iEUVi Mask TWG

Prague, Czech Republic
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Lead: David.Chan@SEMATECH.org

Co-Lead: George.Huang@SEMATECH.org

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Mask TWG: Mission & Objective

- Mission:

  Ensure EUV Mask Infrastructure Readiness for:

  – Pilot Line Production 2010 – 2012

  – High Volume Manufacturing 2013 - 2016

- Objectives:
  - Identify Required Standards
  - Coordinate industry-wide conversions, such as future mask incidence angle change.
  - Identify any gaps between current industry efforts and projected future needs
  - Highlight gaps to member organizations and IEUVI Board for action

International EUV Initiative

Japan
- SELETE
- EUVA
- I.C. Mfg
- Litho Suppliers
- - others

International EUV Initiative

IEUVI

Europe
- More Moore
- LETI
- PREUVE
- IMEC
- I.C. Mfg
- Litho Suppliers
- - others

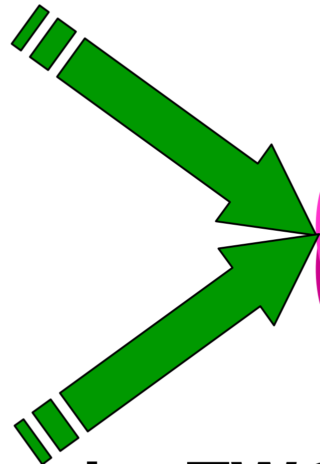
Korea
- Korea National EUVL R&D Program
- I.C. Mfg
- Litho Suppliers
- - others

USA
- SEMATECH
- RFNY
- VNL
- SRC
- I.C. Mfg
- Litho Suppliers

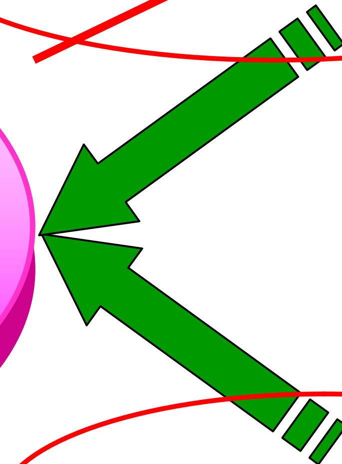
IEUVI http://www.ieuvi.org

International EUV Initiative

IEUVI Source TWG



IEUVI Board



IEUVI Resist TWG

IEUVI Mask TWG

International EUV Initiative
Executive Board
(next meeting 10/23/09)

http://www.ieuvi.org
Executive Chair: Paolo Gargini

- *Regular coordination meetings*
- *Technical Working Groups*
- *Benchmarking data exchange*
- *Co-sponsorship of workshops*

Mask TWG: 2009 Accomplishment

- SEMI Standard Accomplishment
  - E152 - Mechanical Specification of EUV Pod for 150 mm EUVL Reticles
    - Adjudicated in April 2009, published in July 2009
  - P40 - Mounting Requirements for EUV Masks
    - Adjudicated on July 14, 2009, will be published this year
  - P37 – Specification for Extreme Ultraviolet Lithography Substrates and Blanks
    - Adjudicated in September, 2009, will be published this year
  - Specification of Fiducial Marks for EUV Mask Blanks
    - Agreement made by taskforce to submit blue ballot in Q4, '09; yellow in Q1, '10
- Dual Pod Status
  - SEMI compliant Dual Pods arrived in SEMATECH in June
  - Particle protection testing is on-going
- ITRS EUV Mask Specifics
  - Team formed. Survey results rolled up.
  - 7 parameters with agreed changes. Six areas identified champions for next revision.

iEUVi Mask TWG Agenda

Start	Complete	Duration	Topics	Who
9:00 AM	9:10 AM	0:10	Introduction and Greetings	David Chan (SEMATECH) / George Huang (UMC/SEMATECH)
9:10 AM	10:40 AM	1:30	SEMI Standards Updates and 2010 Revision	
			P40	George Huang
			E152 - Carriers	George Huang
			P37	David Chan / John Zimmerman (ASML)
			Fiducial Mark	David Chan
10:40 AM	10:55 AM	0:15	Break	
10:55 AM	11:15 AM	0:20	Strawman Fiducial Mark Alignment Budget	Noreen Harned
11:15 AM	12:00 PM	0:45	Flatness compensation Updates / Challenges	Jaewooong Sohn (SEMATECH)
12:00 PM	1:00 PM	1:00	Lunch	
1:00 PM	1:45 PM	0:45	ITRS EUV Mask Specific Requirements	David Chan / John Zimmerman (ASML)
1:45 PM	2:30 PM	0:45	Defectivity Budget Sheet	George Huang / David Chan
2:30 PM	2:45 PM	0:15	Break	
2:45 PM	4:45 PM	2:00	Panel Discussion: Defect Printability Mask Standardization - Attributes and Possibility	Moderators: Wolf Staud (AMAT); David Chan; George Huang Panelists: 1) Ted Liang - Intel 2) Sean Huh - Samsung / SEMATECH 3) Rik Jonckheere - IMEC 4) Chris Clifford - UC Berkeley 5) T. Terasawa - SELETE 6) Bruno LaFontaine - GlobalFoundries
4:45 PM	5:00 PM	0:15	Wrap Up and Plans for Next TWG Meeting	David Chan / George Huang

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Closing Remarks

IEUVI Mask TWG

- Masks are consistently the top 2 issues facing EUVL
- Sources limit throughput, but masks could end up preventing any yield
  - Masks are more of a ‘Showstopper’
- There are still many issues and activities related to masks to cover in the TWG.

Focus of the two Mask TWGs

- EUV Mask Build TWG:
  - Infrastructure items directly related to building masks
    - Tools – inspection, writing, cleaning, repair
    - Materials – substrate, films
    - Defects
    - SEMI standards for substrates, blanks, masks
- EUV Mask Use TWG:
  - Issues more directly related to using masks
    - CTE of substrate and mask build/use temperatures
    - Flatness compensation
    - Incident angle of exposure light
    - Defect masking thru pattern placement (fiducials)
    - Carriers
    - Potential Pellicles
    - ITRS roadmap
- Suggestions are welcome

Next meeting of IEUVI Mask TWG(s)

- We are looking for suggestions in tasks priorities and topics of discussions
- Inputs on meeting formats, etc. are welcome
- Schedule: @ SPIE, Feb 2010, San Jose, CA