

Find, Classify and
Identify Particles

WITec ParticleScout



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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



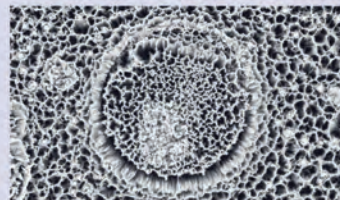
Pharmaceuticals



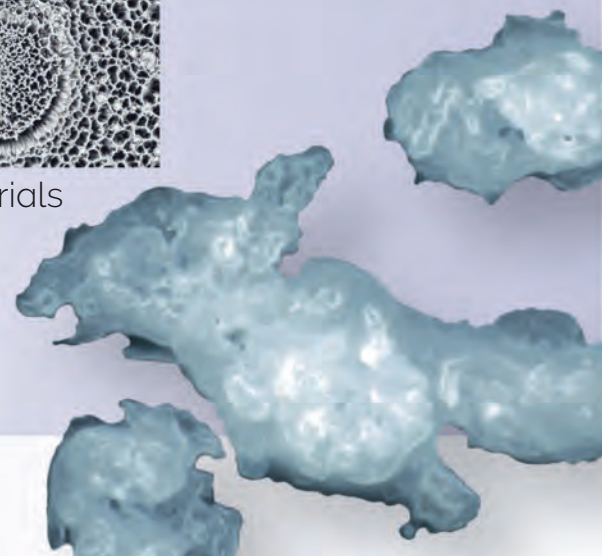
Environmental samples



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



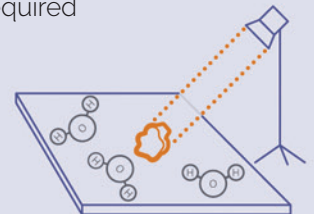
Precise

Target 0.5 μm particles



Sensitive

- Compatible with aqueous samples
- Specialized substrates not required



Comprehensive

Individual report generation

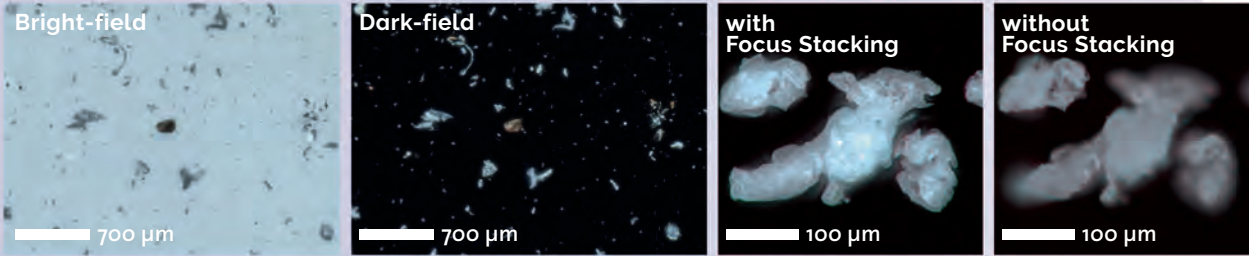


Conclusive

Identify particles with integrated Raman database software



Benefits

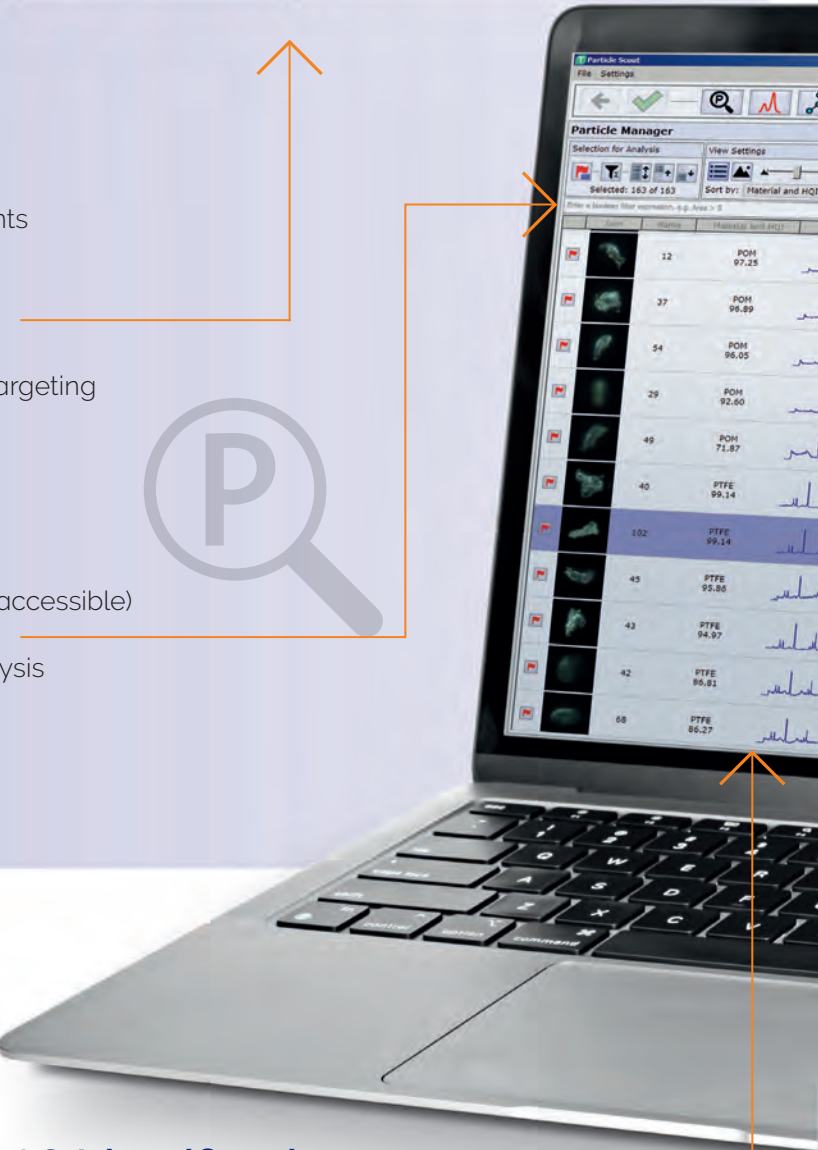


01 Sample Survey

- 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)

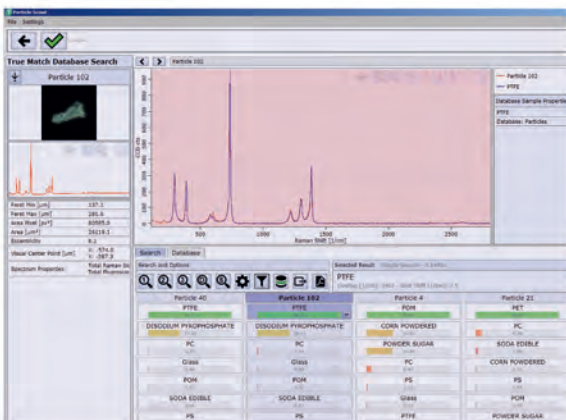
02 Categorization of Particles

- 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



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

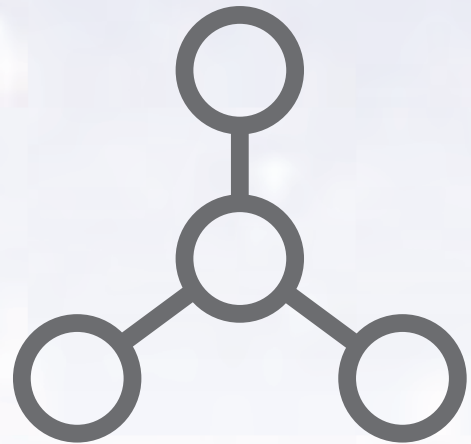


WITec TrueMatch spectral database management software

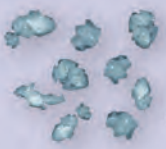
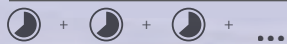
	Σ	5 - 10µm	10 - 20µm	20 - 50µm	50 - 100µm
PS	89	47	12	8	17
POM	59	34	12	8	4
PET	217	106	70	20	17
PC	87	18	45	17	7
PTFE	913	417	297	103	77
Unknown	150	45	78	8	19
Σ	1515	667	514	164	141

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



Fixed acquisition-time per particle



Sample area



Variable acquisition-time per particle
signal-to-noise ratio optimized



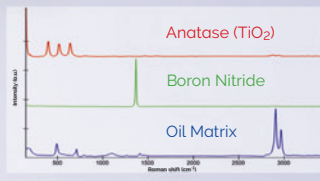
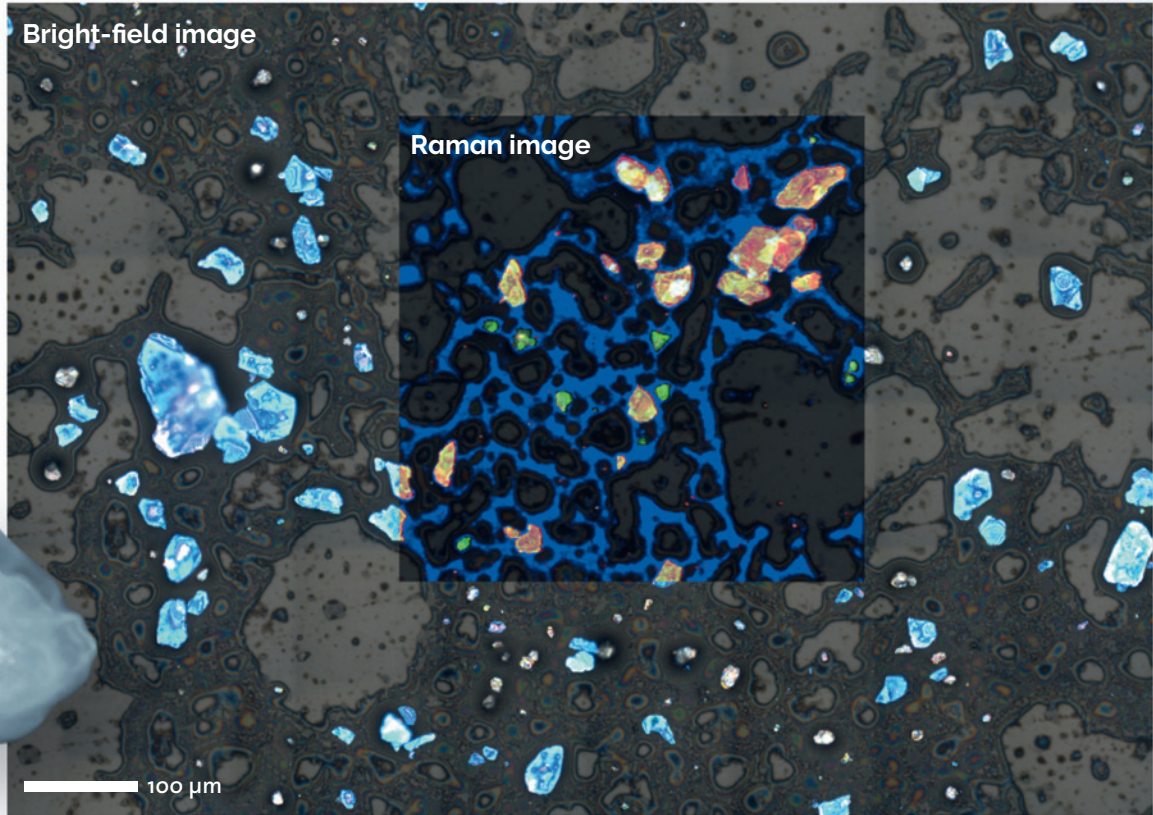
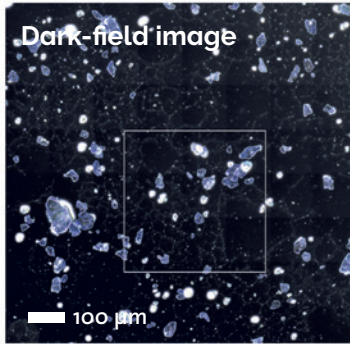
Time savings

Applications

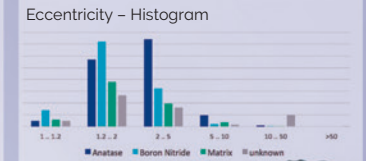
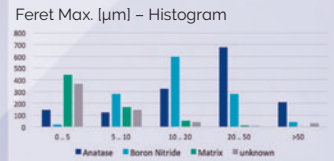
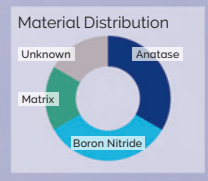
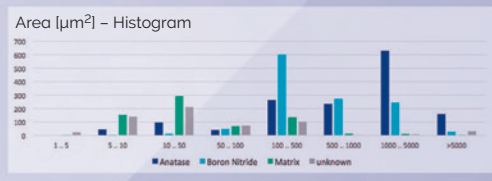
Cosmetic Peeling Cream Measurement

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.

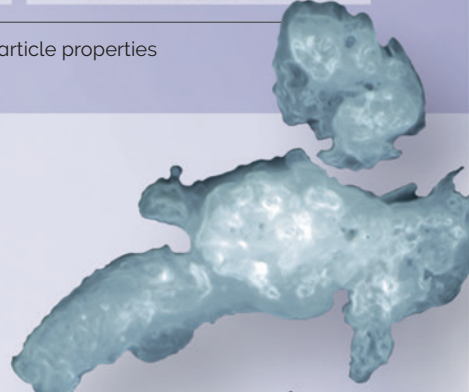
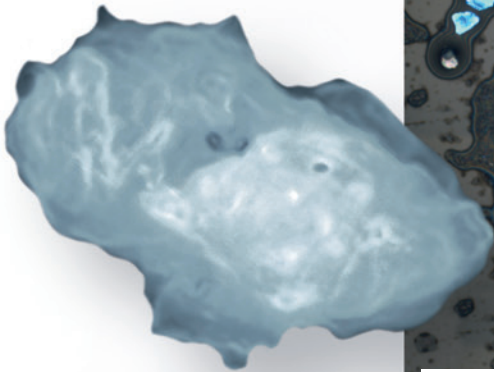
The sample was then investigated further with confocal Raman imaging. The overlay image shows the Raman measurement within the bright-field image.



Corresponding Raman spectra

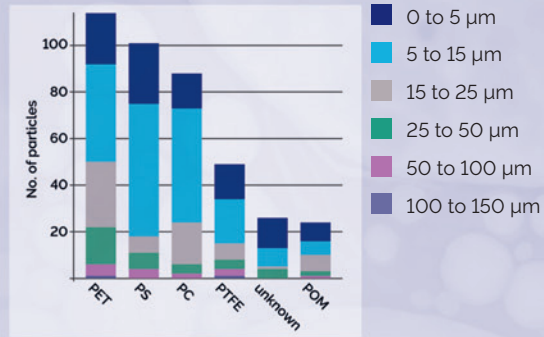
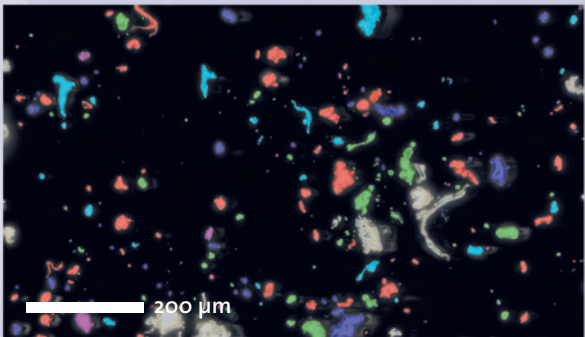


ParticleScout reports describing particle properties (3941 particles analyzed)



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.

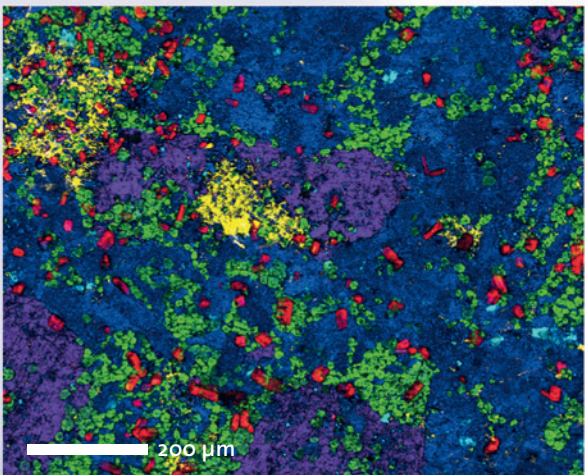


Dark-field image with overlaid map of identified materials

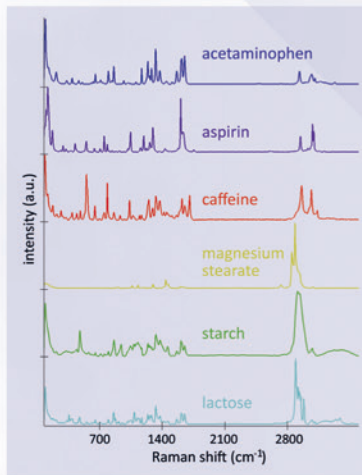
Size distribution (maximum Feret diameter) of different plastic particles

Analyzing Grain Size Distributions in a Pharmaceutical Tablet

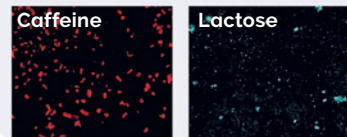
ParticleScout can be applied to overviews obtained by different imaging modes, such as bright-field, dark-field or confocal Raman imaging. The high-resolution, large-area Raman image of a painkiller tablet's surface was color coded according to the Raman spectra of the identified compounds. The individual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



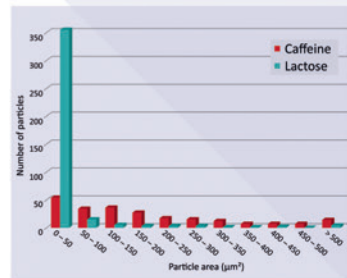
Raman image of the painkiller tablet's surface



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 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 ParticleScout product page

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

