

***Automated Micro
Scanning of Large Areas***



Existing Equipment – Current Status

1) Motorized Autofocus **DUV-NIR Microscope** with

- Reflectance and Transmittance
- Fluorescence and Imaging Options
- Magnification: 12.5x to 400x (appropriate for particle analysis)
- Freely changeable components according to needs
- **High-precision positioning** by closed loop z-check

2) Scanning stage with

- Travelling range 130 x 85 mm
- Resolution 2-4 μm
- **High-precision positioning** by closed loop x/y check
- Special stage insert for **direct mounting of tapes** from the crime scene **without preparation**

3) Color Camera with

- 4 megapixel
- Large pixels size 5.5 μm
- Fast frame rate: 80 fps
 - **fast stitching** of multiple pictures
 - **high sensitivity** for multi purpose functions

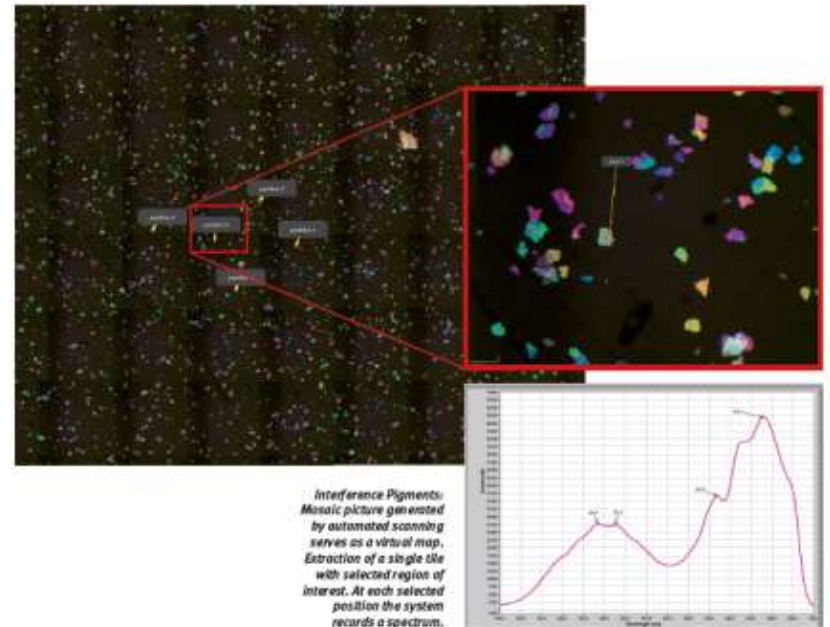
4) Special A.S. & Co. interface electronic synchronize

- stage with camera
- x/y positioning
- z-autofocus



Software: SpectraVision Mapping

- Automated scanning of samples
- Overview image (mosaic) by stitching
- Unlimited number of stitched tiles
- Zooming into the area of interest
- Determination of Particle Positions, accuracy approx. 2.0 μm
- Selection of particles and areas by mouse click, particle recognition on request
- Storage & retrieval of data together with their corresponding coordinates
- Clear offline allocation of data, corresponding coordinates and images



View to the Future – What is possible? –

1) Accelerated Scanning by Macroscopic Preselection

- Fast scanning of the sample
- Sufficiently good detection of the interesting points and their coordinates

2) Data Transfer to microscopic level **in the same unit**

**Combination of Macroscopy & Microscopy
it **one** device**

**No correlative microscopy
at different devices**

3) Classification of selected Particles:

- Imaging for Particle Analysis & Standard Fluorescence
Result: Separation into biotic and anorganic components
(example: Autofluorescence using UV observation)
- Spectral Analysis with DUV- NIR or RAMAN
**Result example: Separation into bacterial (yeast),
DNA – or Flavins and Anthocyanins from plants**

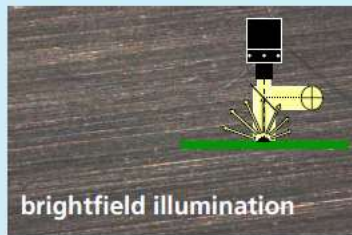
***Examples for A.S. & Co. System in
Particle Detection/Analysis***

**Fraunhofer-Institute for Production
Technology and Automation,
Cleanroom Manufacturing
Stuttgart, Germany**

Microscope **SPECTROSCOPY**

In- situ Detection of Biocontamination on Technical Surfaces

Development – Microscopic Illumination



established method
for surface inspection

gives no contrast between
surface and particle



established method for
inspection of smooth surfaces

gives low contrast between
surface and particle



method for inspection of
rough surfaces

gives high contrast between
surface and particle

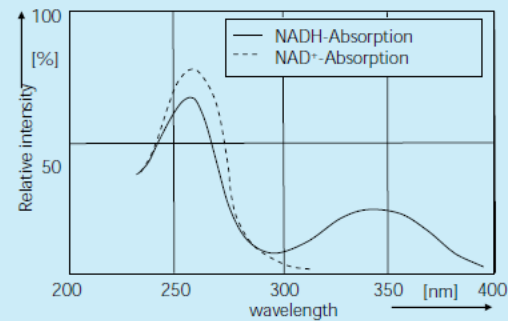
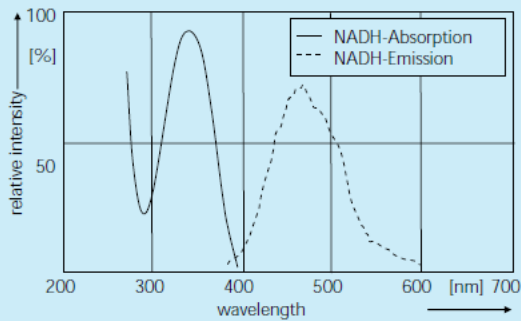


**in-situ detection of particle contamination and biocontamination
of smooth and rough technical surfaces**

In- situ Detection of Biocontamination on Technical Surfaces

Fluorescence of Universal Cell Substances

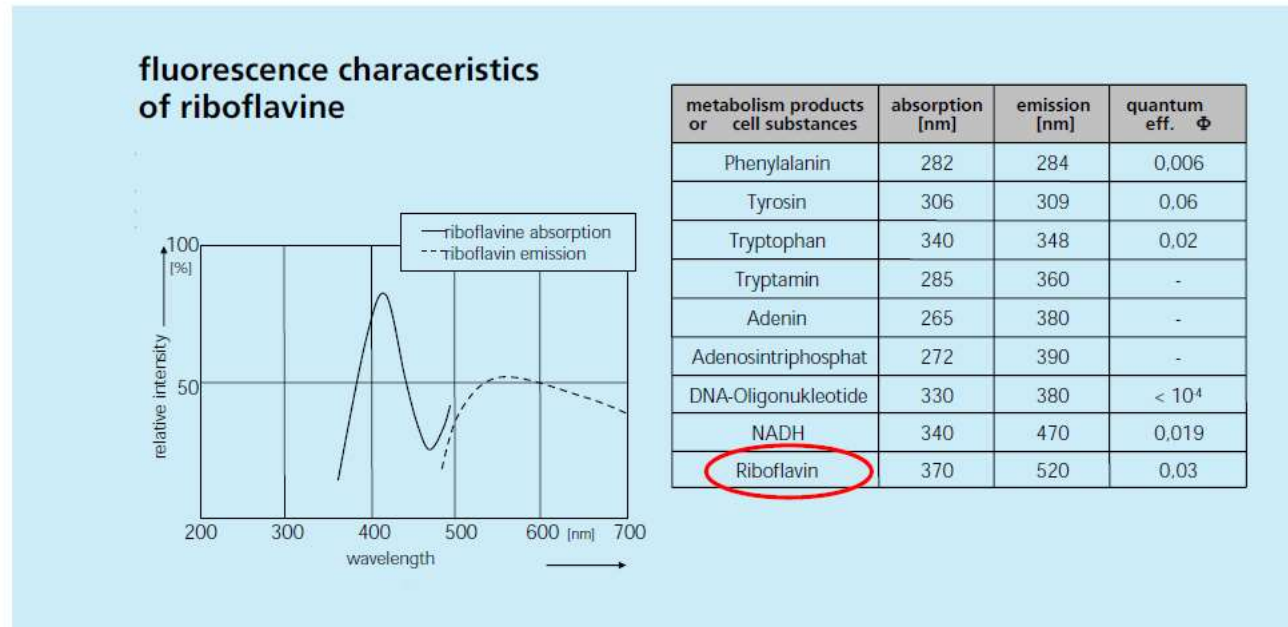
fluorescence characteristics of NADH



➔ specific stimulation and detection of living biocontamination

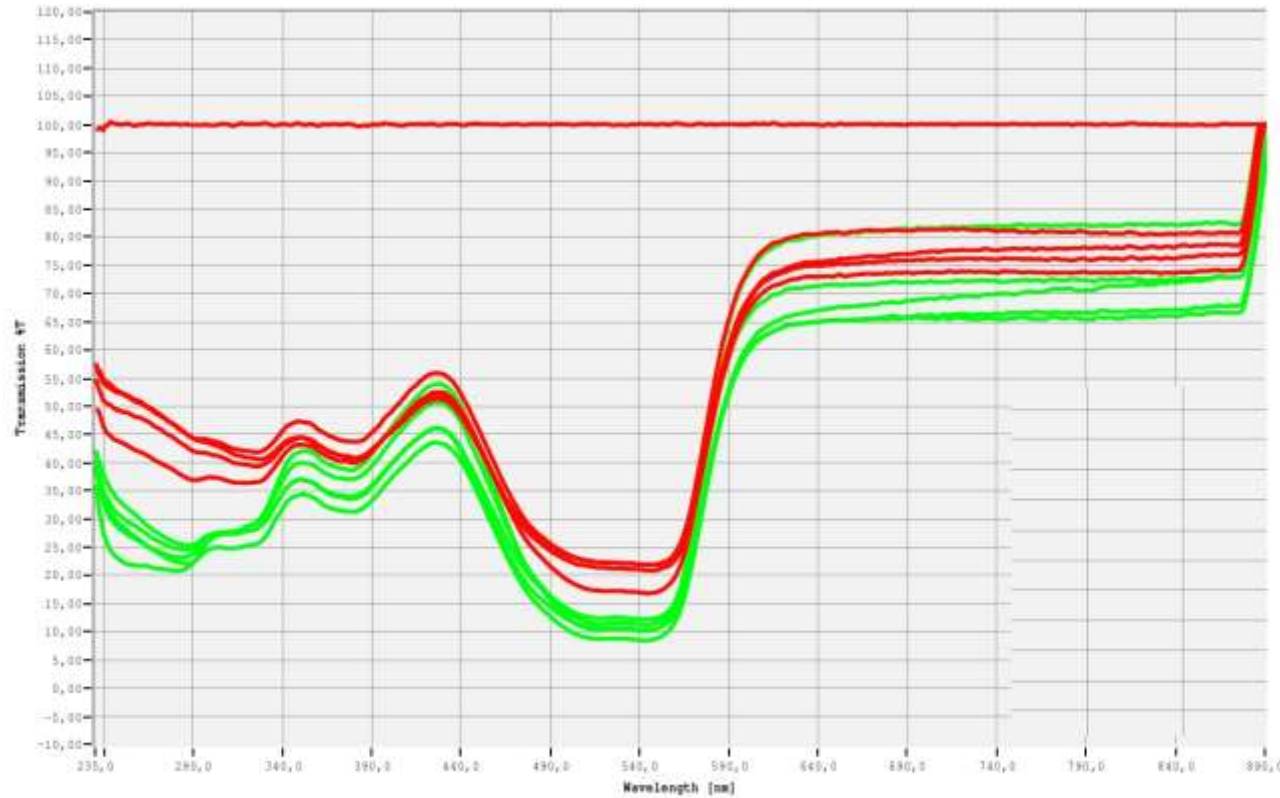
In- situ Detection of Biocontamination on Technical Surfaces

Fluorescence of Universal Cell Substances



Differentiation between biocontamination and abiotic particle contamination

Influence of a Tape in Deep-UV Fiber Inspection



Spectral Results of a fiber comparison **embedded on Quartz glass** and **Deep UV suitable Tape**

A.S. & Co Company Profile

History

- founded in 1999
- focused on Microscope Spectroscopy

- located in Munich
- Present all over the world

Customized Solutions for

- Bio-Medical Spectroscopy
- Color Analysis in Geology
- Forensic Fiber Inspection
- Deep UV Microscopy
- High Resolution Color Analysis on Nanostructures, Particles and Pigments
- Layer Thickness and Non destructive Spectroscopy for Quality Inspection
- Automated Microscope Spectroscopy

