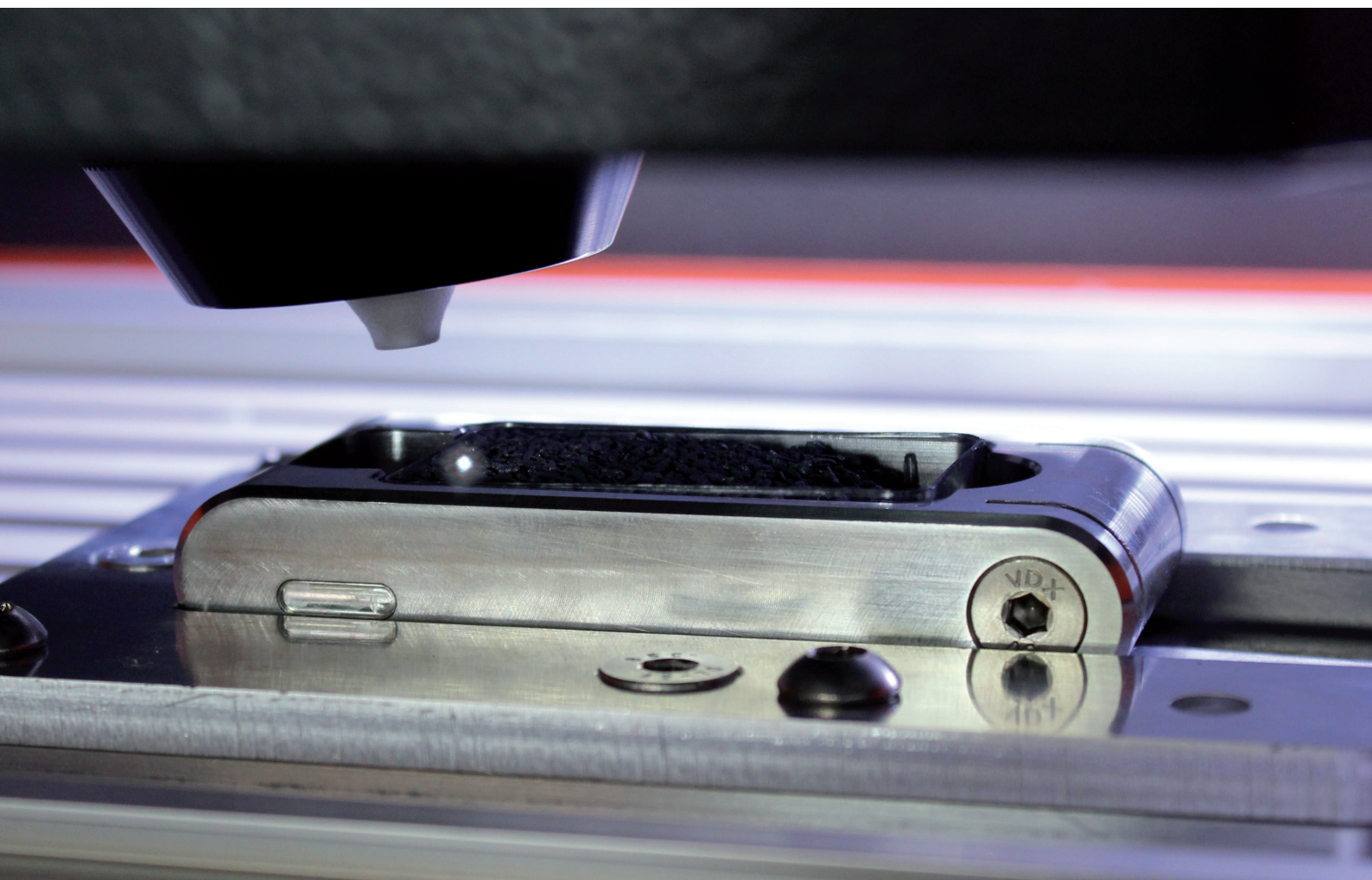




SlagLIBS

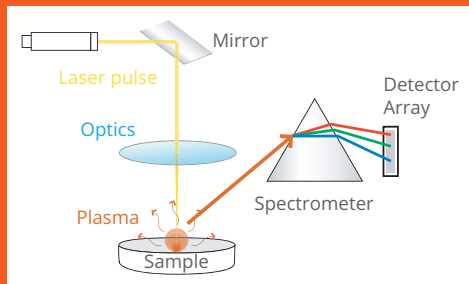
Slag analysis without complex sample preparation – homogenize data instead of samples

- » Process slag analysis in less than 1 min
- » For LF, EAF, AOD, BF
- » Fast ferro alloy composition check

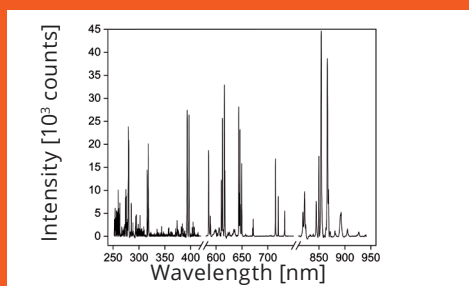


What is LIBS?

LIBS (laser-induced breakdown spectroscopy) is a real-time, non-destructive and contactless method to analyze the multi-element composition of materials.



The principle of LIBS



Exemplary slag spectrum

A laser beam is focused on the surface of a sample. The energy input leads to a sublimation and ablation of a small amount of material (μg) which is transformed into a plasma. The plasma emits characteristic light depending on the sample composition and is detected by a spectrometer.

For each measured position, the information of multiple elements is available immediately. Based on a calibration with matrix-matching reference samples, the detected emission intensities can be converted to quantitative values.

All elements can be analyzed simultaneously with one laser shot and without sample preparation for most of the applications.

Only an optical access to the sample is needed for the LIBS measurements. The topology of the sample does not impact the LIBS measurements as the sample shape can be considered using a laser distance sensor.

**Faster feedback
for on time
process adjustment**

Less sample preparation – reduced lead time

Today's slag analysis is based on the intermediate step of producing homogenized samples. This well-established standard procedure has 2 major shortcomings. Firstly, homogenization requires expensive equipment and manual labour for grinding, demetallization (if needed) and for pressing or melting.

On the other hand, homogenization is very time consuming and means a throughput time of 7 to 30 minutes for each slag analysis.

Optimisation of metallurgical treatment is only possible to a very limited extent with these slag analysis times. In the worst case scenario there is a risk of losing time, material and refractory.

As already seen in many other industries, the use of lasers can open up new possibilities here. With up to 1000 analysis values per second, it is possible to homogenize measurement data instead of homogenizing samples.

With this approach, all types of slags can be analyzed within less than two minutes while using just one device. And the best thing about it: Only one instrument is needed. Manual work is only necessary if the loading of the SlagLIBS is not automated.

Another important advantage is that, besides the pure basicity, also elements like Fluorine can be determined without additional wet chemistry within one measuring procedure and without extending the measuring time.

The SlagLIBS in your lab

The SECOPTA SlagLIBS is an industry-proven analysis system adapted to the specific needs of steel and metal production. Equipped with a maintenance-free laser with a high repetition rate, a robust system and spectrometer design as well as a sophisticated calibration and software package, it delivers reliable results with maximum stability.

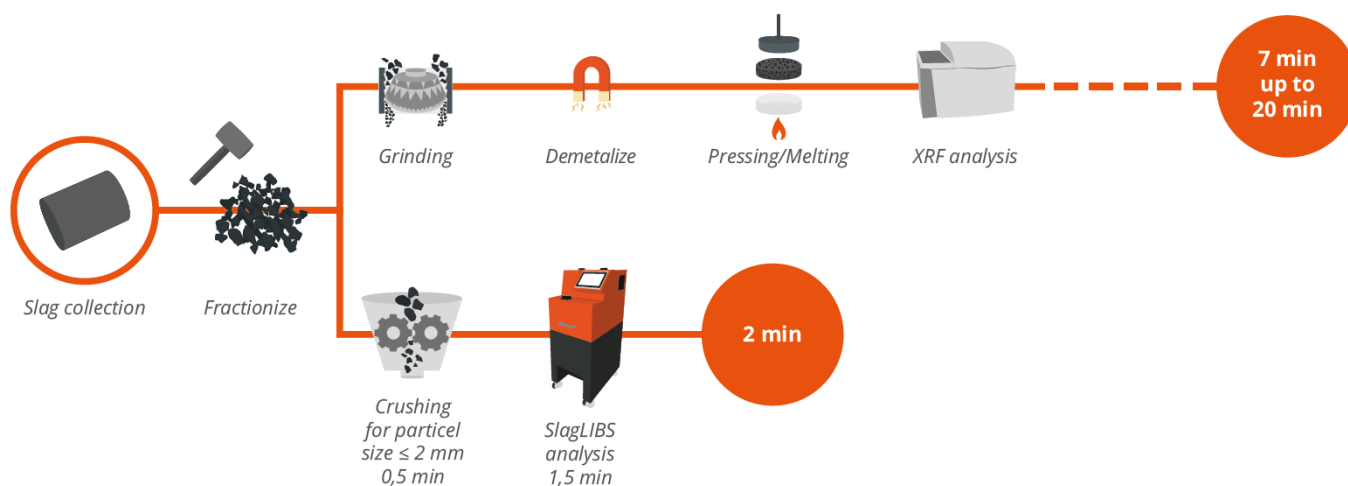
We are the LIBS experts, so you do not have to be one. The SlagLIBS can work on different user levels, from the operator (level 1), who only enters sample numbers, to the professional LIBS user (level 4), who can set all parameters of the system.

To ensure your SlagLIBS performs in a highly stable and reliable way in the long term, you will receive the SlagLIBS system with your process

specific slag calibration and extensive training. Elements such as Ca, Fe, Al, Si, Mg, Mn, F, Cr, Ti, V can be analyzed within one measurement run. Even with changing slag compositions SECOPTA can update your calibration remotely if necessary.

In addition, for audit purposes as well as for checking the reliability of the measured results, SECOPTA software tools offer you convenient functionalities such as checking the measuring equipment capability with just a few clicks.

Beside providing slag analysis of multiple furnaces, SlagLIBS can also be used for quick composition check of incoming alloy material, assuring tighter process control and resource savings.



Analysis with SlagLIBS saves of a minimum of 5 minutes of time and effort.

Your advantages with SlagLIBS

- Fast result (available in 2 mins)
- Placed in LMF or EAF pulpit
- CaO, MgO, SiO₂, Al₂O₃, FeO, MnO, Cr₂O₂, TiO₂, F, V₂O₅
- Run by operator
- Proper basicity and yield loss control
- Optimal use of slag former
- Tighter control of incoming alloys
- Better control of foaming in slag
- Saving of energy & labor occupancy time
- Automatic result transfer to level 2 system
- No ionizing radiation
- Easily integrated into automated industrial applications

Technical specifications SlagLIBS

System dimension (W x L x H)	500 mm x 710 mm x 1290 mm
Weight	~150 kg
Power supply	Supply voltage 230V, power frequency 50/60Hz, power consumption max. 1 kW
Laser safety	Class 1
Protection class	IP 50
Temperature range	+5 °C to +40 °C
Purging gas	Compressed air
Dust evacuation	Prepared
Communication interface	Profinet, Ethernet/IP, EtherCat, Modbus TCP, TCP/IP, UDP, OPC UA, SQL (other industrial protocols and field-bus system possible on request)
Detectable elements	Basicity defining elements and more

Available soft- and hardware options

Additional elements	Fluorine, Chromium and many others → In most cases even possible after delivery
Calibration extension	Extension of existing customer specific calibration → On site or by remote service
Remote service	The fastest option to bring your system back on track
Service contracts	Available
Spare parts	Major components available on stock
Measurement system capability	Sensor performance analysis → For audits and certification processes

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Discover more!

