

NEW POSSIBILITIES WITH MOCCA+®

The complexity of industry-relevant optical filter systems, e. g. in telecommunications, is increasing continuously. In addition, users expect an even higher degree of equipment automation. The MOCCA+® (Modular Optical Coating Control Application) software developed at the Fraunhofer IST is, in addition to the optical broadband monitoring of the individual layers of a filter, also capable of controlling the EOSS® (Enhanced Optical Sputtering System) facility. Between the individual coating operations, it is no longer necessary for the user to intervene, as the exchange of the substrates is an automated process.

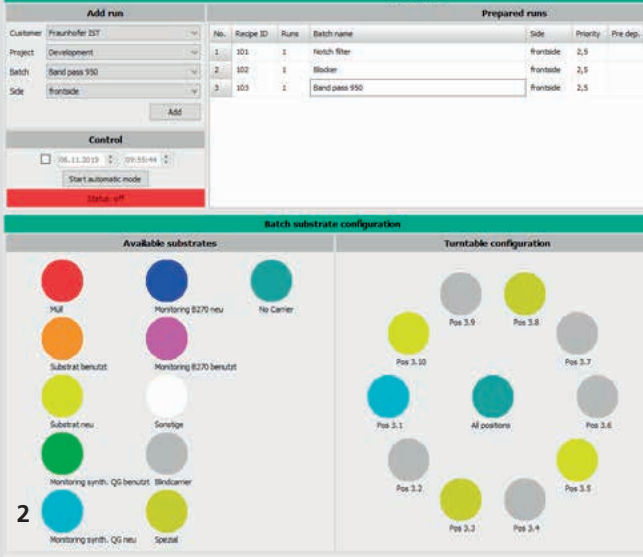
Pre-coating

With the EOSS® facility, which was also developed at the Fraunhofer IST, up to ten substrates can be coated simultaneously. Generally, one of the ten substrates is the so-called monitor substrate, through which the progression of the coating process is monitored with the aid of the MOCCA+® software. Special filter designs often require a pre-coating of the monitor substrate. This is necessary, for example, when the design begins with a low-refractive or very thin layer. The difference in refractive index between the monitor substrate and the low-refractive layer is then insufficient for optical monitoring of the deposition. For this reason, the customer substrates are not brought into the coating chamber until the pre-coating has been completed. The exchange of the substrates is determined prior to the start of the process and takes place automatically.

Parallel recipe steps

Current filter designs sometimes consist of several hundred individual layers. Between two layers, specific respective recipe steps are performed, e. g. alteration of the generator power in preparation for the next layer. With the large number of layers, even short waiting times of a few seconds accumulate to a value in the hourly range which is no longer negligible. For this reason, it is possible to execute recipe steps for the next layer whilst the current layer operation is still running. This shortens waiting times and increases the productivity of the entire system.





1 Program surface during a coating operation.

2 User interface for definition of the substrate assignment.

Re-design/Re-optimization

Optimization of the entire coating can be achieved through the utilization of the external programs OptiLayer and OptiRE. The calling of the applications and the evaluation of the results are also fully automated processes. With the aid of OptiLayer, the layers of a filter which have not yet been deposited can be adapted in order to compensate for process-related fluctuations. OptiRE allows the correction of the layer thicknesses of the already deposited layers, taking into consideration all the final measurements of these layers.

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