

Reticle Handling

Thomas White
ISMT-AMD

1-512-356-7672

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Meeting goal

- **Update on current status.**
- **Share new data and ideas.**
- **Present a forum for discussion and exchange.**
- **Revitalize the working group – phone conferences begin in 2-3 weeks (consensus decision).**

History

- **3/02 first working group meeting held at SPIE in Santa Clara.**
- **4/02 Reticle Protection Working Group begins regular teleconferences.**
- **7/02 Reticle and Chucking Standards meeting at Semicon West, San Francisco.**
- **10/02 Reticle and Chucking Standards meeting at EUVL Symposium, Dallas.**
- **2/03 Chucking and Reticle Carrier Standards meetings preceding SPIE Microlithography, Santa Clara.**

Working Group Charter

- **Mission Statement:**

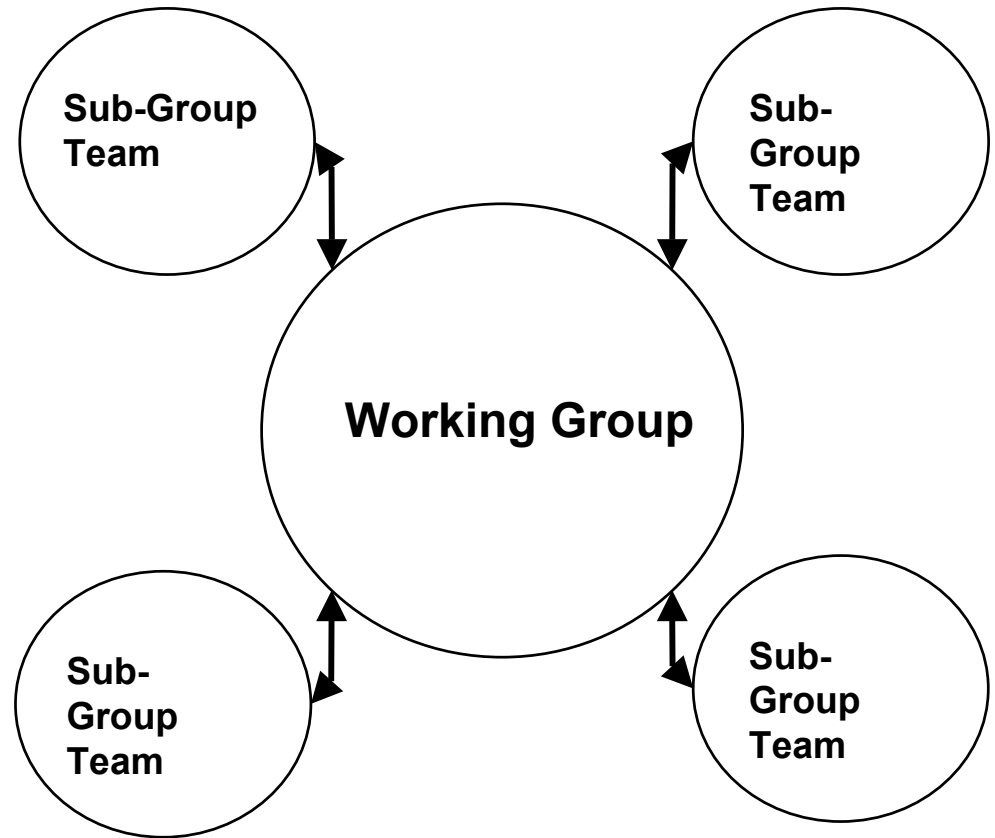
- To show that EUVL reticle handling is feasible to support beta level production by '05 and introductory manufacturing in '07.

- **Problem Statement:**

- There was no industry working group addressing the issues specific to and critical to EUVL Reticle Handling.
- Without the pellicle there is no particle protection for reticle.
- With no chucking standard or particle protection for the backs of reticles, integration of solutions for reticle tools/mask manufacturers are potentially at risk.
- Need to integrate reticle handling for EUVL process modules.

Working Group Structure

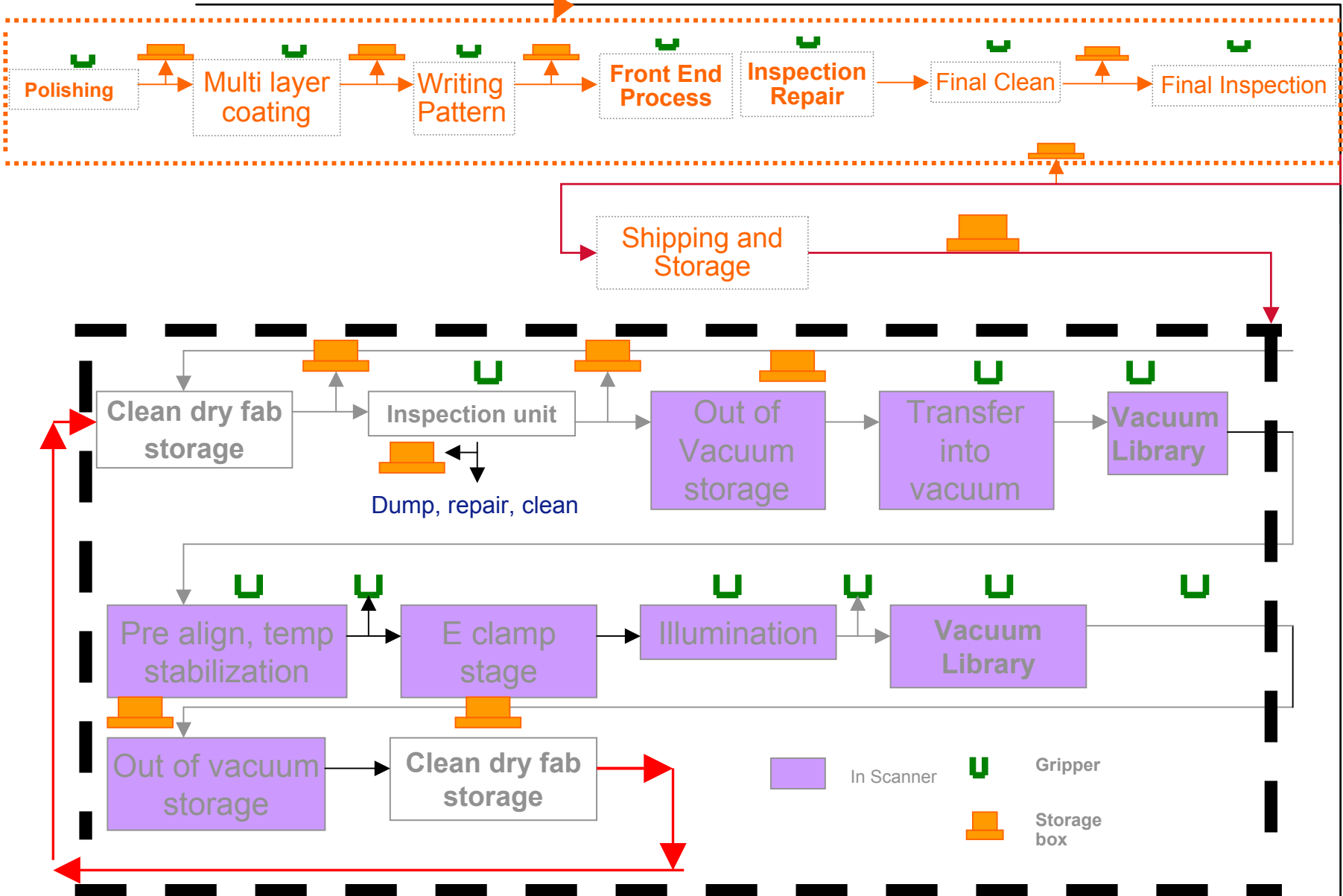
- **Global group to provide technical guidance, steering, and status updates.**
- **Sub-groups to address specific areas of concern**
 - Suggest issues
 - Put project plans in place to address critical issues
 - Provide input on potential solutions



Reticle Protection Mechanism WG

- **Goal: To standardize and recommend reticle handling Best Known Methods to protect reticles from defects from manufacture through use.**
- **Goals for 2003 –**
 - Recommendation for handling standard for handoff from storage box to exposure tool.
 - Recommendation for environmental specification for factory/storage of reticles.
 - Lifetime reticle flow with highlighted operations where protection efforts need attention, with recommended supplemental protection methods.

Manufacturing: once in life time



Thanks to ASML for Reticle Flow

Reticle and Chucking Standards WGs

- **Goal: To standardize solutions to EUV reticle handling problems through the SEMI organization.**
- **Goals for 2003 –**
 - Update, ballot and release SEMI P37 & P38.
 - Drive consensus on chucking standard for balloting in '03.

Cleaning/Inspection WG

- **Goal: To evaluate the need for and develop if required current and novel cleaning and inspection technologies and strategies for EUV reticles.**
- **Currently no work ongoing. What is a feasible schedule?**
- **Goal for 2003(?) –**
 - Recommendation for cleaning and inspection protocol of reticles in the factory to best protect against avoidable repeating defects.

Status of ISMT direct works

- Low-particulating, low-outgassing materials specification and recommendations – ISMT in negotiations. Final document expected six months after execution of contract.
- Carrier cleanliness study to evaluate shipping and routine handling – ISMT nearing definition. Recent acquisition of Asyst carriers business unit by Entegris has caused some rescoping. Full impact of this development is uncertain but not cause for concern. Focus is on SMIF at present, FOUP re-considered in 2004, perhaps involving ISMT-N (UAlbany branch).
- Data Matrix validation – deferred as low priority. ETA 1H'04.

Materials Specification

- ISMT SOW asks for materials that are: low-outgassing, low-particulating, inert, stable, readily available, compliant with SEMI S2, production-grade, non-proprietary, electrically conductive or dissipative, and “affordable”. Transparency was noted as highly desirable but not required.
- Anything to add? Acid-resistant? Easily cleanable?
- “Non-outgassing” and “non-particulating” were changed to “low-” at request of the supplier company.

Areas for refocused attention

- Carrier-tool interface / reticle handoff.
- In-carrier ambient environment.
- Supplemental protection methods (e.g., removable cover, thermophoretic, ASML-style frame, etc.)