

SECOPTA

Fast. Precise. Robust.



SlagLIBS

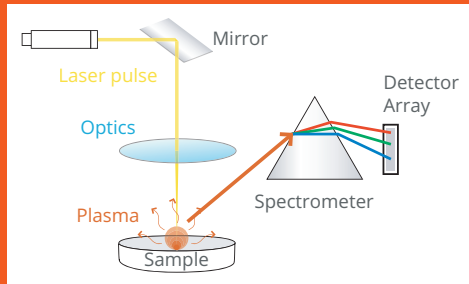
Slag analysis without complex sample preparation – homogenize data instead of samples

- » Process slag analysis in 2 min
- » For EAF, LF, AOD, BOF
- » Fast ferro alloy composition check

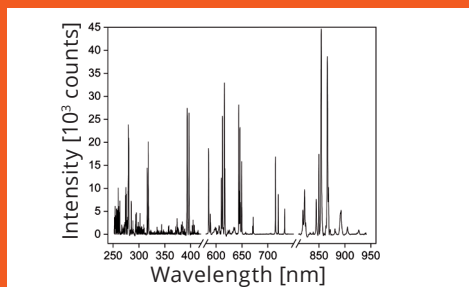


What is LIBS?

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 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 each 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 two major shortcomings. Firstly, homogenization requires expensive equipment and manual labour for grinding, demetallization and for pressing or melting.

Secondly, homogenization is very time consuming and means a throughput time of 7 min up to 20 min for each slag analysis.

Due to the long lead time, optimization of the metallurgical treatment is possible only to a limited extent. Therefore, there is a risk of losing yield, accelerated wear of refractory lining and increased process time as well as raw material consumption.

By collecting hundreds of analysis values every second, LIBS can homogenize the measured data. Therefore, physical sample homogenization is no longer needed.

With this approach, all types of process slags can be analyzed within two minutes, including sample preparation. Additionally, SlagLIBS can be operated in the pulpit or can be integrated into automated sample preparation lines.

As a result, operators can monitor slag during every heat. This ensures tighter control over basicity, yield loss, refractory wear, and raw material consumption.

The SlagLIBS in your lab

The SECOPTA SlagLIBS is an industry-proven analysis system adapted to the specific needs of steel and metal production. It incorporates maintenance-free lasers and spectrometers into a robust system design. To ensure precise results with maximum stability, sophisticated calibration and software packages are included.

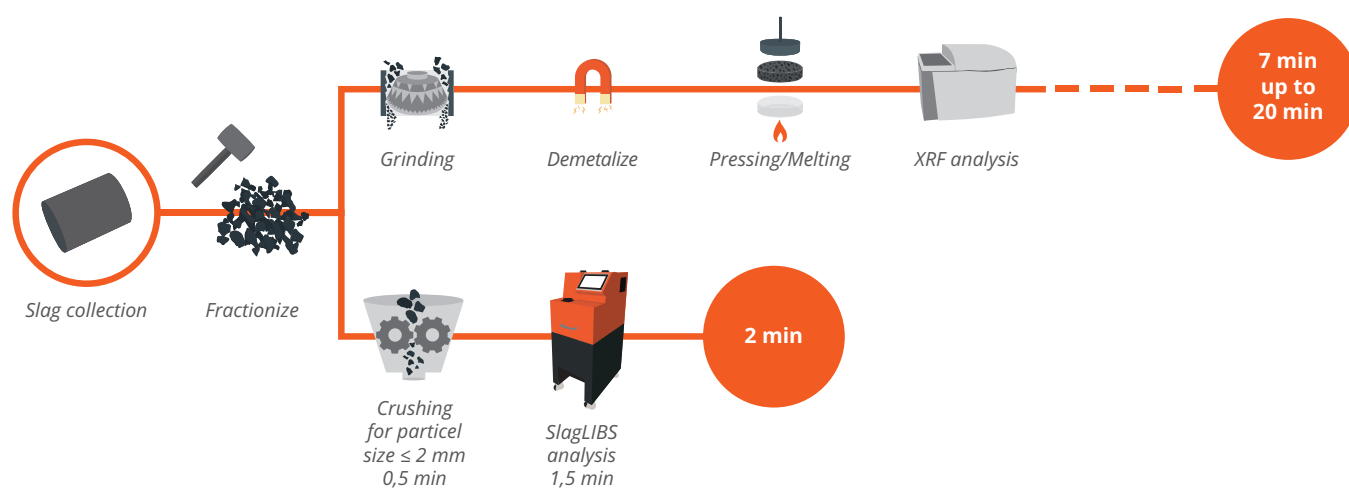
The SlagLIBS can work on different user levels, from the operator (level 1), who only enters sample numbers, to the professional LIBS user (level 4), who can set all parameters of the system.

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 training. Elements such as Ca, Fe, Al, Si, Mg, Mn, F, Cr, Ti, V, S 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.

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.



SlagLIBS saves at least five minutes of time and effort per sample

Your advantages with SlagLIBS

- › Fast result (available in 2 min)
- › Placed in LMF or EAF pulpit
- › CaO , MgO , SiO_2 , Al_2O_3 , FeO , MnO , Cr_2O_3 , TiO_2 , CaF_2 , CaS , V_2O_5
- › Run by operator
- › Proper basicity and yield loss control
- › Tighter control of alloy addition
- › Optimal use of slag former
- › Better control of foaming in slag
- › Saving of energy & labor occupancy time
- › Automatic result transfer to level 2 system
- › Including CE-marked
- › 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 50/60 Hz, 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, FeO, and key alloying elements (see above)

Available soft- and hardware options

Calibration extension	Extending calibration ranges or adding elements → On site or remote
Remote service	Dedicated support with predictive maintenance
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!

