

Feasibility study for the spectral measurement of FACs

Graduate



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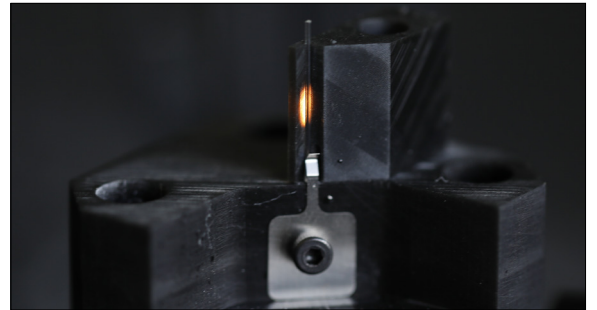
Introduction: As part of this Bachelor thesis, the feasibility and implementation of a measurement setup for determining the spectral properties of coated Fast Axis Collimators (FACs) for the company FISBA AG was investigated. The aim of the work was to develop an optical measurement setup that allows reflection and transmission measurements directly on the coated FACs in order to evaluate the quality and performance of the antireflective (AR) coatings.

Approach: A setup was designed that can be integrated into the Perkin Elmer Lambda 950 spectrophotometer. The measurement system is based on the use of a General Purpose Optical Bench (GPOB) and enables the measurement beam to be first collimated and then precisely focused using two parabolic mirrors. The use of mirrors ensures that no dispersion effects alter the measurement point, thus improving the accuracy. A specially designed aperture ensures that the testing area of the FACs is not exceeded. To enable a perpendicular reflection measurement on the planar surface of the FACs, the second parabolic mirror is equipped with a through-hole that allows the reflected light to be detected.

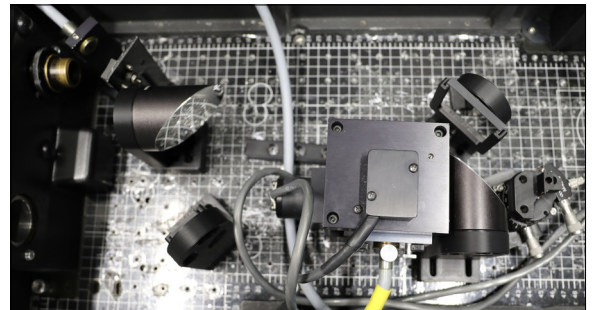
Conclusion: Comparison measurements with test glasses from the same batch showed that the reflection values on the coated FACs were slightly higher. On average, the reflection values of the FACs were about 0.4 % above those of the test glasses but largely remained within the specified tolerance ranges. This confirms the functionality of the measurement setup and its suitability for future quality control measurements at FISBA AG. To improve the measurements and reduce noise, integrating an additional sensor with a sensitivity range between 800 nm and 1000 nm could be beneficial. Furthermore, a common baseplate is already being designed, which

will allow all components to be aligned only during the initial measurement.

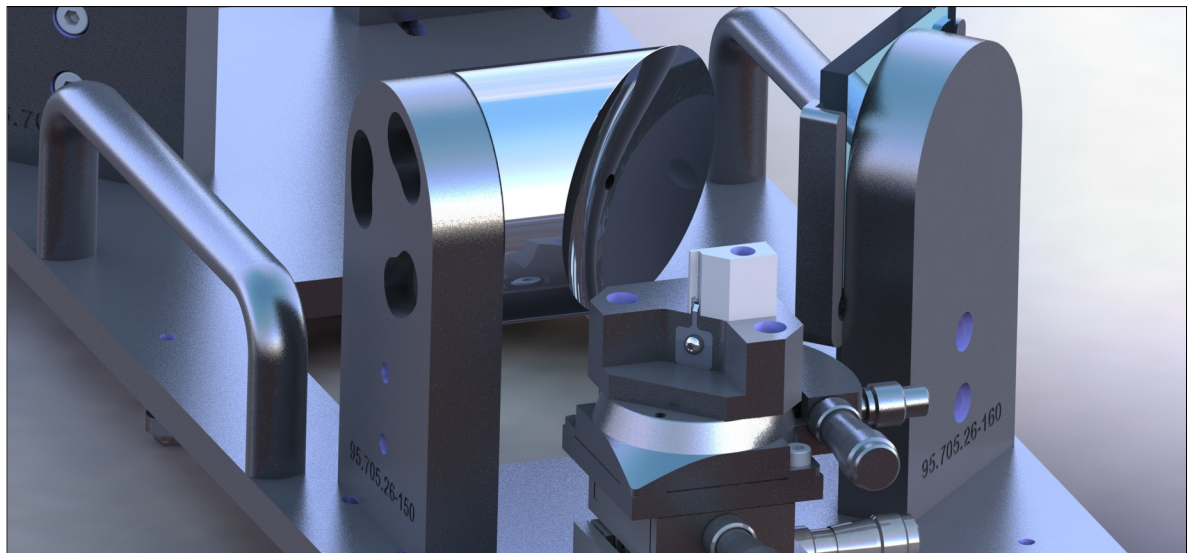
FAC in FAC holder
Own presentment



Test setup on the GPOB
Own presentment



Concept of complete measurement setup with shared baseplate
Own presentment



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Subject Area

Photonics

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