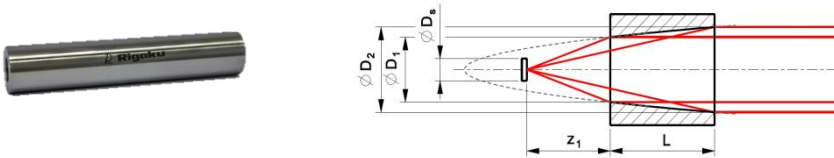


Production challenges and performance of replicated optics for EUV and Soft X-rays

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The production of replicated optics for EUV, soft x-rays and x-rays has already a long tradition within our company. Over the last decades, we designed and produced more than 100 pieces of optics for application in EUV-metrology, spectroscopy and astronomy. These products are always individual optics, designed for one application and produced in very low quantities. Mainly we produced singles, one piece of a special design. See picture below:



Left is a replicated parallel beam optics final product with general design as shown on the right.

Over the recent 2 years, the metrology market, especially for EUV and spectroscopy, is developing rapidly. We are often working to produce higher quantities of optics, including more complicated optics.



The picture above on the left shows an EUV optics designed for 13.5 nm and to be produced out of 4 shells and mounted together for a complete optics. The final product is shown on the right above.

That gives high demand on the mechanical design and alignment procedures. When producing these complicated optics in quantities like 10 per year or higher with repeatable quality in performance, the challenges for both development and production are becoming severe.

In our presentation we will show some technical challenges we faced in production of both higher quantities and complicated designs of replicated optics. We will share the results we could obtain for these challenges.