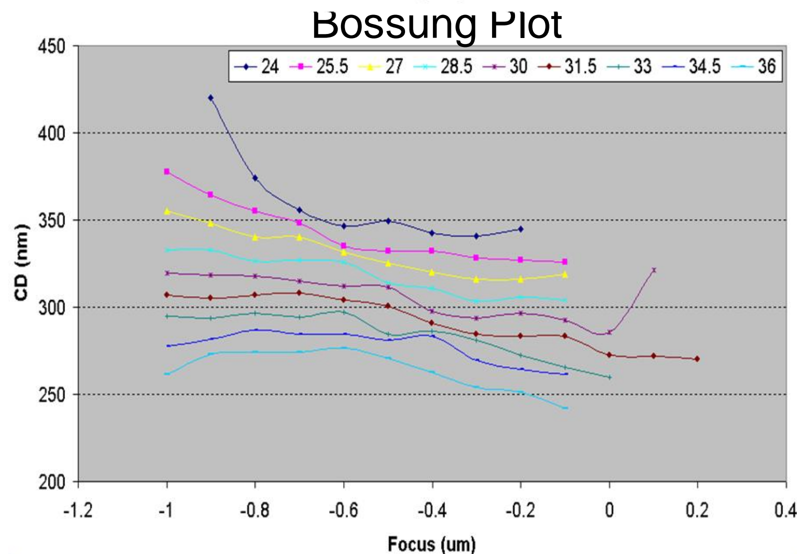
Process conditions

Process step	At JSR Mirco
Dehydration bake	No
Priming	90C, 30s
Film thickness	1.5µm
Soft bake	130C, 90s
Exposure tool	Canon
Illumination	NA = 0.60, σ = 0.65
PEB	130C, 90s
Development	60s single puddle
Hard bake	No
CD target	0.3µm S / 0.6µm P

M35G on Si substrate: 300nmL/600nmP







- Exposure Latitude of 27% is achieved
- DOF with XSEM is 0.5um
- Top Down DOF is 1.1um

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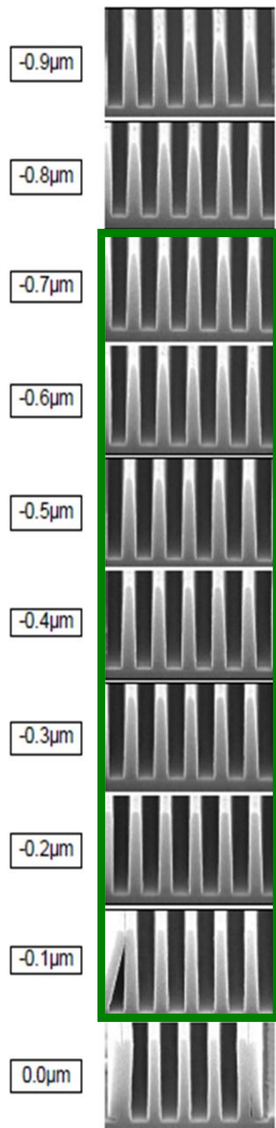
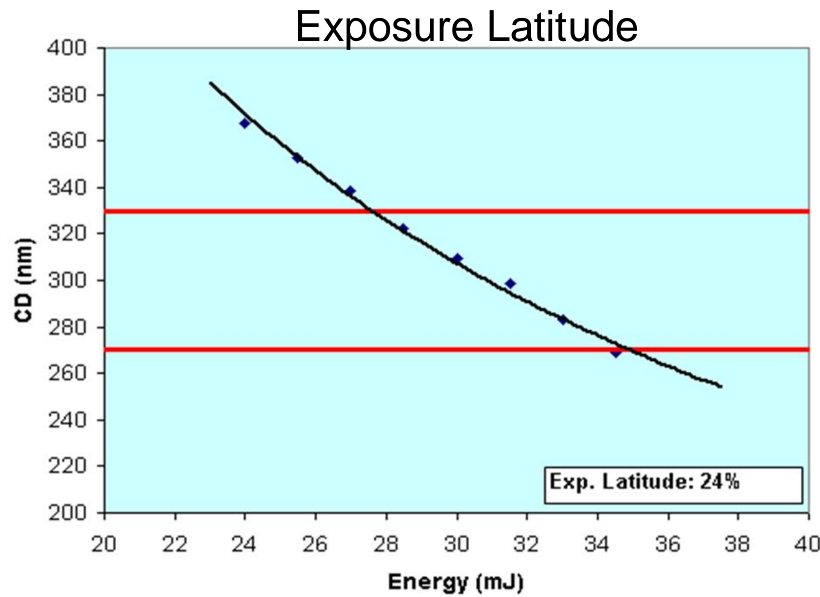
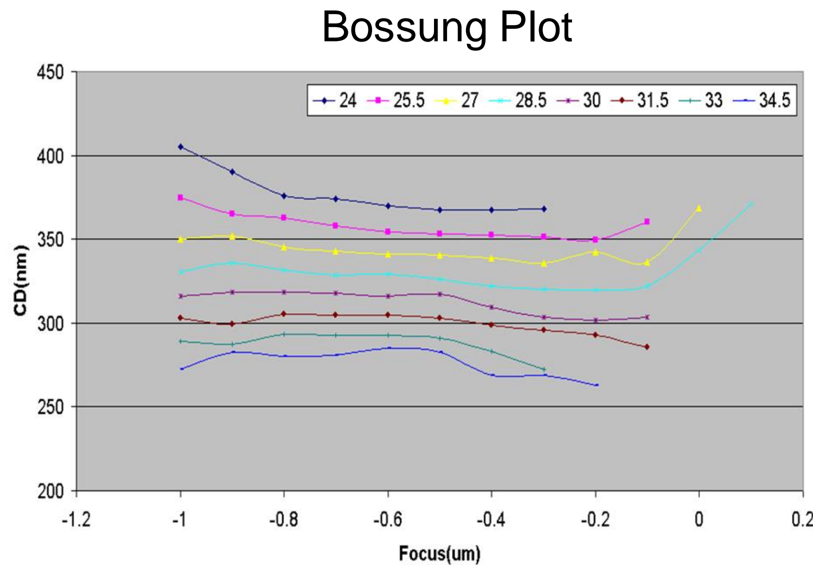
M35G on SiO2 substrate:300nmL/600nmP

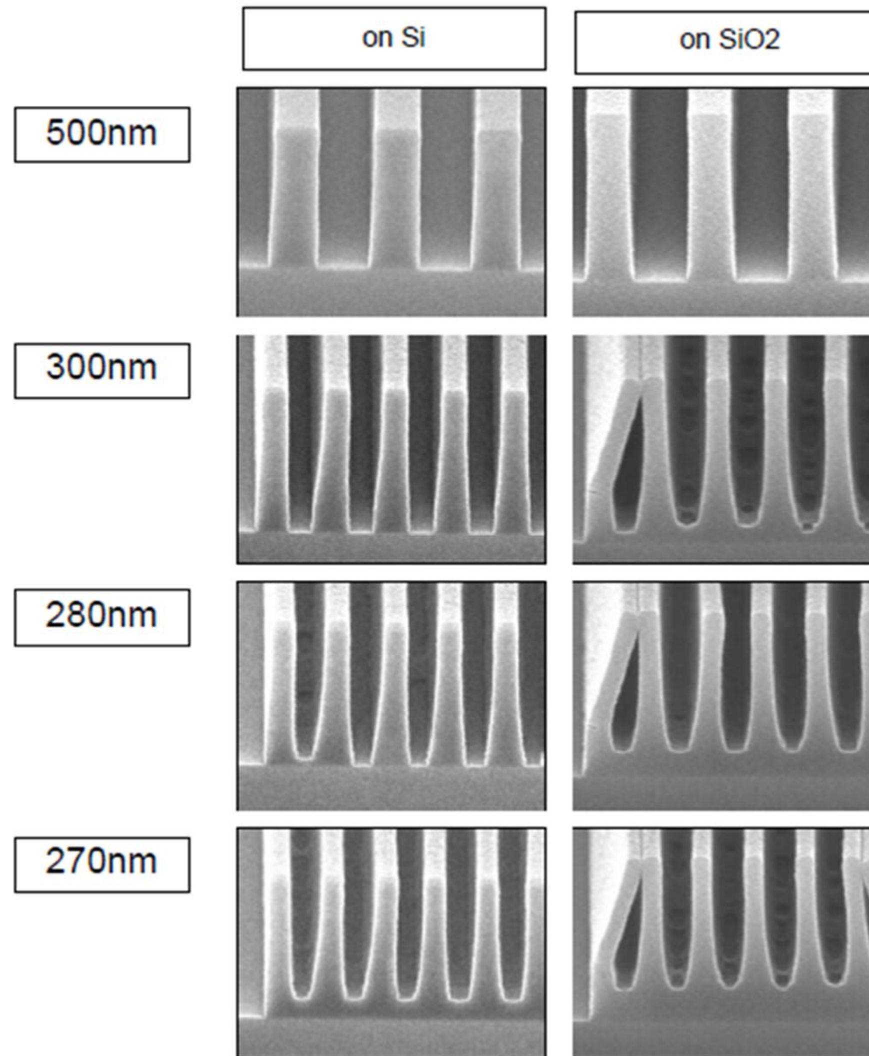






- Exposure Latitude of 24% is achieved
- DOF with XSEM is 0.6um
- Top Down DOF is 0.9um

Resolution of M35G-27cP



M35G-27cP for Metal & implant applications

KrF M35G

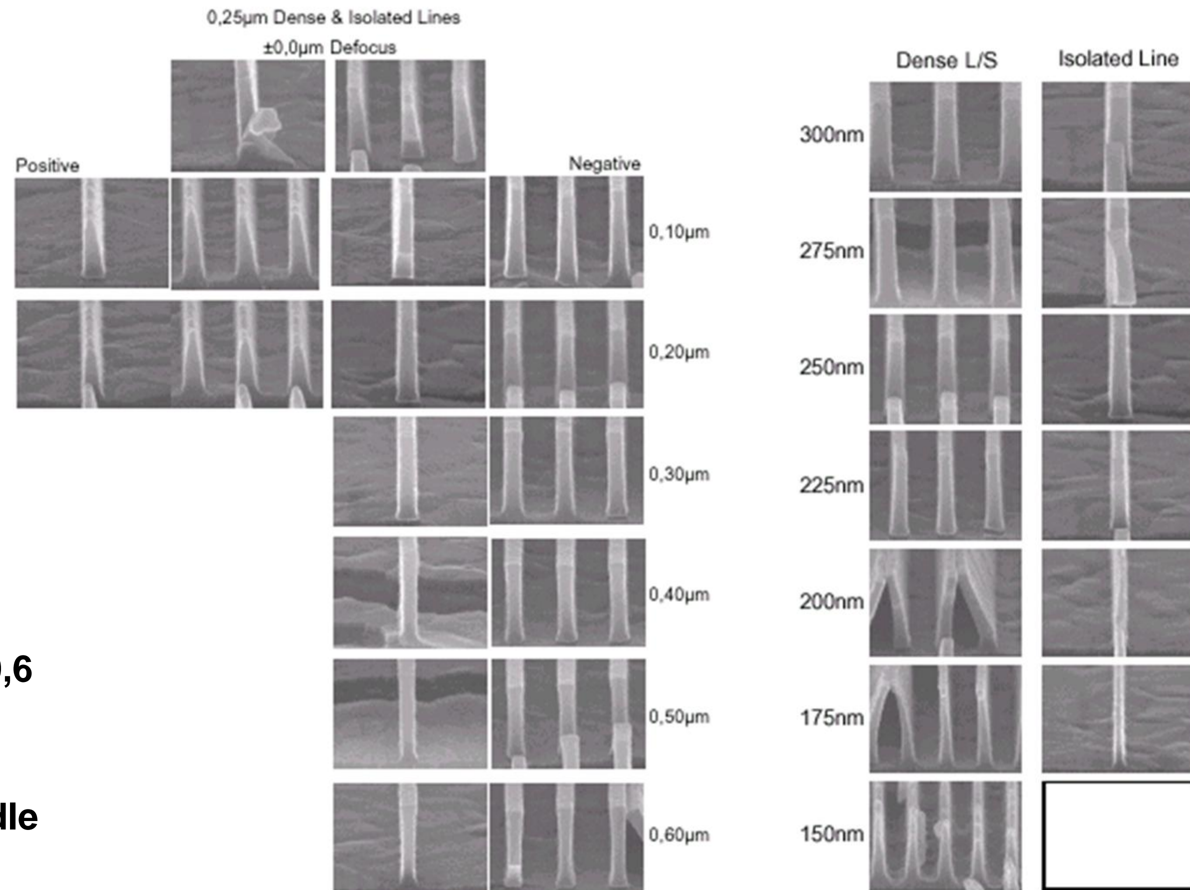
on Ti/TiN @1,0µm FT

0,25µm DOF
& Resolution

Process Conditions:

Substrate:	Ti/TiN
Film Thickness:	1,0µm
Soft Bake:	140° C /90s
PEB:	140° C /90s
Exposure:	ASML 5500/300
	NA = 0,57 ,σ = 0,6
	Binary Mask
Development:	2,38% TMAH
	60s single puddle

E_{opt} = 27mJ/cm²



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Conclusions

- M35G shows nice PW on both Si, SiO2 and metal.
- Large DOF and big EL has been seen.
- Good resolution can be achieved
- JSR likes to propose M35G-27cp as candidate to DANCHIP.