



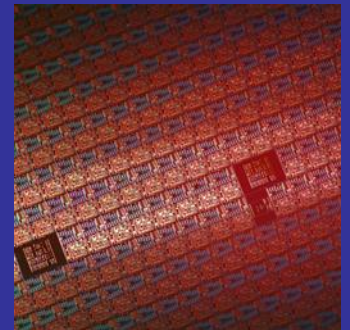
Accelerating the next technology revolution

Maskshop Implementation Discussions

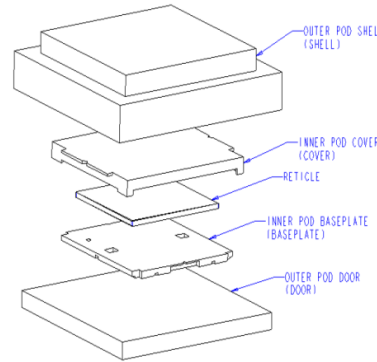
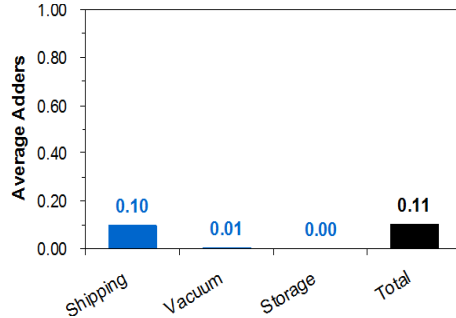
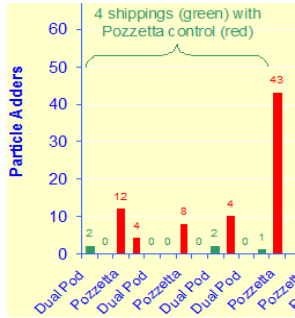
- Carrier status
- Blank shipping, within maskshop, and mask shipping

Long He, SEMATECH/Intel

David Chan, SEMATECH



Key EUV Carrier Development Milestone



The good:
Enables NXE3100

The bad:
Particle-free capability has not been demonstrated.

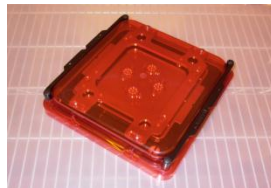
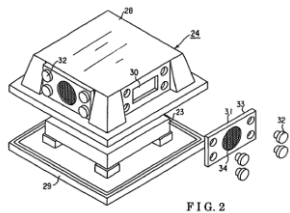
Dual-pod concept demonstrated

Performance capability demonstrated with sPod

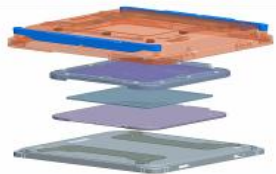
E152 EUV-pod standard established

Implementation start

200?	2007		2008		2009		2010		2011	
	H1	H2	H1	H2	H1	H2	H1	H2	H1	H2



SEMATECH/Entegris outer-pod JDA for commercial availability of a-, n-, c-, and s-Pod.



Current Reticle Shipping Options

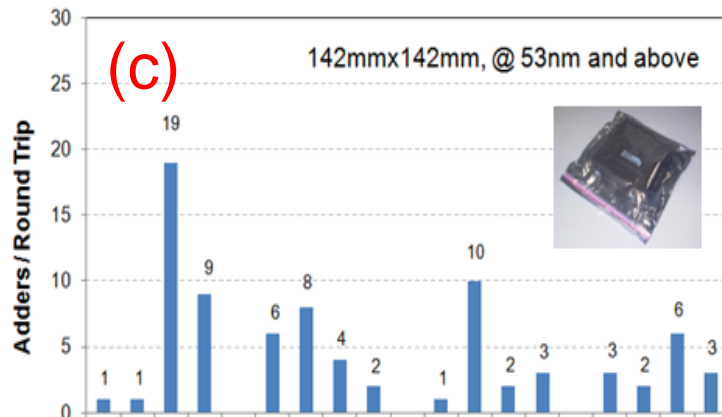


Three options:

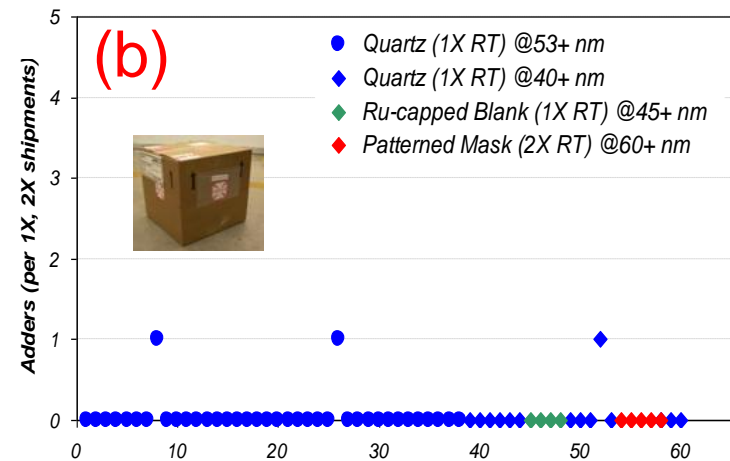
- (a) aPod, and Freight Services (*no data*)
- (b) sPod (*SEMATECH/Intel data*)
- (c) Compact (*SEMATECH data*)



Palletized packaging for aPod, to reduce shipping shocks. It's about 12x bigger in volume than (b).



Typical shipping results with clamp shell compacts



sPod shipping summary, the package is scaled to (a) in size.

(SEMATECH) Carrier Assessment: No Complete Carrier Solution Exists



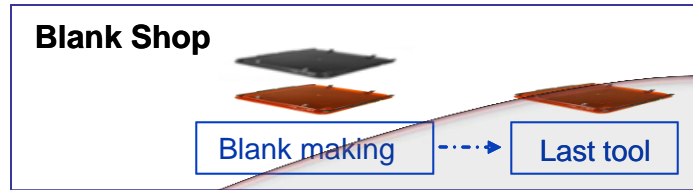
Need	Carrier	Risk	Comment
NXE3100 tools	aPod	(?)	Insufficient data to conclude
Non-exposure tools (clean, inspection, etc.)	aPod, sPod	L	Require full tool compliance with E152 standards
Shipping	aPod	(?)	Palletized packaging, no data
	sPod	L	Require a <i>particle-free</i> transfer
	Clamp shell boxes	H	Require clean at wafer fab arrival
In-fab storage	aPod, sPod	L/M	Need more data

All data published previously by SEMATECH were from sPod carriers, unless indicated otherwise.

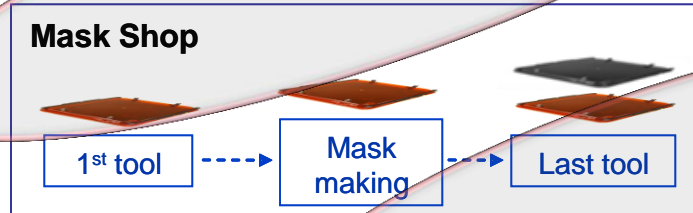
Straw-man Implementation Flow



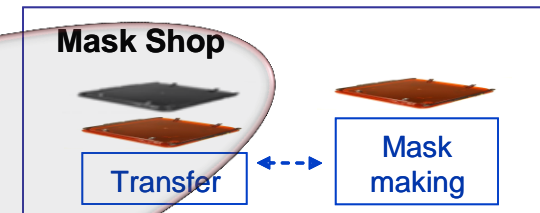
Blank shop:



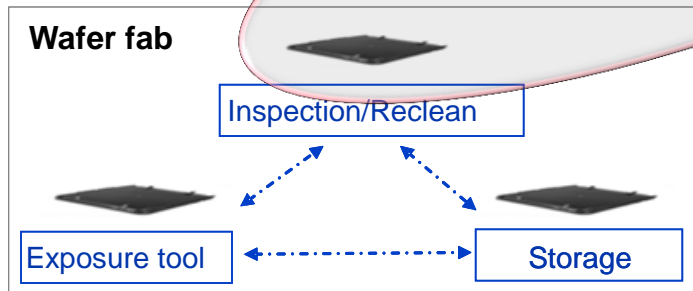
Mask shop:



-- OR --



Wafer Fab:



 : EUV carrier
 : non-EUV carrier

Mask-shop Implementation Discussions - Blank Shipping



- 1. What's the expectation when EUV blank arrives, shipped in current "optical shipping pod" or EUV pod?**
 - If blanks coated with resist?
 - If naked?

Mask-shop Implementation Discussions - Within Maskshop



- 2. Is it still a good assumption that maskshop can cost-effectively manage handling caused patterning defects?**

- 3. Where maskshop needs EUV pod, which tools?**
 - Final clean
 - Final inspection
 - AIMS?
 - Other tools?

Mask-shop Implementation Discussions – Mask Shipping



4. How many times a mask can be *recovered* by re-cleaning?
5. When mask arrived in wafer-fab with particles on, who owns mask recovery process, wafer fab or mask shop?
6. How to ship masks to wafer fab?
 - aPod
 - sPod
 - Compact clam shell
 - Others