

## Topographic Raman Imaging

# TrueSurface™ Microscopy

Chemical Analysis and Profilometry in One Pass



Topographic Raman microscopy image of microstructured silicon with impurities (maximum height variation 8  $\mu\text{m}$ ).

# TrueSurface™ Micros

## Topographic Raman Imaging

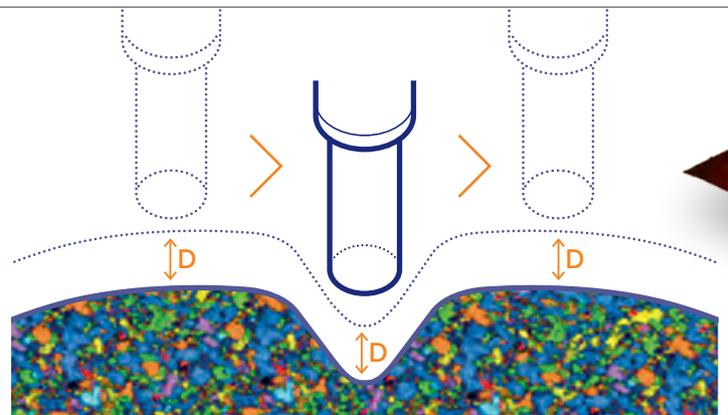
TrueSurface is a patented optical profilometry technology pioneered by WITec. It allows confocal Raman microscopy to be applied to roughly textured and very tilted samples by keeping their surfaces in constant focus. This technique is known as topographic Raman imaging.

**Why use TrueSurface?** To achieve the highest resolution and signal-to-noise ratio in confocal microscopy, it is essential to keep the sample surface precisely in focus. Measuring rough or inclined samples can thus be challenging. To overcome this obstacle, WITec developed TrueSurface technology. It actively compensates for height variations throughout the entire measurement, resulting in perfectly sharp and detailed images.



## Working Principle

A sensor actively monitors and maintains a set distance between the objective and sample surface with sub-micrometer resolution using closed-loop feedback operation. Thus, Raman imaging can be carried out precisely along or at a set distance from irregular surfaces. Topographic and chemical information are obtained at the same time.



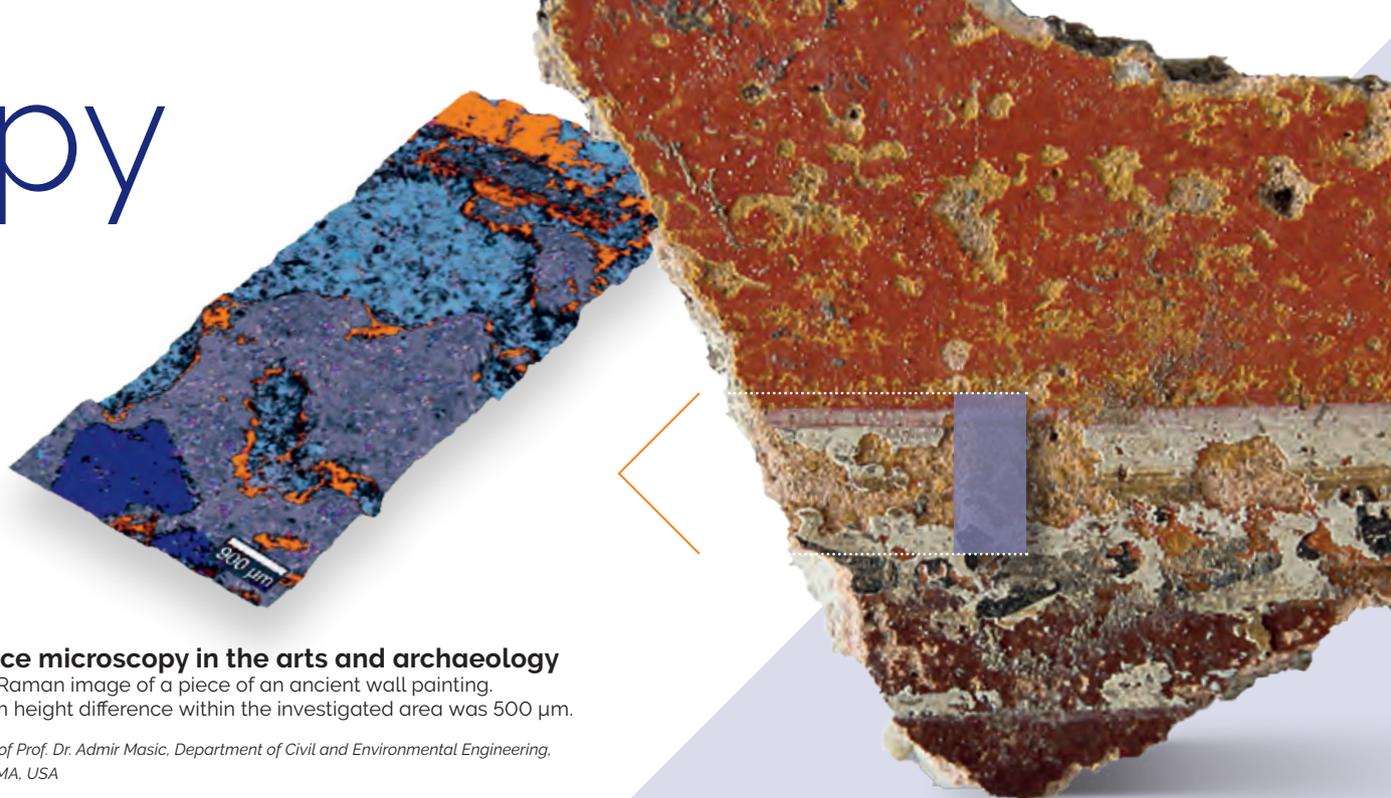
D - Set distance

The TrueSurface™ microscopy option enables the precise tracing of the surface while simultaneously acquiring Raman imaging data, resulting in a topographic Raman image.

## Benefits

- One-pass simultaneous optical profilometry and Raman imaging
- Sharp 3D chemical imaging on coarsely textured or inclined samples
- No specialized sample preparation necessary
- Closed-loop feedback to compensate for dimensional variations during long measurements

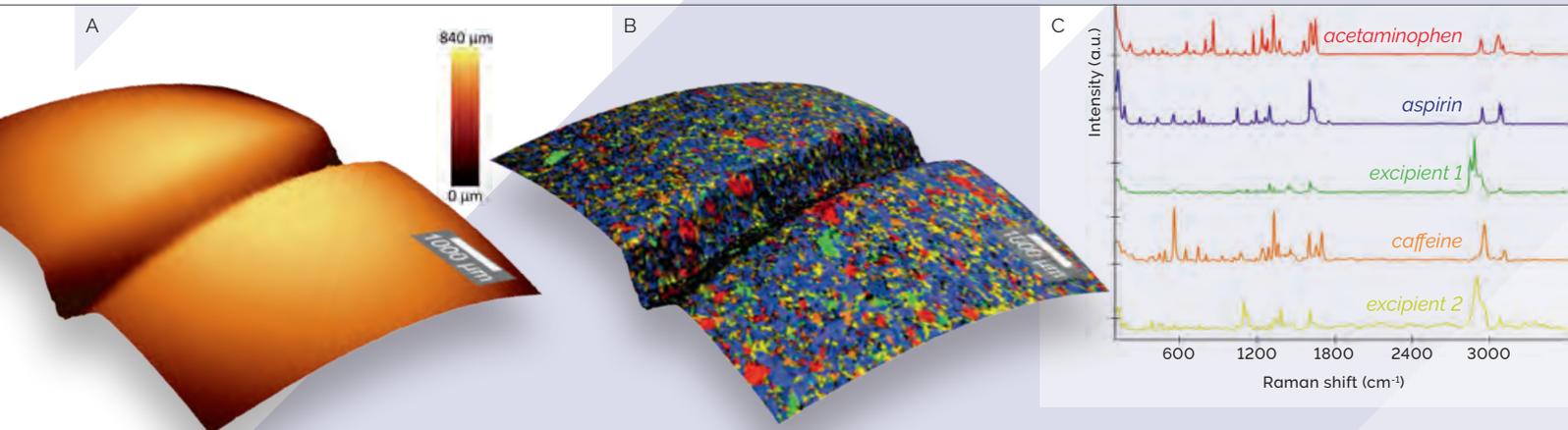
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## TrueSurface microscopy in the arts and archaeology

Topographic Raman image of a piece of an ancient wall painting. The maximum height difference within the investigated area was 500 μm.

Sample courtesy of Prof. Dr. Admir Masic, Department of Civil and Environmental Engineering, MIT, Cambridge, MA, USA



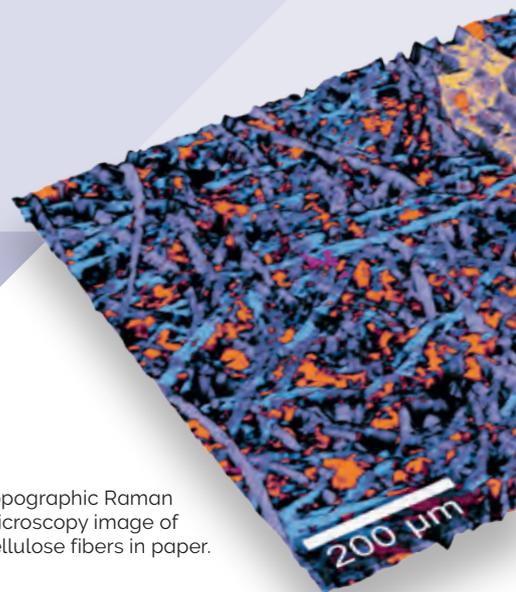
## Topographic Raman imaging of a pharmaceutical tablet

(A) Topography of a painkiller tablet (scan range: 7 x 7 mm<sup>2</sup>). (B) Topographic Raman microscopy image of the same sample area (overlay of topography and Raman image). (C) Raman spectra of the tablet's chemical components.

## Award-Winning Technology



Topographic Raman microscopy image of cellulose fibers in paper.



# WITec Microscopes



**alpha300 S:**  
Scanning Near-field  
Optical Microscope

**alpha300 A:**  
Atomic Force  
Microscope

**alpha300 R:**  
Confocal Raman  
Microscope

**alpha300 Ri:**  
Inverted Confocal  
Raman Microscope

**RISE®:** Raman Imaging  
and Scanning Electron  
Microscope

**alpha300 apyron™:** Automated  
Confocal Raman Microscope

**alpha300 access:**  
Confocal Micro-Raman System

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## Explore the TrueSurface product page

<https://raman.oxinst.com/products/imaging-options/truesurface>

