

# **NIST outgas testing update**

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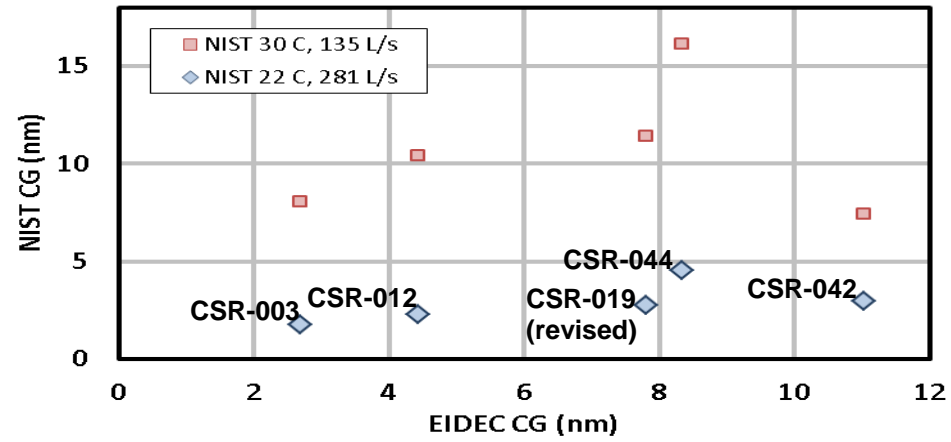
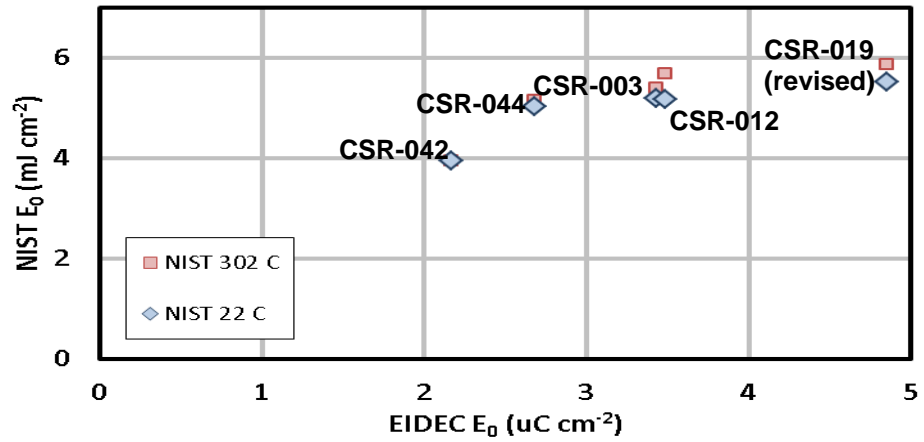
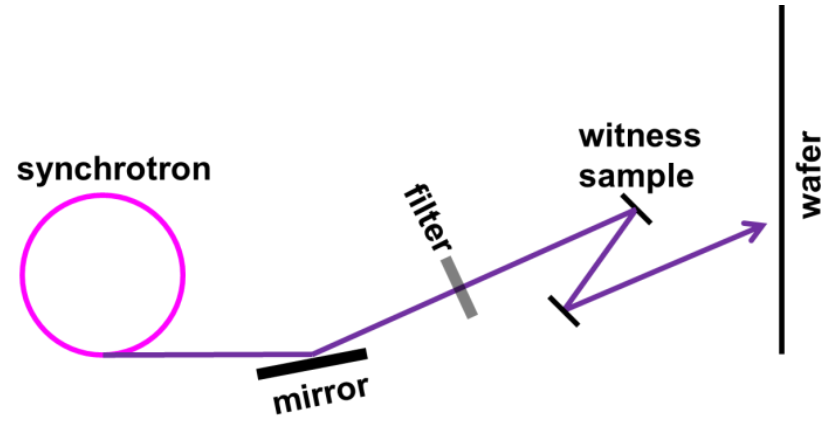
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**IEUVI Resist technical working group  
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# Modifications to improve site-to-site comparability

- 1) Use a filter with more EUV transmission.
- 2) Stabilize the chamber at a higher temperature.
- 3) Decrease the pumping speed.

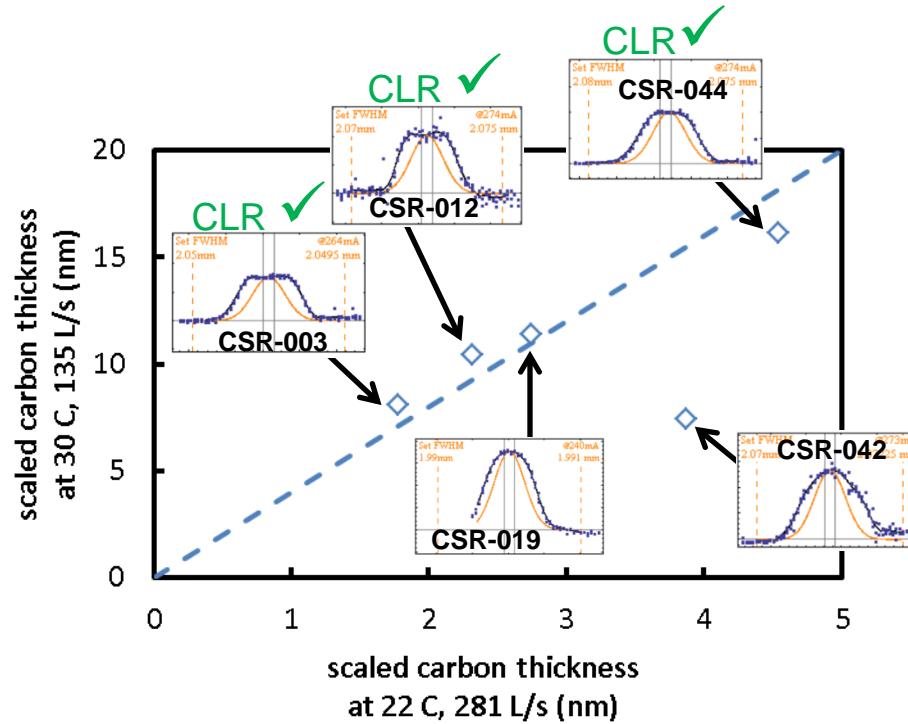
	old	new
EUV filter	Zr	Si
temperature	22 °C	30 °C
pumping speed	281 L/s	135 L/s



- $E_0$  not affected by different EUV filter and higher temperature.
- ( $E_0$  for CSR-019 was revised from 7.77 to 5.52 mJ/cm<sup>2</sup> after re-examination of data for resist thickness vs.  $E$ .)

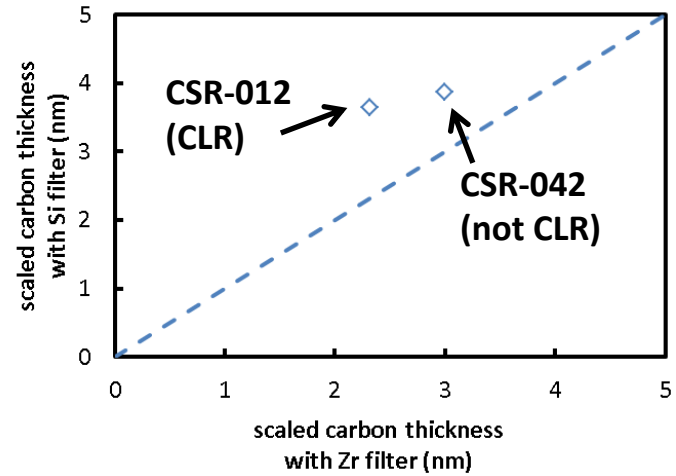
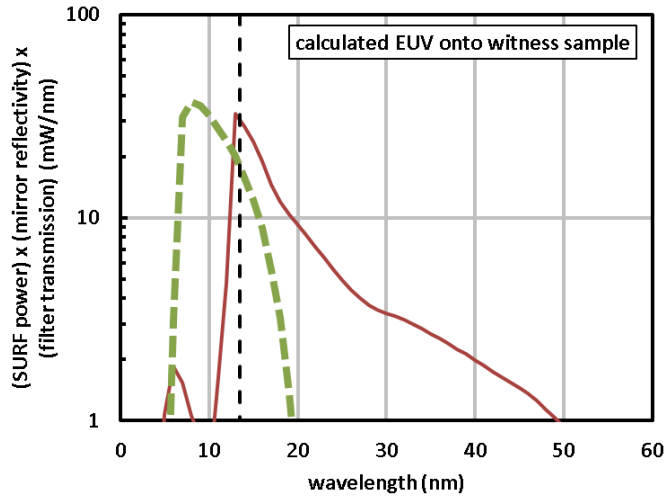
- New conditions caused 4 times more CG for all resists except CSR-042.
- (CG for CSR-019 was decreased from 1.77 to 1.22 in proportion to revised  $E_0$ .)

# CLR not achieved for two of the five EIDEC model resists



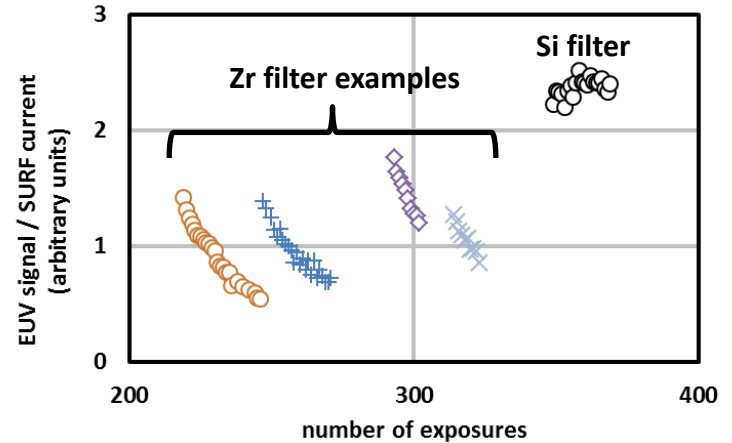
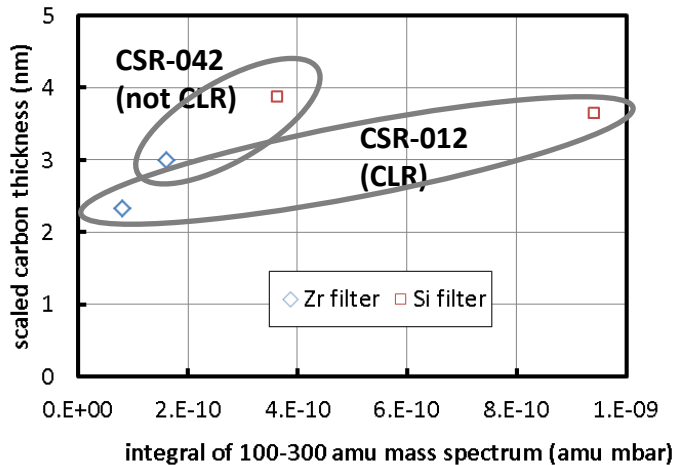
Conditions to attain saturation still not entirely clear – R&D ongoing

# Changing the EUV filter



Changing the filter (but not  $T$  or PS) increased CG.

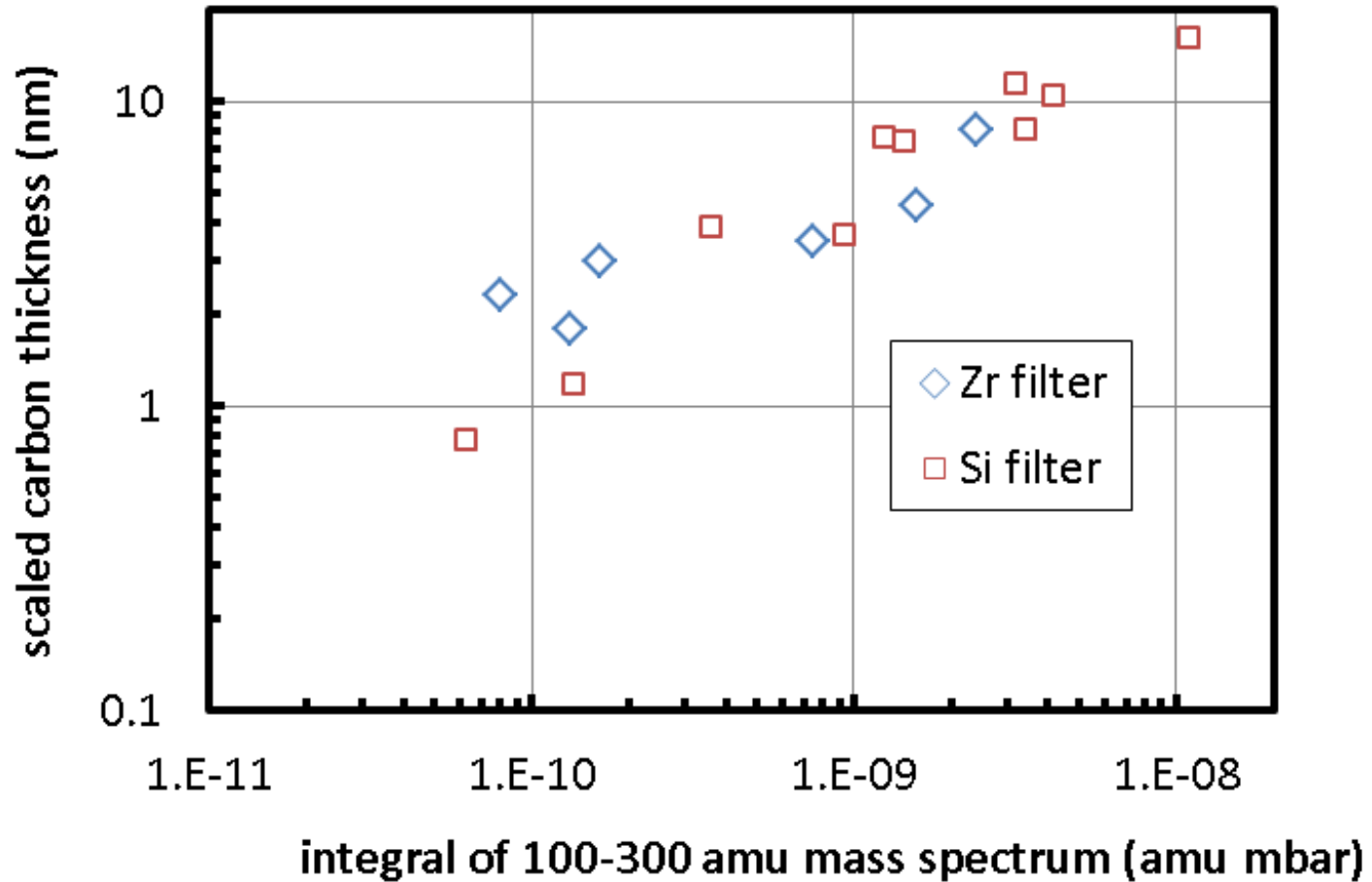
- Silicon transmits more EUV than zirconium in 13 – 50 nm.
- Copper mesh keeps the silicon membrane cool.



The silicon filter transmits more EUV, and it may have a longer life.

These data were taken at  $T = 22\text{ }^{\circ}\text{C}$ , 281 L/s.

## Correlating RGA data with carbon thickness



Overall correlation with RGA data seems OK for both filters.



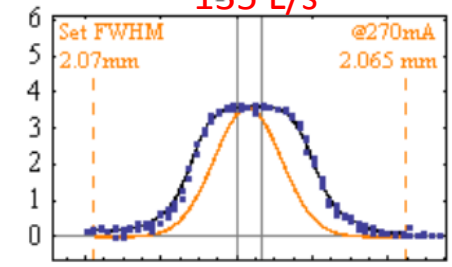
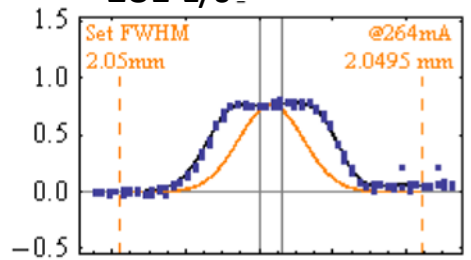
EUV filter  
temperature  
pumping speed

Zr  
22 °C  
281 L/s

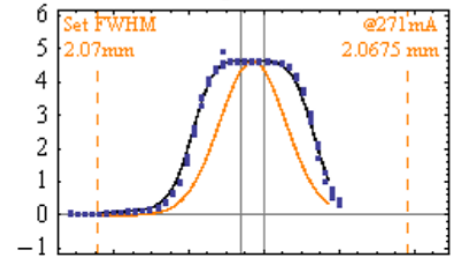
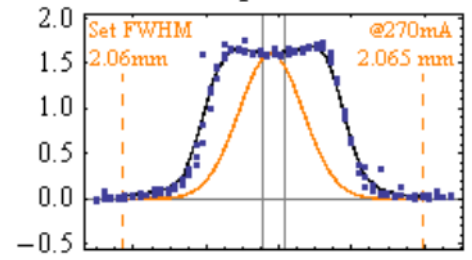
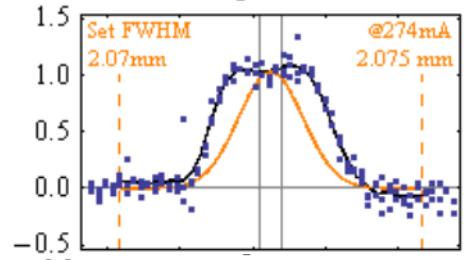
Si  
22 °C  
281 L/s

Si  
30 °C (with baffle)  
135 L/s

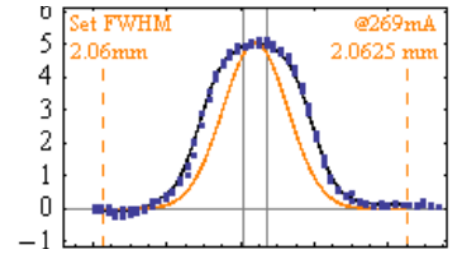
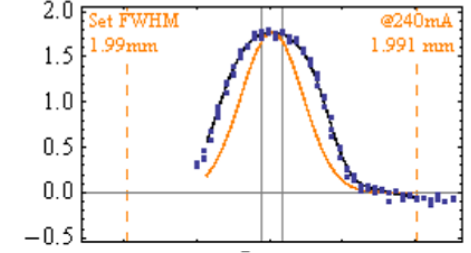
CSR-003



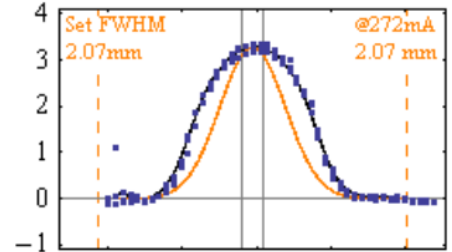
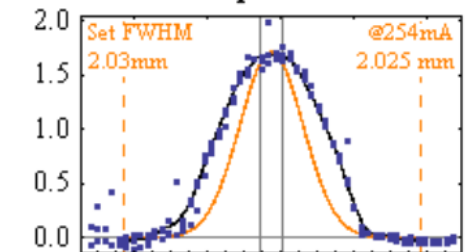
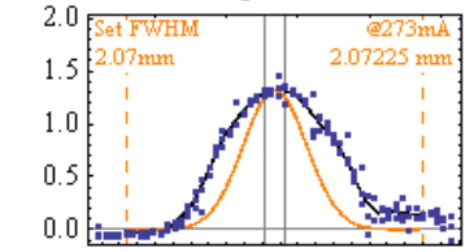
CSR-012



CSR-019



CSR-042



CSR-044

