Where Innovation Takes Flight℠

Brewer Science/NCI

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Outline

- Benefits of under layers for EUVL
- Roadmap
- Results of outgas testing

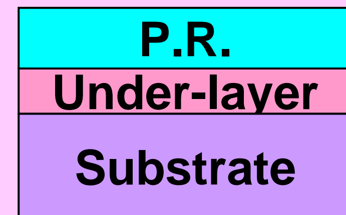
Under layers for EUV Lithography

Requirements and Benefits:

- High adhesion with PR
- Resist profile control
- Block substrate contamination (Barrier film)
- High etching rate
- Good performance with thin film (~30nm)
- Assist in pattern transfer
- Planarization

- **Minimal outgassing**
- **Photo speed enhancement**
- **Reduce LWR, LER**

Stack structure:



EUV Underlayer Roadmap Beyond 32nm HP

2007	2008	2009	2010	2011	2012

Phase I - Exploration/Feasibility

Technical
- Formulation development
- Outgassing tests
- Prototype lithography
- PR compatibility testing

Business
- Work with PR vendors
- Research customers and consortia EUV activities

Phase II - Research

Technical
- EUV lithography testing
- Outgassing tests
- UL to enhance PR performance

Business
- 3-way partnerships (PR/customer/BSI)
- Offer trial packages in partnership with PR

Phase III - Development

Technical
- Pattern transfer (LER/LWR)
- Etch effects / selectivity

Business
- Confirm EUV customer base

October 2007

Initial Outgassing Results

Outgassing Results

6.5 E+14 molecules/cm²

Molecules/cm²

1.00E+15
1.00E+14
1.00E+13
1.00E+12

BSI X1021
BSI X1031
BSI X1041
NCX 001303
NCX 003303
NCX 004303
NCX 005304
NCX 006304
NCX 008303
NCX 009303
NCX 010303
Sematech

Materials

Order of Magnitude lower than Sematech spec

HM - organic and inorganic materials for EUVL

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