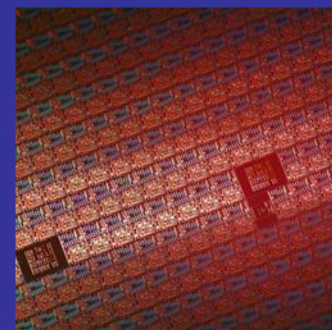
Accelerating the next technology revolution

Mask TWG Handling Summary - Action Items

October, 2011



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Mask TWG – Reticle Handling Agenda
(10/16/11)

8:00 AM	8:10 AM	Introduction / house keeping	David Chan, SEMATECH	
8:10 AM	8:25 AM	Report-out of IEUVI Mask WTG at BACUS	David Chan, SEMATECH	
8:25 AM	8:55 AM	E152 carrier standard update, A/B pod types	Long He, SEMATECH/Intel	Standard
8:55 AM	9:25 AM	Gudeng EUV carrier development and evaluation update	Chenwei Ku, Gudeng	Pod
9:25 AM	9:55 AM	Entegris EUV carrier status and roadmap	Tom Kielbaso, Entegris	Pod
9:55 AM	10:10 AM	Break		Pod
10:10 AM	10:25 AM	Nikon/Canon perspectives of potential improvement of pod performance	Kazuya Ota, Nikon	Pod
10:25 AM	10:40 AM	Issues of reticle coatings	Kazuya Ota, Nikon	Pod
10:40 AM	10:55 AM	Automation challenges of EUV reticle carriers	Katsushi Hayasaki, Rorze	Automation
10:55 AM	11:10 AM	Design and qualify reticle handling	Jacques van der Donck, TNO	Automation
11:10 AM	11:25 AM	EUV carrier implementation to EUVL mask tools	Hiroki Miyai, Lasertec	Automation
11:25 AM	11:40 AM	Initial learning of in-fab handling	Rik Jonckheere, IMEC	End-use
11:40 AM	12:40 PM	Lunch		
12:40 PM	2:00 PM	Topic discussions & action plans: 1. Shipping strategy, wafer-fab mask acceptence, maskshop last tool? 2. Non-exposure tool implementation: Inspection, Clean, AIMS, Blank dep? 3. How to eliminate carrier types - what need to happen first? 4. Pod cleaning - do we have significant problems there? 5. Reticle storage - how to minimize molecular contamination? 6. ESD? 7. EUV pellicle?	All (LH lead)	Discussion

TWG Handling Summary
(9/19/11 and 10/16/11)

- **Reticle handling is back to debate, after many thought the problem was solved.**
  - There is significant discrepancy between earlier demonstration (~2008) and what we get today.
  - There are plenty of concerns, opinions, but very limited or no data.
- **TWG accomplishments:**
  - Progress made in bringing everyone on the same page as to how E152 specifies the physical differences between two carrier types (A/B).
  - Extensive discussions conducted on how E152 specifies for non-scanners to interface with all E152-compliant carriers.
  - Consensuses reached that more data needed for productive discussions.

TWG Handling Summary
(9/19/11 and 10/16/11)

- **Action plans, help needed to make them all actionable!**
  1. Generate aPod (NXE reticle carrier) shipping data for a data-driven decision *(Owners: SEMATECH/ASML/Entegris; ECD: by next TWG)*
  2. Invite HamaTech to next Mask TWG to present a data-based discussion on reticle gripping *(Owner: TWG Chair)*
  3. Meet with suppliers and end-users individually to assess needs at critical steps *(Owner: SEMATECH)*
  4. Verify substrate backside edge damages or no-damages using LTEM substrates, with all carrier types in question. *(SEAMTECH, contingent on pod availability/support)*
  5. All carriers should be tested the same ways for comparison, since data presented appear scattered dots. *(SEMATECH, contingent on collaborations)*
  6. More reticle handling data are needed and shared. *(Owners: All)*
  7. Prepare for molecular contamination discussion in next TWG in the areas of "after-clean" surface, during shipping, in vacuum, in-fab storage, and carrier material outgassing. *(Owners, All)*

Special iEUVi Mask TWG at SPIE BACUS Conference, September 19, 2011

- Mask Handling/shipping/storage strategy needs more tractions to support HVM implementation
- Need industry strategy, consensus from blank shops, mask shops, to mask users
- Special BACUS Session:
  - Capture inputs from those in the mask community who normally do not attend EUVL Sym.
  - Invite inputs for the 11/16/11 Mask TWG Agenda

Start	End	Topic	Lead
10:00	10:15	Introduction	David Chan (SMT)
10:15	10:45	EUV Mask Standard Update	Long He (SMT/Intel)
10:45	11:00	Current EUV mask handling status and issue in maskshop	Naoya Hayashi (DNP)
11:00	11:45	Discussion of carrier types, tool implementation, and shipping strategy	Long He (SMT/Intel)
11:45	12:00	Discussion and conclusion	All / David Chan (SMT)
12:00		Meeting Adjourn	

Company	# Participants
Applied Material	2
ASML	1
Carl Zeiss	2
DNP	1
IBM	1
IMEC	1
Intel	3
KLA	1
Lasertec	1
NuFlare	1
Rorze	1
SEMATECH	2
Toppan	2
TSMC	1
Total Companies	14
Total Participants	20

IEUVI Mask TWG at International EUVL Symposium, Miami, October 16, 2011

- Meeting Agenda:
  - From 8am to 5pm, Sunday, 10/16/11
- Main Focus
  - EUV Mask Handling, Shipping, and Storage
  - Clean and defect printability update and challenges
  - Deposition update and challenges

AGC	1
AMTC	1
Applied Seal	1
ASML	3
Bruker	1
Canon	1
Carl Zeiss	3
CNSE	1
Corning	1
DNP	2
EIDEC	3
Entegris	2
GF	3
Gudeng	1
Hanyang U	1
IBM	2
IMEC	2
Intel	8

KLA-Tencor	1
Lasertec	3
Nikon	1
Novellus	1
NuFlare	1
Rorze	1
Samsung	1
SEMATECH	11
Shin Etsu	2
Suss	2
Tech-X	1
TNO	3
Toshiba	4
TSMC	1
VAT	1
33 Co.	**71**