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*EUV Mask Standards Workshop*

**EUV Reticle Carrier ~  
Joint Proposal and Current Status of  
Canon and Nikon**

Kazuya Ota, Nikon and

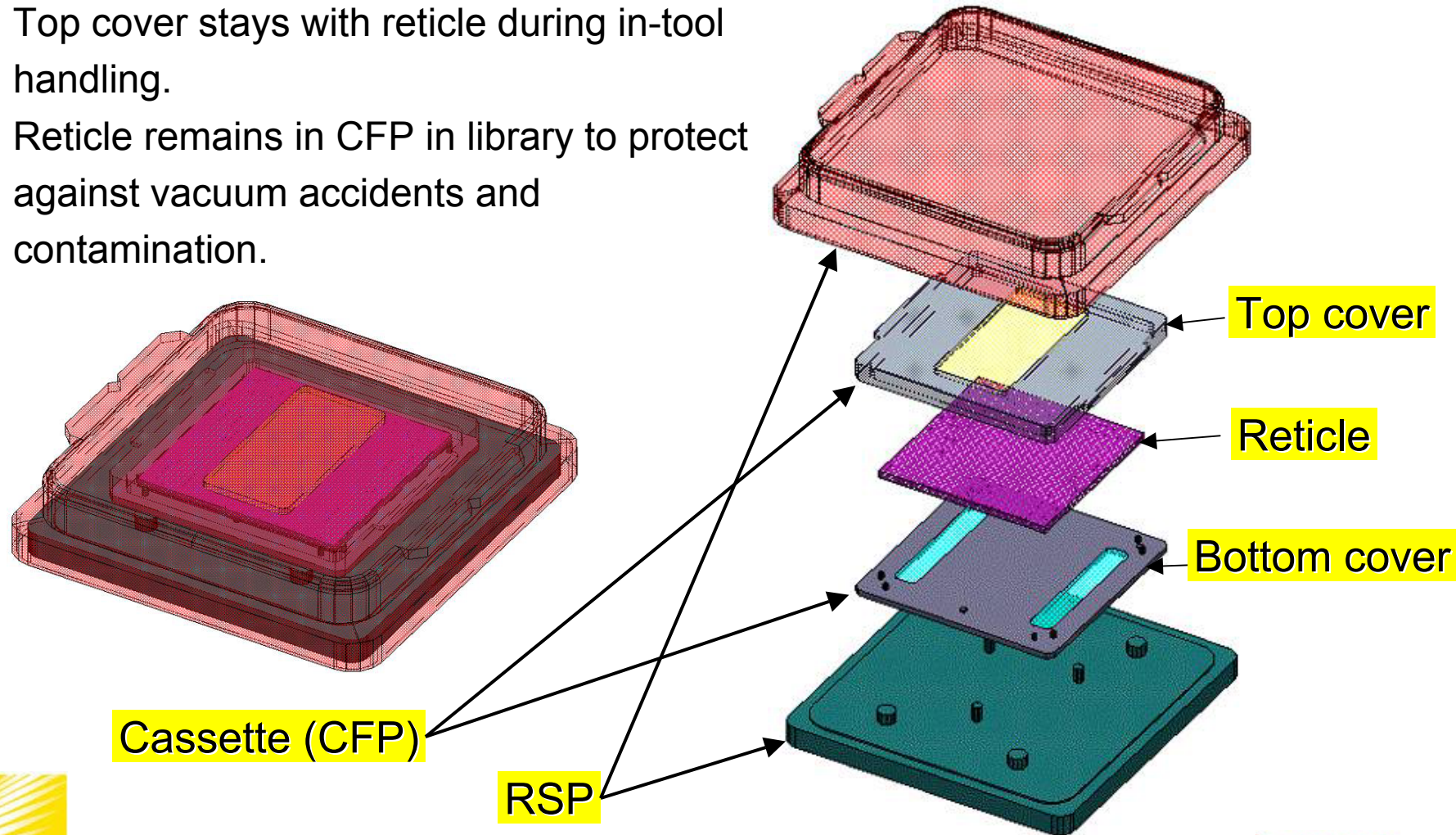
Yoshio Gomei, Canon

February 28th, 2005 @ San Jose, CA

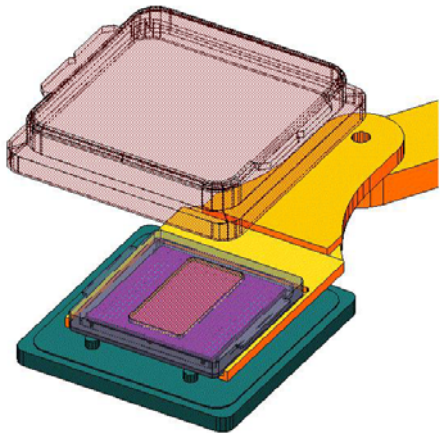


# Dual Pod Concept by Canon and Nikon

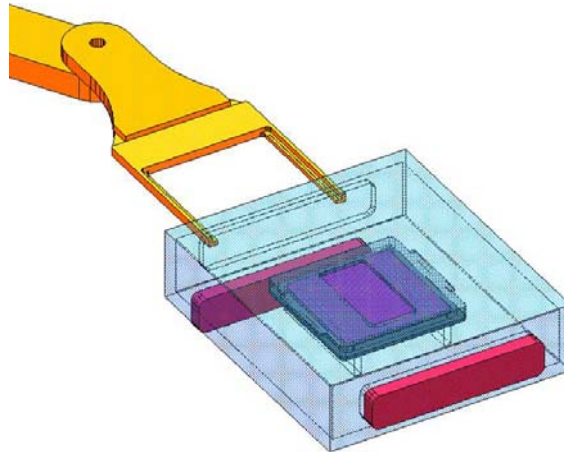
1. Reticle in Cassette(CFP) in Carrier(RSP).
2. Cassette protects the reticle in loadlocks.
3. Top cover stays with reticle during in-tool handling.
4. Reticle remains in CFP in library to protect against vacuum accidents and contamination.



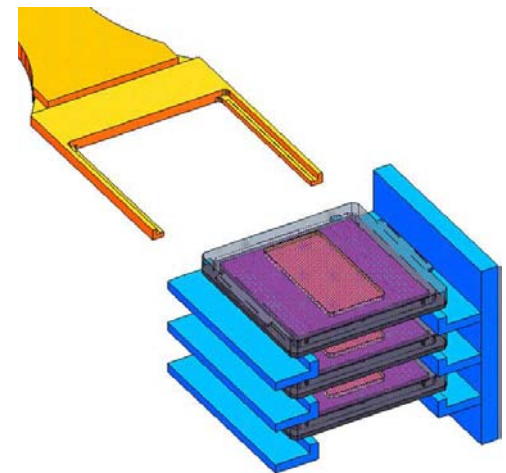
# Schematic Diagram of Reticle Handling



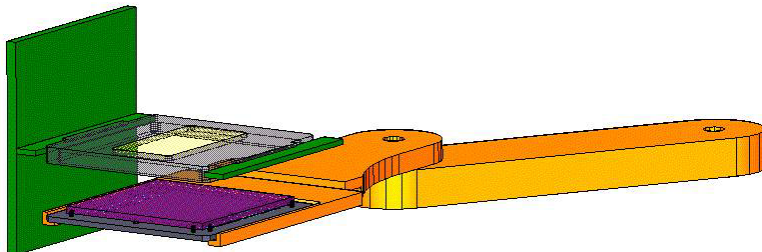
(1) Open the Carrier and take out the Cassette



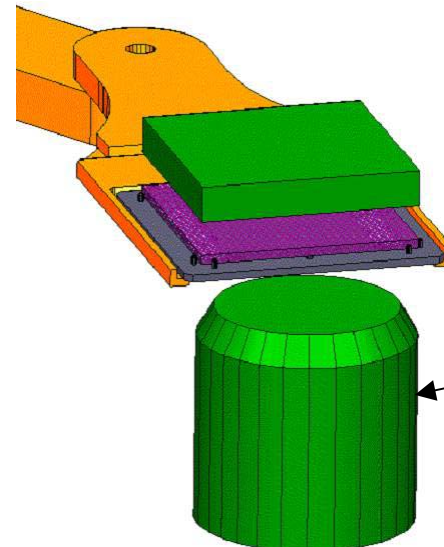
(2) In a loadlock



(3) Library in vacuum



(4) Remove the top cover



Projection Optics Unit

(5) Chuck the reticle

# Features of Dual Pod Concept

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- The reticle is protected by the inner pod with filters during shipping, storage in the atmosphere, pumping down, venting and storage in vacuum.
- The lower part of the inner pod has a function of removal frame to prevent end-effectors directly contacting with the reticle.
- Dimension of the outer pod will be the same as the RSP200 in XY(Z) directions.

# What should be standardized first?

- Key items which should be standardized first.
  - RSP150, RSP200 or FOUP?
    - RSP200 is recommended for the carrier and some modification will be needed.
  - End-effector exclusion volumes.
  - Components of the cassette and the dimensions.

# Potential Standardized Items for the Dual Pod Concept

## Outer pod

1. RSP150, RSP200, or FOUP.
2. End-effector exclusion volumes.
3. Contact points: location, configuration, materials, size, electrical resistance
4. Clamping (means): force, points, configuration
5. Grounding points: location, configuration, (~contact points)

# Potential Standardized Items for the Dual Pod Concept cont.

## Inner pod (cassette) or plate

1. Components, e.g. bottom cover and top cover
2. Exterior dimensions, Flatness, thickness variation,
3. Mass
4. Conducting coat
5. Light transmissivity for inspection, alignment, barcode, human reading, optical clarity
6. Filters: seal performance, pressure accident, safety
7. Joints between the top cover and the bottom cover
8. Reticle positional accuracy in the cassette, nominal reticle position (6DOF)
9. Handling area: configuration, hook feature,
10. Alignment marks/ID on the cassette



# TBDs

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- To demonstrate particle protection data.
    - Collaboration in carrier manufacturing is under way.
    - Evaluation at Albany is in the planning stage.
  - To disclose the detailed design and drawing.
    - Size, weight, ...
    - Contact points.
    - Latch mechanism between the top and the bottom cover.
  - How to mount the reticle on the bottom cover.
- To discuss how to make a carrier standard for EUV.
- Narrow down the concepts.

# Schedule proposal of carrier standardization

CY	04	05	06	07	08
<b>Tool for process development</b>	Development				
<b>Tool for high volume manufacturing</b>			Development		
<u><i>Carrier standard</i></u>	Draft <b>Blue</b> <b>Yellow</b>				
<i>Evaluation</i>	Possibly @Albany				



# Summary

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- A candidate for EUV reticle carrier, Dual Pod Concept by Canon and Nikon, was shown.
  - Reticle in Cassette in RSP.
  - Cassette protects the reticle in loadlocks.
- Canon and Nikon recognize that data demonstration is needed as soon as possible.
  - Under planning.