

# The SEMI standards process and EUV mask chucking

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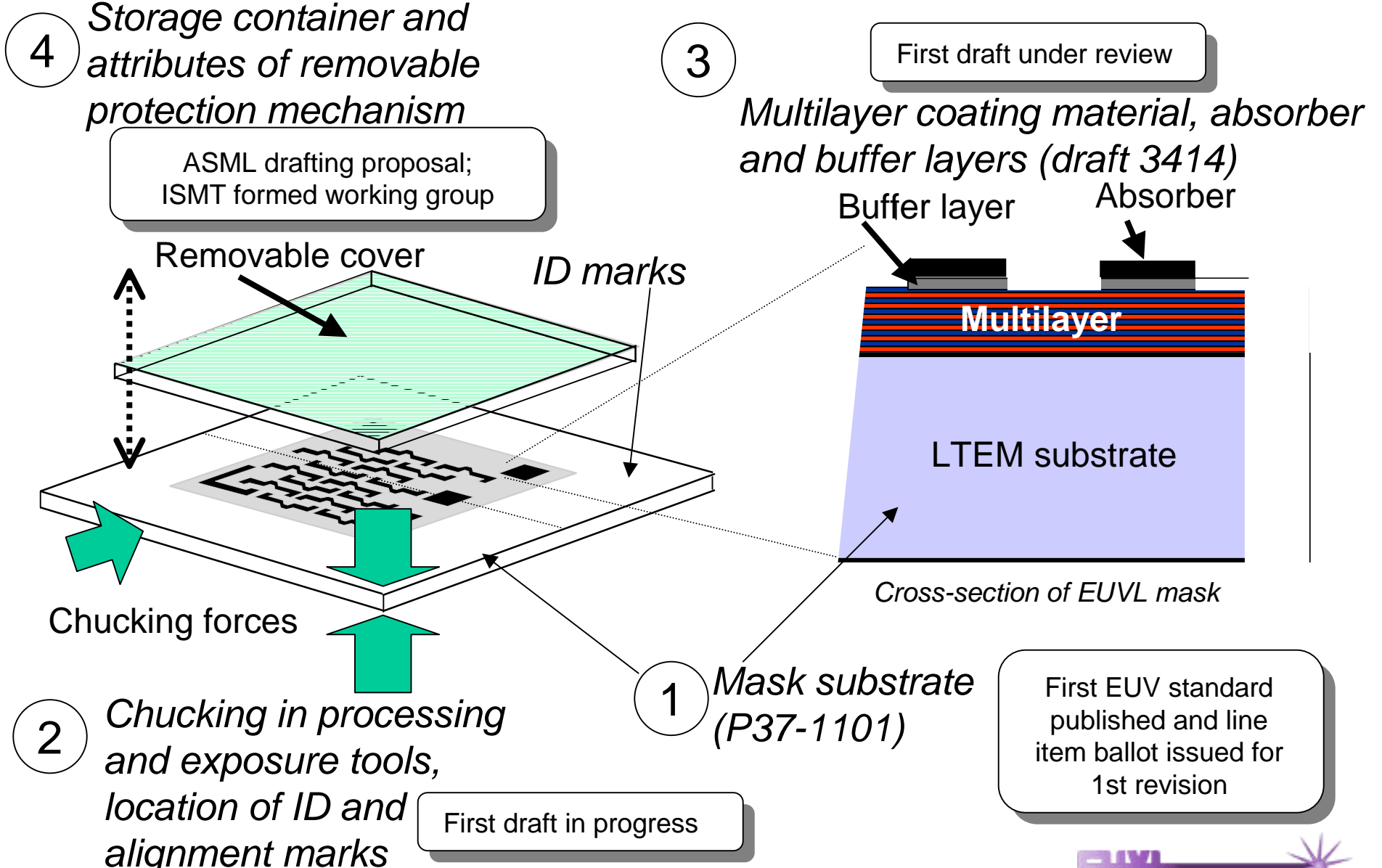
Motorola

and

Chairman of SEMI EUV Mask Task Force



# EUVL mask standards



# Interaction of standards analysis used to prioritize standards development

Standard	Flatness	Manufacturability	Thermal	Reflectivity	Area
Form Factor P37-1101	X	X	X	X	X
Mounting/ Chucking	X	X	X		X
Multilayers 3414	X	X	X	X	
Absorbers	X	X	X	X	
Storage Container		X			
Removable Pellicle					X
ID Marks					X



# SEMI standards development process

- Identify need for standards and establish a task force
  - EUV Mask Task Force formed in March 1999 by Harry Levinson of AMD
- Identify specific standards needed and submit SNARF (Standards New Activity Request Form)
  - SNARF submitted for chucking with Pawitter Mangat and Roxann Engelstad as leaders
  - SNARF approved by NA Microlithography Committee
- Debate standard in task force meetings



# Standards document preparation

- Write a draft standard
- Review draft standard as informational (blue) ballot
  - Can be issued any time and informally via participant web sites, etc.
- Seek approval for standard via letters (yellow) ballot
  - Issued officially via SEMI website to voting members:  
<http://www.semi.org>
  - Requires 60% of voting members to cast a ballot to reach a quorum
    - 20% of votes must accept
    - Negatives must be <20%
    - Votes from multiple members from one company are counted as one
  - Any technical persuasive negative will prevent approval
    - SEMI Microlithography Committee decides whether a rejection is persuasive for this case

# Task force meeting ground rules

- Anyone can participate
- Anyone can vote in task force meetings on motions
- Antitrust reminder
- Confidential information is not protected
- Patents:
  - “All participants in the SEMI Standards program have the responsibility to make known to the group in which they participate any non-confidential patented technology or copyrighted information, including issued patents and published patent applications, of which they have knowledge and which might be required to be used in order to comply with the standard or safety guideline developed by the group.”

(“SEMI Standards Member Handbook,” 1st edition, September 2001, p. 74)

# History of SEMI P37-1101 development

- Discussions started on 3/15/99 after Harry Levinson of AMD started the SEMI process.
- The standard was finalized on 9/18/01. (2.5 years later)
- There were two surveys on mask form factor, and there were 8 SEMI standards meetings before the standard was finalized.
  - Each meeting had about 30 attendees
- Members of 42 companies/organizations contributed to the discussions.

# Status of chucking SEMI standard

- Draft standard document in progress



## SEMI Draft

### SPECIFICATION FOR ALIGNMENT REFERENCE LOCATIONS AND MOUNTING REQUIREMENTS FOR EXTREME ULTRAVIOLET LITHOGRAPHY MASKS

#### General Requirements

##### 1. Preface

1.1 This specification covers the mounting and handling requirements for and mask alignment reference locations on Extreme Ultraviolet Lithography (EUVL) masks.

##### 2. Scope

2.1 This standard details the requirements for EUVL mask mounting and handling. The mask mount is a flat reference surface against which the mask is clamped. The specific design and material of the mask mount is not specified.

2.2 This standard also defines the recommended sites on the EUV mask for proper handling and alignment references. The form of the alignment marks is also not specified.

##### 3.2 ISO Standard<sup>3</sup>

ISO 14644-1 — Cleanrooms and Associated Controlled Environments Part 1: Classification of Air Cleanliness

##### 4. Terminology

4.1 Selected terms relating to mask substrates are given for information only in Terms and Definitions Relating to the Microlithography Industry found at the end of this volume. Definitions may be found in what was ASTM F 127.

##### 5. Ordering Information

5.1 Purchase orders for EUVL mask substrates furnished to this specification shall include the following:

*Need to define approach for the standard before developing informational (blue) ballot*

