DRAWELL
Artist of Science

Direct-reading ICP-Optical Emission Spectrometer (for Metal alloy/Stainless steel)

DW-ICP-OES 8000S

DW-ICP-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.

Direct-reading spectrometer is widely used in element content analysis in iron and steel, nonUferrous 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.

Features

- 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 environmental-friendly

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 Fibrary

Accessories

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

  Alternating current UPS-1 KVA.

  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.

Advantages

- **Full spectrum detection of a wide range of metals and elements.**

  CMOS detector with full spectrum test technology, able to test all kinds of metal elements for their spectral lines, 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**

  Drawell 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. It is calibrated by international and national standard samples, and fitted and calibrated by professional instrument software.

- **Core components supplied by top international manufacturers**

  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

- **1.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.

- **2.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 Spectochemical Analysis.

- **3.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.

- **4.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.

- **5.Test Data Saving**

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

Parameters

Light chamber design **-Special materials to ensure that the light chamber deforms to minimum**	
Pasing Longge structure with diameter	Roland circle being 400mm
Wavelength range	134-680nm
Pixel resolution	10pm
Constant temperature	32.5 ±0.5°C
Concave Grating	
Engraved line density	24001/mm
Primary spectral line dispersion rate	1.04nm/mm
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.	
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/Weight	
H435mm, L900mm, W 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	

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 YSBS11378A-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				