



## Skyray 8000 OES

The ISO 9001: 2008 international quality certification

Fast | Accurate | Stable

The worlds finest optical emission spectrometer



Metals Analyzer

**OES 8000**  
Optical Emission Spectrometer

140 countries & regions are using Skyray Instruments



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Metals Analyzer

# OES 8000

Optical Emission Spectrometer



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## Performance advantages

Based on a Multi-CCD detection system and total spectrum technology, the model 8000 Optical Emission Spectrometer can detect all spectral lines within the range 140 – 800nm. The instrument is extremely easy to install and specific matrix channels can be added as required to the analytical program. With its compact size, the OES 8000 is easy to maintain and position within the laboratory. OES 8000 is a good choice for more complex analysis of both ferrous and non-ferrous metals in a single instrument.

## Application fields

Element analysis for metal is commonly used for many applications including research and development, quality control, process control and other requirements related to metal smelting, casting and processing industries.

The Skyray 8000 Optical Emission Spectrometer is widely used around the world for the analysis of ferrous and non-ferrous metals. The instrument can simultaneously analyze dozens of elements with fast, accurate and stable performance, meeting the requirements in areas such as industrial development, process control, incoming inspection, product sorting, etc.

Skyray Optical Emission Spectrometers provide a convenient, eco-friendly and low-cost solution for metal analysis, making R&D, production process and product quality to be more controllable, helping users upgrade their level of technology and quality; while speeding up analytical procedures and improving economic and environmental benefits for all users..

- Designed to work 24/7 with high stability and reliability
- Fast analysis times with results within 35 seconds
- The operation and maintenance are simple and convenient for users
- All of the analytical programs are calibrated at Skyray,
- Easy to calibrate the instrument with standardizing samples
- No need for chemical reagents, the analysis process is safe and eco-friendly.

## Requirements

Ambient temperature: 15-30°C

Atmospheric humidity: ≤70%

Power: Voltage 220V ± 5V 50Hz; single phase with protective ground

No vibration, dust, strong electromagnetic interferences, strong drafts or corrosive gases in the laboratory

## Technical Specifications

### ■ Spectrometer design

- ◇ Paschen-Runge polychromator, 350mm focal length
- ◇ Effective wavelength range: 140-800 nm
- ◇ Resolution: 10pm/pixel
- ◇ Temperature controlled at  $34 \pm 0.5^\circ\text{C}$ , vacuum type or air type
- ◇ Special casting alloys ensure very high thermal stability

### ■ Grating

- ◇ Holographic concave grating: 3600 l/mm
- ◇ Dispersion of the first order spectrum: 1.2nm/mm

### ■ Detector

- ◇ High-performance linear array CCD

### ■ Analysis Time

- ◇ Depending on the type of materials, typically less than 30 seconds

## Auxiliary equipments

Argon—Purity is to be above 99.999%

AC parameter voltage stabilizer—1KVA

Surface Grinder—For samples such as Steel, Nickel alloys, etc

Small lathe—For samples such as

Aluminum, Copper, Zinc, Magnesium, etc

Air conditioner—Select a suitable power supply

### ■ Spark Source

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

### ■ Spark Stand

- ◇ 4mm analytical gap of the sample stand
- ◇ Jet stream technology
- ◇ No Argon consumption in standby mode

### ■ Dimension and Weight

- ◇ Dimensions: Height 450 Width 750 Depth 800
- ◇ Weight: 85kg

### ■ Electrical Power

- ◇ Max. 1.5kVA
- ◇ Standby mode: 70VA

## Technical advantages

### ■ Comprehensive analysis for the elements in most metals with the full spectrum detection

Based on multiple CCD detectors and full spectrum detection technology, the instrument can comprehensively detect the spectral lines of most of the elements in metal samples, and carry out an analysis for multi-matrix and multi-elements. The instrument is convenient and inexpensive to install and add other matrix channels as well as analytical programs either at Skyray or the users' laboratory

### ■ Professional test solution

With long experience in providing analytical services, Skyray Instruments provides users with the optimum solutions for the analysis of ferrous and non-ferrous metals.

Our analysis programs are designed according to the classification of metal grades, meeting the various analysis needs of all users.

The analysis programs are factory-calibrated with international standard samples, and have been installed and corrected by state of the art software.

Using the standard samples supplied by Skyray, a user can easily carry out routine calibrations. It is therefore unnecessary to purchase a large number of standard samples for an analysis program.

### ■ Top international suppliers provide the core components

Dispersive optics—The gratings used are manufactured by CARI ZEISS in Germany ensuring excellent resolution. Our CCD Detectors are manufactured by TOSHIBA in Japan ensuring optimum detection of each spectrum and ensuring low noise.

Optical lenses are manufactured by CARI ZEISS in Germany;

The Optical fiber is manufactured by Agilent Technologies in America.

### ■ Excellent thermal system for the polychromator

The thermostatically controlled optical system is configured with a unique feedback heating feature and the highly efficient thermal insulation, ensures excellent temperature stability of the polychromator.

Thermostatic control of the optical system minimizes drift due to temperature changes



## Test examples

### ■ Sampling

There are two kinds of sampling for spectrochemical analysis: melt sampling and the product sampling method. With melt sampling, liquid metal is placed into a mould and solidified into a solid sample. With product sampling, the size and shape of the sample should be of reasonable dimensions .

#### Reference standards

ISO 14284 Steel and iron—Sampling and preparation of samples for the determination of elemental composition

ASTM E 1806 Standard Practice for Sampling Steel and Iron for Determination of elemental composition

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

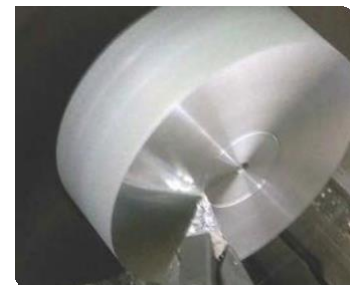
### ■ Preparation

For hard metals samples (such as steel, Nickel and Cobalt alloys), prepare the surface with a grinder; for softer metals ( such as Aluminum, Copper, Zinc and Magnesium alloys), prepare the surface with a lathe. The treated surface should be flat and smooth and with all scratches orientated in the same direction.

### ■ Analysis

Place the sample on the spark stand and start the analysis process by operating the software. After completing the test, all the results of programmed elements are displayed simultaneously. The time of a single test procedure is less than 40 seconds, and analyzing the same sample for the three times is generally recommended for best accuracy.

### ■ Save the results to data base file



## Typical results

### 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	0.083	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	3.118	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				