

Topographic Raman Imaging –  
Chemical Analysis and Profilometry  
in One Pass

# TrueSurface Microscopy



Topographic Raman microscopy image of microstructured silicon.

# TrueSurface Microscopy

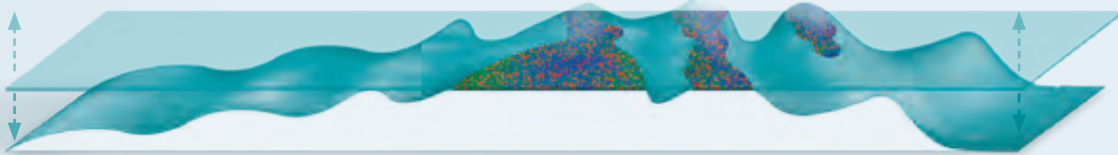
WITec's patented TrueSurface Microscopy option enables confocal Raman imaging guided by surface topography. Topographic Raman Imaging, a technique pioneered by WITec, uses an advanced optical profilometer integrated within the instrument to provide one-pass simultaneous operation.

3D chemical characterization on rough, inclined or irregularly-shaped samples can be carried out precisely along or at a set distance from a surface without requiring sample preparation.

Confocal Raman microscopes strongly reject out of focus light. The TrueSurface module allows the surface of even large or coarsely-textured samples to remain in constant focus during the measurement. As the sensor actively monitors and maintains a set distance between the objective and sample surface with sub-micrometer resolution, its closed-loop operation can eliminate any variations during measurements with long integration times.

Investigations of pharmaceutical coatings, geological samples, composite emulsions, complex semiconductor structures and many other applications can benefit from the accelerated workflow and methodological advantages provided by the new TrueSurface.

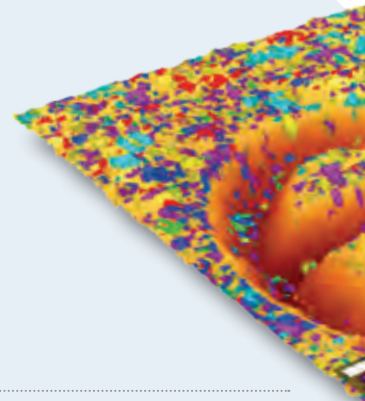
## Working Principle



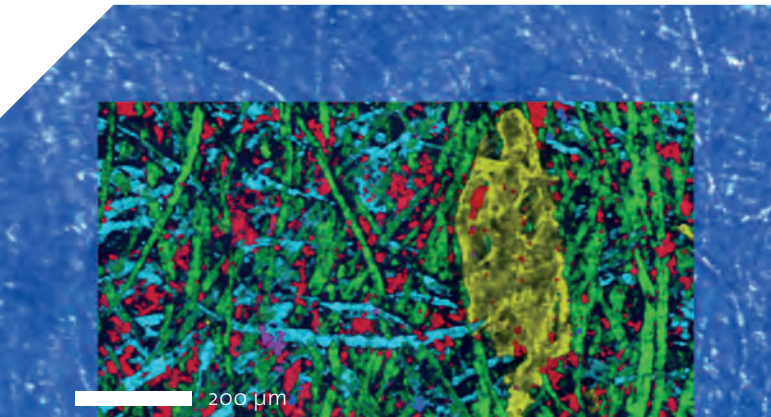
Confocal Raman imaging on large samples delivers an optical cross section of the sample. If the sample is not transparent, only the intersection of the focal plane and sample surface will give a Raman signal. Depending on the objective used, the focal plane might have a thickness of less than 1  $\mu\text{m}$ .



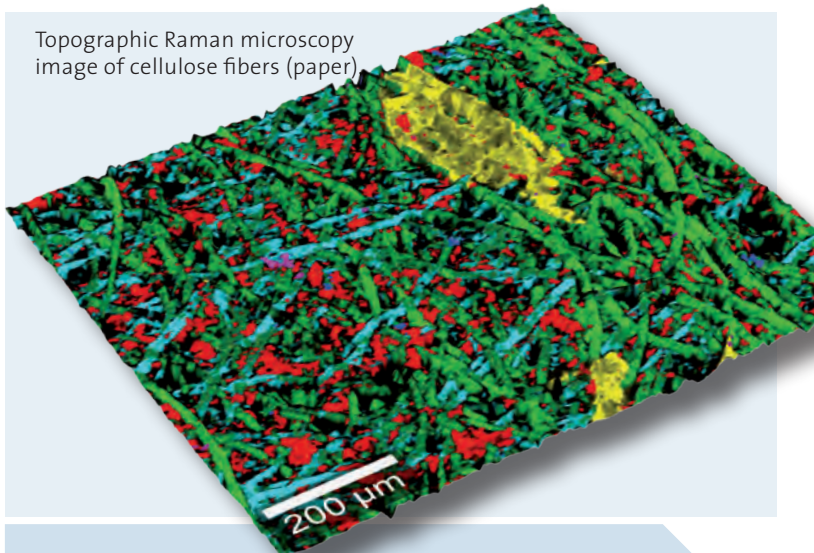
The TrueSurface Microscopy option enables the precise tracing of the surface while acquiring Raman imaging data, resulting in a topographic Raman image.



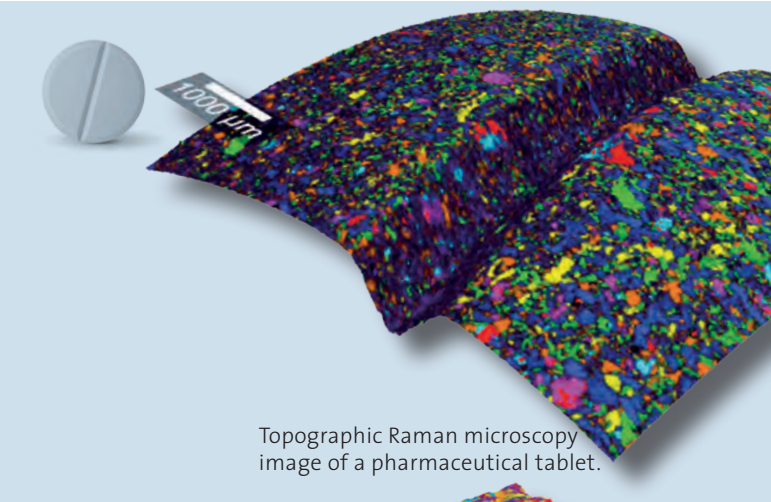




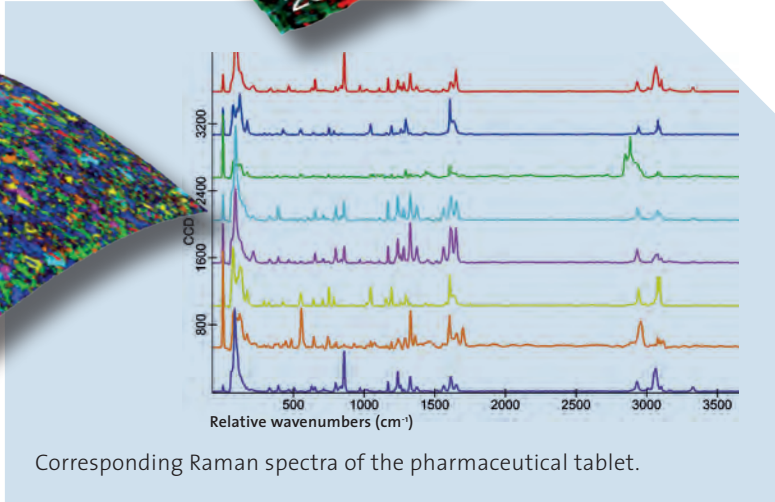
Confocal Raman microscopy image of cellulose fibers (paper) overlaid on the white light image.



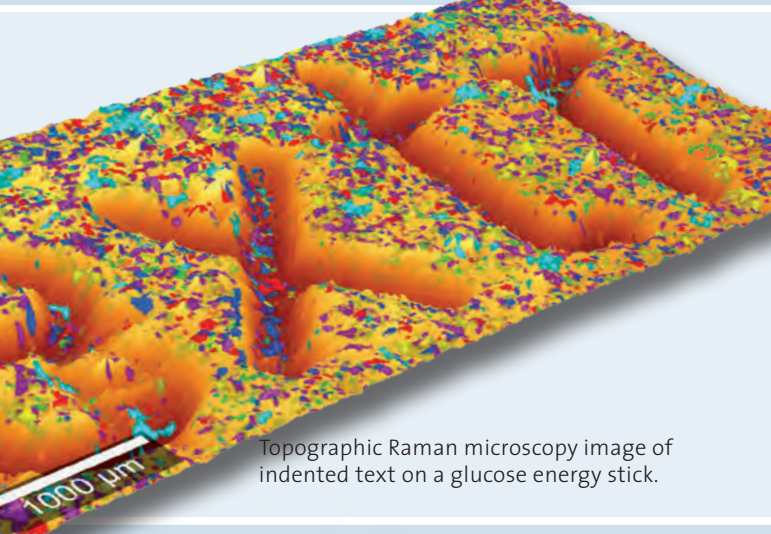
Topographic Raman microscopy image of cellulose fibers (paper)



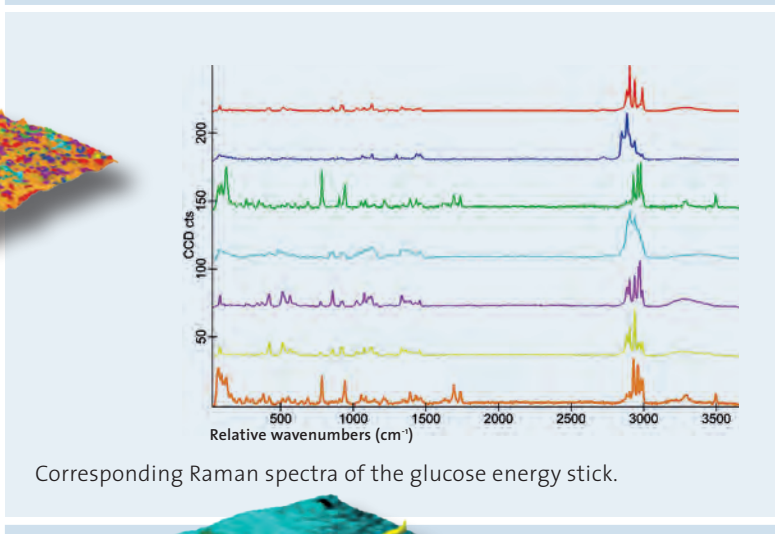
Topographic Raman microscopy image of a pharmaceutical tablet.



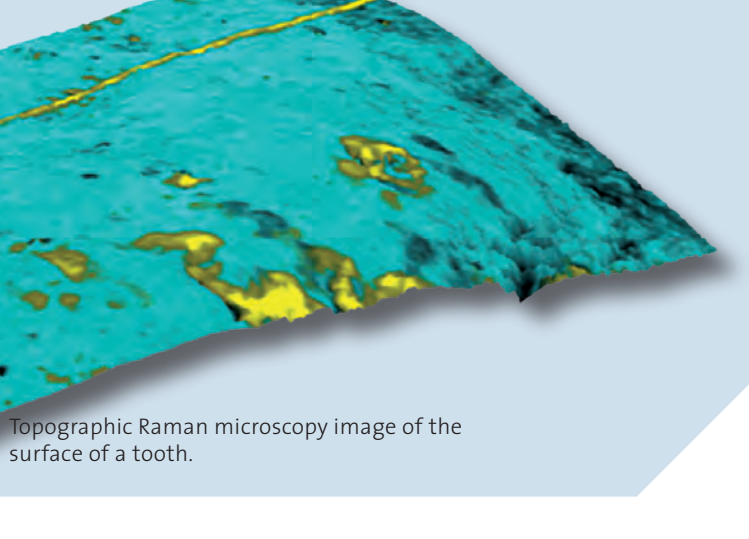
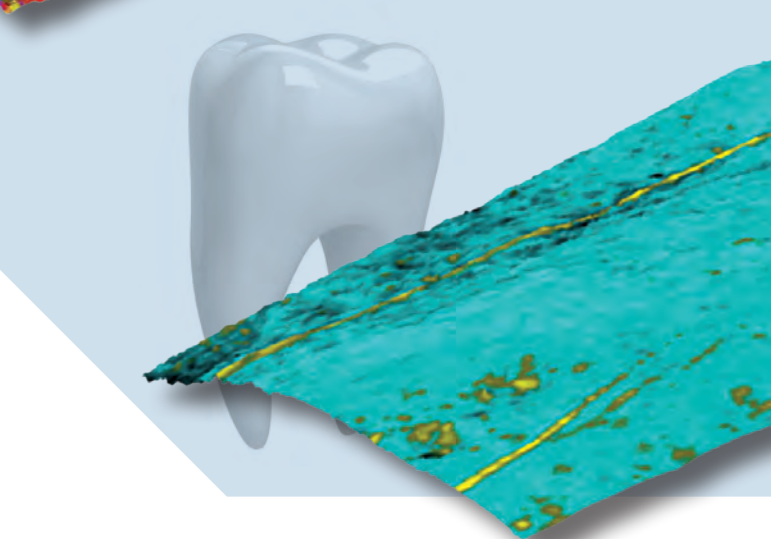
Corresponding Raman spectra of the pharmaceutical tablet.



Topographic Raman microscopy image of indented text on a glucose energy stick.



Corresponding Raman spectra of the glucose energy stick.



Topographic Raman microscopy image of the surface of a tooth.

## TrueSurface Microscopy – Next Generation Topographic Raman Imaging

The power of 3D confocal Raman imaging made more immediate and versatile than ever before. See your sample in relief and in depth.

- One-pass simultaneous optical profilometry and Raman imaging
- 3D chemical characterization on coarsely-textured or inclined samples
- No specialized sample preparation necessary
- Closed-loop operation eliminates variations during long measurements

## TrueSurface Microscopy – Award-Winning Technology



Photonics Prism Award, PITTCON Editors' Gold Award, R&D 100 Award, Microscopy Today Innovation Award

### WITec Headquarters

WITec GmbH  
Lise-Meitner-Straße 6  
D-89081 Ulm . Germany  
Phone +49 (0) 731 140700  
Fax +49 (0) 731 14070200  
info@WITec.de  
www.WITec.de

### WITec North America

WITec Instruments Corp.  
130G Market Place Blvd  
Knoxville . TN 37922 . USA  
Phone 865 984 4445  
Fax 865 984 4441  
info@WITec-Instruments.com  
www.WITec-Instruments.com

### WITec South East Asia

WITec Pte. Ltd.  
25 International Business Park  
#03-59A German Centre  
Singapore 609916  
Phone +65 9026 5667  
shawn.lee@witec.biz

### WITec China

WITec Beijing Representative Office  
Unit 507, Landmark Tower 1  
8 North Dongsanhuan Road  
Beijing, PRC., 100004  
Phone +86 (0) 10 6590 0577  
Info.China@witec-instruments.com

### WITec Japan

WITec K.K.  
KSP W713B Sakado 3-2-1 Takatsu-ku  
Kawasaki-shi Kanagawa 213-0012  
Japan  
Phone +81 44 19 7773  
keiichi.nakamoto@witec-instruments.biz