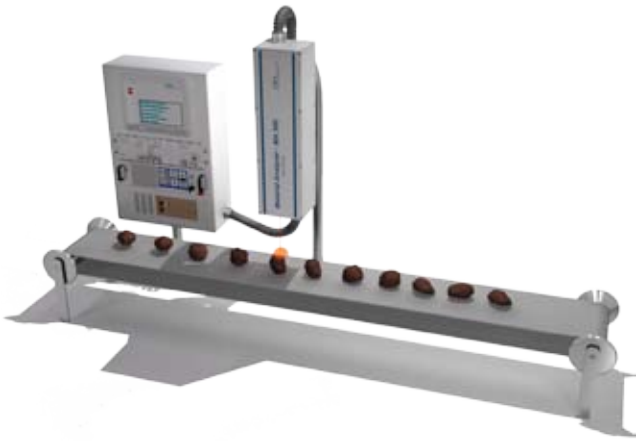
LTB LASERTECHNIK BERLIN

Material/Elemental Analyzer



Material Analyzer MA 300

Based on laser-induced breakdown spectroscopy for industrial process control

- **Quick start-up**
- **Long operating life**
- **Completely sealed**
- **Compact and rugged**

The Material Analyzer MA 300 is a module which is part of a system for process control and monitoring tasks. The MA 300 will be part of a series of different modules with varying working distances up to several meters for remote sensing in industrial environments. It offers an OEM-solution to simplify adaptation to different industrial applications. It can be used directly in the industrial process, for example at a conveyer belt, and can operate at working distances of 300 mm. The measurements can be used for material sorting as well as for process monitoring of the elemental composition of different materials, like minerals, metals or ores. A preparation of the samples is not necessary.

The MA 300 consists of a high power Nd:YAG-laser, a coaxial sending and receiving telescope optics with a pilot laser and video observation in a sealed and vibration-protected housing.
In combination with a high-resolution echelle spectrometer (ARYELLE series) it is an analyzing tool for all conductive and non-conductive materials.

The analyzing approach is Laser Induced Breakdown Spectroscopy. LIBS or LIPS (laser-induced plasma spectroscopy) is an analytical method utilizing laser ablation and the subsequent atomic emission from the plasma for elemental analysis. Laser ablation is at present the only element-analytical method that offers direct sampling from any kind of material without sample preparation. So LIBS allows a multi-elemental analysis of virtually all types of materials (solids, liquids, gases) through atomic emission spectroscopy.

The MA 300 combines compactness and robustness due to:

- Completely sealed housing
- Anti-vibration technology
- Entrance window with purging
- Remote and contactless measurement technique

The integrated high-power Nd:YAG laser generates plasma on the sample surface from a distance of 300 mm. The MA 300 works in horizontal and vertical direction or any other angle. The light collecting optics is coaxial to the laser beam that provides a tolerance against changes of the working distance. An integrated pilot laser combined with a video camera allows a remote video monitoring of the sample and a fast start up time.

- Material sorting
- Process control
- Process monitoring

The collected plasma light is detected by a high-resolution echelle spectrometer ARYELLE. The spectrometer has the capability of calibrating itself automatically.
In the future a module MA 500 will be provided which allows working in distances up to 500 mm.

Specifications MA 300

			MA 300
General	Working distance	mm	300 (up to 500 optional)
	Sampling rate	fps	up to 3
	Control		Software
	Warranty	year	1
	Laser class		4
	Spectrometer		ARYELLE series

			MA 300
Laser	Nd:YAG wavelengths	nm	1064, 532, 355, or 266
	Pulse energy, typ.	mJ	up to 200
	Repetition rate	Hz	up to 30
	Energy stability SD (for all rep. rates)	%	2
	Power density	GW/cm²	5.7 (1064 nm)

			MA 300
Electrical interface	Power supply	V AC	115 / 230
	Average current	A	10 / 5
	Average power consumption	VA	400
	Compressed air	bar	1

			MA 300
Environment and conditions of use	Operating temperature	°C	-10 ... +40
	Storage temperature	°C	-10 ... +60
	Max. relative humidity (non-condensing)	%	85
	Air pressure	mbar	750 ... 1,300
	Dimensions of the laser (L x W x H)	mm	710 x 190 x 170
	Weight of the laser	kg	21

Subject to technical changes.

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