

شرح فنی دستگاه کوانتومتر مدل: ARL iSpark 8860 با پایه آهن و آلومینیوم

No.	Art. N° and Designation	
OES Spectrometer		
1	OE-8860	ARL 8860 Metals Analyzer + Computer (Standard)
ARL iSpark matrix		
2	OE-8860-MAT-FE	Fe Matrix
3	OE-8860-MAT-AL-PURE	Al Matrix for Pure Material
4	OE-8860-MAT-AL-ALLOY	Al Matrix for Alloyed Material
OXSAS Software		
5	OE-ISPARK-OXSAS	OXSAS OES Analytical Software
6	OE-8860-IR-FE-A0	Standard Inclusion Analysis with Inclusions Report in low alloy steel
7	OE-88-CNO	CNO Option
Spectrometer		
8	OE-8860-LINE	Analytical Channels
9	OE-8860-N	Nitrogen Channel
10	OE-8860-O	Oxygen Channel
Fe Calibrations		
11	OE-8860-CAL-FE-A0	Calibration of Low Alloy Steel
12	OE-8860-CAL-FE-A4	Calibration of CNO in Low Alloy Steel
13	OE-8860-CAL-FE-AS1	Calibration of Al sol/insol in LAS with PIM Method
14	OE-8860-CAL-FE-AS2	Calibration of B sol/insol in LAS with PIM Method
15	OE-8860-CAL-FE-AS3	Calibration of Ca sol/insol in LAS with PIM Method
16	OE-8860-CAL-FE-AS4	Calibration of Ti sol/insol in LAS with PIM Method
17	OE-8860-CAL-FE-G0	Calibration of Free Cutting Steel
18	OE-8860-CAL-FE-H0	Calibration of Cr Steel
19	OE-8860-CAL-FE-J0	Calibration of Cr-Ni Steel
20	OE-8860-CAL-FE-J2	Calibration of Nitrogen VUV in Cr-Ni Steel
21	OE-8860-CAL-FE-K0	Calibration of Mn Steel
22	OE-8860-CAL-FE-L0	Calibration of Tool & High-Speed Steel
23	OE-8860-CAL-FE-M0	Calibration of Ni-hard, Cast Iron, Nodular Iron
24	OE-8860-CAL-FE-M2	Calibration of Nitrogen VUV in Ni-hard, Cast Iron, Nodular Iron
25	OE-8860-CAL-FE-N0	Calibration of High Alloy Cast Iron
26	OE-8860-CAL-FE-P0	Calibration of Ni Resist

27	OE-8860-CAL-FE-Z0	Global Iron Calibration
28	OE-8860-CAL-FE-Z2	Calibration of Nitrogen VUV in Global Iron
29	OE-8860-CAL-FE-Z3	Calibration of Oxygen in Global Iron
Al Calibrations		
30	OE-8860-CAL-AL-A0	Calibration of Low Alloy Al
31	OE-8860-CAL-AL-B0	Calibration of Pure Aluminum
32	OE-8860-CAL-AL-C0	Calibration of Ultra-Pure Aluminum
33	OE-8860-CAL-AL-G0	Calibration of Al-Si
34	OE-8860-CAL-AL-H0	Calibration of Al-Si-Cu
35	OE-8860-CAL-AL-J0	Calibration of Al-Cu
36	OE-8860-CAL-AL-K0	Calibration of Al-Zn
37	OE-8860-CAL-AL-L0	Calibration of Al-Mg
38	OE-8860-CAL-AL-Z0	Global Aluminum Calibration
Instrument Accessories		
39	OE-PR-AR	High Pressure Regulator
40	OE-SIRCAL-230	Rare Gas Purifier SIRCAL (230 V)
No.	Art. N°	Designation
1	OE-8860	ARL 8860 Metals Analyzer + Computer (Standard)
		ARL 8860 Metals Analyzer (OE-8860) The spectrometer system includes the following: • Vacuum spectrometer with PMT channels • Air cooled spark stand • IntelliSource, double current controlled source • Electronics controlling all instrument functions • Instrument documentation in electronic form • Packing for truck transport Personal Computer system DELL OptiPlex XE Desktop (COMP-STD) with the following minimum specifications: • Intel Core™ 2 Duo Processor E7400, 4 GB Memory; • One hard disk drive (500 GB), internal DVD+/-RW. No floppy disk drive; • Operating system Windows® 10 • 22" LCD TFT video screen, USB keyboard and mouse; • 2 x PCI full height + 1 x PCIe + 1 x PCI

		• 1 x SVGA and 1 x Display Port • 2 x integrated Ethernet 10/100/1000 LAN interface (RJ-45 connector); • 1 serial (1 reserved for instrument link), 7 USB ports (2 front and 5 back). 2 USB ports are already used for the mouse and the keyboard; but 2 PS/2 ports are also available for keyboard and mouse • Includes factory installation and configuration of operating system and instrument software. <i>Note: Thermo Fisher Scientific reserves the right to substitute the latest equivalent (or better) computer model & configuration;</i>
2	OE-8860-MAT-FE	Fe Matrix Iron and steel matrix, includes: • Adjustment and control of the analytical lines at the factory • Quality assurance report including validation test made in the factory • Necessary SUS for the ordered calibrations • One analytical table • One electrode, 5 brushes, 1 insulator, 1 set of O-rings, 1 gauge
3	OE-8860-MAT-AL-PURE	Al Matrix for Pure Material Aluminum matrix for analysis of pure and ultra-pure material, includes: • Adjustment and control of the analytical lines at the factory • Quality assurance report including validation test made in the factory • Necessary SUS for the ordered calibrations • One analytical table • 50 pin electrodes (0.5mm diameter), 1 electrode holder, 1 insulator, 1 set of O-rings, 1 gauge
4	OE-8860-MAT-AL-ALLOY	Al Matrix for Alloyed Material Aluminum matrix for analysis of alloyed material, includes: • Adjustment and control of the analytical lines at the factory • Quality assurance report including validation test made in the factory • Necessary SUS for the ordered calibrations • One analytical table

		• One electrode, 5 brushes, 1 insulator, 1 set of O-rings, 1 gauge
5	OE-ISPARK-OXSAS	OXSAS OES Analytical Software Software that runs on Windows® 10 and includes the following main features: • Modern, State-of-the-Art Graphic User Interface; • Integrated Microsoft® SQL Server Express Edition relational database which stores your set up data and analyses; • Quantitative analysis with analysis parameter template; • Shortcuts allowing starting routine sample analyses, routine measurements of SCT samples and batches using a user-defined analysis template. The value of parameters such as the sample identification can be predefined. With support of shortcut keys enabling users to operate analysis exclusively on the keyboard • Powerful batch management for unknown samples analysis and other operations such as standardization, measurement of control, type standard and calibration samples or custom scripts execution • Comprehensive editor for setting up methods with measurement and corrections parameters such as Diffuse Spark Filtering, Time Gated Acquisition, Sparks frequency, PMT high voltage, ...; • Manual inputs and status values. Pseudo values computed on intensities, concentrations or any calculation step; • Calibration curve determination using multi-variable regression with additive and multiplicative corrections; • Powerful flexible sample identification; • Manual and automatic result processing; • Multi-purpose analysis result display and printing; • Measurement uncertainty combining in a single value the repeatability of the results when measuring an unknown sample and the uncertainty from the calibration; • Grade check (target and alternative), grade search and sort; • Grade conformity probability indication based on grade limits and measurement uncertainty values; • 'Key to Metals for OXSAS': a multilingual steel and nonferrous metals database. Unlimited access to more than

		4,500,000 records for chemical composition, properties and specifications for metals. Easy direct export for up to 200 grades concentration data to OXSAS grade limits. Search and cross reference tools; • Element display with possibilities to show units, grade limits and measurement uncertainty value. Precision: dynamic (proportional to the concentration range), fixed number of decimals or fixed number of significant digits. ASTM rounding is supported; • Result validation and edition, with history; • Automatic method choice based on element(s) concentration(s) or sample identification • Results recalculation (unknown samples, calibration samples, Setting-Up, Control and Type Standards samples). With possibility to recalculate multiple samples in one operation; • Result storage and post-treatment with powerful database query filters. Statistics. Export to files in Excel or CSV formats. Tracing of result modification with integrated display of modification history; • Instrument check with on-line integrated SPC-Basic. On-line evaluation by SPC of control samples with immediate feed-back. Automatic detection of out-of-control and other abnormal states (bias, trends, etc.) according to numerous normalization rules. Control samples analysis scheduling; • Instrument standardization, with history; • Type standardization, with history; • Management of SCT samples: supervision of the status and maintenance of Setting-Up, Control and Type Standards samples. One click creation of a batch with all samples requiring analysis; • Monitoring: instrument parameters monitoring, system event logging, peripheral device monitoring, maintenance management modules for helping defining maintenance schedule; • Integrated instrument profile tool allowing overlaid graphical view of selected channels intensities; • Integrated contextual help; • Accounts with password protection with definable access
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		and operational rights, database maintenance tools; • Full IntelliSource support with graphical Spark Shape editor; • Argon management allowing up to 100% saving during idle time • On ARL iSpark 8880 only: CCD spectrometer support: Graphical Spectrum viewer, custom library for spectral lines • Text customization and translation into any language that have a character set supported by the Windows operating system. Standard language delivery: English. Following other complimentary languages are included: Chinese, Japanese, Russian, French, German, Spanish, Portuguese and Turkish. <i>Notes:</i> - <i>A beginner manual is available as a PDF file (First Steps with OXSAS, standard language delivery is English)</i> - <i>The Software user and configuration documentation is available in the form of an integrated, contextual Help file. Standard language delivery is English.</i> - <i>The instrument computer must be dedicated to running the OXSAS software application and any afferent 3rd party software supplied or agreed by Thermo Fisher. Installing and running other software applications can be done only at the customer's own risk, Thermo Fisher does not assume the responsibility for any compatibility issue that could arise therewith.</i> - <i>Computer requirements if the computer is not supplied by Thermo Fisher Scientific (Ecublens) SARL: refer to PC-Take-Out option.</i>
6	OE-8860-IR-FE-A0	Standard Inclusion Analysis with Inclusions Report in low alloy steel Standard qualitative analysis of inclusions in low alloy steel with customizable inclusion analysis report. With Standard Inclusion Analysis with Inclusions Report in low alloy steel: • All the necessary Spark-DAT algorithms are included; • An analytical program allowing stand-alone qualitative inclusion analysis is included; • An analytical program allowing combined qualitative inclusion analysis and analysis in concentration is included;

		• A customizable inclusion analysis report for the analytical program with combined inclusion analysis and analysis in concentration is included. Different information fields can be selected (e.g. General information on the sample, general information on the analysis, important cleanness indicators, sample composition, peak and peak coincidence counts). The report can be produced automatically at the end of the sample analysis or manually from the results retrieval facility of OXSAS. The company logo can be displayed on the report. The report can be printed locally or on any accessible network printer; • Customization of programs and report is possible. The set-up of algorithms for specific inclusion types and the content of the report must be agreed with the user before completing the order.
7	OE-88-CNO	CNO Option
		Option for ultra-low determination of elements C in steels. Includes: • Improved analysis stands minimizing contamination forms; • Special low C line with special PMT tube for ultra-low carbon determination;
8	OE-8860-LINE	Analytical Channels
		Including: • Complete additional PMT channel; • Calibration of the element in qualities selected according to Thermo OE Calibration Menus. <i>Note: Maximum number of channels = 80</i>
9	OE-8860-N	Nitrogen Channel
		For analysis in Fe base, Includes: • Nitrogen line assembly; • Special spectrometer optics; • High purity vacuum system; • Argon gas purifier
10	OE-8860-O	Oxygen Channel
		For analysis in Fe base, Includes: • Oxygen line assembly; • Special spectrometer optics;

		• High purity vacuum system; • Argon gas purifier
11	OE-8860-CAL-FE-A0	Calibration of Low Alloy Steel
		Refer to Calibrations Table
12	OE-8860-CAL-FE-A4	Calibration of Carbon, Nitrogen and Oxygen in Low Alloy Steel
		Refer to Calibrations Table
13	OE-8860-CAL-FE-AS1	Calibration of Al sol/insol in LAS with PIM Method
14	OE-8860-CAL-FE-AS2	Calibration of B sol/insol in LAS with PIM Method
15	OE-8860-CAL-FE-AS3	Calibration of Ca sol/insol in LAS with PIM Method
16	OE-8860-CAL-FE-AS4	Calibration of Ti sol/insol in LAS with PIM Method
17	OE-8860-CAL-FE-G0	Calibration of Free Cutting Steel
		Refer to Calibrations Table
18	OE-8860-CAL-FE-H0	Calibration of Cr Steel
		Refer to Calibrations Table
19	OE-8860-CAL-FE-J0	Calibration of Cr-Ni Steel
		Refer to Calibrations Table
20	OE-8860-CAL-FE-J2	Calibration of Nitrogen VUV in Cr-Ni Steel
		Refer to Calibrations Table
21	OE-8860-CAL-FE-K0	Calibration of Mn Steel
		Refer to Calibrations Table
22	OE-8860-CAL-FE-L0	Calibration of Tool & High-Speed Steel
		Refer to Calibrations Table
23	OE-8860-CAL-FE-M0	Calibration of Ni-hard, Cast Iron, Nodular Iron
		Refer to Calibrations Table
24	OE-8860-CAL-FE-M2	Calibration of Nitrogen VUV in Ni-hard, Cast Iron, Nodular Iron
		Refer to Calibrations Table
25	OE-8860-CAL-FE-N0	Calibration of High Alloy Cast Iron
		Refer to Calibrations Table
26	OE-8860-CAL-FE-P0	Calibration of Ni Resist
		Refer to Calibrations Table
27	OE-8860-CAL-FE-Z0	Global Iron Calibration
		Refer to Calibrations Table
28	OE-8860-CAL-FE-Z2	Calibration of Nitrogen VUV in Global Iron
		Refer to Calibrations Table

29	OE-8860-CAL-FE-Z3	Calibration of Oxygen in Global Iron
		Refer to Calibrations Table
30	OE-8860-CAL-AL-A0	Calibration of Low Alloy Al
		Refer to Calibrations Table
31	OE-8860-CAL-AL-B0	Calibration of Pure Aluminum
		Refer to Calibrations Table
32	OE-8860-CAL-AL-C0	Calibration of Ultra-Pure Aluminum
		Refer to Calibrations Table
33	OE-8860-CAL-AL-G0	Calibration of Al-Si
		Refer to Calibrations Table
34	OE-8860-CAL-AL-H0	Calibration of Al-Si-Cu
		Refer to Calibrations Table
35	OE-8860-CAL-AL-J0	Calibration of Al-Cu
		Refer to Calibrations Table
36	OE-8860-CAL-AL-K0	Calibration of Al-Zn
		Refer to Calibrations Table
37	OE-8860-CAL-AL-L0	Calibration of Al-Mg
		Refer to Calibrations Table
38	OE-8860-CAL-AL-Z0	Global Aluminum Calibration
		Refer to Calibrations Table
39	OE-PR-AR	High Pressure Regulator
		Type HBS 315/3 for gas bottles, argon stand.
40	OE-SIRCAL-230	Rare Gas Purifier SIRCAL (230 V)
		Required to purify argon for the determination of low levels of carbon, nitrogen and/or oxygen in metals. Includes: • Stainless steel tube linking the Sircal to the instrument • 1 Ti getter tube (removes oxygen and nitrogen impurities) • 1 Cu oxide tube (removes carbon monoxide & hydrocarbons) • 1 Molecular sieve drier tube (removes moisture and carbon dioxide) • For 220 V 50/60 Hz. <i>Notes:</i> - <i>The SIRCAL purifier is included in the nitrogen channel option for ARL 3460, ARL 4460, ARL iSpark 8860, ARL iSpark 8880</i>

		<i>only (OE-34-N, OE-44-N, OE-88-N).</i> - <i>The SIRCAL purifier is included in ARL Advantage FE 4, FE 6, ARL 8820 FE 3, FE 4</i> - <i>Required for zinc base with ARL 4460</i>
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Fe Calibrations

	OE-8860-CAL-FE-A0	OE-8860-CAL-FE-G0	OE-8860-CAL-FE-H0
Element	Low Alloy Steel	Free Cutting Steel	Cr Steel
Fe	90-99.99	93-99.3	62.5-89.5
Al	0.0005-1.9	0.001-0.12	0.002-0.35
As	0.0005-0.15	0.015-0.08	
B	0.00015-0.012		
Bi	0.002-0.1		
C	0.0015-1.5	0.002-1.3	0.035-2.3
Ca	0.00015-0.005		
Ce	0.0015-0.06		
Co	0.0005-0.65	0.005-0.25	0.018-0.3
Cr	0.0015-2.5	0.006-2.5	9-31
Cu	0.002-1.5	0.006-0.7	0.025-2.3
La	0.0005-0.02		
Mg	0.00005-0.0006		
Mn	0.0005-2.4	0.05-1.9	0.2-2.8
Mo	0.001-1.6	0.001-1	0.03-2.8
Nb	0.001-0.8	0.006-0.07	0.01-2.5
Ni	0.001-2.2	0.007-2.2	0.1-6.3
P	0.0005-0.12	0.009-0.08	0.01-0.05
Pb	0.0005-0.15	0.0015-0.35	
S	0.0005-0.1	0.009-0.35	0.001-0.07
Sb	0.001-0.25		
Se	0.003-0.025		
Si	0.001-3.3	0.002-1.8	0.2-2.8
Sn	0.0005-0.25	0.001-0.1	0.003-0.06
Ta	0.005-0.2		
Te	0.001-0.015		
Ti	0.0005-0.6	0.0015-0.12	0.002-0.2
V	0.002-1	0.002-0.6	0.02-0.85
W	0.003-1.5	0.05-0.35	0.02-0.75
Zn	0.001-0.04		
Zr	0.001-0.25	0.006-0.08	

Fe Calibrations

	OE-8860-CAL-FE-A4
Element	CNO in Low Alloy Steel
C	0.0004-0.15
N	0.0009-0.045
O	0.006-0.1

Fe Calibrations

	OE-8860-CAL-FE-J0	OE-8860-CAL-FE-K0	OE-8860-CAL-FE-L0
Element	Cr-Ni Steel	Mn Steel	Tool & High Speed Steel
Fe	40-89	77.5-87.5	59-90.5
Al	0.001-1	0.004-0.1	
As	0.002-0.025		
B	0.0002-0.025		
Bi	0.002-0.02		
C	0.007-2	0.6-1.7	0.3-1.45
Ca	0.0002-0.006		
Ce			
Co	0.02-0.6	0.01-0.8	0.06-11
Cr	4-35	0.15-4	2-5
Cu	0.01-6.3	0.003-0.6	0.02-0.1
La			
Mg			
Mn	0.025-13	8.5-20	0.08-0.5
Mo	0.008-6.8	0.03-2	0.1-10
Nb	0.005-3.5		
Ni	3-38	0.04-3.8	0.03-0.45
P	0.002-0.05	0.02-0.1	0.01-0.05
Pb	0.0005-0.004		
S	0.001-0.07	0.005-0.07	0.002-0.05
Sb	0.005-0.2		
Se			
Si	0.04-4.3	0.1-1.6	0.07-0.5
Sn	0.002-0.12	0.01-0.06	
Ta	0.008-0.12		
Te			
Ti	0.002-2.2		
V	0.01-1	0.01-0.35	0.4-4
W	0.01-4.5		1.8-24.5
Zn			
Zr			
	OE-8860-CAL-FE-J2		
Element	N ₂ VUV in Cr-Ni Steel		
N	0.002-1		

Fe Calibrations

	OE-8860-CAL-FE-M0	OE-8860-CAL-FE-N0
Element	Cast & Nodular Iron & Ni Hard	High Alloyed Cast Iron
Fe	79.5-95	53-80
Al	0.003-0.15	
As	0.002-0.15	
B	0.0002-0.1	
Bi	0.002-0.025	
C	1.4-4.5	1.3-4
Ca		
Ce	0.0015-0.06	
Co	0.004-0.45	
Cr	0.02-10	12-35
Cu	0.01-2.7	0.02-1.5
La	0.002-0.02	
Mg	0.001-0.1	
Mn	0.06-1.9	0.3-2.3
Mo	0.001-2	0.25-4
Nb	0.003-0.55	
Ni	0.02-7.5	0.15-18
P	0.003-1.2	0.02-0.45
Pb	0.001-0.06	
S	0.001-0.22	0.007-0.1
Sb	0.0015-0.29	
Se	0.001-0.06	
Si	0.25-4	0.3-2
Sn	0.002-0.4	
Ta		
Te	0.001-0.04	
Ti	0.0015-0.3	
V	0.002-0.7	
W	0.003-0.2	
Zn	0.001-0.03	
Zr	0.0005-0.05	
	OE-8860-CAL-FE-M2	
Element	N ₂ VUV in Cast & Nodular Iron & Ni Hard	
N	0.004-0.013	

Fe Calibrations

	OE-8860-CAL-FE-P0	OE-8860-CAL-FE-Z0
Element	Ni Resist	Global Iron
Fe	53-79.5	30-99.8
Al		0.003-1.9
As		0.002-0.15
B		0.0005-0.1
Bi		0.003-0.1
C	0.4-3	0.01-4.5
Ca		0.0003-0.006
Ce	0.0015-0.04	0.002-0.06
Co	0.03-0.15	0.004-19
Cr	0.2-4	0.015-35
Cu	0.1-9	0.002-7
La		0.002-0.02
Mg	0.02-0.13	0.003-0.13
Mn	0.3-7.5	0.005-21
Mo	0.005-1	0.002-10
Nb	0.09-0.4	0.005-3.5
Ni	12-39	0.015-38
P	0.01-0.25	0.005-1.2
Pb		0.002-0.06
S	0.005-0.1	0.002-0.2
Sb		0.005-0.29
Se		
Si	0.5-6	0.015-6
Sn		0.002-0.4
Ta		0.01-0.6
Te		0.002-0.02
Ti		0.002-2.2
V	0.005-0.35	0.002-10
W		0.01-24.5
Zn		0.001-0.04
Zr		0.004-0.25

Fe Calibrations

Element
N

Element
O

OE-8860-CAL-FE-Z2
N ₂ VUV in Global Iron
0.005-0.9

OE-8860-CAL-FE-Z3
O ₂ in Global Iron
0.01-0.1

Al Calibrations

	OE-8860-CAL-AL-A0	OE-8860-CAL-AL-B0	OE-8860-CAL-AL-C0
Element	Low Alloy Al	Pure Al	Ultra-Pure Al
Al	93-99.99	99-99.99	99.7-99.99
Ag	0.0001-0.02	0.00005-0.02	0.00001-0.005
As	0.0006-0.05	0.0006-0.01	0.0006-0.005
B	0.00005-0.0075	0.00005-0.02	0.00005-0.001
Ba			0.00001-0.004
Be	0.00001-0.01	0.00001-0.002	0.00001-0.002
Bi	0.0005-0.08	0.0003-0.02	0.0002-0.005
Ca	0.0001-0.013	0.0001-0.006	0.00005-0.002
Cd	0.0002-0.03	0.0001-0.02	0.00008-0.0035
Ce			0.0003-0.002
Co	0.0002-0.02	0.0001-0.02	0.00005-0.002
Cr	0.0003-0.35	0.0001-0.05	0.00003-0.005
Cu	0.0002-0.5	0.0001-0.05	0.00002-0.007
Fe	0.0005-1.6	0.0002-0.18	0.0001-0.023
Ga	0.0001-0.05	0.0003-0.035	0.0001-0.002
Hg	0.0002-0.012	0.0002-0.012	0.00015-0.008
In	0.0002-0.016	0.0001-0.016	0.00008-0.002
La			0.0002-0.007
Li	0.0001-0.047	0.00005-0.01	0.00002-0.0003
Mg	0.0001-1.4	0.00008-0.05	0.00002-0.004
Mn	0.0002-1.8	0.0001-0.05	0.00008-0.005
Mo	0.0002-0.01		0.0001-0.004
Na	0.0001-0.025	0.00005-0.005	0.00002-0.003
Ni	0.0002-0.1	0.0001-0.05	0.00006-0.005
P	0.0006-0.006	0.0006-0.007	0.0005-0.006
Pb	0.0002-0.08	0.0002-0.023	0.00007-0.005
Sb	0.0008-0.04	0.0006-0.025	0.0004-0.005
Si	0.0003-1.5	0.0004-0.1	0.00006-0.012
Sn	0.0005-0.08	0.0005-0.02	0.0002-0.005
Sr			
Ti	0.0002-0.15	0.0001-0.05	0.00007-0.002
Tl			0.00004-0.0035
V	0.0002-0.045	0.0001-0.05	0.00006-0.002
Zn	0.0008-0.22	0.0004-0.055	0.0002-0.006
Zr	0.0005-0.17	0.0003-0.025	0.00006-0.01

Al Calibrations

	OE-8860-CAL-AL-G0	OE-8860-CAL-AL-H0	OE-8860-CAL-AL-J0
Element	Al/Si	Al/Si/Cu	Al/Cu
Al	72-97.5	72-93.3	85.5-98
Ag			
As			
B			
Ba			
Be	0.0003-0.024		0.0001-0.013
Bi			0.004-0.2
Ca	0.0001-0.023	0.0002-0.01	
Cd			
Ce			
Co			0.02-0.26
Cr	0.001-0.4	0.001-0.15	0.0005-0.15
Cu	0.0005-0.6	0.5-5	1.4-12
Fe	0.01-0.9	0.04-1.2	0.003-1.3
Ga			
Hg			
In			
La			
Li			
Mg	0.005-1.4	0.01-1.7	0.0015-2
Mn	0.005-0.9	0.004-0.7	0.005-1
Mo			
Na	0.0001-0.015	0.0001-0.005	
Ni	0.0005-0.1	0.001-2.2	0.002-2.2
P	0.0006-0.004	0.0006-0.017	
Pb	0.001-0.1	0.0005-0.3	0.0005-0.5
Sb	0.0008-0.45	0.002-0.3	
Si	1-27	3-27	0.005-2.6
Sn	0.0005-0.1	0.001-0.35	0.001-0.3
Sr	0.0005-0.15	0.0005-0.15	
Ti	0.001-0.25	0.001-0.2	0.002-0.27
Tl			
V			0.0008-0.13
Zn	0.002-0.3	0.003-3.6	0.001-3
Zr			0.005-0.23

Al Calibrations

	OE-8860-CAL-AL-K0	OE-8860-CAL-AL-L0	OE-8860-CAL-AL-Z0
Element	Al/Zn	Al/Mg	Global Al
Al	85-99	88-98	72-99.5
Ag			
As			0.0006-0.045
B		0.0001-0.004	0.0002-0.015
Ba			
Be	0.0001-0.01	0.0001-0.008	0.0002-0.025
Bi			0.001-0.2
Ca			0.0001-0.023
Cd		0.0002-0.01	0.0002-0.05
Ce			
Co		0.0002-0.01	0.0002-0.26
Cr	0.005-0.45	0.001-0.35	0.0005-0.4
Cu	0.008-4.2	0.001-0.4	0.0005-12
Fe	0.003-0.8	0.006-0.6	0.001-1.25
Ga			0.0002-0.042
Hg		0.0002-0.014	0.0005-0.014
In			
La			
Li		0.0001-0.01	0.0001-0.047
Mg	0.05-3.5	1-11	0.0005-11
Mn	0.007-0.6	0.04-1	0.001-1.8
Mo			
Na		0.0001-0.004	0.0001-0.025
Ni	0.0006-0.3	0.002-0.1	0.0005-2.2
P			0.0006-0.016
Pb	0.0005-0.2	0.003-0.05	0.0005-1.1
Sb		0.001-0.01	0.001-0.45
Si	0.004-2	0.02-1.5	0.001-27
Sn	0.0005-0.1	0.002-0.05	0.0005-0.35
Sr			0.001-0.15
Ti	0.001-0.2	0.002-0.15	0.0003-0.25
Tl			
V		0.002-0.04	0.001-0.13
Zn	0.8-8	0.01-0.23	0.002-8
Zr	0.01-0.2	0.003-0.15	0.0005-0.28