

Infinite focus

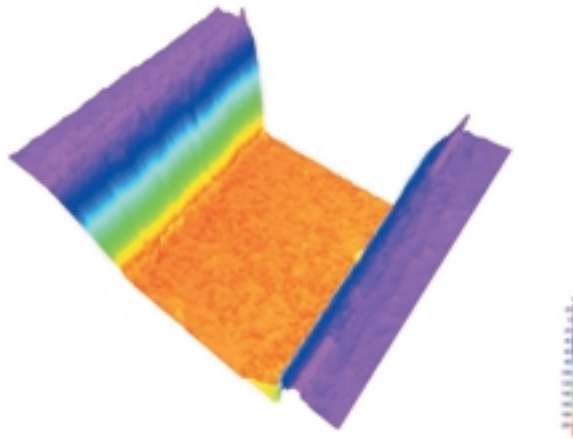
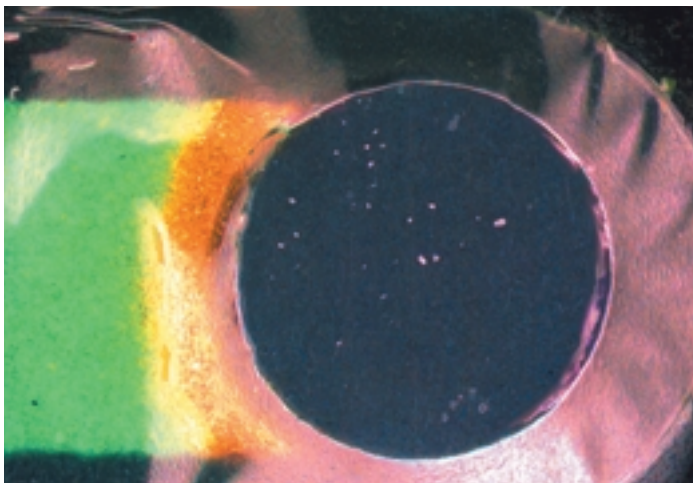
InfiniteFocus Milestone Topomicroscopy provides a breakthrough in 3D non-contact measurement of blood sensors at Roche. By Dr. Stefan Scherer

The measurement of blood sensors is of major importance at Roche. Conventional devices such as the confocal laser scanning microscope or the profilometer are not able to carry out the critical measurements necessary to provide their customers with first class medical equipment. The Austrian topomicroscopy company Alicona Imaging has provided Roche with a remarkable 3D measurement solution, Infinite Focus. This non contact 3D measurement tool not only enables enhanced 2D visualisation and 3D reconstruction but also generates a highly accurate microscope image on which depth information can be measured. With Infinite Focus microscopy and metrology are provided in one unit.

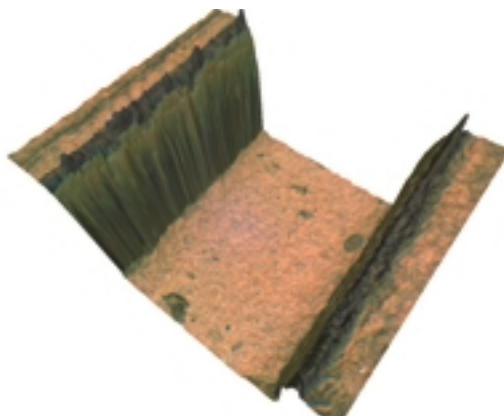
Roche Diagnostics

Roche Diagnostics is one of the leading health companies in pharmacy and diagnostics worldwide. Graz is the global location for Near Patient Testing, Applied Science, centralized and molecular diagnostic as well as diabetes care. The Near Patient Testing team daily works in the fields of blood gas analysis, coagulating, urine analysis, clinical chemistry and

2D texture of the blood sensor. InfiniteFocus achieves a 2D image with absolute depth of focus in the entire field of view. More than that, 3D measurement capabilities such as height, volume, area and roughness analysis is achievable as well.



3D reconstruction of the blood sensor in pseudo-colouring mode. This visualisation already provides metric information about the composition of the sensor.



3D reconstruction of the blood sensor in true-colour mode. Despite steep flanks InfiniteFocus enables a reconstruction with absolute depth of focus in the entire field of view.

many more. Due its success in these fields, Roche has a leading position in in-vitro diagnostics.

Roche manufactures blood sensors that consist of up to 12 layers. For a proper analysis of these sensors a highly accurate visualisation and a non destructive 3D measurement of the surface is essential. In particular, Roche needs to determine the conductor paths of the sensors. Devices used so far are not able to provide the necessary measurement capabilities. A confocal laser scanning microscope, for instance, cannot manage a proper reconstruction. The wave length of the laser comes along with the translucence of the polycar-

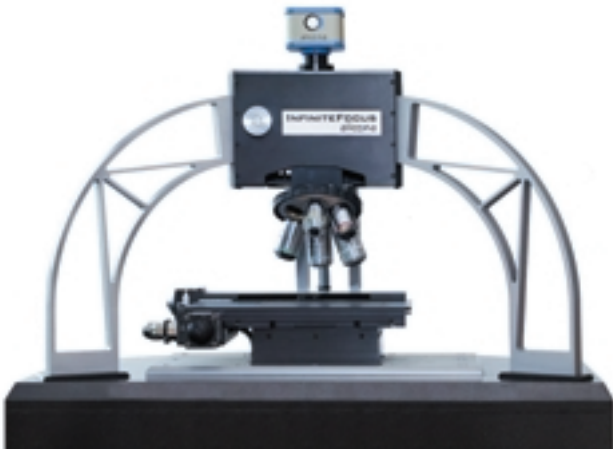
Topomicroscopy

InfiniteFocus is a new 3D measurement device that includes all the functionalities of a light microscope.

The user receives a 2D image with the entire depth of focus in the whole field of view, which also includes the depth information. The user measures directly on the 2D image and receives the 3D topography information of his specimen. Texture and depth information also provided in the one unit whereas other systems are only capable to provide either a (microscope) image or the depth values. InfiniteFocus fills a gap in surface analysis and opens completely new applications in material science, life science, nanotechnology - and many more. InfiniteFocus enables true colour 3D reconstructions and 3D measurement capabilities. Even under difficult circumstances such as very rough surfaces, difficult reflections or steep flanks the system provides enhanced visualisation and highly accurate measurement results.

The fusion of microscopy and metrology enables the 3D measurement of profile, volume, area and roughness directly on the 2D microscope image. These functionalities guarantee non destructive examination as well as a quick identification of defects.

bonate, so the confocal system fails for this application. The use of tactile devices such as the profilometer does not lead to the proper visualisation either, let alone a non tactile measurement. The profilometer, in this case, only enables a view on limited spots of the surface but can not establish an overall adequate analysis. More than that, the coherent diffu-




sion is far beyond an acceptable grade. However, the method of tactile measurement does not lead to any significant results in terms of production and research for an optimisation of the sensitive blood sensors.

The solution

The search for an alternative surface measurement unit to acquire a proper visualisation, as well as a meaningful 3D reconstruction and measurement of the topography of the sensor, led Roche to Alicona Imaging. The topomicroscopy company's InfiniteFocus is a 3D measurement system capable of carrying out the measurement requirements of Roche. InfiniteFocus is a 3D measurement device that combines all the functionalities of microscopy and metrology. The unit generates 2D texture as well as depth information of surfaces, making measurements possible that were not feasible before.

2D images of the sensors' surfaces are captured during different

periods of production. InfiniteFocus enables visualisation of the texture in true colour and shape. This allows initial checking of the accuracy of the topography of the sensors. For further, highly accurate evaluation, InfiniteFocus generates a 3D reconstruction of the surface. Also at this stage, the measurement unit provides various analysis modules allowing measurement of profile, roughness, waviness, area, volume and "Z" height. For Roche particularly, the profile analysis is of major importance to determine the measurement of the height of the sensor. With Infinite Focus height measurements from 20nm to 5µm resolution are feasible. These capabilities provide enormous advantages for the general optimisation of the sensors.

The use of InfiniteFocus has enabled Roche to achieve optimisation of the sensors. In addition the development times have been significantly reduced. 

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Non tactile height measurement of blood sensors. The measurement unit InfiniteFocus provides 3D measurement capabilities directly on the 2D image. The user receives the microscopic image as well as the according depth information. Profile, volume, area and roughness measurement capabilities are provided.

