

Coating Characterisation with Optical Coherence Tomography (OCT)

Abstract

In this project the OCT Heliinspect H3 (OCT=optical coherence tomograph) for coat thickness measurements had to be put into operation. A test setup had to be built and the software to optimize the display of 3D images had to be customized. Then measurements had to be taken. An OCT with three different compatible measuring heads has been available. With the OCT it is possible to scan surfaces and layers near the surface comparable with ultrasonic imaging, but with light instead of acoustic waves.

The control of the OCT can be realized with the program "HeliViewer" that is included in the purchased package. It can also be realized with LabVIEW. LabVIEW examples are included in the purchased package as well.

In the context of the undergraduate studies the OCT has to be put into operation and tested first. Subsequently a rack has to be built. The OCT shall be mounted vertically to the rack and calibrated, to make measuring of samples more convenient.

After this different samples shall be scanned by the OCT. The OCT shall be controlled by a LabVIEW program. To optimize the quality of the scans the LabVIEW software has to be adapted.

The result allows taking optimized measurements of surfaces and layers near the surface. An instruction manual has been written to make operation easy to every user. When controlling the OCT by LabVIEW the average over a user-defined number of measurements can be built. Unfortunately the available OCT is not explicitly useful to scan organical samples. Therefore not even the optimized images fulfill the previous expectations. This is associated with the wavelengths of the infrared light used. The central wavelength is 840 nm, whereas the recommended central wavelengths for organical samples are over 1300 nm. By the OCT Heliinspect H3 good measurements can be taken from reflecting surfaces and transparent materials.



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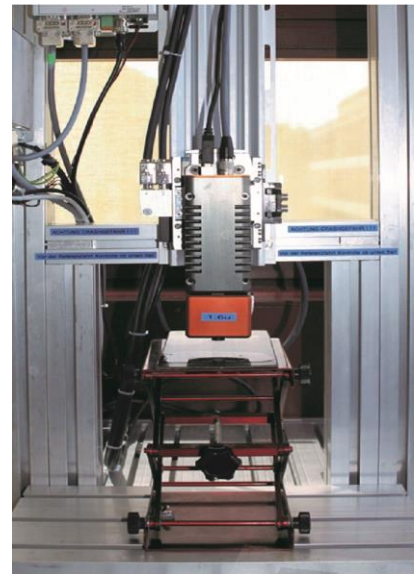


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