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Laser Elemental Analyzer LEA-S500



THE NEXT GENERATION OF LASER ANALYZERS

The LEA-S500 is a Laser Induced Breakdown Spectrometer (Atomic Emission Spectroscopy) with bright analytical performance.

The spectrometer combines the advantages of the recent developments in spectroscopy, laser technique and analytical Software.

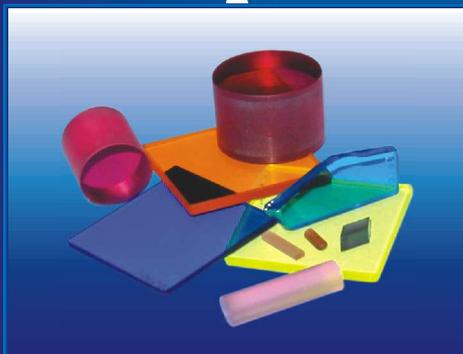
The LEA-S500 is a fully automated spectrometer permitting analysis of the composition of different solids, such as:



Cu-alloys (bronze, brasses) and pure copper



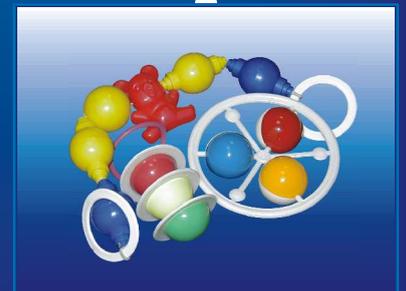
Fe-alloys (cast irons, steels), Al-alloys (cast, wrought) and pure aluminium



Glass & Crystals



Ceramics



Plastics

- metals and alloys
- glass
- ceramics
- plastics
 - trace elements in pure materials
 - compacted powder

The specially-designed laser as a spectrum excitation source allows one to analyze conducting/non-conducting materials, to considerably minimize the interaction between elements thus providing a generic calibration curve for a variety of element concentrations and also to eliminate the sample-preparation step.

By varying the laser pulse power, the area and depth of the damage surface one can analyze the composition and thickness of coating layers, thin films, impurities (trace elements, inclusions) and structural components.

The high-resolution spectrograph allows a high-quality aberration-free flat optical field to be obtained.

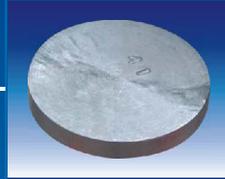
The multi-element spectrum detection system (2048 pixels CCD camera) ensures the fast data readout.

The triple (mechanical, electronic and Software) protection against laser irradiation provides the LEA-S500 safe operation.

ANALYTICAL CAPABILITIES

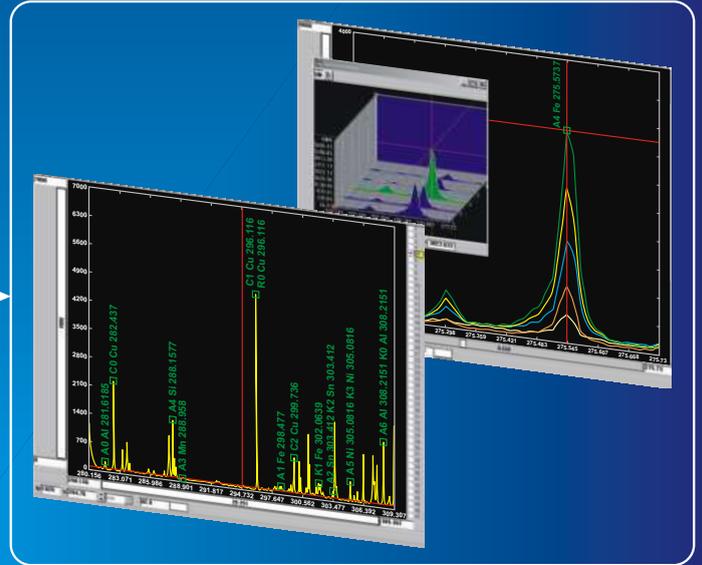
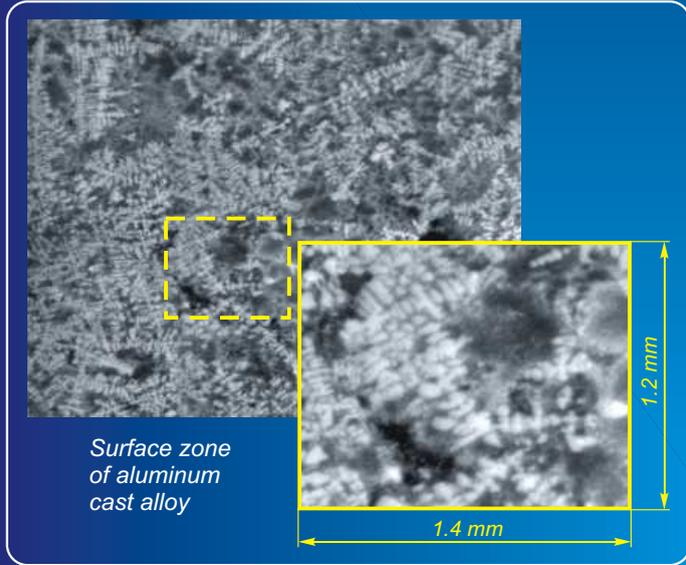
One-, two- or three-dimensional analysis can be available

The unique property of spectrum laser excitation is the locality of impact on the analyst surface. The local analysis of the element composition provides the additional data about the surface- and layered-distribution of the element content.



Visualization of sample surface, selection of surface zone to analyze

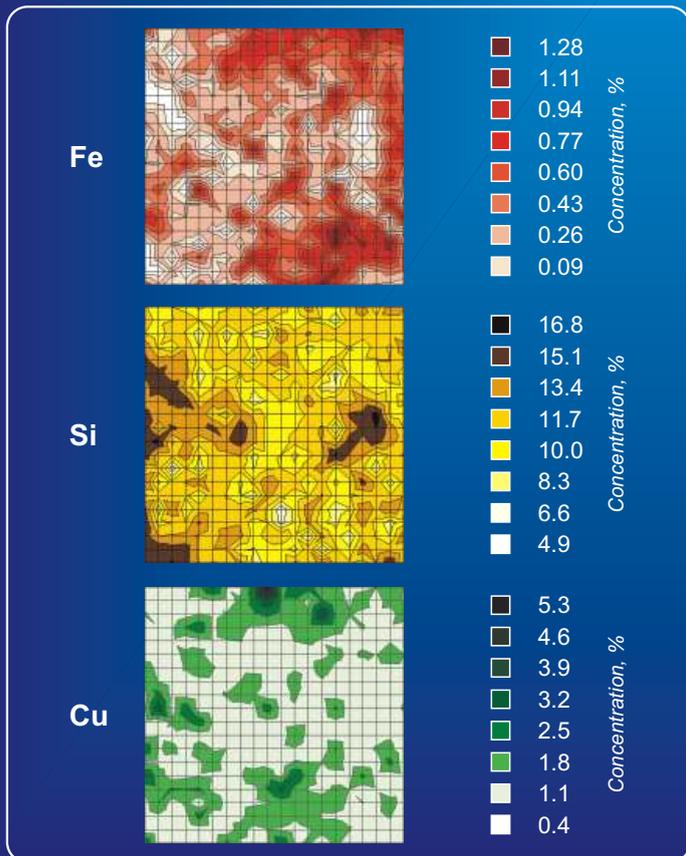
Spectrum detection and analysis



Graphic presentation of results

(element distribution inhomogeneity in aluminum cast alloy)

Concentration calculation via calibration curves



Numerical presentation of results

Cu-2	Fe-1	Ni-1	Si-1
0.5787	0.5576	0.9648	11.5874
0.294	0.8414	0.2463	1.8055
1.4704	0.5641	>1.3606	10.5453
0.4768	0.4415	0.8024	10.5687
0.1	0.3503	0.6596	10.4487
0.2453	0.5	0.9882	9.7525
0.4855	0.5469	1.0886	11.2588
0.8569	0.7057	>1.3606	12.3867
0.0544	0.591	1.1515	13.9845
0.0357	0.5712	1.1143	12.007

SAMPLE COMPARTMENT

The sample compartment configuration provides its easy operation and maintenance. The sample area to analyze is selected through positioning of the sample stand with simultaneous visualization of the surface area via the built-in video camera.



Probe on the sample stand



Sample in holders

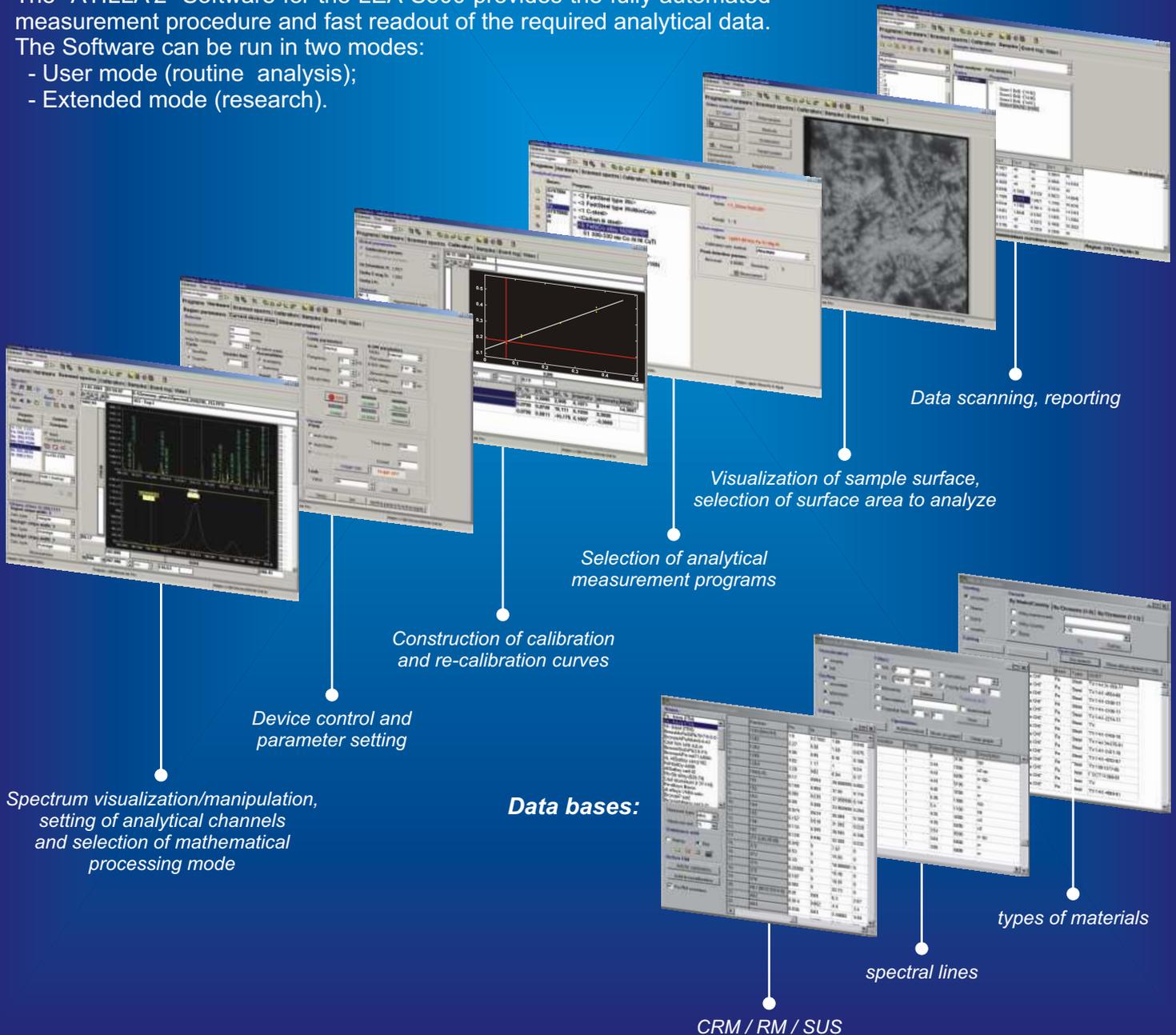


Adapters for wire, foil, small size samples

SOFTWARE for Windows 9x/2000/XP

The "ATILLA 2" Software for the LEA-S500 provides the fully automated measurement procedure and fast readout of the required analytical data. The Software can be run in two modes:

- User mode (routine analysis);
- Extended mode (research).



SPECIFICATIONS

OPTICS

Focal length, mm:	500	500	500
Grating, grooves/mm:	1800	2400	3600
Wavelength range, nm:	190-800	190-600	190-400
Dispersion, nm/mm:	1.0	0.7	0.5
Wavelength resolution, nm:	0.028	0.020	0.014

SAMPLE COMPARTMENT

Sample size (without adapters):
12x12x2 mm (min), 75x75x40 mm (max)
Availability of sample displacement along X-Y axes
+/- 5 mm (for averaging of measurement results)
Analyzed zone size: DIA 0.03 - 1.7 mm
Environment - Air
Evacuation (optional)
Adapters for wire, foil, small size samples

EXCITATION

Original Q-switched Nd:YAG laser
Average pulse energy 100 mJ
Energy stability +/- 3% for 99% of pulses

DETECTION:

2048 pixels linear CCD, 14 bit, USB-Interface
(other detectors available)
Full spectrum detection (Panorama)

MINIMUM SYSTEM REQUIREMENTS

Win 9x/2000/XP
Processor P-III/550
RAM 256Mb
Graphic card 16Mb with Video In
Screen resolution 1024x768, True color
HDD free space 50 Mb

SOFTWARE for Win 9x/2000/XP

Automatic wavelengths calibration
Indication of deviation from the specified type of material
Control of unaccounted impurities
Control of quality and reliability of analysis results
Graphical representation of analytical signal
Databases for:
- CRM / RM / SUS
- spectral lines
- types of materials
Printout and mathematical processing of analysis results

ANALYTICAL PROGRAMS

Analytical programs (methodology) for analysis of:
- alloys based on aluminium, nickel, copper, titanium etc.
- any type steel and cast iron
- conducting and non-conducting materials (plastics, ceramics, glass etc.)
Qualitative, semiquantitative and quantitative analyses of different materials
Automatic identification of material type or base element

ANALYSIS TIME

10 sec to 3 min in one point (depending on the quantity of elements to determine)

POWER REQUIREMENTS

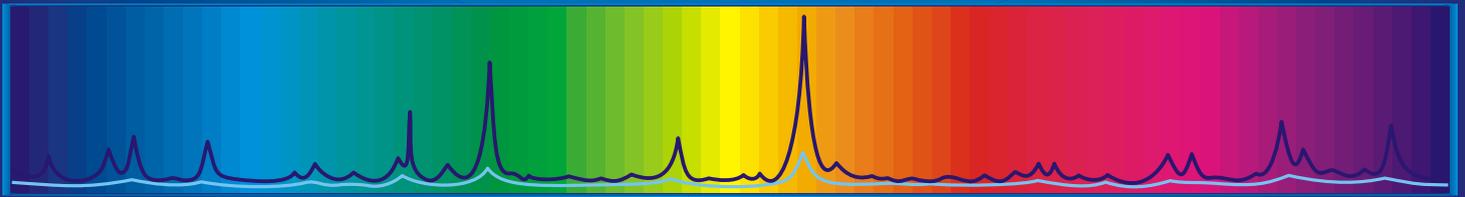
230VAC, 50/60 Hz
900 W during measurement
100 W stand-by

OVERALL SIZE:

1100x550x750 mm

WEIGHT:

120 kg



Detection Limits (DL)

Element	Be	B	C	Mg	Al	Si	P	Ti	V	Cr	Mn	Fe	Co	Ni	Cu
DL, ppm	0.1	1.2	10.0	0.5	1.0	5.0	10.0	0.3	0.5	2.0	0.5	1.0	4.0	0.8	0.5

Element	Zn	As	Zr	Nb	Mo	Cd	Sn	W	Pb	Bi	Ag	Sb	Na	Ca	K
DL, ppm	5.0	10.0	1.0	1.0	1.0	1.0	10.0	5.0	20.0	5.0	0.5	10.0	0.1	1.0	10.0

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