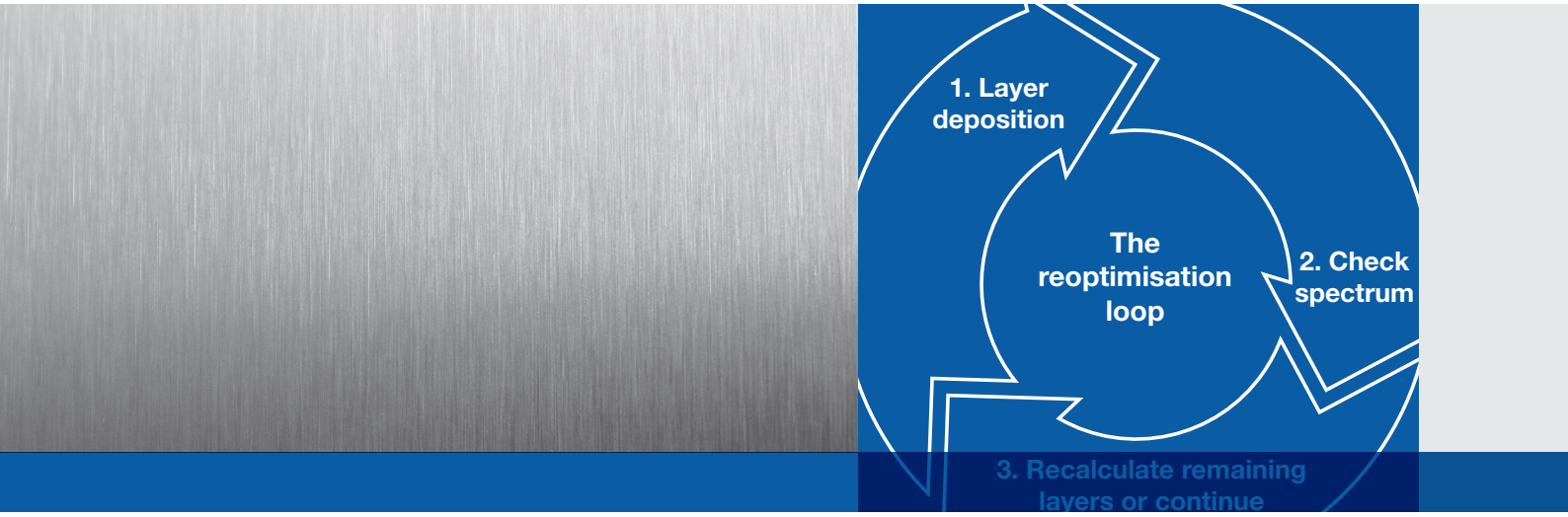
evatec
process systems



IN-SITU REOPTIMISATION

Intelligent software for optical coatings

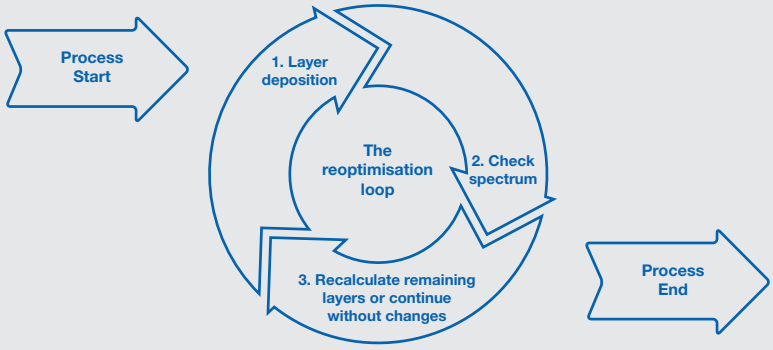
IN-SITU REOPTIMISATION

- Maximises yields for complex filter designs
- Batch recovery after unforeseen events
- Fully automated process according to user defined guidelines

THE PRINCIPLE

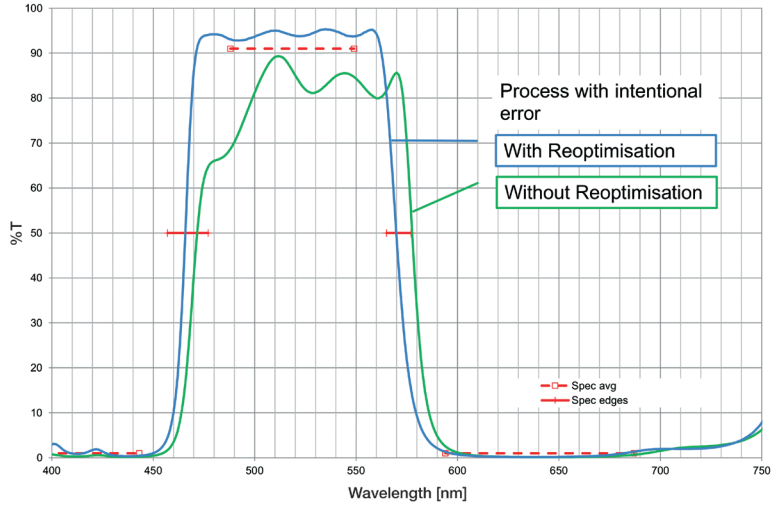
State-of-the-art deposition techniques like PIAD and magnetron sputtering allow for tight control of refractive indices and coating rate. Combined with optical monitoring for layer termination this enables reliable production of optical interference filters for a wide range of applications. However, the drive to ever higher specifications requires eliminating even small variations in deposition conditions which then can lead to significant yield improvements and cost reductions.

In-situ reoptimisation uses broadband optical monitoring not just during the actual coating process but also after the deposition of each layer to ensure the final stack performance is as close as possible to the original theoretical design. The actual reflection or transmission spectrum measured after termination of a layer is compared with the theoretical performance. In the case of significant deviation, the remaining coating recipe is adjusted by recalculating the layer thicknesses and target spectra for the remaining layers to keep the coating process on track. The “reoptimisation” process is repeated after deposition of each layer automatically until the whole stack is complete without any extension to the process time.

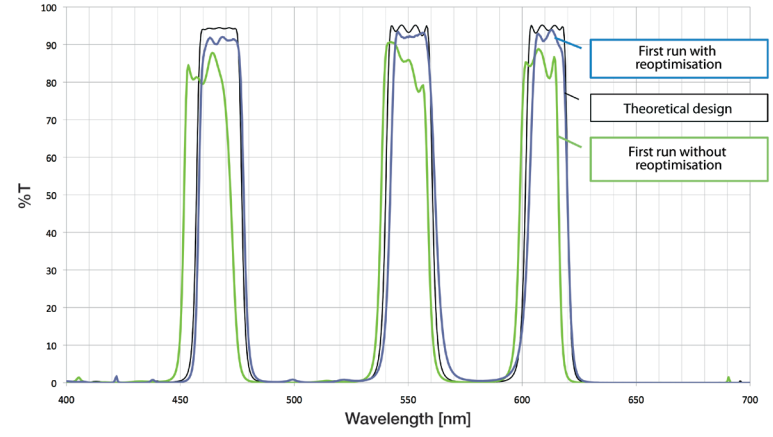


THE RESULTS

Demonstration example for the error compensation capability: 31 layer green transmission filter, large, intentional error introduced in layer 13 is efficiently corrected by in-situ reoptimisation.



A triple bandpass filter



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