OXFORD INSTRUMENTS | WITec

Find, Classify and Identify Particles

WITec ParticleScout

https://raman.oxinst.com

WITec ParticleScout

Raman-based Microparticle Analysis

ParticleScout is an advanced software tool that finds, classifies, identifies, and quantifies particulate sample components. It leverages the speed, sensitivity, and resolution of WITec's Raman microscopes to accelerate microparticle analysis by moving seamlessly from overview survey, through categorization by physical attribute, to spectral acquisition and chemical characterization.

Catalogs of particles and quantitative reports can be created for reference and evaluation. Integration-time optimization and TrueMatch Raman spectral database integration deliver the high sample measurement rate and chemical specificity required by researchers in some of today's most dynamic application fields.

ParticleScout will help your analyses of:

Minerals

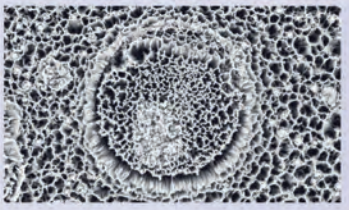
Microplastics

Cosmetics

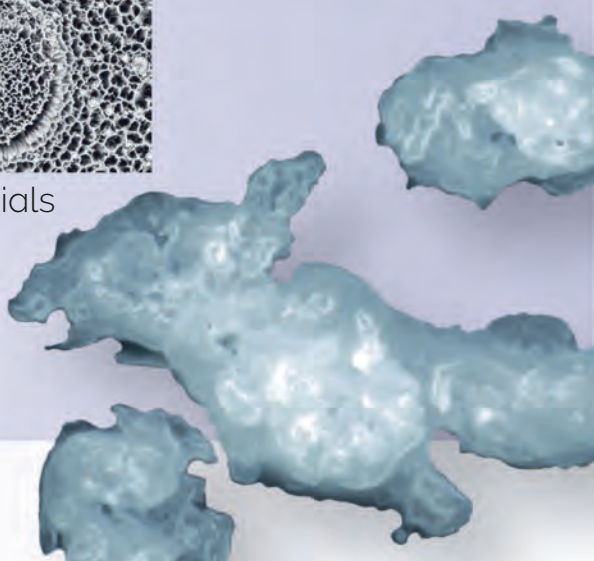
Pharmaceuticals

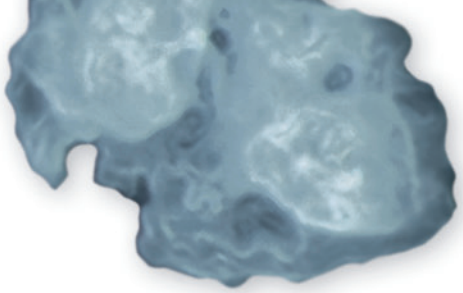
Environmental samples

Food and beverages



Nanomaterials

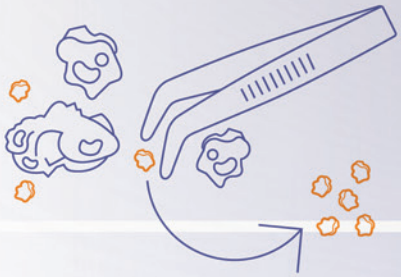




ParticleScout is...

Specific

Easy and fast particle selection and characterization



Fast

- Measure up to 1000 particles per hour
- Analyze thousands of spectra per minute

Automated

- High throughput
- High reproducibility

Precise

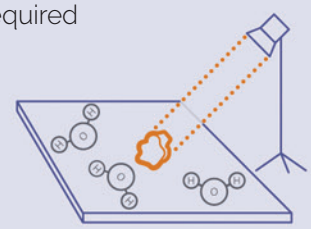
Target 0.5 µm particles

Raman
> 0.5 µm

FTIR
> 20 µm

Sensitive

- Compatible with aqueous samples
- Specialized substrates not required



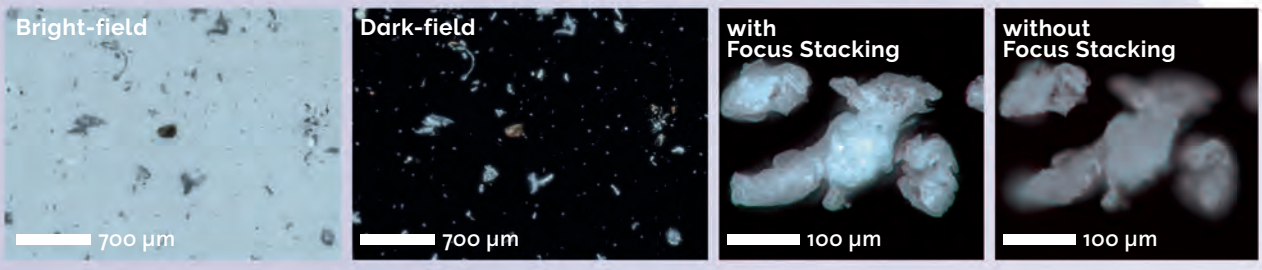
Comprehensive

Individual report generation

Conclusive

Identify particles with integrated Raman database software

Benefits

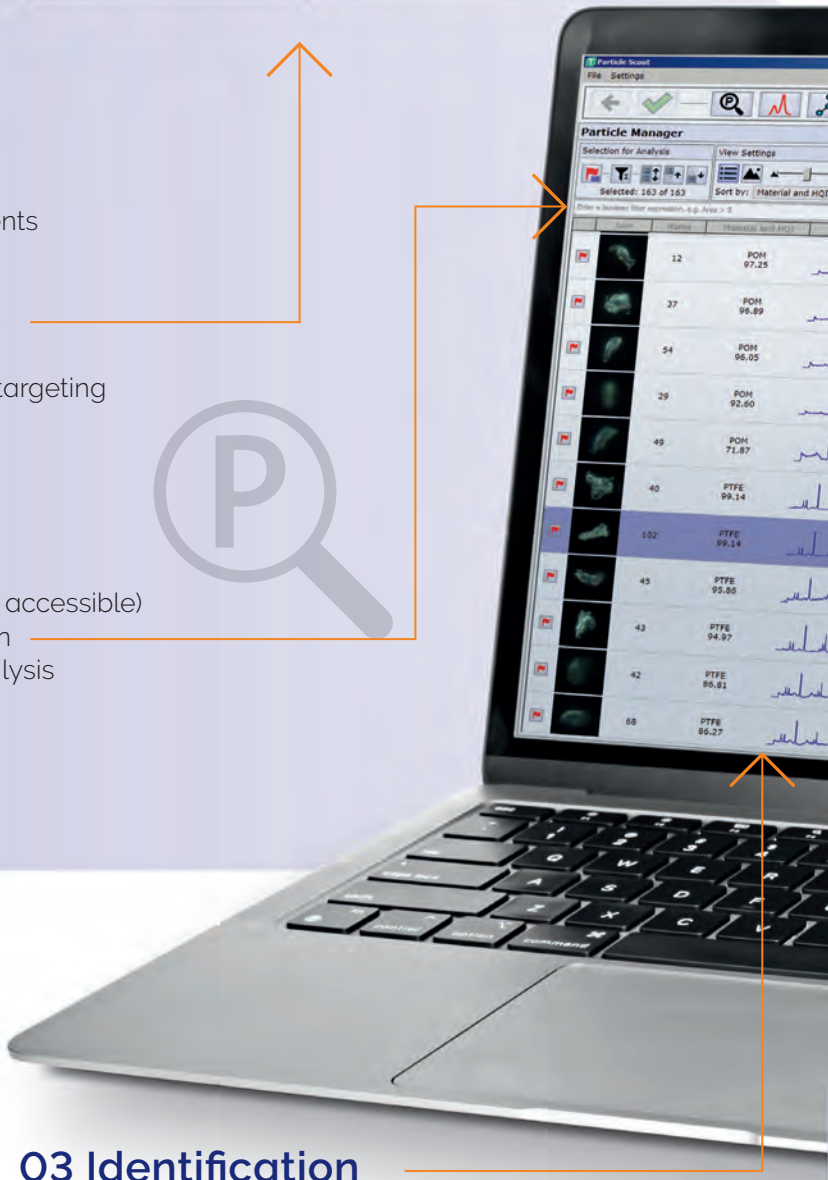


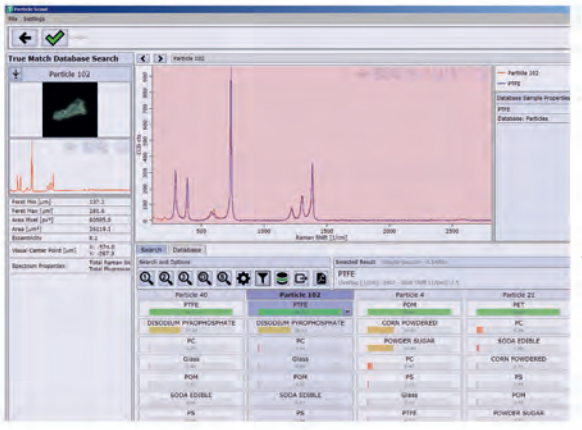
01 Sample Survey

- Sample illumination options: bright-field, dark-field, epifluorescence and transmission
- Objectives for sample survey and Raman measurements independently selectable
- Image Stitching for large-area overview
- Focus Stacking for sharp and defined particle outlines
- Vignetting correction for uniform brightness
- Region of interest selection (including multiple region targeting and wedge sectioning of round samples)

02 Categorization of Particles

- Selection by physical shape and size (many properties accessible)
- Application of Boolean filters for precise categorization
- Automated mask creation for subsequent Raman analysis
- Smart separation of particles in densely packed, heterogeneous samples





WITec TrueMatch spectral database management software

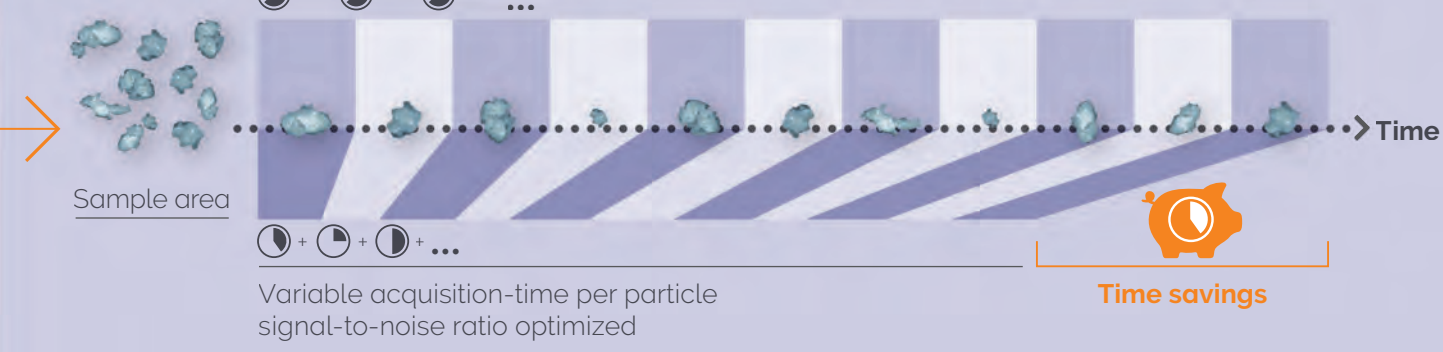
03 Identification

- Automated Raman spectral acquisition from each selected particle
- Fast autofocus procedure using Raman signal
- Integration time optimization for each particle based on signal-to-noise ratio
- Fast chemical identification of all particles with integrated spectral database
- Use of extracted information in WITec Control for detailed follow-up measurements

	Σ	5 - 10µm	10 - 20µm	20 - 50µm	50 - 100µm
PS	89	47	12	8	17
POM	59	34	12	8	4
PET	217	106	70	20	17
PC	87	18	45	17	7
PTFE	913	417	297	103	77
Unknown	150	45	78	8	19
Σ	1515	667	514	164	141

04 Report Generation

- Quantitative reports of particles by category that link physical and chemical properties
- Filters for more precise conclusions
- Templates in table, bar graph histogram and pie chart formats for clear and easy data presentation

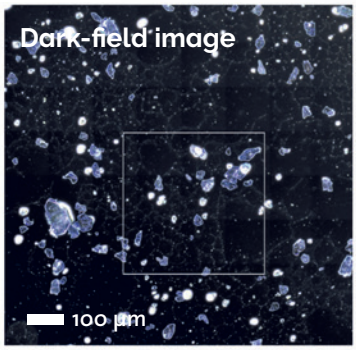


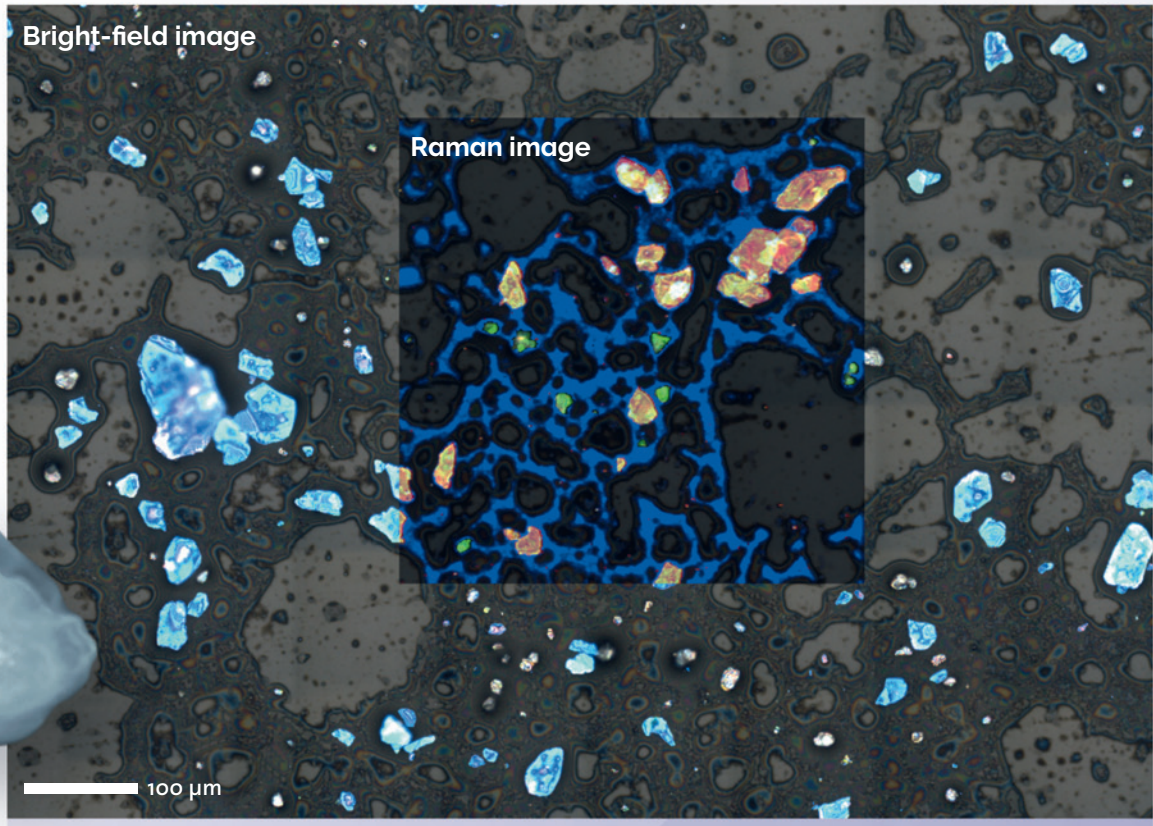
Applications

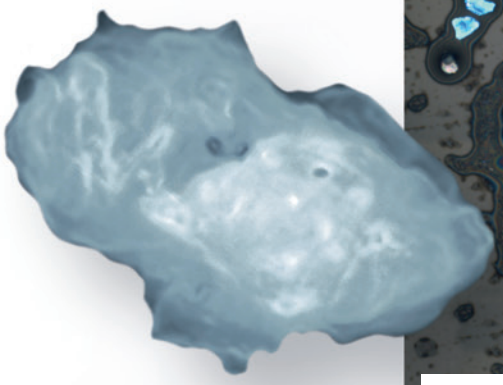
Cosmetic Peeling Cream Measurement

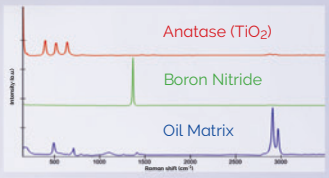
A cosmetic peeling cream was analyzed with ParticleScout. Using dark- and bright-field images, particles were located and categorized as shown in the report examples that detail their physical and chemical properties.

The sample was then investigated further with confocal Raman imaging. The overlay image shows the Raman measurement within the bright-field image.

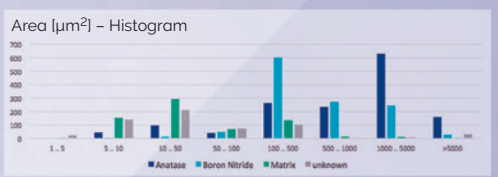


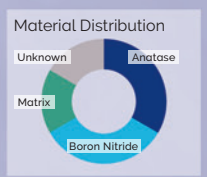


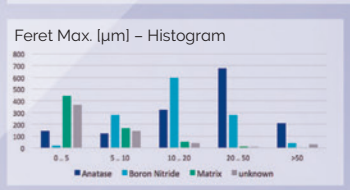


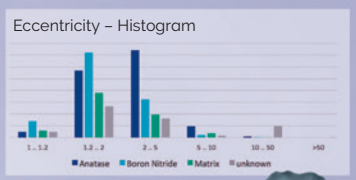


Corresponding Raman spectra

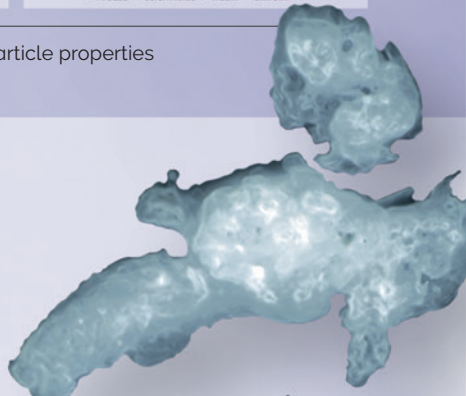






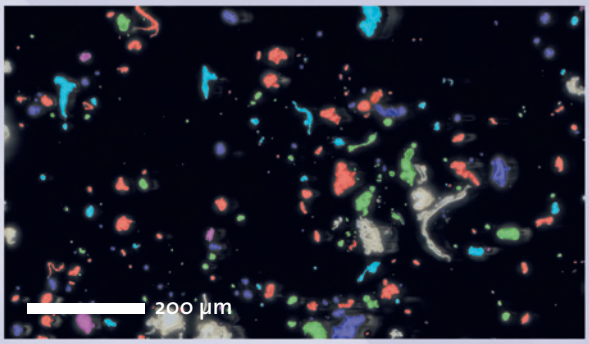


ParticleScout reports describing particle properties
(3941 particles analyzed)

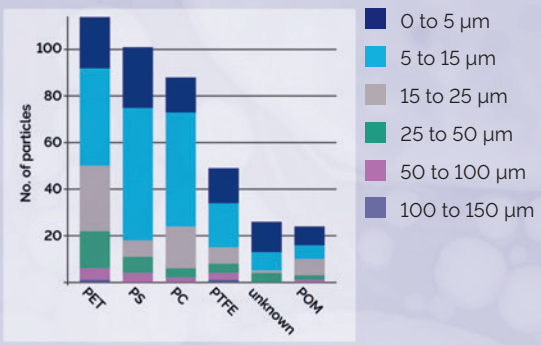


Microplastics Analysis with ParticleScout

The detection, characterization, and quantification of microplastic particles is especially important in environmental research and food sciences. A mixture of different microplastic particles was analyzed. The Raman spectra of about 400 particles were measured in only about 45 minutes, and then identified using the TrueMatch database software. ParticleScout generated a comprehensive report. A map color coded according to the material of the identified particles was overlaid on the dark-field image. The size distributions for the different plastic particle types were also quantified.



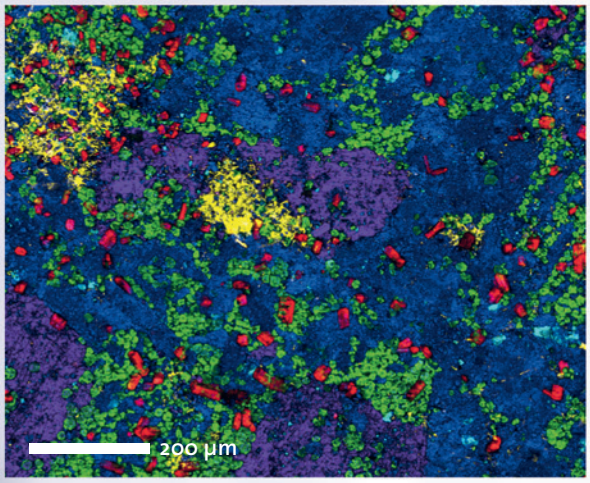
Dark-field image with overlaid map of identified materials



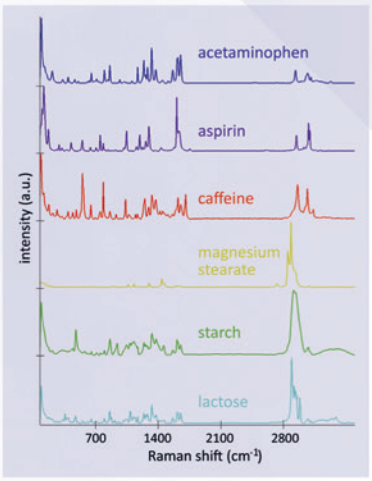
Size distribution (maximum Feret diameter) of different plastic particles

Analyzing Grain Size Distributions in a Pharmaceutical Tablet

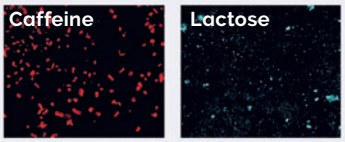
ParticleScout can be applied to overviews obtained by different imaging modes, such as bright-field, dark-field or confocal Raman imaging. The high-resolution, large-area Raman image of a painkiller tablet's surface was color coded according to the Raman spectra of the identified compounds. The individual Raman images of two components were analyzed and their grain size distributions were depicted in a histogram.



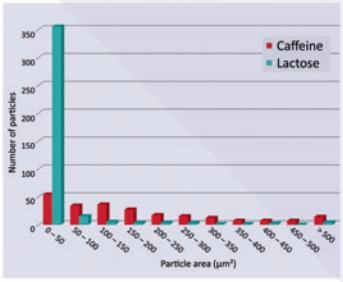
Raman image of the painkiller tablet's surface



Raman spectra in corresponding colors



Individual Raman images of caffeine and lactose



Grain size distributions for caffeine and lactose

WITec Microscopes

alpha300 S: Scanning Near-field Optical Microscope

alpha300 A: Atomic Force Microscope

alpha300 R: Confocal Raman Microscope

alpha300 R*i*: Inverted Confocal Raman Microscope

RISE®: Raman Imaging and Scanning Electron Microscope

alpha300 *apyron*™: Automated Confocal Raman Microscope

alpha300 *access*: Confocal Micro-Raman System

WE TAKE CARE – WITec uses environmentally friendly printed materials. While this policy is only a small contribution to a healthy environment, we at WITec believe that focusing on details can effect positive change in the world.

Find your regional WITec and Oxford Instruments contact at https://raman.oxinst.com/contact

WITec Headquarters

WITec Wissenschaftliche Instrumente und Technologie GmbH
Lise-Meitner-Str. 6, D-89081 Ulm, Germany
Phone +49 (0) 731 140 700, Fax +49 (0) 731 14070 200
info@witec.de, https://raman.oxinst.com

Explore the ParticleScout product page

https://raman.oxinst.com/products/software/particlescout