

Sequential Plasma Emission Spectrometer

ICPS-7510



At your will, without restriction

“At your will, without restriction” is the key phrase of this ICPS-7510.
It can be used for a wide range of analytical assessments,
from research and development to environmental management -
“At your will, without restriction”.



Emission spectrometry that employs inductively coupled plasma (ICP) for its light source is particularly suited to the analysis of solution samples. With the increase in recent years of the number of samples and elements analyzed, the speed and high precision of ICP emission analysis is making it widely adopted in the field of official laws, such as JIS, ISO, and the Japanese Water Works Law.

The scope of elemental analysis using an emission spectrometer with a plasma light source is limitless.

The ICP light source is characterized by

High detection capability on the ppb level.

Little interference between elements.

Wide range of analyzed concentrations.

Excellent precision and reproducibility.

The sequential plasma emission spectrometer that realizes operation free of restrictions

SEQUENTIAL PLASMA SPECTROMETER

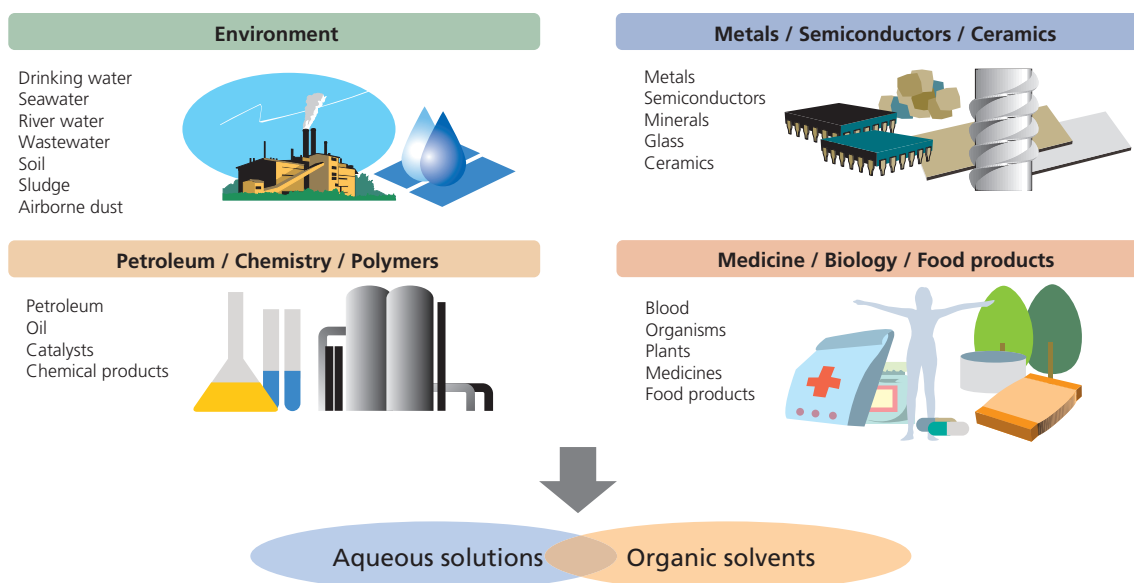
ICPS-7510

- Accurate spectral measurement of a wide range of wavelengths at a high resolution and sensitivity.
- All types of samples can be analyzed at will, such as acidic/aqueous solutions, and organic solvents.
- The radio frequency generator has sufficient power supply (Max. 1.8 kW) for various analyte.
- Excellent stability in its radio frequency power source, spectrometer, and gas flow rate.
- Easy to use automated functions and a comprehensive data processing menu.
- Small installation footprint.

The ICP that works at your will, without restrictions

**Produces high precision analytical results in all kinds of fields,
such as the detection of ultra trace elements, and chemical composition analysis.**

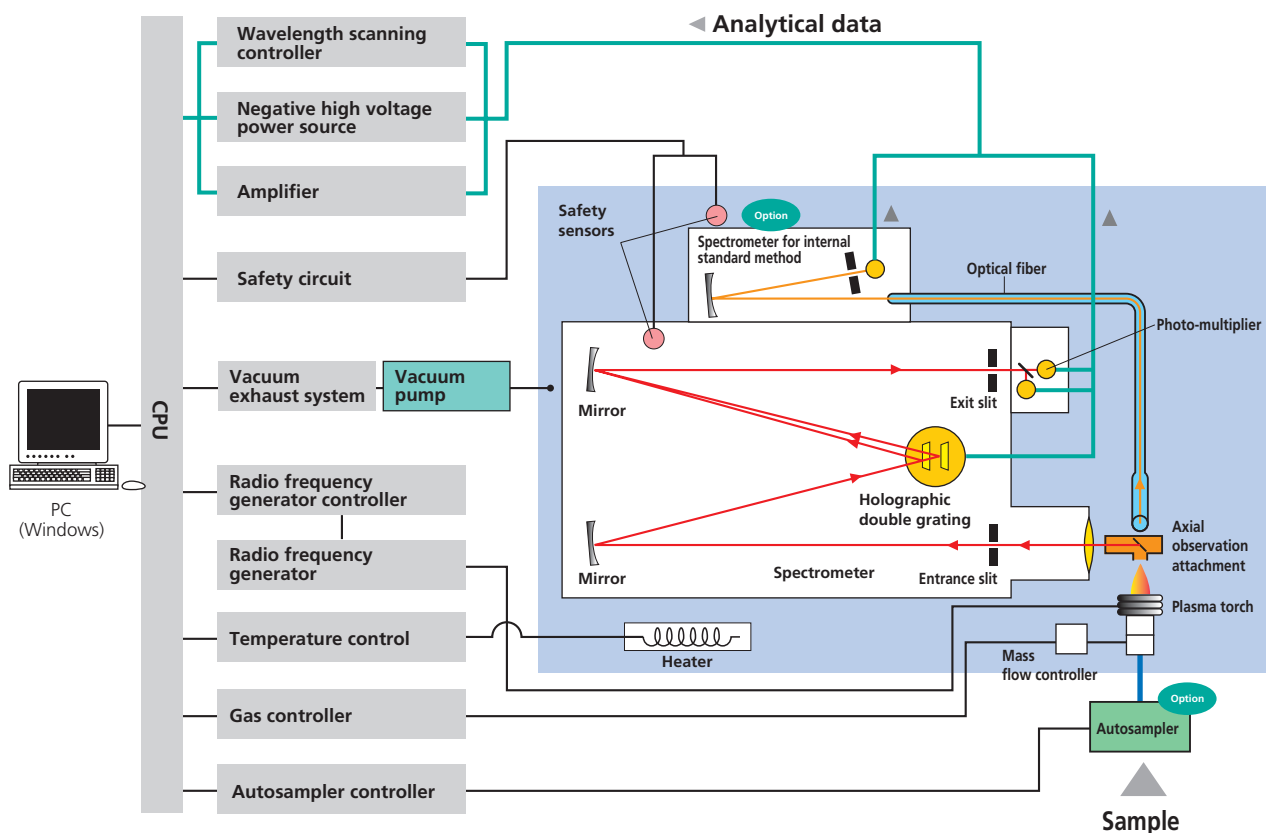
The "Shimadzu Sequential Plasma Emission Spectrometer ICPS-7510" can be employed in applications where a broad range of highly precise analytical assessments are required, from ultra trace elements to analyses involving high concentrations, such as in chemical composition analysis. Such applications include high precision elemental analysis for research and development, analysis of the important major elements in production control, and environmental management analyses such as water quality control, which has a great effect on our lives.



Elements analyzed by the ICPS-7510

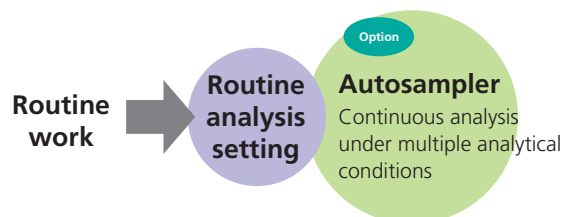
1 ppb and below Between 1 and 10 ppb Between 10 and 100 ppb 100 ppb and above

1a	2a	3b	4b	5b	6b	7b	8			1b	2b	3a	4a	5a	6a	7a	0
1 H	SHIMADZU INDUCTIVELY COUPLED PLASMA SPECTROMETER																2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	* L	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	** A															
* L	57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	Detection limits of the ICPS-7510 <div>1 ppb and below Between 1 and 10 ppb Between 10 and 100 ppb 100 ppb and above</div>	
** A	89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr		



The routine analysis setting supports analytical work

The routine analysis setting is convenient in analyses such as water quality inspection and quality control where analysis is repeated under set analytical conditions. Continuous analysis can be executed under multiple analytical conditions, and automatic analysis employing the autosampler (option) can achieve significant labor savings.



The setting of analytical conditions, the condition of the instruments, and the settings of each type of controller required in analysis are all controlled with the PC.

Spectrometer temperature regulation to achieve precision with stability

The main spectrometer and the spectrometer for internal standard method (option) are constantly regulated to a fixed temperature to maintain a high degree of precision and stability in the analytical results.

The optimal plasma power controls high precision analysis

The optimal power settings are made automatically in order to execute high precision analysis with the best plasma flame.

The mass flow controller controls the gas flow rate for stable analysis

Control over the gas flow rate is exercised through the digital mass flow controller. This prevents variations in analytical precision caused by changes in the gas flow rate.

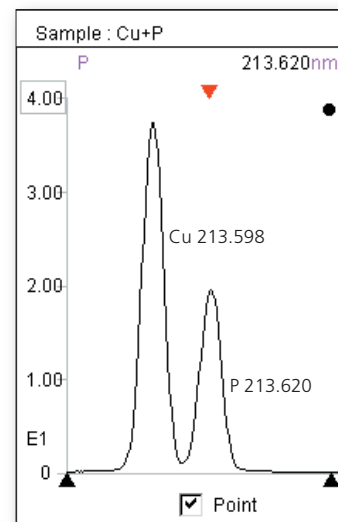
Applicable to all types of analytical assessments

Resolution

0.0066 nm
0.013 nm

High Resolution

The resolution is high, at 0.0066 nm (160 to 458 nm) and 0.013 nm (458 to 850 nm).
The effect of adjacent spectra is minimal, which enables high precision trace analysis.



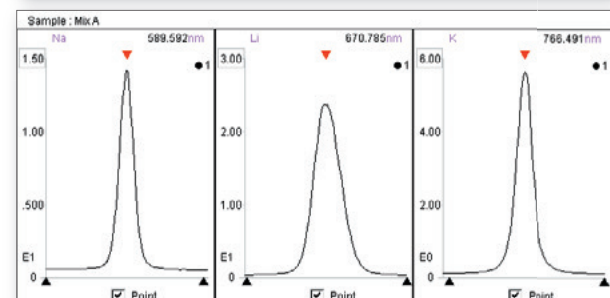
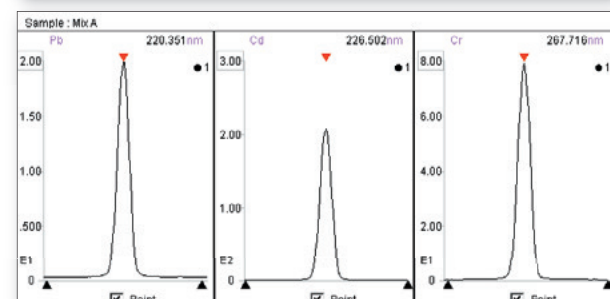
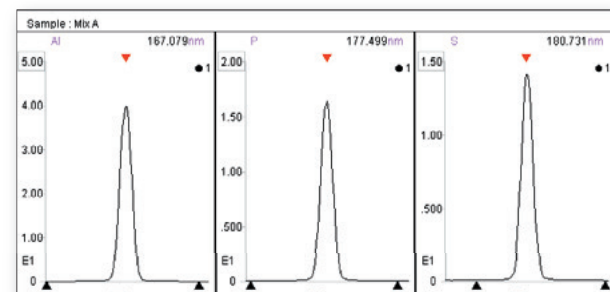
The ICPS-7510 sharply resolves the Cu 213.598 nm and the P 213.620 nm.

Holographic double grating

For short wavelengths: **3600** grooves/mm
For long wavelengths: **1800** grooves/mm
160 nm to 850 nm

Covers a wide range of spectral measurements

A holographic double grating with 3600 grooves/mm for short wavelengths and 1800 grooves/mm for long wavelengths is installed. A wide range of spectra from 160 nm to 850 nm can be measured at will under computer control.
High precision analysis is possible for elements that have intense spectra in the vacuum ultraviolet region - Al, P, S, B - as well as for elements that have their spectra in the near infrared region such as Li, K, and Rb.

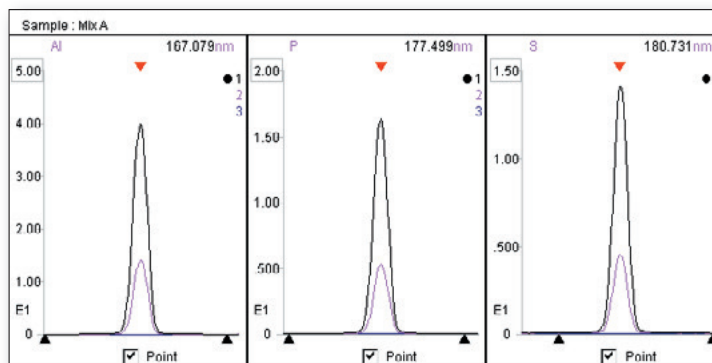


Stable analysis with a vacuum type spectrometer

The inside of the spectrometer is a vacuum. This enables highly sensitive analysis of Al, P, S, B, I, Br, Hg etc. which have intense spectra in the vacuum ultraviolet region.

A gas purge is unnecessary, which means that there is no fluctuation due to convection of the purge gas, and no distortion of the optical system. This leads to a short stabilization time, and the continuance of stable analysis over a long period of time.

The condenser lens can be cleaned in the vacuum, which means that the internal parts of the spectrometer will not be exposed to the atmosphere.



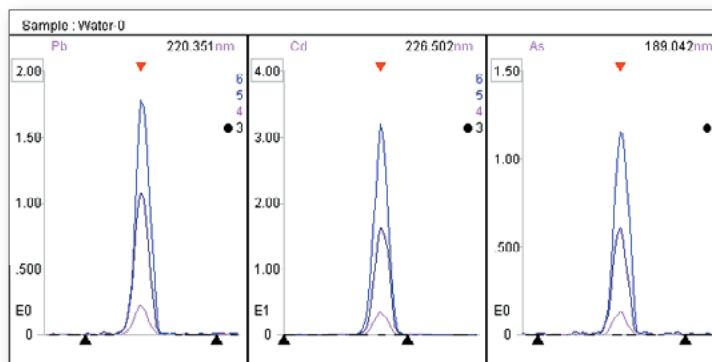
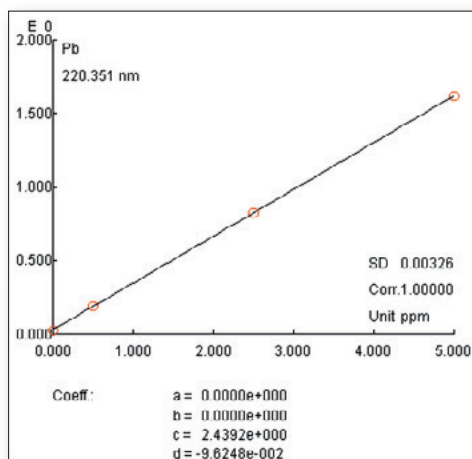
Limits of detection (3σ)

Element	Wavelength	$\mu\text{g/L}$
Al	167.079	0.3
P	177.499	2.0
S	180.731	4.0

* Using the standard nebulizer (measurement in the radial direction)

Highly sensitive analysis through axial observation

With the attachment for observing the light in the axial direction that comes as standard, the ICPS-7510 is configured for ultra trace analysis. Combined with the observation of the plasma in the radial direction, analyses can be made from ultra trace amounts to high concentrations.



Limits of detection (3σ)

Element	Wavelength	$\mu\text{g/L}$
Pb	220.351	2.0
Cd	226.502	0.3
As	189.042	4.0

* Using the standard nebulizer

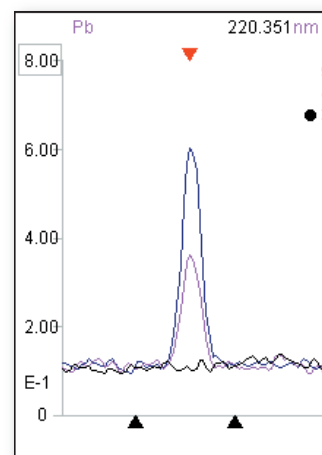
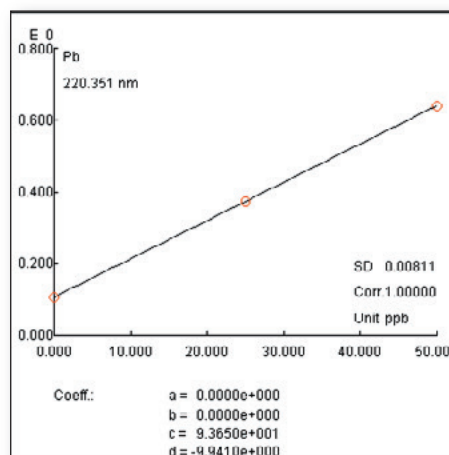
Applications at your will, without restrictions

Environmental standards

River water

Example of the measurement of Pb in river water

By using the axial observation system and the ultrasound nebulizer (option), the spectrometer is configured for applications that demand high sensitivity, such as those concerned with environmental standards and the Japanese Water Works Law.

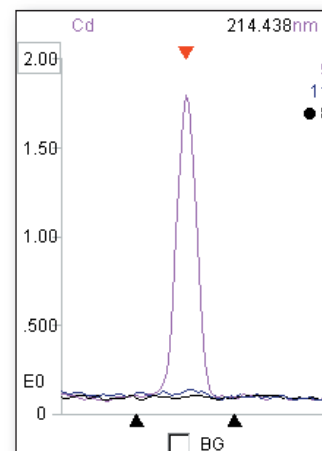
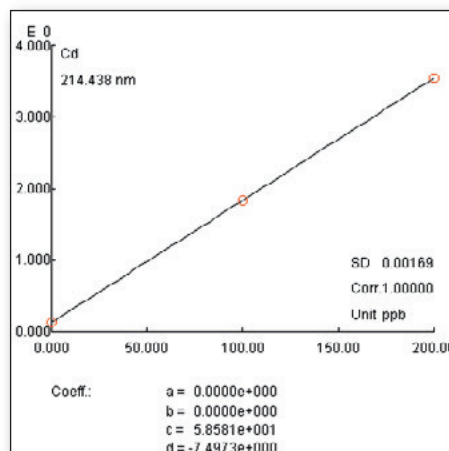


Environmental standards

Sea water

Example of analysis of Cd in sea water

The direct injection of high matrix samples is possible, and trace elements can be measured with a high degree of sensitivity.

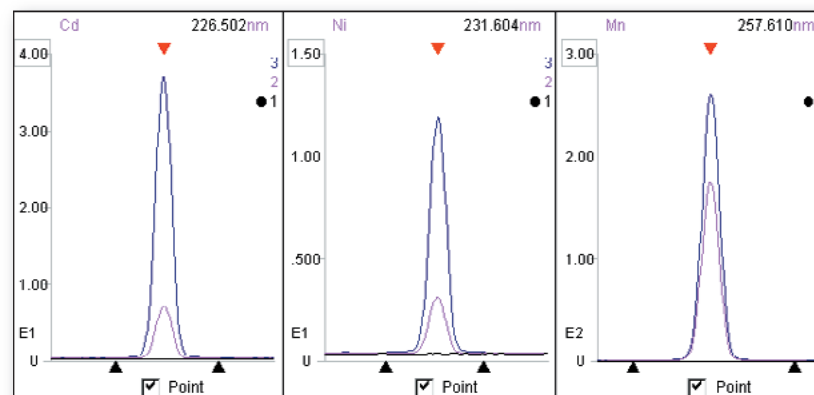


Atmosphere

Airborne dust

Example of analysis of standard urban airborne dust substances (NIST SRM1648)

Ultra trace amounts of dust samples collected with an air sampler can be easily measured at a high sensitivity through simultaneous analysis.

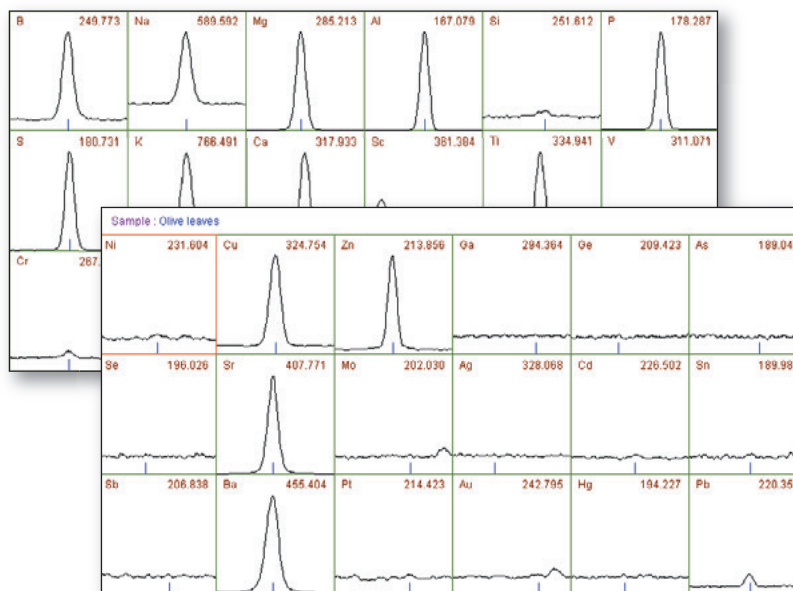


Safety standards

Food products / Medical supplies

Example of the qualitative analysis of an olive leaf

It can be used for a variety of samples such as raw materials, produce, and additives. Multiple element, simultaneous analysis can be performed, such as analysis of nutritional compounds.

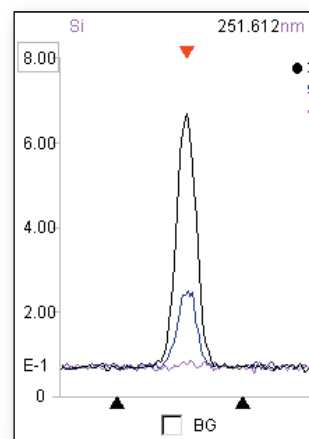
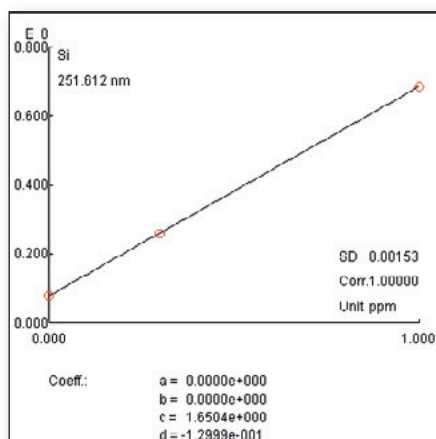


Organic solvents

Vegetable oil

Example of analysis of vegetable oil (xylene diluted)

The direct injection of organic solvents can be done with ease due to the excellent radio frequency generator. In addition, high sensitivity measurement can be achieved within organic solvents as well.

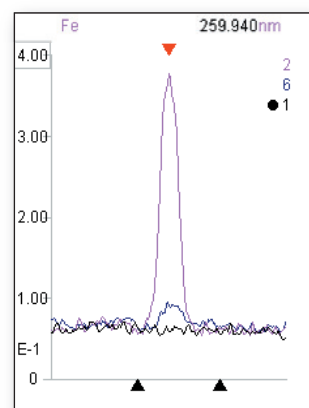
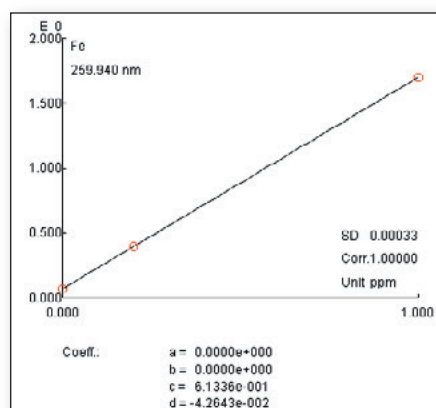


Analysis of chemical products

Synthetic resins

Example of the analysis of a synthetic resin (dissolved in DMAC)

Even solid chemical products such as synthetic resins can be measured with ease and at a high degree of sensitivity, either directly after being dissolved in a solvent, or by dilution.



Operation is of course at your will, without restriction

Control over the whole device, including analytical operation, is exercised through a personal computer. Device control and alteration of analytical conditions is possible at will, and without restrictions. Analysis can be performed through simple operations made possible by PC control. Features include the routine analysis mode where multiple types of samples can be analyzed continuously, and the ability to print out measurement results in report format.

**The emission spectrometer is
controlled by a PC**

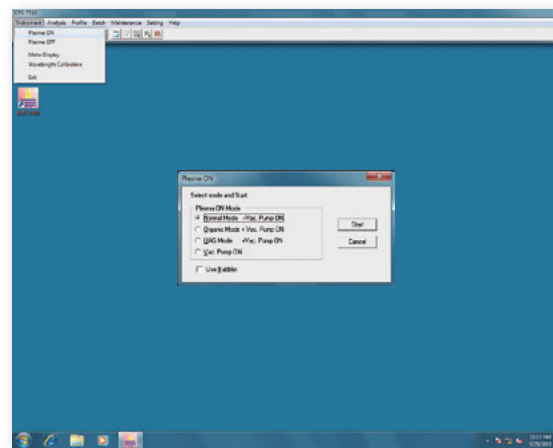
All aspects of control over the device, and not just the analytical operation, can be exercised through instructions given on the PC screen.

Analysis can be started by just registering the name of the sample since the analytical conditions have been readied beforehand.

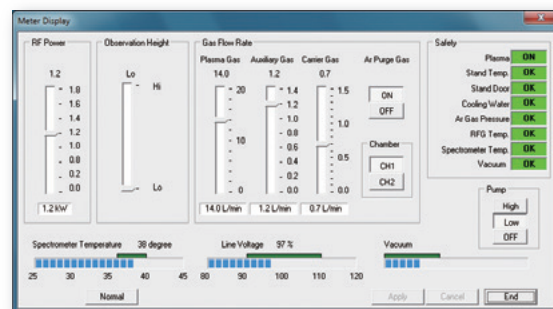
The analytical conditions can be altered with ease, and incorporated into the routine. A routine analysis mode that performs continuous analysis under multiple conditions has also been set.

The measurement results can be expanded directly in a report format into software commonly available on the market.

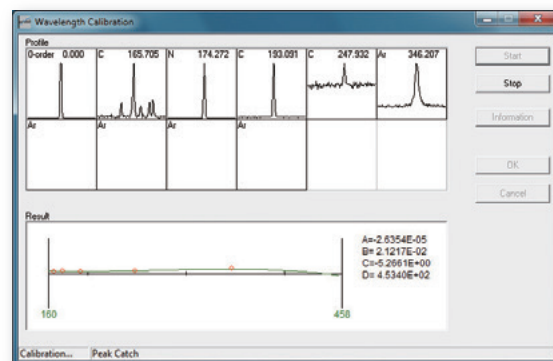
Starting up the program



Program start up Plasma ignition



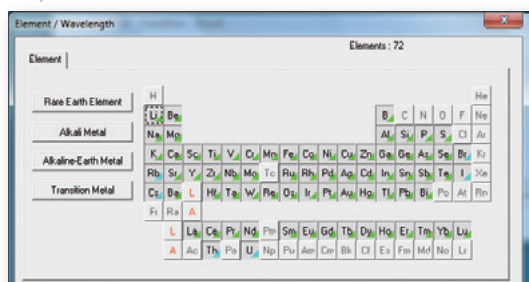
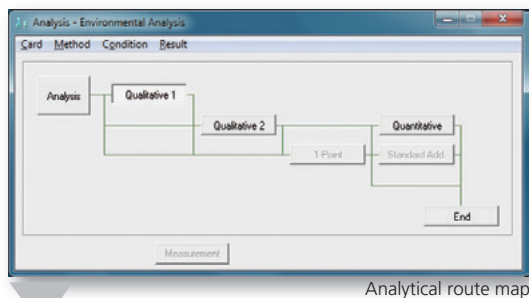
Meter display



Wavelength calibration



All element determination

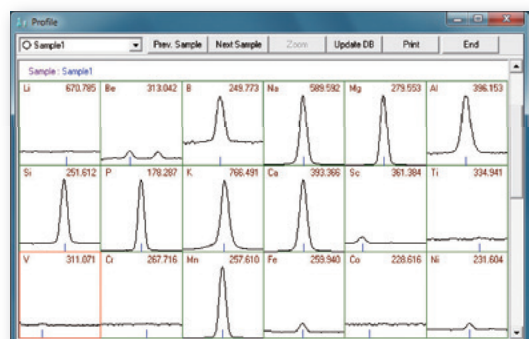


Selection of element wavelengths

All that is required is to select the wavelength

No.	Type	Repeat	Sample Name	Weight	Table	Status
1	Sample	1	Sample1	.00000	1	
2	Sample	1	Sample2	.00000	2	
3	Sample	1	Sample3	.00000	3	
4	Sample	1	Sample4	.00000	4	
5	Sample	1	Sample5	.00000	5	

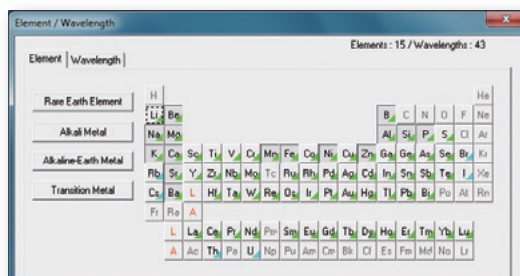
Measurement



	Na 120	K 160			
>100ppm	Na 120	K 160			
>1ppm	Mg 7.1	Al 1.4	P 6.3	Ca 1.8	Mn 1.3
>0.1ppm	Si 50				
<0.1ppm	Li .0049	Be .0015	B .039	Sc .0068	Ti .0053
	Cr .0026	Fe .037	Co .0020	Ni .032	Cu .0077
	Ga .033	Ge .011	As .011	Se .010	Sr .0051
	Zr .0016	Nb .021	Mo .0027	Pd .016	Ag .0034
					Cd .0007

Display of the measurement results values

High precision determination



Selection of element wavelengths

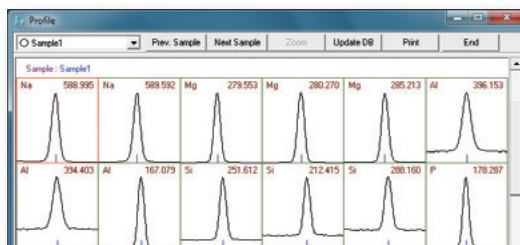
All that is required is to select the wavelength

Wavelength	BEC	ATT	Wavelength...	Order
<input checked="" type="checkbox"/> 213.856	.060000	15	213.923	1
<input checked="" type="checkbox"/> 202.551	.140000	15	202.616	2
<input checked="" type="checkbox"/> 206.191	.180000	15	206.257	3
<input type="checkbox"/> 334.502	2.200000	15	334.598	
<input type="checkbox"/> 300.250	1.300000	15	300.354	

Selection of measurement wavelength

Selection of measurement wavelength

The measurement wavelengths are set automatically



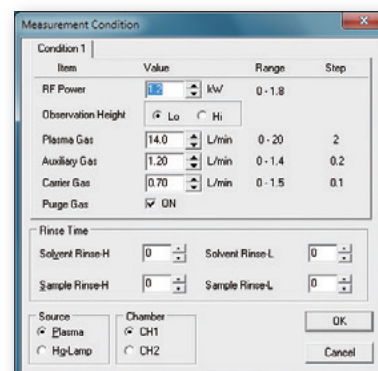
Sample1	Prev. Sample	Next Sample	Confidence	Print	End
>100ppm	Na 120	K 160			
>1ppm	Mg 7.0	Al 1.0			
>0.1ppm	Si 43	P 6.1	Ca 1.3	Mn 1.3	
<0.1ppm	Be .0001	B .032	Fe .031	Ni .032	Zn .079
	Be .0038				Sr .0044

Display of the results values

Display of the results values

Setting the measurement conditions

Although it is preset to the optimal conditions, it can be changed at will.

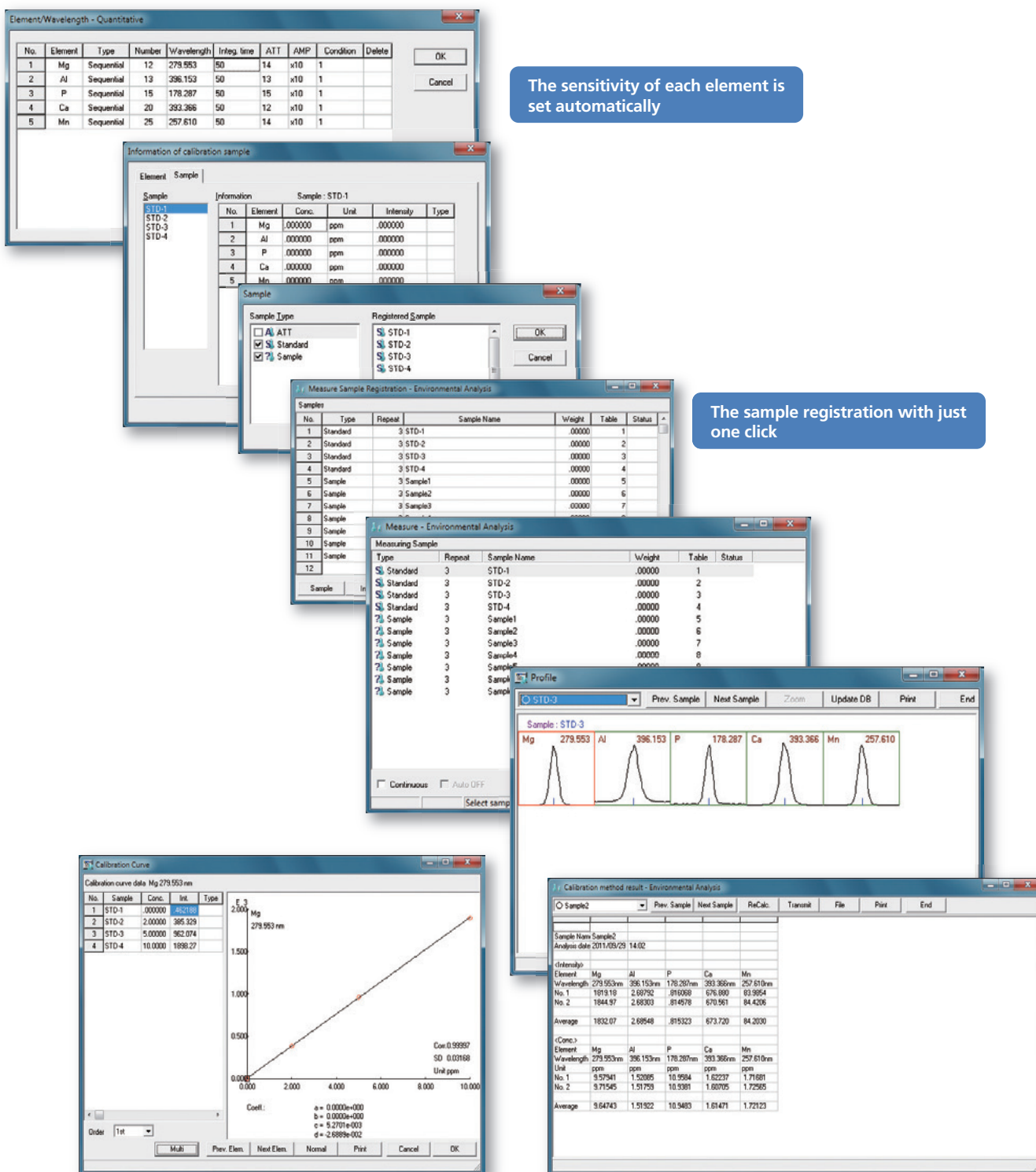


Quantitative analysis

The conditions for quantitative analysis are automatically generated from qualitative analysis in order to minimize the labor required to prepare for measurement.

The sensitivity of each element is set automatically

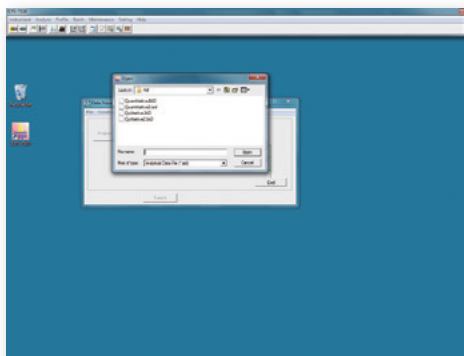
The sample registration with just one click



Data Search and Report Formation at your will, and without restrictions

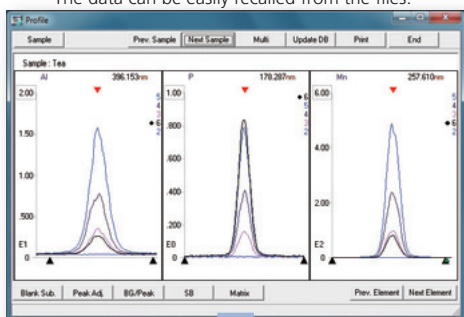
Processing the analytical data

The results of the qualitative analysis 1, qualitative analysis 2, and the quantitative analysis of the measured data will be filed.
The measurements profiles will of course be filed in the same way.

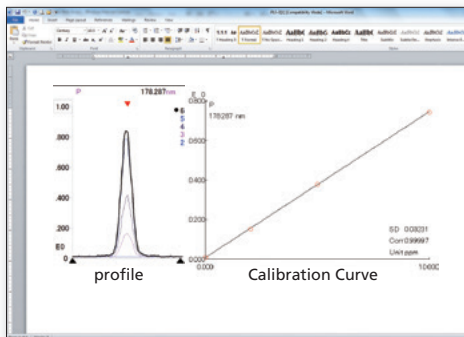


Reading the data

The data can be easily recalled from the files.



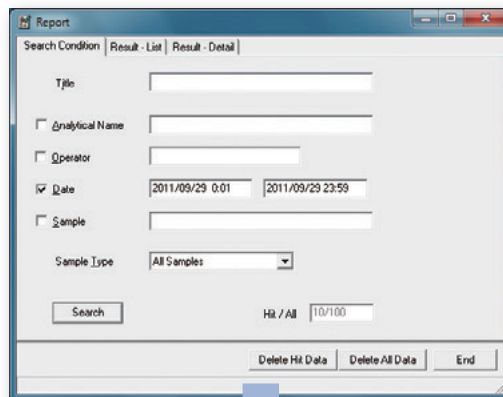
Paste into generic software



Data display

Creating the report

The name of the analysis, sample name, date etc. are searched for out of the filed quantitative results. Analytical reports can be easily created based on the results of these searches.

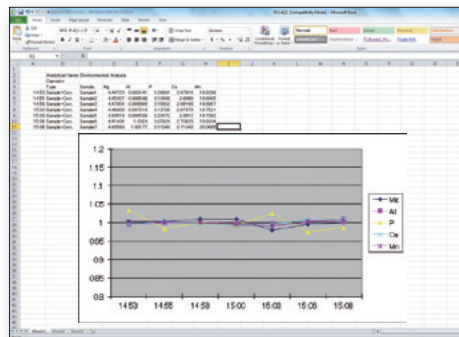


Reading the data

The necessary data can be easily retrieved with wild cards.

Analytical Name	Operator	Type	Sample	Mg	Al	P	Co
2011/09/29 14:53	Sample-Con.	Sample1	4.44723	993141	3.20901	2.67914	
2011/09/29 14:55	Sample-Con.	Sample2	4.45307	99540	3.10950	2.69090	
2011/09/29 14:58	Sample-Con.	Sample3	4.47254	390990	3.15902	2.69169	
2011/09/29 15:00	Sample-Con.	Sample4	4.48003	997216	3.13739	2.67379	
2011/09/29 15:03	Sample-Con.	Sample5	4.34518	99838	3.23472	2.68120	
2011/09/29 15:06	Sample-Con.	Sample6	4.41404	1.00240	2.07924	2.70920	
2011/09/29 15:08	Sample-Con.	Sample7	4.43993	1.00177	3.11349	2.71043	

Paste into generic software

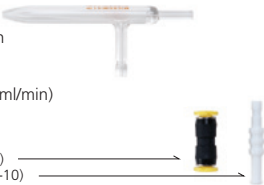

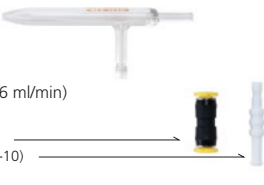

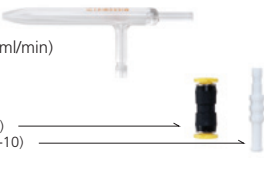

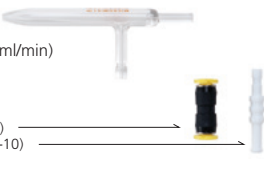



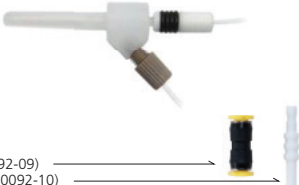





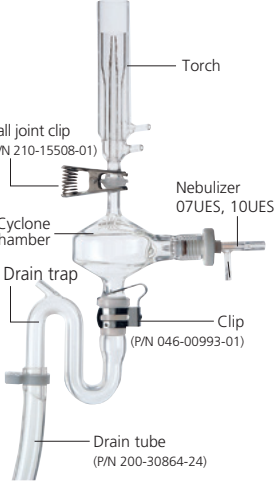



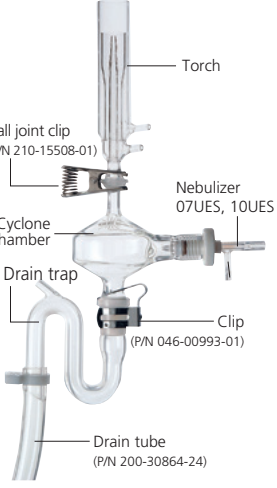


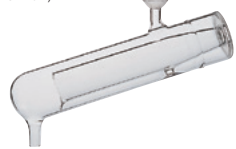

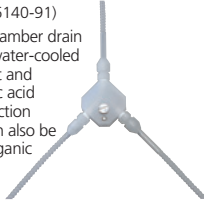

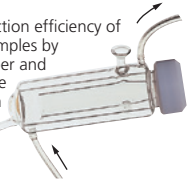
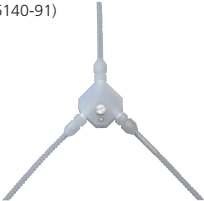



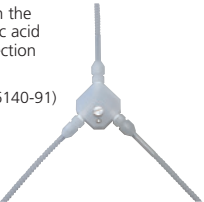
Creating the report

The analysis/search results can be pasted into various word processing and spreadsheet software such as Microsoft Excel, helping in the creation of reports etc.

Accessories, Options

Note) Purchase items individually for sample types without a part number (P/N)

Sample Type	Item	Nebulizers	Sample Take-up Tubing
Standard Set ICPE-7510 Standard Accessories		Nebulizer, 10UES (P/N 046-00092-20) Designed for high-concentration samples, with high-efficiency nebulization. (Sample take-up rate approx. 1 ml/min) 	Take-up tube ASSY, NFTS-075 (P/N 046-00092-06) For "10UES" and "07UES" nebulizers. 
For Small Amounts of Samples		Nebulizer, 07UES (P/N 046-00092-21) A nebulizer with high-efficiency nebulization. (Sample take-up rate approx. 0.6 ml/min) 	Take-up tube ASSY, NFTS-075 (P/N 046-00092-06) For "10UES" and "07UES" nebulizers. 
High Salt Samples (Used to inject high salt concentration samples)		Nebulizer, 10UES (P/N 046-00092-20) (Sample take-up rate approx. 1 ml/min) 	Take-up tube ASSY, NFTS-075 (P/N 046-00092-06) For "10UES" and "07UES" nebulizers. 
Organic Solvent Samples (Injection systems for organic solvents)		Nebulizer, 10UES (P/N 046-00092-20) (Sample take-up rate approx. 1 ml/min) 	Take-up tube ASSY, NFTS-075 (P/N 046-00092-06) For "10UES" and "07UES" nebulizers. 
Organic Solvent Samples (Water-cooled chamber) (Controls evaporation of solvents)			
Hydrofluoric Acid Sample Injection System (P/N 211-42853-03) (Used for hydrofluoric acids)		Nebulizer, PFA1S (P/N 046-00092-17) 	

Chambers	Torches	Drains	Other
Cyclone chamber, HE (P/N 046-00093-02)  <p>Locking screw, 0152 (P/N 046-00093-92) Seal, 0237 (P/N 046-00093-93) These are included.</p>	Torch (P/N 204-70272) 	Drain trap, 8214 (P/N 046-00093-01) Drain trap for Cyclone chamber (Indicated by "●")  <p>Torch Ball joint clip (P/N 210-15508-01) Nebulizer 07UES, 10UES Cyclone chamber ● Drain trap Clip (P/N 046-00993-01) Drain tube (P/N 200-30864-24) (Cyclone chamber assembly)</p>	Ball joint clip (P/N 210-15508-01) Connects the cyclone chamber and torch. Clip (P/N 046-00993-01) Fixes the drain trap to the cyclone chamber. Drain tube (P/N 200-30864-24) This is the tube from the drain tube to the drain. Water bubbler (P/N 204-19281) Used to prevent blockages in the nebulizer when analyzing samples containing large amounts of sodium. Inserted in the carrier gas pathway. 
Cyclone chamber, HE (P/N 046-00093-02)  <p>Locking screw, 0152 (P/N 046-00093-92) Seal, 0237 (P/N 046-00093-93) These are included.</p>	Torch (P/N 204-70272) 	 <p>(Cyclone chamber assembly)</p>	
Cyclone chamber, HE (P/N 046-00093-02)  <p>Locking screw, 0152 (P/N 046-00093-92) Seal, 0237 (P/N 046-00093-93) These are included.</p>	Torch for high-concentration salt solution samples (P/N 204-74323) Used when introducing an undiluted solution of a sample where the base element is of the % order of concentration. 		
Chamber drain straight (P/N 211-80437-01) 	Torch for organic solvent samples (P/N 204-77296) Used when analyzing organic solvent samples that are difficult to inject into the plasma. 	Drain kit* (P/N 211-86140-91) Used for chamber drain (straight), water-cooled chamber kit and hydrofluoric acid sample injection system. Can also be used for organic solvents. 	Bracket (P/N 211-85456-91) Metal fittings for drain kit installation. Nebulizer holder kit type 2 (P/N 211-48062) Includes organic solvent resistant O-rings. They are attached to each chamber other than the cyclone chamber, and are used to support nebulizers. 
Water-cooled chamber kit (P/N 211-43472) This increases injection efficiency of organic solvent samples by cooling the chamber and suppressing sample evaporation within the chamber.  <p>*Cooling water circulator is necessary.</p>		Drain kit* (P/N 211-86140-91) 	Low-temperature thermostatic chamber NCB-1200 (SP) for water-cooled chambers (P/N 044-01910-01) 
Chamber ASSY (P/N 205-07778-02) 	Demountable torch (P/N 205-09627-01) 	Drain kit* (Included in the hydrofluoric acid sample injection system) (P/N 211-86140-91) 	Bracket (P/N 211-85456-91) Metal fittings for drain kit installation. (Not included in the hydrochloric acid sample injection system. Please purchase separately.)

*Bracket is required when installing the Drain kit to ICPS-7510.

Options

Accessories that enable automatic analysis and sample introduction at your will, without restrictions

A wide variety of peripherals

Autosampler AS-9

(P/N 211-43575-01)

After placing the samples in the autosampler, the sample names and all the analysis conditions can be set in a PC, and several samples analyzed continuously.

Size: W470 × D268 × H370 mm
Electrical power is supplied from the main unit. (DC 24 V, DC 5 V)
Note: A table ND is necessary.



Table ND with caster (P/N 219-96005)

Size: W600 × D480 × H750 mm

Autosampler AS-8T

(P/N 205-04940-02)

For organic solvents (P/N 211-48059-01)

This type handles both beakers and test tubes. It can be loaded with 100 of the 20ml test tubes or 50 of the 30ml beakers.

Size: W500 × D680 × H525 mm
Electrical power is supplied from the main unit. (Single phase 100 V, 50/60 Hz, 3 A)
Note: A SO table is necessary.



SO Table (P/N 210-44026)

Size: W600 × D600 × H690 mm
With caster

Ultrasonic nebulizer UAG-1

(P/N 205-09295)

This is a sample injection system developed for high sensitivity ICP analysis. Unlike the usual nebulizer that uses the negative pressure of the carrier gas, this nebulizer uses ultrasonic energy to nebulize a solution.

Ultrasonic energy can produce large amounts of extremely fine particles. This enables the UAG-1 to perform analyses at a high sensitivity of 10 to 100 times the sensitivity of conventional nebulizers.

Size: Main unit W320 × D380 × H540 mm
Power supply W382 × D360 × H159 mm
Power supply: Single phase 100 V, 50/60 Hz, 10 A
Note: A cooling water system is necessary as a utility.



Table ND with caster (P/N 219-96005)

Size: W600 × D480 × H750 mm

Hydrofluoric acid sample injection system HFS-2

(P/N 211-42853-03)

Samples composed primarily of silicates, such as rocks, soil, cement and ceramics are insoluble or dissolve poorly in strong acids. When hydrofluoric acid is used to dissolve these samples, normal injection systems cannot be used as they are made of glass. A sample dissolved in hydrofluoric acid can be injected into the plasma directly by using an injection system made of fluorinated ethylene resin.

Note: A Bracket is necessary.



Bracket (P/N 211-85456-91)

Hydride generator HVG-1

(P/N 206-17143 to 58)

The elements within the sample are reduced and vaporized by the nascent hydrogen generated in the decomposition of sodium borohydride. Only the gas phase is injected into the plasma to achieve measurement with a high degree of sensitivity.

As, Se, Sn, Te, Bi etc. can be measured.

Size: W333 × D214 × H195 mm
Power supply: Single phase 100 V, 50/60 Hz, 2 A
Note: A table ND (with casters) is necessary.
HVG-ICP connection kit (P/N 211-40981-02) and pump are necessary.



Table ND with caster (P/N 219-96005)

Size: W600 × D480 × H750 mm

Peristaltic pump (P/N 204-77310-01)

Used in the analysis of high viscosity samples. A fixed sample injection is possible.



Spectrometer for internal standard method (P/N 205-02165-02)

This is installed in the Shimadzu sequential plasma spectrometer to perform simultaneous internal standard analysis.

Specifications

Optical mount: 0.5 m Pachern-Runge mount
No. of grooves in the diffraction grating: 2700 grooves/mm
Internal standard element: Y (371.0 nm)
Light guide: by optical fiber
Place of installation: Installed inside the thermostatic chamber of the main unit.

Cooling water circulator CA-1115A-1 (P/N 044-01813-01)

For the ultrasonic nebulizer UAG-1
For the ICPS-7510

Size: W354 × D384 × H851 mm 43 kg
Power Supply: Single phase 100 V 50/60 HZ 15 A
Note: When only the main unit ICPS-7510 is connected the piping kit A is needed.
When the ultrasonic nebulizer UAG-1 is also connected the piping kit B is needed.



Low temperature thermostatic water heater NCB-1200 (SP) (P/N 044-01910-01)

For the water cooled chamber kit

Size: W238 × D450 × H592 mm 25 kg
Power supply: Single phase 100 V, 50/60 Hz, 8 A



Piping kit A: Main unit only (P/N 211-83633-01) Piping kit B: Main unit and UAG-1 (P/N 211-83633-02)

Specifications

Spectrometer unit

Optical system	Czerny-Turner mounting
	Double grating
Focal length	1000 mm
No. of diffraction grating grooves and wavelength range	3600 grooves/mm for 160 to 458 nm
	1800 grooves/mm for 458 to 850 nm
Reciprocal dispersion	0.22 nm/mm (3600 grooves)
	0.44 nm/mm (1800 grooves)
Detector	Photo-multiplier tube
Slit	Entrance slit 20 μ m
	Exit slit 30 μ m
Wavelength scanning	Sine-bar method
	Driven by a computer controlled pulse motor
	Minimum step wavelength 0.0002 nm
	Maximum speed 50 nm/sec (3600 grooves)
Temperature control	Proportional control method $38 \pm 0.1^\circ\text{C}$
Exhaust system	Rotary pump exhaust capability 160 liters/minute
	With oil backflow prevention valve

ICP light source

Torch unit	Cyclone chamber (misting chamber)
	Quartz plasma torch
	Coaxial type nebulizer
Observation position switching	Up and down, 2 steps (during radial observation)
Gas controller	3 plasma flow channels
	Flow rate setting range (computer controlled)
	Plasma gas 2 to 20 liters/minute
	Auxiliary gas 0.2 to 1.4 liters/minute
	Carrier gas 0.1 to 1.5 liters/minute
	Purge gas 3.5 liters/minute
Axial observation attachment	Direction of observation can be changed (radial/axial)

Radio frequency generator

Oscillator	Crystal oscillator
Frequency	27.120 MHz $\pm 0.05\%$ (ISM band)
Output	0.8, 1.0, 1.2, 1.4, 1.6, 1.8 kW
Output stability	Within $\pm 0.3\%$
Radio frequency circuit element	Transistor
Ignition method	Fully automatic ignition
Load matching	Automatic matching (auto tuning)
With safety function	Radio frequency generator temperature fault detection

Photometry and control

Negative high voltage power supply	Variable 16 steps
Photometric method	Sequential element measurement method
Dynamic range	9 figures

Data processor

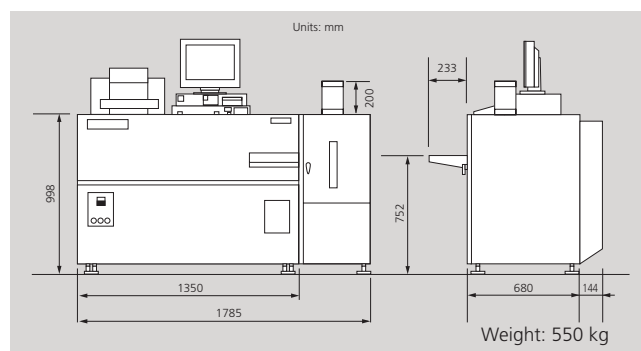
Personal computer	
CPU	Intel Celeron 1.6 GHz or higher
Memory	Main memory: RAM 512 MB
External memory device	1 CD-ROM installed
	Hard disk over 80 GB
Display	17 inch color TFT
Printer (option)	Monochrome laser printer
	Matrix inkjet printer

Software

OS	Windows 7
No. of measurement wavelengths	Qualitative analysis 1: 72 elements \times 1 wavelength
	Qualitative analysis 2: 72 elements Maximum 216 wavelengths
	Quantitative analysis: 72 elements Maximum 72 wavelengths
Database	Analyzed wavelengths data: 72 elements, maximum 16 wavelengths
	Wavelength table: Approx. 110,000 wavelengths recorded
Analysis cards	100 cards
Quantitative analysis	Calibration curve sample Maximum 16 samples per card
	Drift correction
	Internal standard correction (sequential internal standard correction)
	Background correction
	Blank signal elimination
	Matrix correction

* Windows is a registered trademark of Microsoft Corporation in the United States and other countries.
 * Intel and Celeron are registered trademarks of Intel Corporation in the United States and other countries or trademarks of the subsidiary company.

External dimensions



Installation

Installing the ICPS-7510

1. Installation room environment

Temperature	18 to 28°C (Rate of temperature change: 2°C/h or lower)
Humidity	70% or below
Avoid places with a lot of vibration or dust.	

2. Power source

Main unit	3-phase, 200/220 V \pm 10%, 50/60 Hz, 20 A
Data processor unit	Single phase (supplied from the main unit)

Options

- Autosampler AS-9/AS-6/AS-8T supplied from the main unit. (single phase 100 V 3 A)
- Ultrasonic nebulizer UAG-1 Single phase 100 V 10 A
- Hydride generator HVG-ICP Single phase 100 V 2 A

All of the above are grounded and require 3 pronged sockets.

- Check separately when using the cooling water circulator

3. Grounding

Resistance	independent grounding below 30 Ω
------------	---

4. Gas installation

Type	Argon gas of 99.95% or greater purity
------	---------------------------------------

Adjust so that the argon gas is supplied at a pressure of 350 ± 10 kPa (3.5 ± 0.1 kg/cm²).

*Approximately one 7 m³ gas cylinder is necessary for 5 hours of operation.

5. Cooling water

Water supply	Flow rate of 1 L/min or greater 1 line
Drainage	Natural water flow drain (Unnecessary when using the cooling water circulator)
Note	UAG-1 requires a separate supply of cooling water.

*When a cooling water circulation device is used with the main unit and UAG-1, confirm the piping kit, etc.

6. Exhaust duct

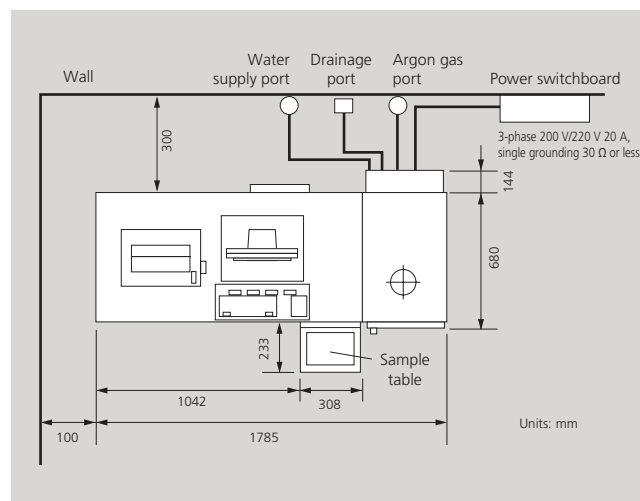
Plasma stand

The exhaust gas is mostly argon. Install an exhaust duct however as it contains some metallic vapor and solvent.

7. License

Usage of this device needs to comply with the radio laws. A license for an installation using radio frequency needs to be obtained from the authority.

Example of installation



- * The placement can be easily changed because it has casters with stoppers.
- * The sample table is detached during installation, allowing the unit to fit through an entrance width of 800 mm.
- * The dimensions at the time of installation is 735 × 1785 × 998 mm.

The following warning labels are affixed onto the system. Please take sufficient care when handling these areas.

1. At the gas purge tube



2. At the switch panel



3. At the vacuum pump and valve



4. At the transformer





Shimadzu Corporation
www.shimadzu.com/an/

Company names, product/service names and logos used in this publication are trademarks and trade names of Shimadzu Corporation or its affiliates, whether or not they are used with trademark symbol "TM" or "®".
Third-party trademarks and trade names may be used in this publication to refer to either the entities or their products/services. Shimadzu disclaims any proprietary interest in trademarks and trade names other than its own.

For Research Use Only. Not for use in diagnostic procedures.
The contents of this publication are provided to you "as is" without warranty of any kind, and are subject to change without notice. Shimadzu does not assume any responsibility or liability for any damage, whether direct or indirect, relating to the use of this publication.

© Shimadzu Corporation, 2015
Printed in Japan 3655-08502-15ANS