

## Applications:

- Geology
- Metallurgy
- Environment
- Gemology
- Forensics



## CALIBSO

### All-in-one LIBS System

CALIBSO is a laboratory measurement solution based on laser-induced breakdown spectroscopy (LIBS). The technology allows qualitative and quantitative multielement analysis. By means of a high-quality sample imaging, pre-selected measurement positions are analysed contact free and with high spatial and spectral resolution. The easy-to-use software Sophi nXt ensures the reliable control of all components and forms the central interface between operator and technology. The robust housing with its integrated interlocking circuit ensures safe handling and a long-term protection of the implemented cutting-edge components.



High-quality sample imaging with micrometer sized resolution, single spot measurement or area scans



Durable diode pumped laser with a spot size of  $\sim 70\mu\text{m}$  on sample surface for high spatial resolution



High-resolution echelle spectrometer with spectral resolving power in the pm-range and a large simultaneous wavelength range



Material identification, classification and quantification of bulk materials or surfaces with univariate or multivariate data analysis

CALIBSO

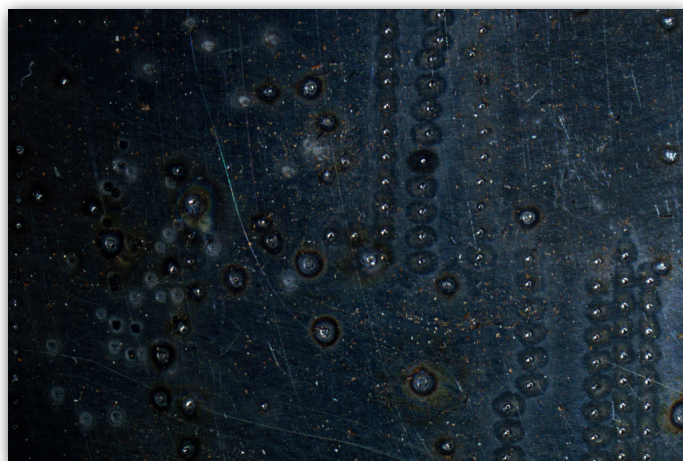


Fig. 1: Sample image - steel plate

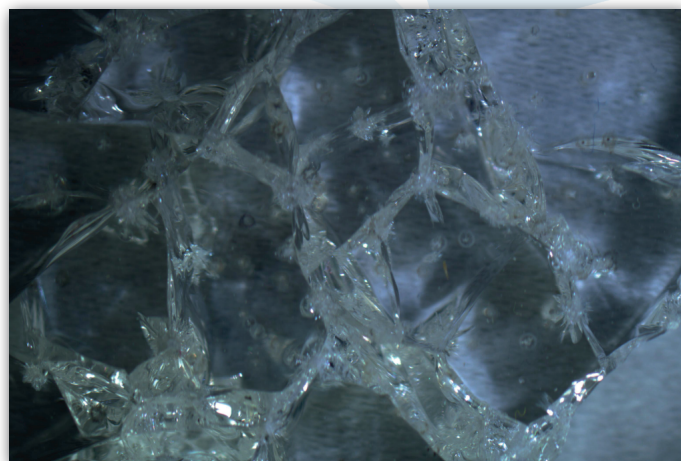


Fig. 2: Sample image - shattering glass

## Specifications

Measuring technique	Laser-induced breakdown spectroscopy (LIBS) Imaging	Qualitative and quantitative multi-element analysis High quality imaging on a coaxial beam path with a high spatial resolution better than 50 µm
Samples formats	Solid	Bulk samples, any shape Sample size up to 50x50x50 mm <sup>3</sup>
	Liquid	In sample vessel (cuvette, Petri dish, multiwell plate, etc.)
LIBS	Wavelength laser	1064 nm
	Excitation	Diode pumped
	Laser repetition rate	40 Hz
	Pulse energy on sample	1 - 26 mJ, stepless adjustable
	Wavelength range	210 nm - 850 nm
	Spectral resolution	28 pm - 113 pm
XYZ stage	Travel range	X = 145 mm , Y = 95 mm , Z = 50 mm
	Resolution	10 µm
	Repeatability	10 µm
Sample Imaging	CMOS camera	6 Mpixel
	Image field	~ 17 x 25 mm
General properties	Dimensions	810 mm x 1100 mm x 590 mm
	Weight	< 200 kg
	Safety	Laser class 1
	Temperature range (in operation)	15 - 30 °C
	Relative air humidity	15 - 80 %, non-condensing
Software	Measuring methods	Single measurement Continuous single measurement Multipoint measurement Mapping Depth profile combined with single, multi-point measurements, mapping Measurement "On the fly"
Analysis	LIBS	Elemental analysis (NIST database emission lines) Material classification (PCA or PLS-DA) Material quantification univariate Material quantification multivariate (PLS, Lasso)
Accessories	Standard samples	Reference materials for LIBS integrated in sample table