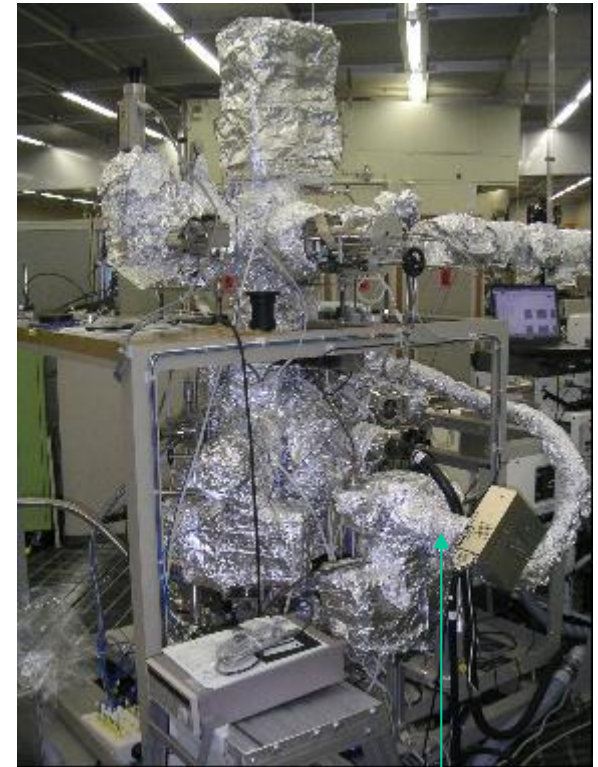
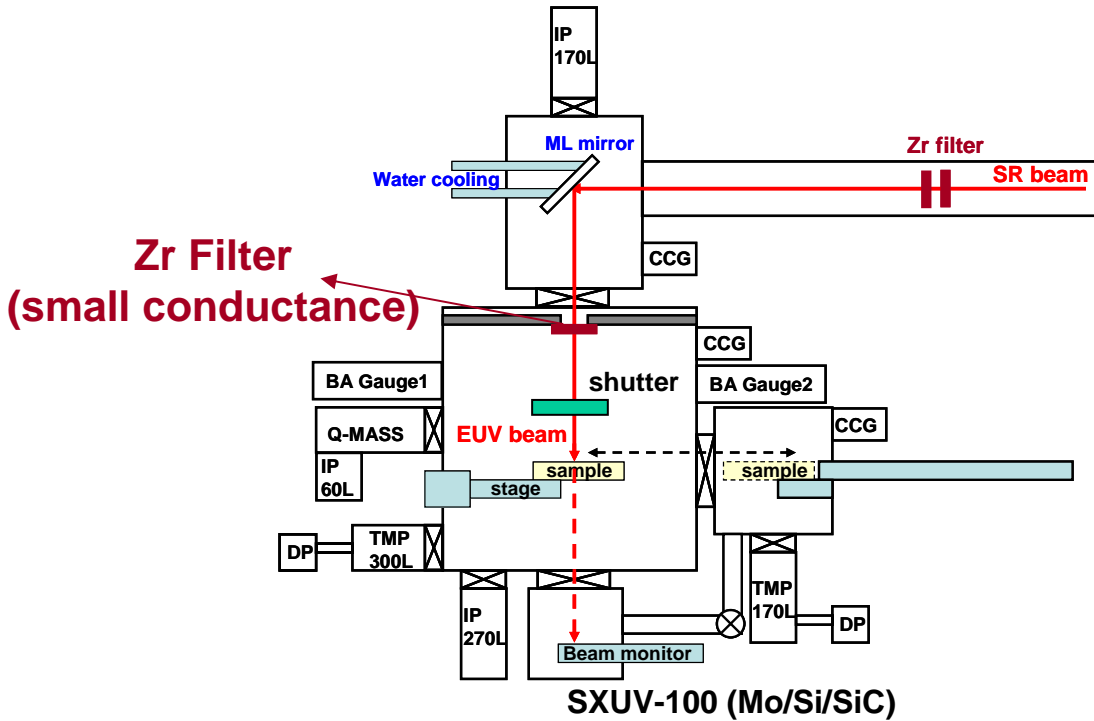

Status of ASET-Outgassing evaluation

Hiroaki Oizumi

ASET EUV Lithography Laboratory

This work was supported by NEDO.

ASET-Outgassing evaluation apparatus



Back pressure: $<1 \times 10^{-7}$ Pa (just after baking)

Back pressure: $2-9 \times 10^{-7}$ Pa (in resist film)

EUV intensity: $0.1 \sim 1$ mW/cm²@250mA

Exposed area: 1 cm x 2 cm

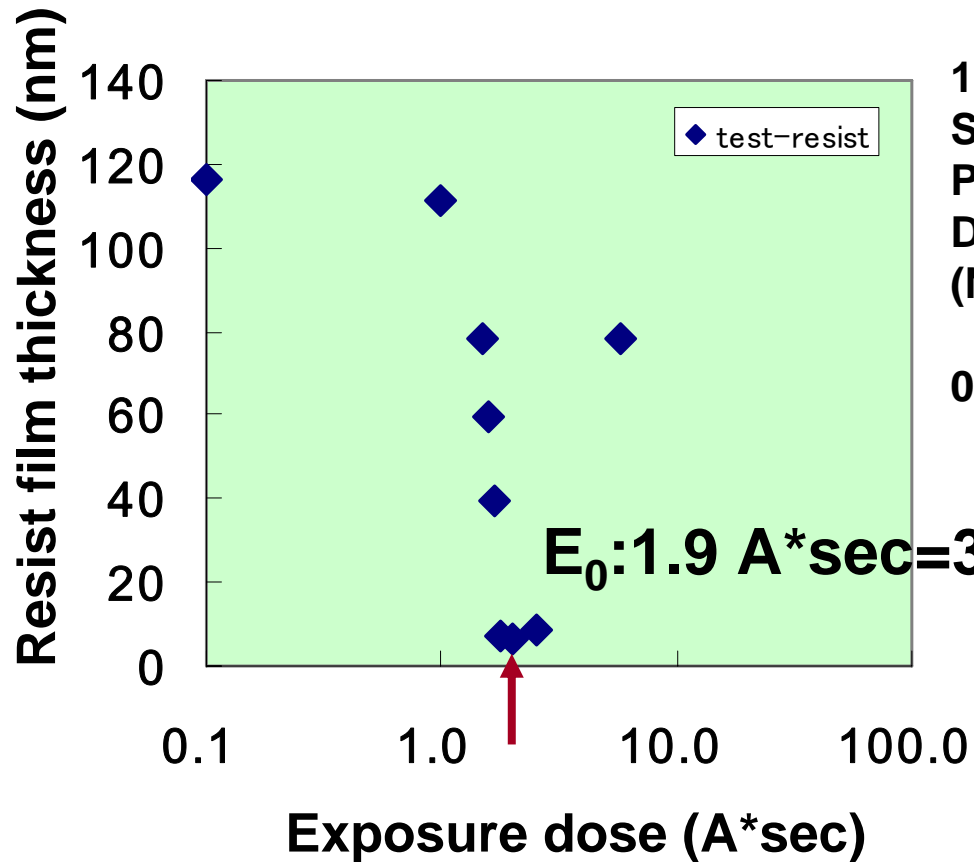
Q-MASS: M-QA200TS (ANELVA)

60sec@1-200 amu scan

Progress of ASET-Outgassing evaluation apparatus

- 2005/3** **Installed**
- 2005/4** **Adjustments**
- 2005/5-6** **Preliminary experiments**
- 2004/7** **Adaptation (Beam monitor, Filter, Orifice)**
- 2005/8-9** **Adjustments**
- 2005/10-** **Round robin outgassing**
Preliminary results

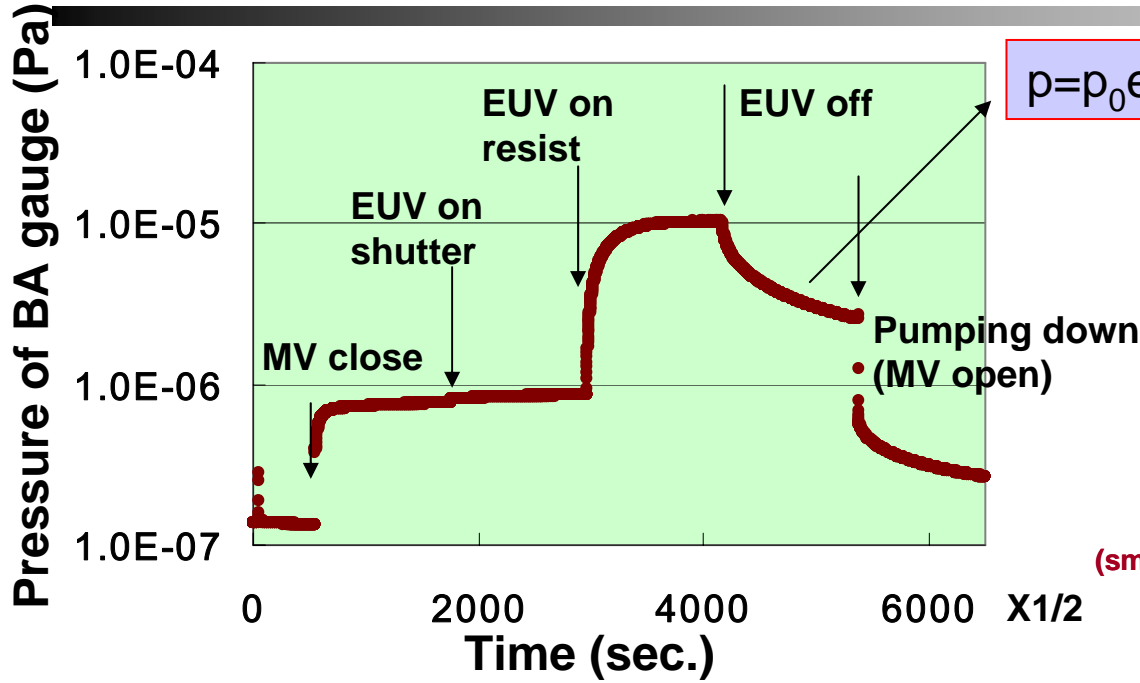
Ezero evaluation



125 nm thickness
Softbake: 140° C for 60 seconds
Postbake: 130° C for 90 seconds
Development: use 0.26N TMAH
(NMD-3 2.38%) for 40 seconds

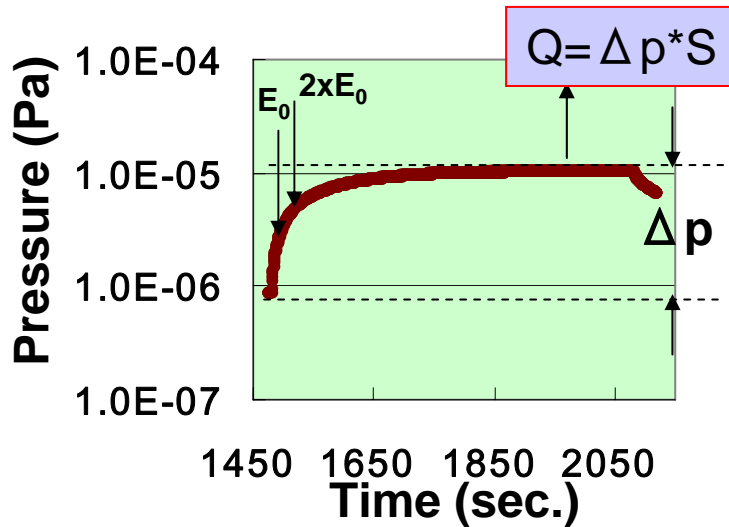
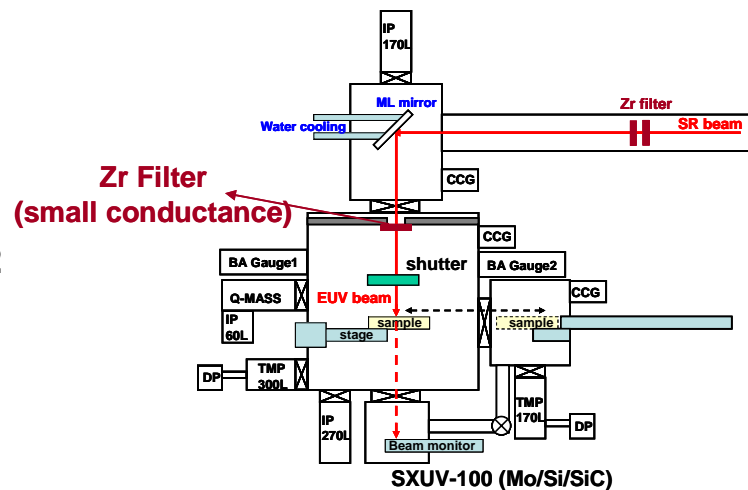
0.5 mW/cm²@250mA

Outgassing evaluation



$$p = p_0 \exp(-SAt/V) + p_e (1 - \exp(-SAt/V))$$

0.13 mW/cm² @ 234mA
Exposed area: 2cm²



$$Q = \Delta p * S$$

$Q = \Delta p * S: 2.65 \times 10^{-5} \text{ Pa} \times 1.28 \text{ L/s} = 9.0 \times 10^{12} \text{ molecules/sec in stationary state}$

$Q: 4.5 \times 10^{12} \text{ molecules/cm}^2\text{/sec at } 0.13 \text{ mW/cm}^2 \text{ in stationary state}$