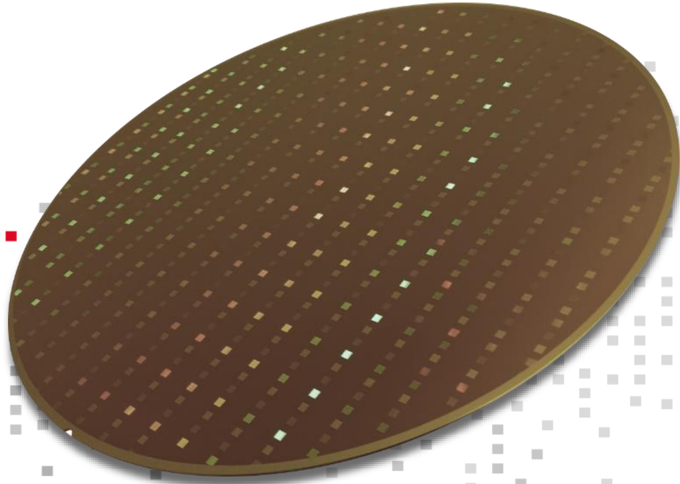


THE LETI NIL ASSESSMENT PLATFORM

LETI Lithography Workshop SPIE 2018 NIL session

WHICH PROBLEMS COULD BE ADDRESSED WITH THIS TECHNOLOGY

High Resolution
Large surface
Single step 3D patterning
Various substrates materials
Rough surfaces

High volume manufacturing
Throughput
Alignment & integration
Proof of concept

Non-permanent layer
Permanent resist layer
Functionnal materials
High & low index materials

Low entry barrier - Cost
Repeatability

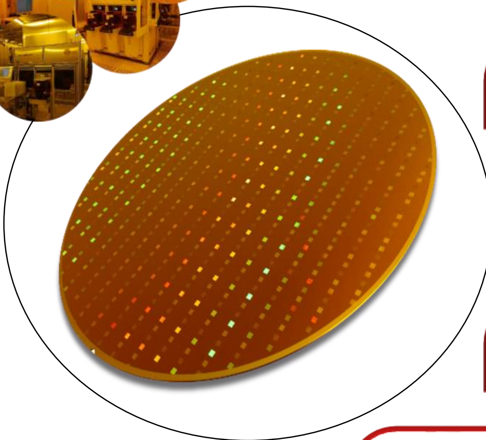
EVG-LETI SOLUTION: INSPIRE PROGRAM

Imprint materials

Post-Processing module

SmartNIL technology

Upgrades for advanced processes



Master program

Material benchmark

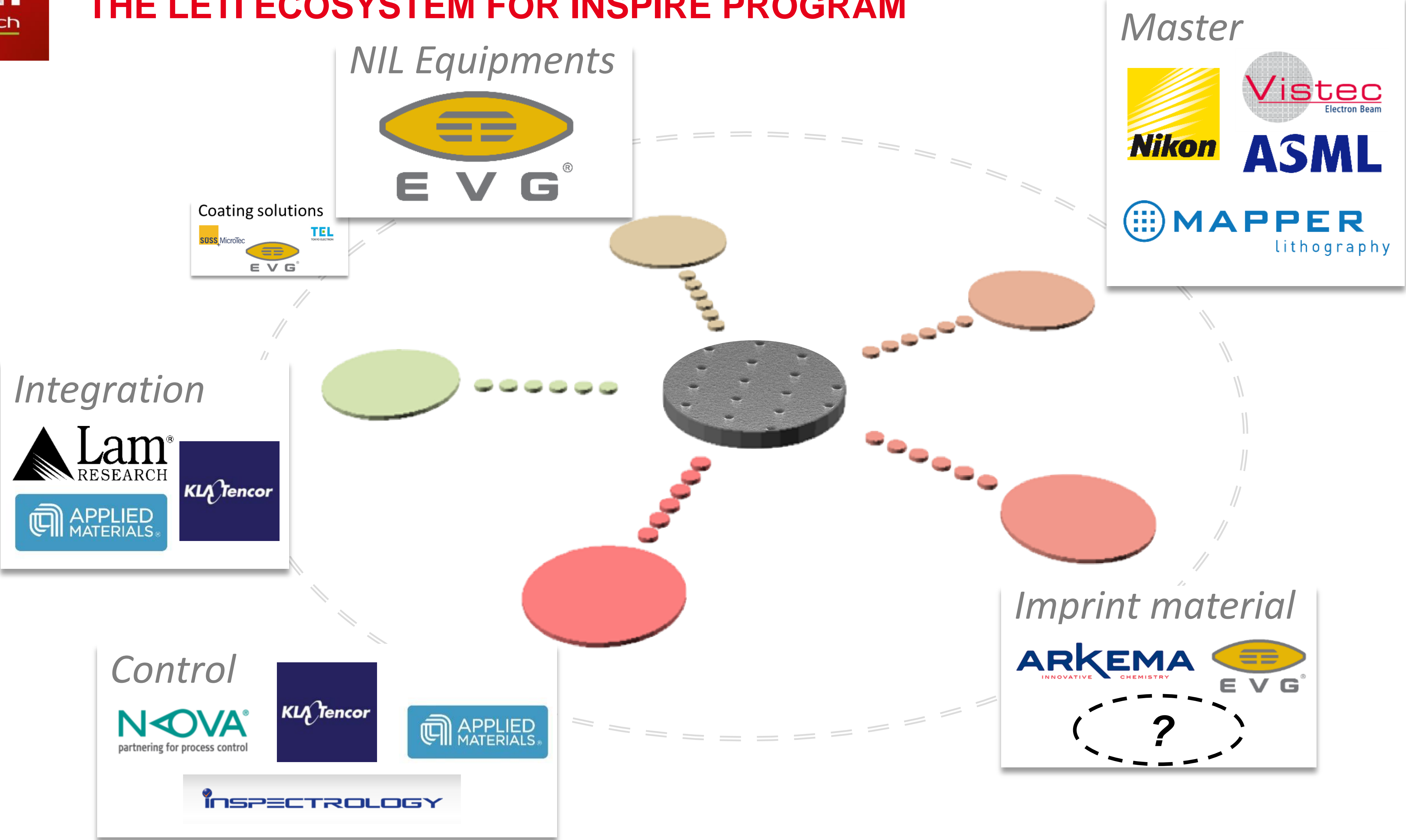
CDU-overlay-defectivity

Technology assessment

ramp-up of integrated process

THE MAIN INSPIRE PROGRAM OBJECTIVES

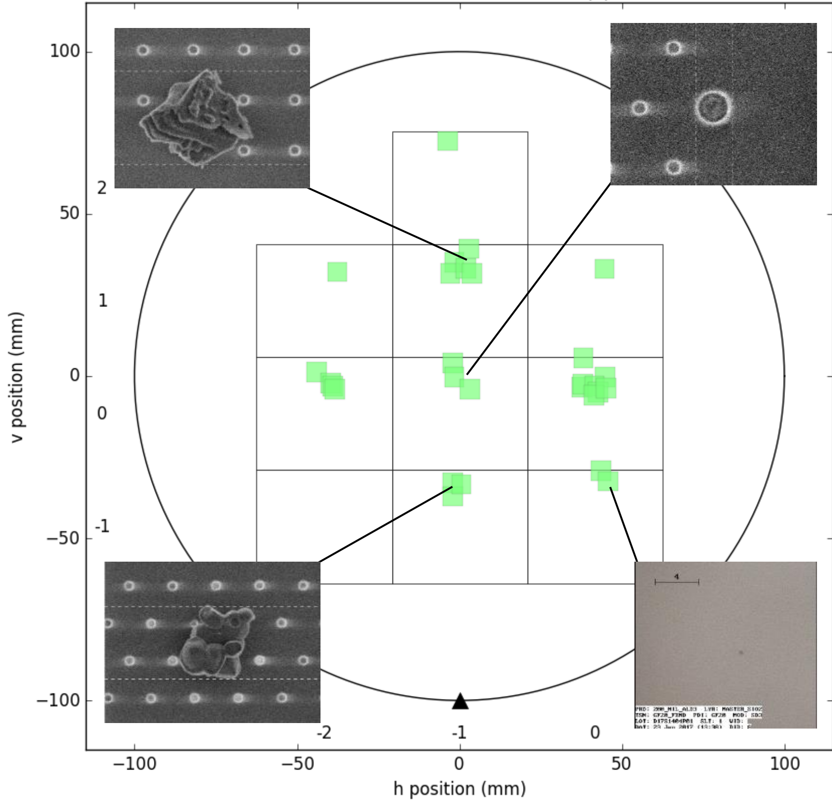
THE LETI ECOSYSTEM FOR INSPIRE PROGRAM



MASTER LIFETIME

- **Lifetime through defectivity story**

Post etch - sub 200 nm contacts – 8"



ARKEMA
INNOVATIVE CHEMISTRY

production
09/17 - 12/17

Master contamination

LETI cleaning solution

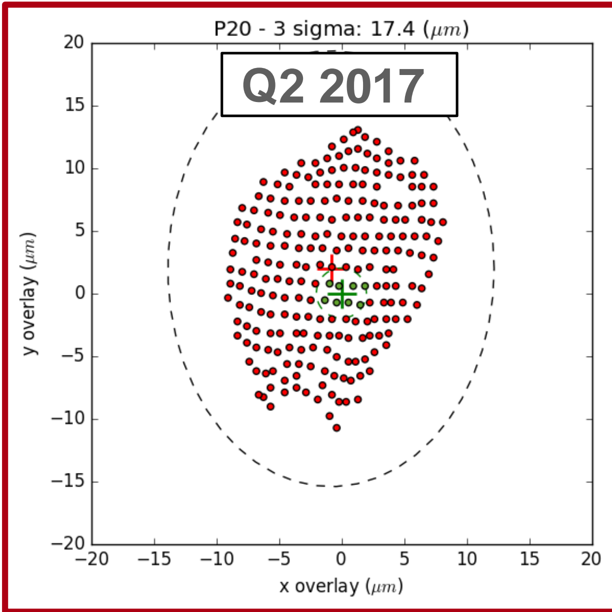
N

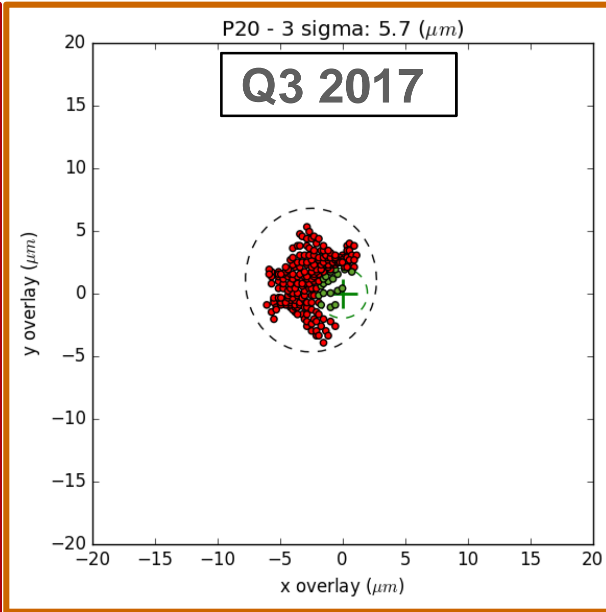
5000
4000
3000
2000
1000
0

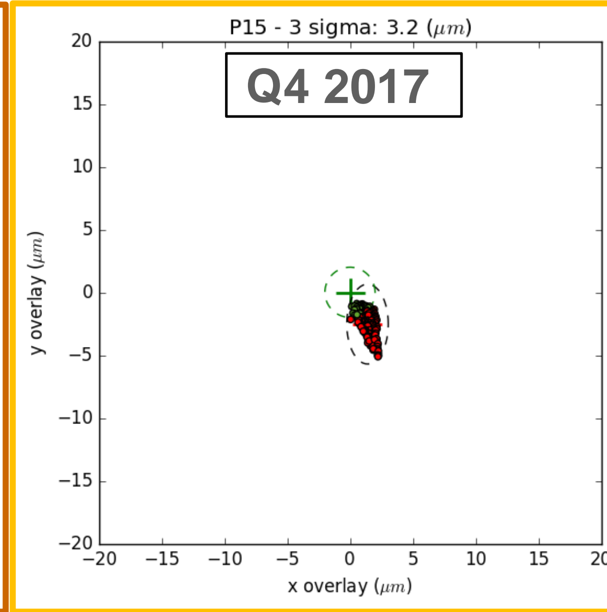
148 173 121 122 129 105 92 118 114 89 88 93 90 80 83 83 84 123 531 5235 270

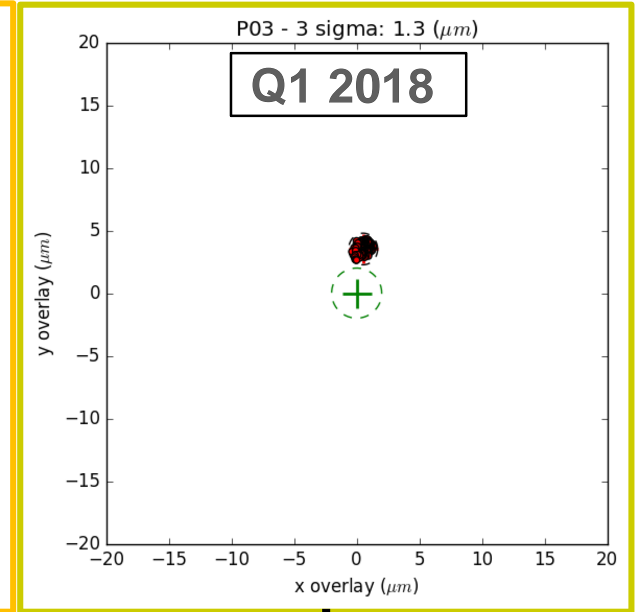
Slot 17 : 01
Slot 24 : 02
Slot 24 : 04
Slot 24 : 05
Slot 17 : 06
Slot 17 : 07
Slot 17 : 08
Slot 17 : 09
Slot 17 : 10
Slot 17 : 11
Slot 17 : 12
Slot 17 : 13
Slot 17 : 14
Slot 17 : 15
Slot 17 : 16
Slot 17 : 17
Slot 17 : 19
Slot 17 : 20
Slot 17 : 21
Slot 17 : 22
Slot 17 : 30

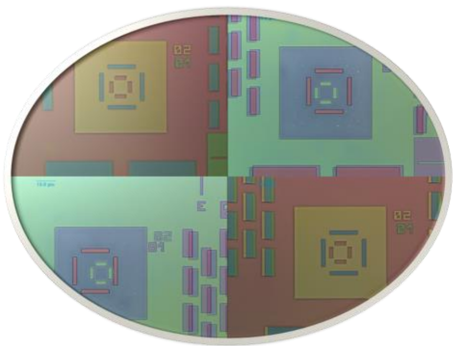
DISTORSION IMPROVEMENT

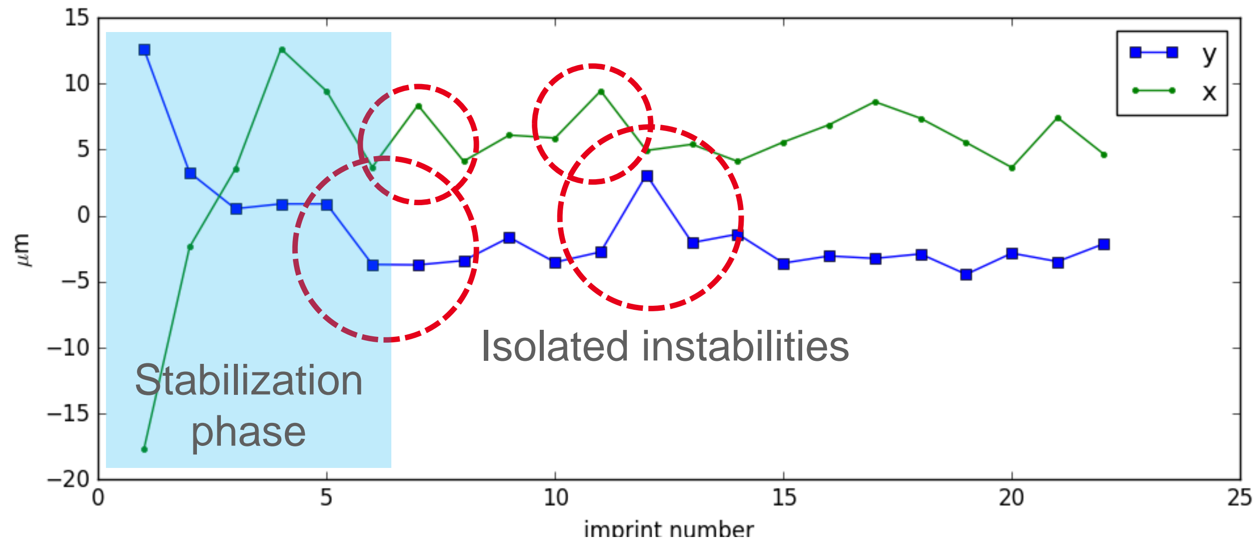












Process on lot
Target 2018
m+3σ → 1 µm

THE 2018 ROADMAP

	Q1	Q2	Q3	Q4
Materials	Filters in tool qualification	< 200 particles [90-500nm] in MOR film	Imprint materials benchmark	imprint resist prod. ready for etch mask app.
Overlay	< 1 µm wafer scale	< 1 µm / 4" area w2w & lot 2 lot repeatability	< 1 µm / 6" area w2w & lot 2 lot repeatability	< 1 µm / 8" area w2w & lot 2 lot repeatability
Production	Imprint fingerprint stability assessment	Metrology and Master platform access	Reference 100 nm produc Yield > 50%	Reference 100 nm produc Yield > 80%
Integration	100 nm feat. AR 1 in dielectric mat. transfer	50 nm feat. AR 1 in dielectric mat. transfer	20 nm feat. AR 1 in dielectric mat. transfer	Mix and match with DUV tools

THE NEXT STEPS FOR FURTHER ASSESSMENT AND VALIDATION