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Progress in the optics lifetime programme for ASML EUV Lithographic Tools

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One of the challenges for EUV Lithography is molecular contamination and lifetime of EUV optics. In order to make EUV economically viable, optics lifetime should be in the range of 7-10 years (tens of thousands of illumination hours).

Within the ASML/Carl Zeiss SMT AG EUV projects, an optics contamination/lifetime program is in place to develop contamination control strategies. Different EUV exposure facilities are available making use of pulsed sources. Long duration experiments are performed to prove the required lifetime. Cleaning methods can also be tested at the EUV exposure test setups. In this way the cleaning/exposing strategy is validated. In addition, cleaning methods are investigated seperately and optimized for tool implementation.

In addition, we have performed many contamination experiments, under accelarating conditions. The goal of these experiments is to validate scaling laws, necessary for reaching production tool specifications.

In this presentation, an overview will be given of the results achieved in the past year within the optics lifetime and contamination program.