

# Physical Electronics GmbH Analytical Services

## Spatially Resolved Analysis in the $\mu\text{m}$ and nm Range

### The Idea of Analytical Services

If routine analysis does not help, then our service becomes valuable to you. We offer contract analysis with an unique combination of surface analysis methods, trainings and seminars. We operate our analysis systems (XPS, TOF-SIMS and AES) in daily use and with the many years of experience of the device manufacturer. Special analysis of thinnest layers on the surface requires sophisticated analysis methods. The surface chemistry is determined by the top nanometer and our analysis methods look right there: the top 5-10nm.

Local distributions of substances may be intentional (structure) or unwanted (stains). We can find that out with our surface science methods by means of an imaging analysis in the micrometer range.

If you need to go deeper, the underlying micrometers below the surface are also accessible by sputter removal.

High availability is ensured by the technical service in the house and leads to very fast answers to problems of our customers. Delivering fast and understandable answers is the focus. The spectra and measurement data are the basis of the answers and not the end in itself.

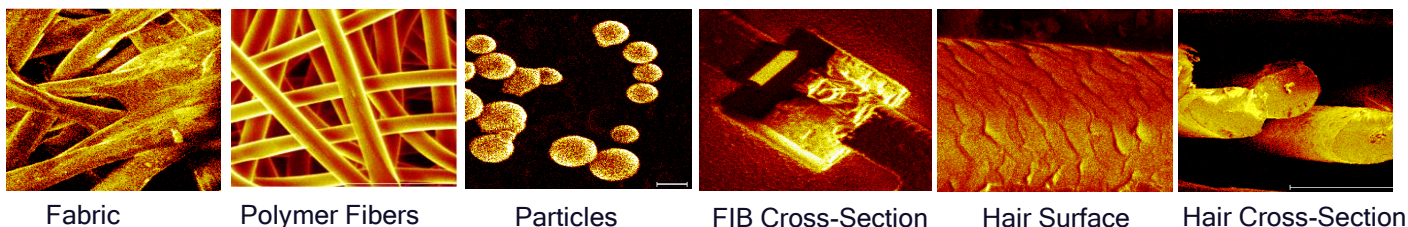
When is which analysis method useful for surfaces? These and other questions are dealt with in our seminar (NanoX-Pert). We also offer individual customer training.

### Experimental Aspects

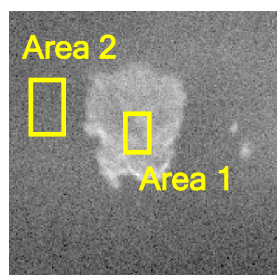
- What is on the surface? How much and where?
- Analytical methods that are sensitive and non-destructive
- Extremely thin deposits (atomic monolayers) can be detected, in very small (micrometer) areas
- Adhesion of paints, coatings, labels ...
- Component connections by welding, soldering, gluing ...
- Functionalization of surfaces - sensors, catalysis ...
- Layer thickness and layer composition - process parameters and control
- Compensation - optical components, tools, decorative surfaces, ...
- Component cleaning - residue, staining, corrosion
- Electrical contacts - bonding, contact resistance

# Physical Electronics GmbH's contract analysis laboratory provides solutions:

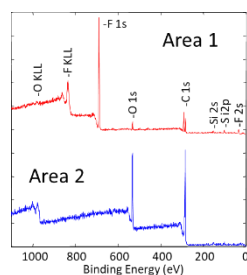
TOF-SIMS used an ion beam to extract secondary ions from the sample surface. Distribution Images of the detected species, with a spatial resolution below one micrometer.



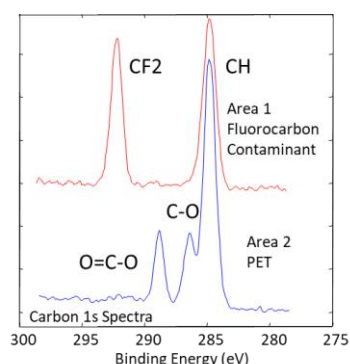
## XPS measurements: PET Contamination



SXI - Secondary X-ray Induced Electron Image

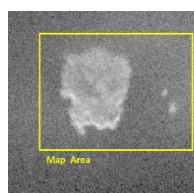


Survey spectra from selected areas identify an unknown contaminant

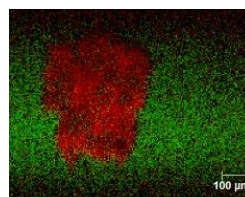
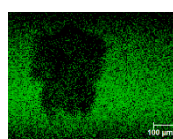
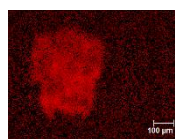


Detailed 'high resolution' spectra from selected areas provide chemical state information about the contaminant

Chemical maps provide information about distribution of the contaminant on the sample surface



SXI - Secondary X-ray Induced Electron Image



Chemical maps (C1s and F1s) and its overlay

## Analytical Services Summary

- Unique combination of surface analysis methods ( XPS; TOF-SIMS and AES)
- More than 25 years of experience
- Contract analysis laboratory has the answers for the identification of substances in the micro and nanometer range
- Reliability
- Speed
- Goal orientation
- Intelligibility



Phone: +49/89/962750  
info@phi-europe.com  
www.phi-gmbh.eu



Salzstraße 8  
85622 Feldkirchen