

# DFS-500



DFS-500 Spectrometer is designed for the analysis of ferrous and non-ferrous metals for all alloying elements and impurities, including sulphur, phosphorus and carbon.

#### Applications:

- Melted metal composition monitoring
- Incoming material control
- Molding composition control

OPTICAL EMISSION SPECTROMETER FOR METAL ANALYSIS

## DFS-500

DFS-500 spectrometer represents a new generation of DFS series spectrometers combining the best features of previous models with a brand-new technical solutions. The modern design and use of reliable components provides high accuracy in all required ranges of measurement of the element concentrations in accordance with the requirements of GOST and other regulatory documents. That is why DFS-500 spectrometer is an excellent analytical solution for metals, foundry and machine-building industry.

### Registration system:

The linear CCD arrays with wide dynamic range, high sensitivity and low dark signals ensure high resolution spectral registration with low detection limits.



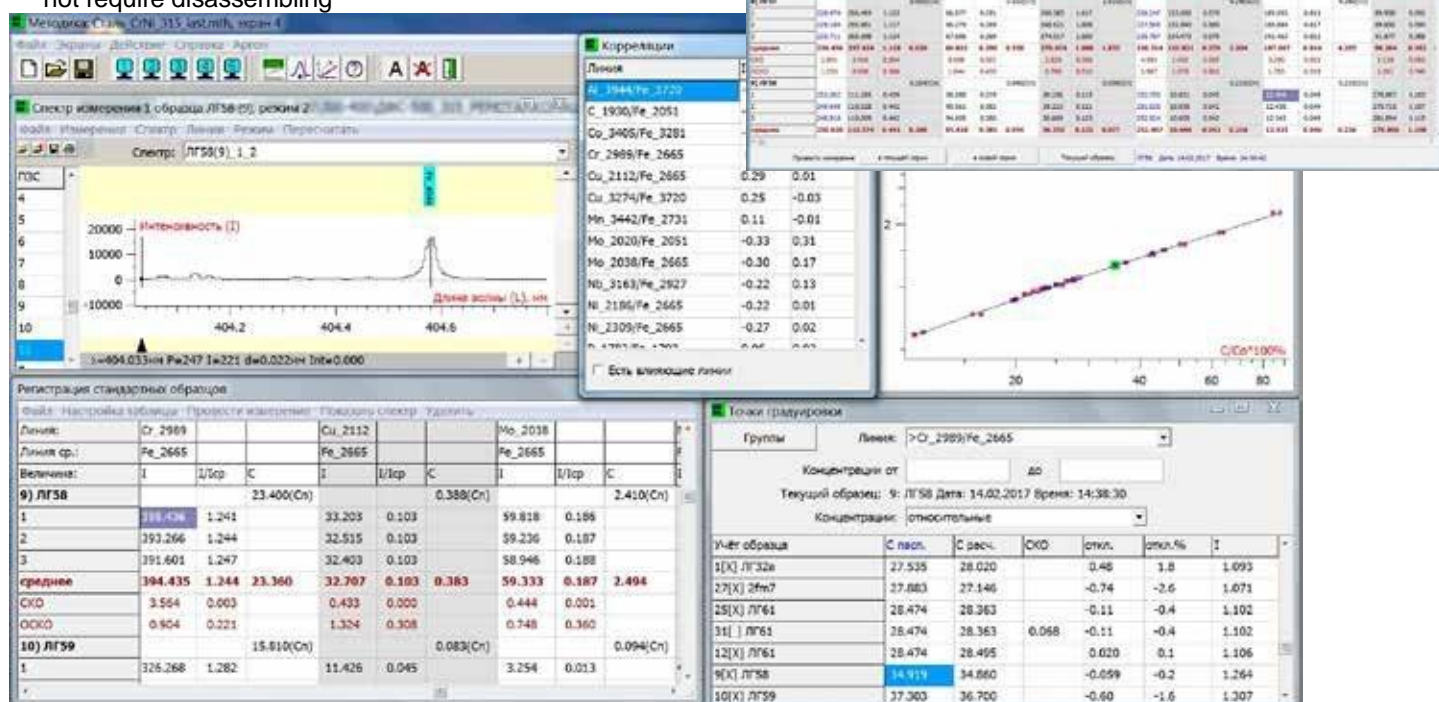
### Sample stand:

- Simple and convenient sample clamp for analysis of samples with various shapes
- Special adapters are available for thin rods and wires analysis
- Water cooling system for elimination of the sample stand overheating
- Optimized table stand design for argon consumption reduction
- Simple procedure of the discharge chamber cleaning does not require disassembling

### Wccd software:

The soft is easy for operator. It is an excellent analytical tool, which comprises spectrums handling, analytical data collecting and processing capabilities and allows to perform the quantitative analysis of samples. The Wccd software has a rich databases of spectral lines. Convenience and simplicity of the instrument software allows a user to learn it during commissioning without the need in additional visiting the manufacturer.

- Registration of the entire spectrum of the analyzed sample
- Detailed studying of a single spectral line shape
- Correction for the neighboring spectral lines and background
- Plotting of calibration graphs in linear or logarithmic scale, including the cross impact of elements, base dilution.
- Adjustment of calibration curves in different ways
- Automatic spectrum position control and adjustment
- Automatic determination of the material grade based on analysis results



### The excitation source SPARK-500:

SPARK-500 is a high-stable spectrum excitation source. It ensures an outstanding analytical performance of the spectrometer.

- Automatic controlling of the pulse waveform
- Switching the discharge modes during one exposure: possibility of using up to 5 different modes within one analysis
- Additional sharpening of the discharge pulse leading edge.

Parameter	UoM	Value
Pulse repetition frequency	Hz	50–400
Pulse duration	μs	50–1000
Pulse sharpening current	A	175–350
Discharge current	A	5–40

## Spectrometer Options

### Standard version

DFS-500 spectrometer for analysis of ferrous and non-ferrous metals



### Desktop version

Compact version of DFS-500 spectrometer. Analytical capabilities are the identical to the standard version



### Spectrometer with external stand (option) for analysis of elements composition of large-sized or heavy parts

External stand:

- purged with argon and provides an analysis of ferrous and non-ferrous metals for all alloying elements and impurities except for sulfur and phosphorus;
- allows to analyze the details and structures of various shapes and dimensions, while keeping the possibility of using a conventional holder of the spectrometer.



### Spectrometer with air stand (option)

It provides for analysis on the one spectrometer the solid samples and samples of irregular shape, powders etc.



DFS-500 multipurpose optical emission spectrometer employs optimum technical solutions ensuring outstanding analytical results for metals with the accuracy several times exceeding the requirements of standards and regulatory documents.

## SPECIFICATION

Optical system and focal length	Paschen Runge system with 0.5 m Rouland circle
Polychromator	Argon-purged (argon flow rate is 0.05 l/min)
Spectral range	175-425 nm, with the possibility of installing an additional CCD-array for sodium line 589 nm (optionally the range may be expanded to 175-850 nm)
Sample stand	Argon-purged. Open structure. Special adapters for analysis of bars and wires
External stand (option)	Optionally the remote sensor Weight 1,2 kg, Cable length 2,5 m
Additionally air stand	Is installed on special order
The excitation source	SPARK-500 generator
Operating conditions	Temperature: +15 - 30 °C, relative humidity ≤ 80%
Power supply	Power 1 kVA, voltage 220±22 V 50 Hz, single-phase with earthing
Argon gas	Purity: 99,998 %, Ar-gas purification filter is included. If necessary, SOAR-1 Argon Stand - option
Dimensions, mm (length, width, height)	810 x 525 x 975 – floor version, standart 810 x 525 x 430 – desktop version
Weight, kg	80 - standard version, 50 - desktop version.
Concentrations range	0,0001% ... tens of%
Relative error (depending on concentration)	0,5%...5%
Analysis time	10...40 s

### Ranges of some standard calibrations

Low and medium alloyed steel	<b>C</b>	<b>Mn</b>	<b>Si</b>	<b>Cr</b>	<b>Ni</b>	<b>P</b>	<b>S</b>	<b>Mo</b>	<b>V</b>	<b>W</b>
	0,0022	0,015	0,017	0,022	0,037	0,0027	0,0022	0,0013	0,006	0,0041
	1,65	1,82	2,36	3,13	4,71	0,071	0,045	1,01	0,7	0,89
	<b>Ti</b>	<b>Cu</b>	<b>Al</b>	<b>As</b>	<b>Co</b>	<b>Nb</b>				
	0,001	0,007	0,005	0,0061	0,012	0,0056				
Pure aluminum	0,249	1,25	1,07	0,082	0,355	0,103				
	<b>Mn</b>	<b>Si</b>	<b>Cr</b>	<b>Ni</b>	<b>V</b>	<b>Ti</b>	<b>Sn</b>	<b>Zn</b>	<b>Co</b>	<b>Cd</b>
	0,0006	0,0014	0,000157	0,00112	0,000702	0,00012	0,00094	0,0004	0,000519	0,00019
	0,209	1,035	0,0522	0,094	0,0414	0,0381	0,0494	0,95	0,0263	0,0094
	<b>Pb</b>	<b>Cu</b>	<b>Fe</b>	<b>Sr</b>	<b>Mg</b>	<b>Ga</b>	<b>Zr</b>	<b>Ca</b>	<b>Be</b>	<b>Bi</b>
	0,0006	0,0006	0,0006	0,0001	0,00089	0,00128	0,00024	0,00026	0,000094	0,00121
	0,0413	0,326	1,09	0,0876	1,62	0,0474	0,102	0,0151	0,00531	0,004

A complete list of standard calibrations is available on our website: <http://okb-spectr.ru/products/es/dfs500analysis/>



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