

fast and accurate
metal analysis



Metals Analyzer

OES 8000

Optical Emission Spectrometer

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Application fields

Elemental analysis plays a crucial role in the quality control of the metal smelting, casting and processing industry.

Skyray Instruments Optical Emission Spectrometers are widely used for elemental analysis of ferrous and non-ferrous metals. OES 6000 and OES 8000 can simultaneously analyze dozens of elements with excellent precision and fast performance, greatly benefiting operators in metal industries.

OES8000 is the instrument of choice for companies in the metal production and processing industry, who need a cost-effective and compact optical emission spectrometer.



Metals Analyzer

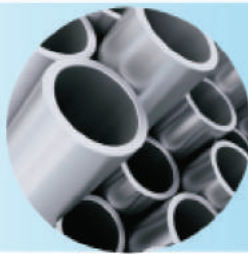
OES 8000

Optical Emission Spectrometer

Performance Advantages

Based on the Multi-CCD detector and total spectrum technology, OES 8000 Optical Emission Spectrometer is able to detect all the spectral lines within the wavelength range. OES 86000 Optical Emission Spectrometer features a new design which eliminates the need of a vacuum pump and vacuum sealed chamber for accurate analysis. With extended wavelength range the instrument is suitable for the complex analysis of ferrous and non-ferrous metals

- ▣ Fast analysis: 35 seconds testing
- ▣ Excellent reliability and repeatability: 24/7 operation
- ▣ High Resolution: 10 pm/pixel
- ▣ Total spectrum technology simplifies installation of new matrix or channel
- ▣ Simplified calibration procedure with the standard samples
- ▣ Safe and eco-friendly analysis without chemical reagents



CARL ZEISS Grating and Optical lens Toshiba CCD Detector & Agilent Optical Fiber

Technical Specifications

Requirements

Ambient temperature: 15-30°C

Atmospheric humidity: <70%

Power: Voltage 220V \pm 5V 50Hz: single phase with protective ground

Environment free from vibration, dust, strong electromagnetic interference, strong airflow or corrosive gases

Control Circuit Specifications

Spectrometer design

- ▣ Paschen-Runge polychromator-350mm focal length
- ▣ Resolution: 10pm/pixel
- ▣ Temperature controlled at 34 \pm 0.5°C
- ▣ Special casting materials reduce chamber deformation

Grating

- ▣ Holographic concave grating; 3600 l/mm
- ▣ Dispersion of the first order spectrum: 1.2nm/mm
- ▣ Effective wavelength range: 140-800 nm

Detector

- ▣ High-performance linear array CCD

Analysis Time

- ▣ Depend on material-typical test 35 seconds

Auxiliary equipment

Argon - The purity is above 99.999%

AC parameter - 1 KVA stabilized power supply

Grinding machine - for high hardness metal samples similar to: Steel, Nickel alloy, etc

Lathe - for low hardness metal samples similar to: Aluminum, Copper, Zinc, Magnesium, etc

Other Specifications

Spark Source

- ▣ Digital plasma generator
- ▣ High energy pre-spark (HEPS)
- ▣ Frequency: 100-1000Hz
Current: 1-80A

Spark Stand

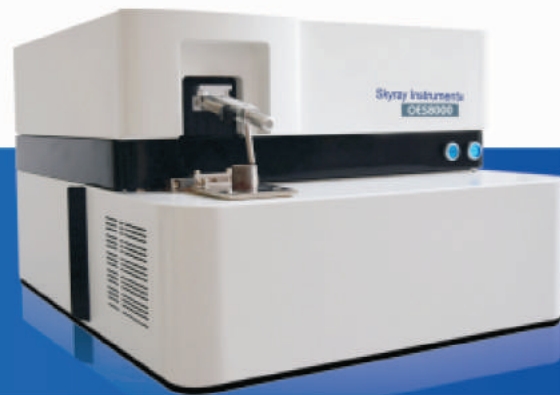
- ▣ 4mm analytical gap
- ▣ Jet stream technology
- ▣ No Argon consumption in standby mode

Dimension and Weight

- ▣ Dimensions LxWxH: 80cm x 75cm x 45cm
- ▣ Weight: 30 kg

Electrical Power

- ▣ Operation: max 1.5 kVA
- ▣ Standby mode: 70VA



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Testing Procedure

Reference

The following reference standards should be used when testing with OES8000

ISO 14284 Steel and Iron-Sampling and Preparation of Samples for the Determination of Chemical Composition

ASTM E 1806 Standard Practice for Sampling Steel and Iron for Determination of Chemical Composition

ASTM E 716 Standard Practices for Sampling and Sample Preparation of Aluminum and Aluminum Alloys for Determination of Chemical Composition by Spectrochemical Analysis

Preparation

High hardness metal samples require grinding the surface. Typical samples include steel, Nickel, Cobalt alloy and others

Low hardness metal samples require turning the surface with the lathe. Typical samples include Aluminum, Copper, Zinc, Magnesium alloys and others

Analysis

Place the sample on the spark stand and start the analysis with the software. The test is complete in less than 40 seconds and all the results of the customized elements are displayed. The results of the analysis can be stored in the software database or printed directly.



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Test Example

Low alloy steel GBW1398

Elements	C	Si	Mn	P	S	Cr	Ni	Mo	Cu
Reference Value	0.499	2.140	0.798	0.029	0.021	0.974	1.970	0.830	0.303
Results	0.491	2.168	0.818	0.027	0.019	0.953	1.939	0.820	0.291
Elements	V	Ti	Al	Nb	W	B	Co	Zr	
Reference Value	0.469	0.082	0.027	0.124	1.530	0.0047	0.238	0.051	
Results	0.475	0.083	0.025	0.127	1.501	0.004	0.230	0.055	

Stainless steel YSB S 11378a-2008

Elements	C	Si	Mn	P	S	Cr	Ni	Mo	Cu
Reference Value	0.066	0.760	1.160	0.030	0.0091	17.490	8.230	0.205	0.355
Results	0.066	0.790	1.180	0.027	0.007	17.573	8.173	0.189	0.344
Elements	V	Ti	Al	Nb	W	Co			
Reference Value	0.061	0.006	0.014	0.011	0.021	0.099			
Results	0.059	0.007	0.018	0.010	0.029	0.094			

Al-Si alloy E513e

Elements	Si	Fe	Cu	Mn	Mg	Ni	Zn	Ti	Pb	Sn	Sr
Reference Value	12.64	0.212	2.070	0.540	0.753	0.066	0.216	0.042	0.074	0.021	0.062
Results	12.715	0.190	2.031	0.528	0.737	0.068	0.211	0.040	0.078	0.020	0.064

Low alloy Aluminum E423b

Elements	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti
Reference Value	1.280	0.432	0.522	0.234	0.911	0.340	0.030	0.091	0.028
Results	1.261	0.417	0.513	0.226	0.893	0.321	0.026	0.092	0.026

Copper 31XB21

Elements	Cu	Zn	Sn	Pb	Fe	Ni	Al	Si	Mn
Reference Value	69.6793	29.500	0.132	0.120	0.129	0.107	0.121	0.147	0.0647
Results	69.781	29.403	0.121	0.101	0.124	0.112	0.134	0.135	0.061

Zn-Al alloy 43XZ4

Elements	Al	Cu	Fe	Mg	Pb	Cd	Sn
Reference Value	4.760	3.210	0.064	0.043	0.0024	0.0025	0.030
Results	4.723	3.168	0.052	0.043	0.0029	0.0021	0.026

Mg-Al alloy E2612

Elements	Al	Zn	Mn	Si	Fe	Cu	Ni
Reference Value	7.180	2.990	0.339	0.097	0.013	0.087	0.0045
Results	7.116	2.942	0.359	0.090	0.017	0.082	0.002

Inconel B.S.600C

Elements	C	Mn	Si	Cr	Fe	Mo	W	Al	Ti
Reference Value	0.072	0.500	0.390	15.620	9.300	0.027	0.003	0.200	0.210
Results	0.058	0.469	0.412	15.559	9.212	0.0246	0.007	0.182	0.242
Elements	Cu	Co	Nb	V	Mg				
Reference Value	0.040	0.040	0.014	0.022	0.002				
Results	0.043	0.038	0.012	0.025	0.004				

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• Spectroscopy • Chromatography • Mass Spectrometry

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