



Testing solution to metallic material elements

OES 8000S

Direct-reading Optical Emission Spectrometer



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Performance advantages

Skyray OES8000S adopts a CMOS detector with full-spectrum test technology to test all spectral lines within the wavelength range. Featuring easy configuration as well as addition of test matrix, channel, and analysis program, the instrument is compact in size, easy to maintain and good for laboratory placement. It is a general-purpose instrument for comprehensively testing elements of steel and non-ferrous metal materials.

Application fields

Content tests of metallic material elements are traditional test items in smelting, casting, and processing of metals and in R&D, production control, quality inspection and other related work of machine industry.

Skyray direct-reading spectrometer is widely used in element content analysis in iron and steel, non-ferrous metal materials, which is fast, accurate, stable, and as dozens of elements are analyzed simultaneously, the instrument meets the needs of industrial research and development, process control, incoming inspection, product sorting and other aspects.

Skyray direct-reading spectrometer is convenient, environment-friendly and low-cost to test the element content of metal materials. It makes process and quality of R&D and production more controllable, helping users to improve the technology and quality level of products; at the same time, it speeds up related processes and creates obvious economic and environmental benefits for users. The direct-reading spectrometer has become a landmark equipment for demonstrating technology and quality level of an enterprise.

- Full spectrum analysis technology and easy configuration of additional matrix and elements to facilitate customization
- Compact structure requires low laboratory space
- Around-the-clock working with premium stability and reliability
- Fast detection with a single test less than 30 seconds
- Easy to use and maintain, and little professional knowledge demanded for operators
- Original factory-set software, accurate test data, and complete alloy grades
- Configured with standard samples to periodically calibrate the instrument
- No chemical reagents to make the test process safe and environment-friendly



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Working Conditions

Working temperature: 15-30 °C;

Relative humidity: ≤70%;

Power supply: 220±5V, single-phase 50Hz, grounding resistance <10;

The laboratory is expected to have no vibration, dust, strong electromagnetic interference, strong airflow, or corrosive gas.

Accessories

High-purity argon with a purity of over 99.999%.

Alternating current UPS-1KVA.

Spectral grinding machine for steel, nickel alloy and other samples.

Small lathes for making samples such as aluminum, copper, zinc, magnesium alloy, etc.

Air conditioner should be supplied based on the area of laboratory.



Technical Performance and Parameters

■ Light chamber design

- ◇ Pasing Longge structure with diameter of Roland circle being 400mm
- ◇ Wavelength range 134-680nm
- ◇ Pixel resolution 10pm
- ◇ Constant temperature 32.5 ±0.5°C
- ◇ Special materials to ensure that the light chamber deforms to minimum

■ Concave Grating

- ◇ Engraved line density 2400l/mm
- ◇ Primary spectral line dispersion rate: 1.04nm/mm

■ Software

- ◇ Polynomial correction method to calculate the concentration ratio
- ◇ Matrix correction
- ◇ Intensity standardized correction
- ◇ Material grade type re-calibration
- ◇ Automatic correction of the interference between the spectral lines of the elements
- ◇ Recognition of grade library
- ◇ One-key position correction
- ◇ One-key printing function
- ◇ The test results are output in different formats
- ◇ National Standard Sample Library

■ Excitation light source

- ◇ High energy plasma spark light source technology
- ◇ High-energy pre-sparking technology (HEPS)
- ◇ Frequency 100-1000Hz

■ Excitation Platform

- ◇ 3mm analysis spacing on sample platform
- ◇ Spray electrode technique

■ Dimension

- ◇ Height 435mm, length 900mm, width 600mm
- ◇ 120 kg

■ Power

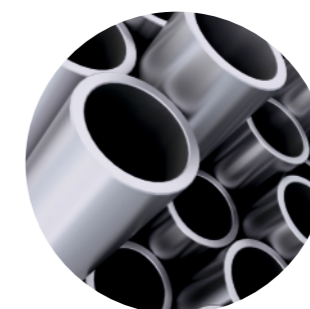
- ◇ Maximum power 1500 W
- ◇ Standby power 70 W

■ Detector

- ◇ High-performance linear array CMOS

■ Analysis time

- ◇ 30 seconds or less, depending on sample type





Fast | precise | stable



Technical Advantages

Full spectrum detection of a wide range of metals and elements

CMOS detector with full spectrum test technology is able to test all kinds of metal elements for their spectral lines, thus achieving multi-matrix, multi-element test easily.

It is very convenient to configure and add test matrix, channel and analysis program, which facilitates fast addition of test elements and analysis program at the customer's premise after delivery.

Professional Test Solutions

Skyray Instrument offers mature testing solutions to users analyzing steel and nonferrous metal materials by virtue of its long-term accumulated experience in testing technology and service.

Analysis programs are based on the classification of material element content to meet various common testing requirements of users.

Analysis program is calibrated by international and national standard samples by the original manufacturer, and fitted and calibrated by professional instrument software.

By having a small number of standardized samples from the manufacturer, users can complete the daily maintenance of the instrument. They do not need to buy a large number of standard samples for making analysis procedures.

Our core components are supplied by top international manufacturers in the industry

Spectral dispersion part or grating is manufactured by JY, France, which guarantees excellent spectral resolution.

Spectral detector or high performance CMOS is manufactured by Hamamatsu, Japan, which ensures sensitive spectral line detection and low noise.

Excellent light chamber vacuum system

The vacuum chamber is precisely designed and processed, with excellent airtight performance, which provides high vacuum environment for the light path.

Therefore, there is no need to start vacuum pump frequently, resulting in minimum power consumption and better chances to keep the light chamber clean.

Test Examples

Sample taking

Sampling can be divided into melt sampling and finished product sampling. Melt sampling injects liquid metal into a mold to solidify into a lump sample. Finished product sampling requires evaluation of the size, shape of the sample to decide whether to cut it.

Reference standards

GB/T 20066-2006 – Steel and iron---Sampling and preparation of samples for the determination of the chemical composition.

GB/T 5678-2013 Method for Sampling Casting Alloys for Spectrochemical Analysis.

Sample Pretreatment

High-hardness metals (such as steel, nickel alloys, cobalt alloys) need to be polished with a spectroscopic grinder, and low-hardness metals (such as aluminum alloy, copper alloy, zinc alloy, magnesium alloy) should be lathed with the test surface to make it flat, smooth, and with consistent scratches.

Sample testing

Place the sample on the sample excitation platform, and operate on the computer software to start the test. After the test is completed, contents of all configured elements will be displayed. Each single test is usually less than 30 seconds. It is generally recommended testing the same sample three times.

Test Data Saving

Test results can be saved in the software database or printed directly.

Example of Test Results

Low-alloy steel

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

Stainless steel YSBS 11378A-2008

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

Aluminum silicon alloy E513E

Element	Si	Fe	Cu	Mn	Mg	Ni	Zn	Ti	Pb	Sn	Sr
Std valu	12.64	0.212	2.070	0.540	0.753	0.066	0.216	0.042	0.074	0.021	0.062
Measured value	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

Element	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti
Std valu	1.280	0.432	0.522	0.234	0.911	0.340	0.030	0.091	0.028
Measured value	1.261	0.417	0.513	0.226	0.893	0.321	0.026	0.092	0.026

Brass 31XB21

Element	Cu	Zn	Sn	Pb	Fe	Ni	Al	Si	Mn
Std valu	69.6793	29.500	0.132	0.120	0.129	0.107	0.121	0.147	0.0647
Measured value	69.781	29.403	0.121	0.101	0.124	0.112	0.134	0.135	0.061

Zinc aluminum 43XZ4

Element	Al	Cu	Fe	Mg	Pb	Cd	Sn
Std valu	4.760	3.210	0.064	0.043	0.0024	0.0025	0.030
Measured value	4.723	3.168	0.052	0.043	0.0029	0.0021	0.026

Magnesium aluminum alloy E2612

Element	Al	Zn	Mn	Si	Fe	Cu	Ni
Std valu	7.180	2.990	0.339	0.097	0.013	0.087	0.0045
Measured value	7.116	2.942	0.359	0.090	0.017	0.082	0.002

Inconel B.S.600C

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