



1. Title:	IBF Technology development for EUVL Mirrors
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3. Abstract body:

IBF (Ion Beam Figuring) technology development for EUVL optics in Canon will be presented. We have been developing IBF machine in collaboration with EUVA, which has a precision 5-axis NC controlled motion stage for a processed mirror and an ion beam gun in a vacuum chamber. The aim of our IBF technology development is to establish a well-balanced fabrication process for EUVL-mirrors. Usually to smooth high frequency roughness is incompatible to correct figure errors in traditional polishing, and this dilemma often causes to repeat polishing process.

We developed two special ion beam guns with beam diameters of 1mm FWHM (Full Width at Half-Maximum) for 3mm foot print, and 3mm FWHM for 8mm foot print. Our IBF process is able to correct figure errors (spatial frequency range of 0.33mm⁻¹ to clear aperture) into 0.2nmRMS without changing MSFR (Mid Spatial Frequency Roughness), and less change in HSFR (High Spatial Frequency Roughness). This excellent feature solved the dilemma, and we chose IBF for a final figure correction process. Furthermore, the performance of our IBF for fabricating SFET mirrors will be discussed.