



Testing wide range of elements
Applied in laboratory test of steel industry

IEDX 4500

XRF Spectrometer



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IEDX 4500 XRF Spectrometer

Testing wide range of elements,
fully meeting the demand of laboratory test in steel industry

XRF Spectrometer utilizes XRF testing principle to realize rapid, accurate and nondestructive analysis on all kinds of elements.
IEDX 4500 XRF Spectrometer has its unique advantage in on-the-spot sample analysis during smelting and steel products component analysis in steel companies.



Application Fields

Iron alloy test and full-element analysis, hazardous elements test.

Specifications

Model: IEDX 4500
Name: XRF Spectrometer
Detection Range: Mg ~ U
Analyzing range of element content: ppm—99.99% (range varies from elements)
Ability of simultaneous analysis: analyzing dozens of elements simultaneously
Analysis accuracy: 0.05% (sample with content above 96%, test stability for 21 times)
Test time: 60s to 200s
Energy resolution of detector: 145±5eV
High voltage: 5KV-50KV
Tube current: 1mA
State of testing object: powder, solid, liquid
Input voltage: AC 220V (optional: 110V)
Ambient temperature: 15°C—30°C
Ambient humidity: 35%-70%
Volume of sample chamber: 320mm×100mm
Dimension: 660mm×510mm×350mm
Weight: 65Kg

Efficiency Comparison Table before and after Adopting XRF Technology in Steel Factory

Item	Before Using XRF (Chemical Analysis)	After Using XRF	Direct Economic Benefit
Personnel	Requiring several professionals who are familiar with chemistry and operation	Less demanding on professionals, easy to learn and operate	Saving salary cost over 10,000 Yuan per month, improving test efficiency, reduce labor cost
Accuracy	Manual test, with testing data greatly infected by human and environmental factors	Machine test, with testing data slightly infected by human and environmental factors	Promoting company's production efficiency
Production Efficiency	More than 2 hours	About 2 minutes for sample testing	Greatly promoting company's production efficiency, shortening production cycle; producing extra thousands of steel per day, significantly reducing energy consumption.
Consumables	Consuming chemicals worthy tens of thousand Yuan per month	Low demands on test sample, both solid and liquid testable, needn't preparing sample	Saving sample preparation cost over 10,000 Yuan per month
Environmental protection	The disposal of residue agent is complicate, causing pollution and environmental protection cost which increases company's economic burden	Nondestructive test without any pollution	Reducing environment pollution, avoid environmental protection cost

By using intelligent vacuum system, IEDX 4500 has a good excitation effect on light elements like Mg, Al, Si, P, etc. Through XRF technology, it is able to precisely analyze high content key elements like Cr, Ni, Mo. Besides, it shortens measurement time in smelting, which greatly improves working efficiency.
In addition, it is widely used in alloy analysis, full element analysis and hazardous elements test

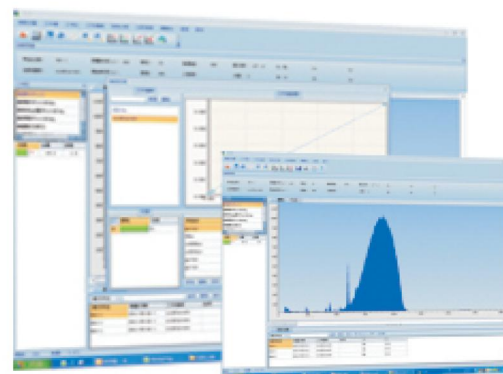


Features

- High efficient ultrathin X-ray tube;
- Latest digital multi-channel technology with counting rate reaching 40000/S and analyzing time reduced within 30s (under non-vacuum condition);
- Silicon drift detector with excellent energy linearity, energy resolution and energy spectrum characteristics, as well as higher peak-to-background ratio;
- Lan interface control makes commutation more reliable
- Innova instrument's patented product- Signal-Noise-Enhancer (SNE) improves the signal processing ability by up to 25 times;
- Through intelligent pumping vacuum system, low energy X-ray has good excitation effect on light elements;
- Automatically switch between 8 collimators and 5 optical filters as required, exempting from trouble of manual operation;
- Special accessory for measurement in steel industry
- In-built camera with high resolution;
- 90mm×70mm LCD clearly displays the important parameters (tube voltage, tube current, vacuum) of the instrument;
- Vacuum Pump

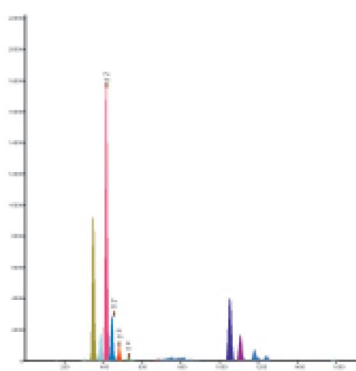
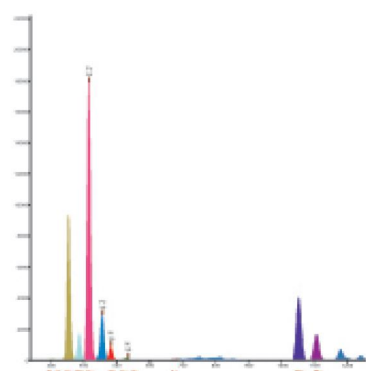
Software Introduction

- User-friendly interface design
- Support Chinese and English interfaces, and other languages can be added by users if required

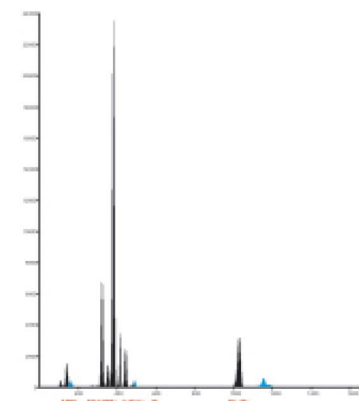


Testing Example and Data

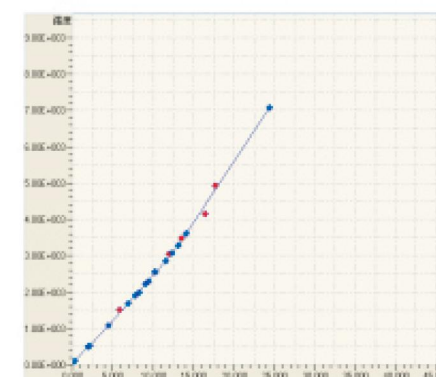
Test Spectrogram of iron alloy



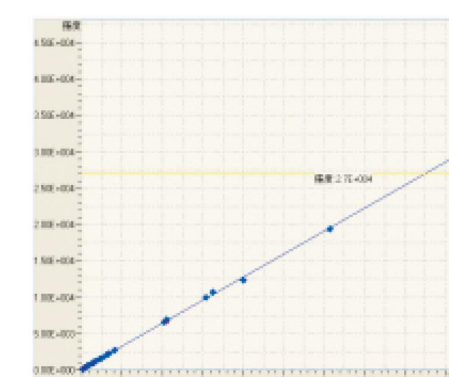
Test Spectrogram of Sample with alloy grade of 316



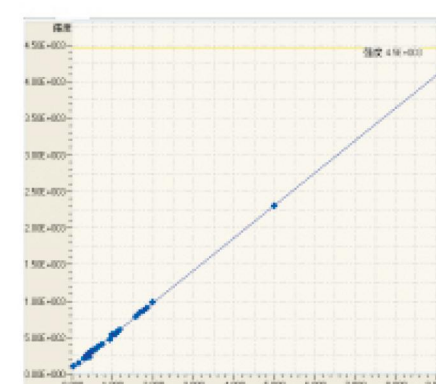
Ni Testing Curve



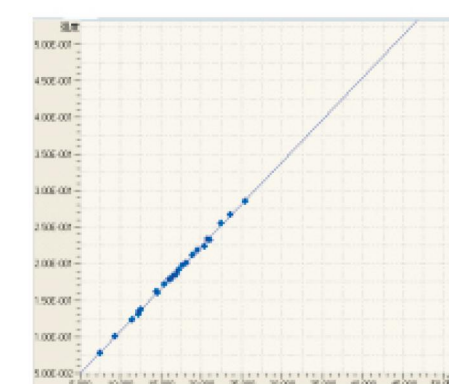
Mo Testing Curve



Mn Testing Curve



Cr Testing Curve



The Tested Content of Cr, Mn, Cu, Mo in Stainless Steel Standard Sample by Skyray IEDX4500

Test Times	IEDX4500 test (100s)					
	Stainless Steel Standard Sample YSBS20312-2-2007					
	Cr	Mn	Ni	Cu	Mo	Grade
#1	16.6098	1.0665	10.2078	0.3499	2.0344	SS316
#2	16.5704	1.1002	10.2379	0.3421	2.0383	SS316
#3	16.5882	1.0611	10.2270	0.3481	2.0438	SS316
#4	16.5963	1.0730	10.2398	0.3513	2.0402	SS316
#5	16.6020	1.0766	10.2017	0.3456	2.0322	SS316
#6	16.6114	1.0703	10.2175	0.3494	2.0382	SS316
#7	16.6004	1.0621	10.2497	0.3518	2.0408	SS316
#8	16.5896	1.0814	10.2523	0.3457	2.0421	SS316
#9	16.5734	1.0771	10.2215	0.3480	2.0435	SS316
#10	16.5883	1.0879	10.2361	0.3451	2.0385	SS316
#11	16.5942	1.0810	10.2277	0.3490	2.0426	SS316
#12	16.6089	1.0861	10.2572	0.3523	2.0434	SS316
#13	16.6148	1.0702	10.2245	0.3440	2.0393	SS316
#14	16.5954	1.0786	10.2545	0.3411	2.0432	SS316
#15	16.5947	1.0922	10.2700	0.3484	2.0392	SS316
#16	16.5956	1.0915	10.2416	0.3424	2.0395	SS316
#17	16.5905	1.0781	10.2247	0.3504	2.0462	SS316
#18	16.5936	1.0779	10.2872	0.3459	2.0430	SS316
#19	16.5897	1.0748	10.2651	0.3459	2.0396	SS316
#20	16.5997	1.0838	10.2529	0.3428	2.0462	SS316
#21	16.5724	1.0796	10.2710	0.3473	2.0428	SS316
Average Value	16.5942	1.0786	10.2413	0.3470	2.0408	
Real Value	16.59	1.07	10.23	0.35	2.04	
Standard Deviation	0.0121	0.0098	0.0221	0.0033	0.0035	
Max. Value	16.6148	1.1002	10.2872	0.3523	2.0462	
Min. Value	16.5704	1.0611	10.2017	0.3411	2.0322	
Range Value	0.0444	0.0391	0.0856	0.0113	0.0141	
RSD(%)	0.0728	0.9089	0.2159	0.9564	0.1708	

PERIODIC TABLE OF ELEMENTS
(Characteristic X-Ray energy table)

Per	PERIODIC TABLE OF ELEMENTS																0										
(Characteristic X-Ray energy table)																		2 He 4.008									
1A												IIA		IIIA		IVA		VA		VIA		VIIA					
1	1 H 1.008											4 Be 9.012		13Al 13.003		14Si 14.013		15P 15.000		16S 16.000		17Cl 17.004					
2	3 Li 6.941											9 F 18.998		10Ne 20.179		18Ar 39.948		19K 39.098		20Ca 40.078		21Sc 44.956					
3	11Na 22.990											12Mg 24.305		26Fe 55.845		27Co 58.933		28Ni 58.693		29Cu 63.546		30Zn 65.380					
		III B		IV B		V B		VI B		VII B		VIII		I B		II B											
4	19 K 39.1	20 Ca 40.08	21 Sc 44.96	22 Ti 47.90	23 V 50.94	24 Cr 51.99	25 Mn 54.94	26 Fe 55.84	27 Co 58.93	28 Ni 58.69	29 Cu 63.54	30 Zn 65.38	31 Ga 69.72	32 Ge 72.64	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80									
5	37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc 98.91	44 Ru 101.07	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.76	52 Te 127.60	53 I 126.91	54 Xe 131.30									
6	55 Cs 132.91	56 Ba 137.33	Ln		72 Hf 178.49	73 Ta 180.95	74 W 183.84	75 Re 186.21	76 Os 190.23	77 Ir 192.22	78 Pt 195.08	79 Au 197.04	80 Hg 200.59	81 Tl 204.38	82 Pb 207.2	83 Bi 208.98	84 Po 209	85 At 210	86 Rn 222								
7	87 Fr 223	88 Ra 226	An		90 Th 232	91 Pa 231	92 U 238	93 Np 237	94 Pu 244	95 Am 243	96 Cm 247	97 Bk 247	98 Cf 251	99 Es 252	100 Fm 257												
																		Alkali Metals				Non-Metal		Transitional element			
																		Halogen		Lanthanoids		Actinides					
																		Alkaline earth		Rare gases		Main group metal					
																		Mark 1: #Radioactive Elements				*Man Made Elements					
																		2: All the Numbers are ordered one by one in this way, Atomic Number									
																		Element Symbol, Atomic Weight, K α, K β, L α, L β, L γ, Lε									
Ln		57 La 138.9	58 Ce 140.1	59 Pr 140.9	60 Nd 144.2	61 Pm 145	62 Sm 150.4	63 Eu 152.0	64 Gd 157.2	65 Tb 158.9	66 Dy 162.5	67 Ho 164.9	68 Er 167.2	69 Tm 168.9	70 Yb 173.0	71 Lu 175.0											
		33.30	34.57	35.86	37.19	38.54	39.91	41.32	42.76	44.23	45.73	47.26	48.82	50.41	52.04	53.59											
		37.99	39.45	40.95	42.48	44.05	45.65	47.28	48.95	50.65	52.38	54.16	55.96	57.81	59.69	61.61											
		4.651	4.840	5.034	5.230	5.431	5.636	5.846	6.059	6.275	6.495	6.720	6.948	7.181	7.414	7.654											
		5.043	5.262	5.489	5.722	5.956	6.206	6.456	6.714	6.979	7.249	7.528	7.810	8.103	8.401	8.708											
		5.789	6.052	6.322	6.602	6.891	7.180	7.478	7.778	8.104	8.418	8.748	9.089	9.424	9.779	10.14											
		4.124	4.287	4.452	4.632	4.816	4.994	5.176	5.361	5.546	5.742	5.942	6.152	6.341	6.544	6.752											
An		89 Ac 227	90 Th 232	91 Pa 231	92 U 238	93 Np 237	94 Pu 244	95 Am 243	96 Cm 247	97 Bk 247	98 Cf 251	99 Es 252	100 Fm 257														
		89.79	92.19	94.64	97.14	99.69	102.3	104.9	107.7	110.5	113.3	116.2	119.2														
		103.3	106.1	108.9	111.8	114.7	117.7	120.8	123.9	127.1	130.4	133.7	137.2														
		12.65	12.97	13.29	13.61	13.95	14.28	14.62	14.96	15.31	15.66	16.02	16.38														
		15.71	16.2	16.7	17.22	17.74	18.28	18.83	19.39	19.97	20.56	21.17	21.79														
		18.41	18.98	19.55	20.16	20.77	21.40	22.04	22.69	23.37	24.06	24.76	25.47														
		11.12	11.36	11.62	11.89	12.12	12.38																				