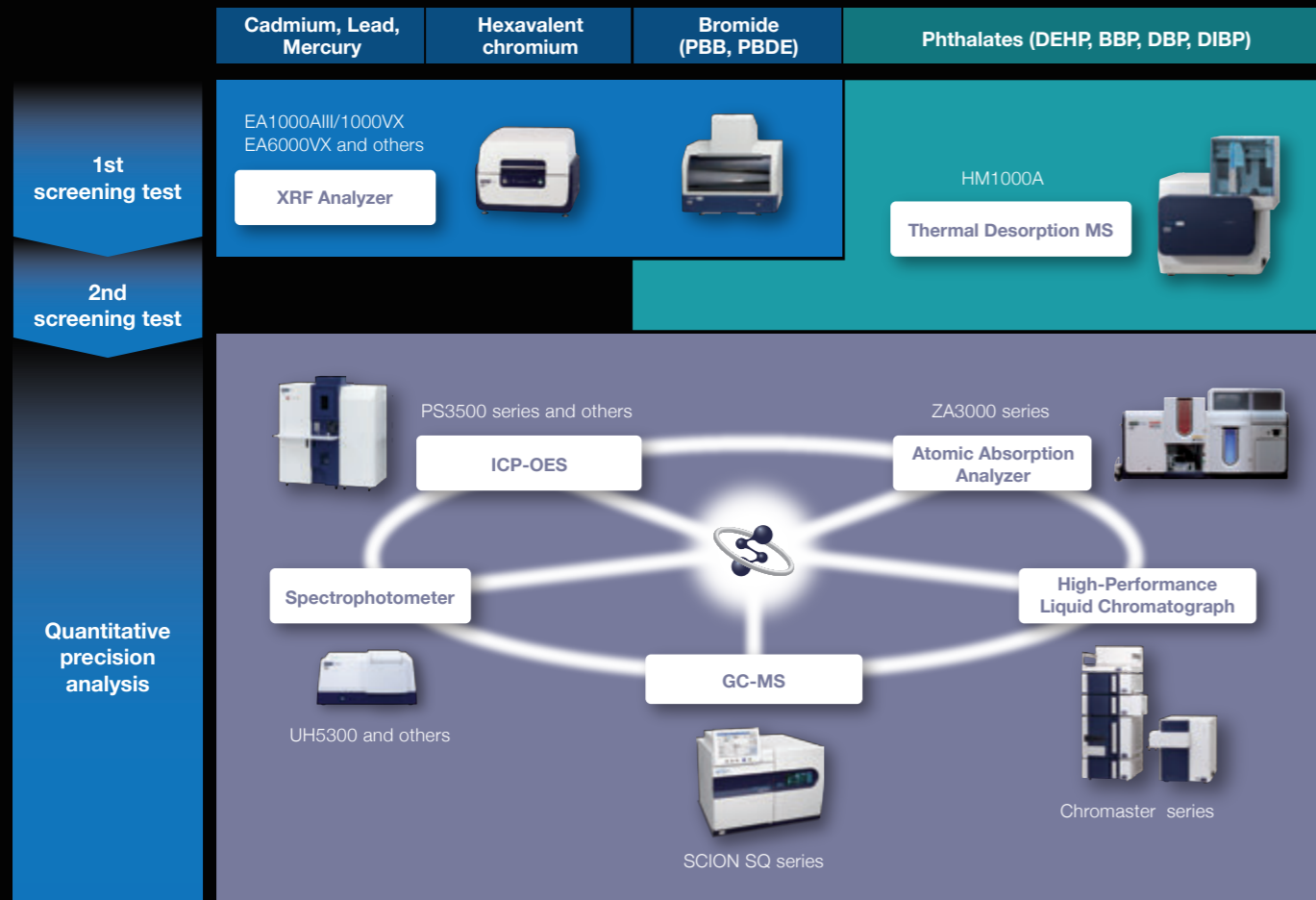


Solutions provided by Hitachi High-Tech Science
to analyze 10 substances restricted under the RoHS directive

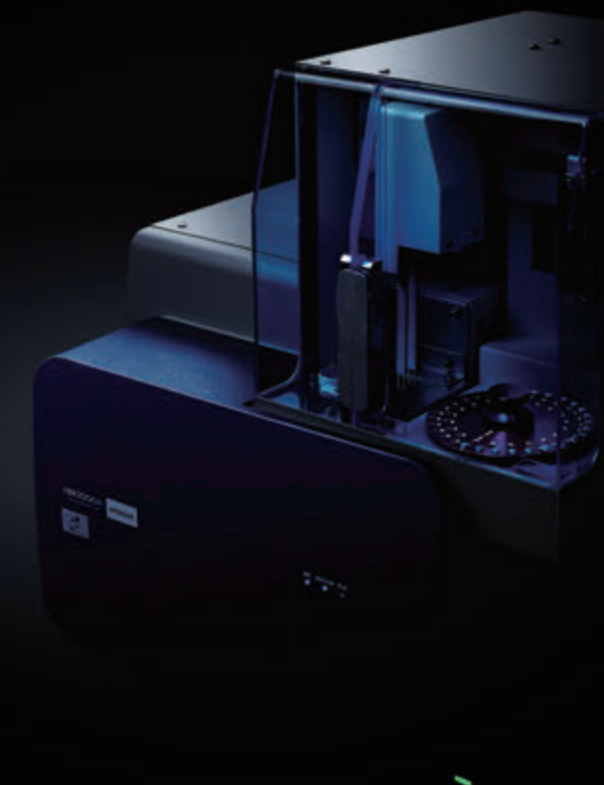


- From screening tests to quantitative precision analysis -

Hitachi High-Tech Science serves every analytical needs of customers with an abundant line-up of products.

HM1000A

Thermal Desorption MS (Screening Device for Phthalates)



Science for a better tomorrow

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Hitachi High-Tech Science

Quick and Simple Testing for Phthalates!

For testing substances restricted under the amended RoHS Directive, a quicker and simpler on-site screening for Phthalates is required.

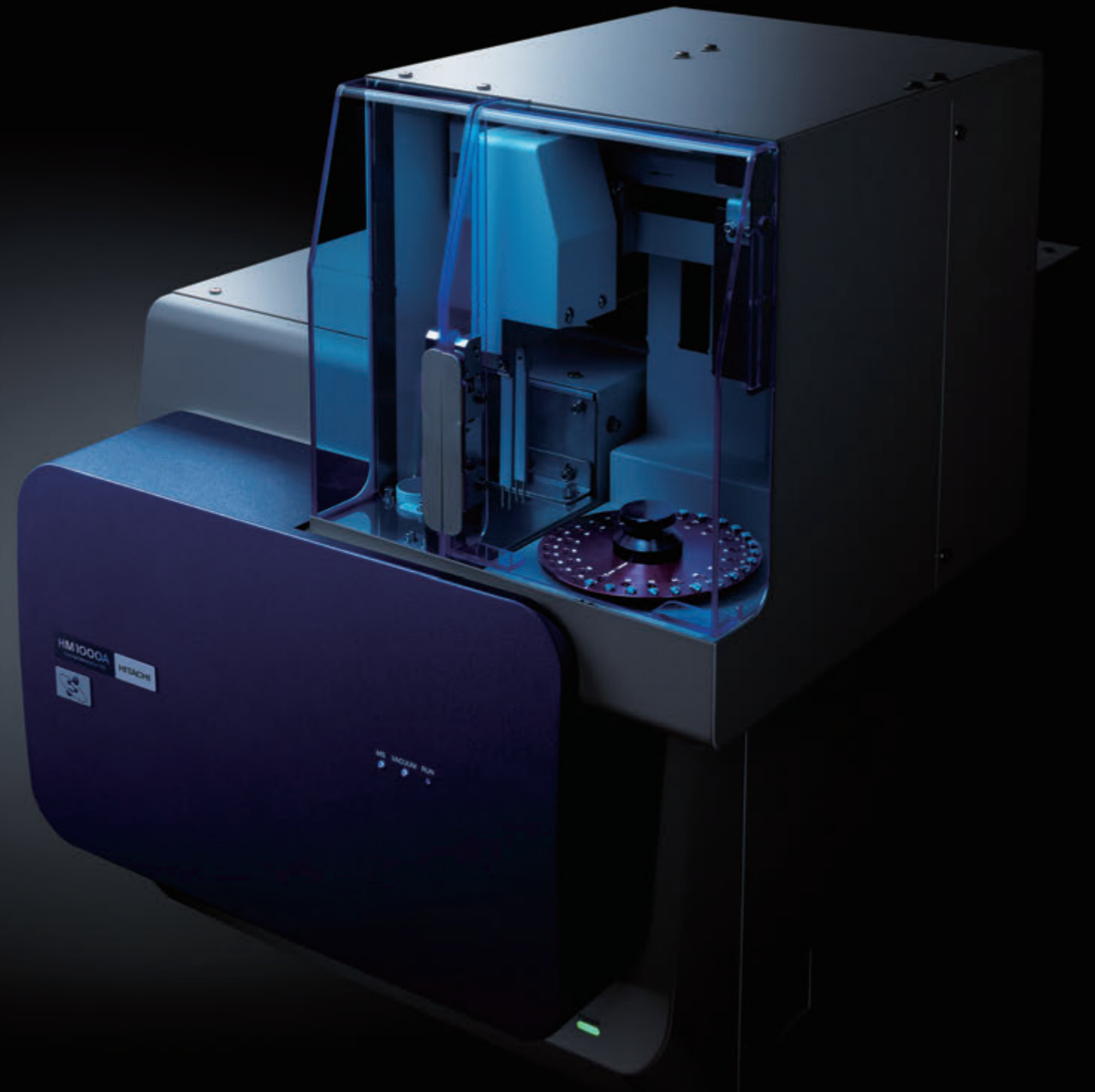
Phthalates are widely used as plasticizers for softening plastic and rubber in wire sheaths, electrical insulation tape, and packing films, etc.

The amendment to the RoHS Directive to restrict the use of the four Phthalates (DEHP, BBP, DBP, DIBP) from July 2019 has created an urgent compliance issue.

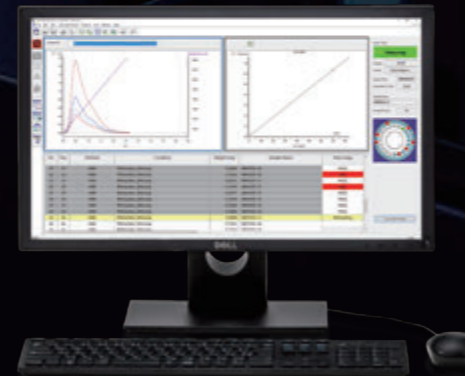
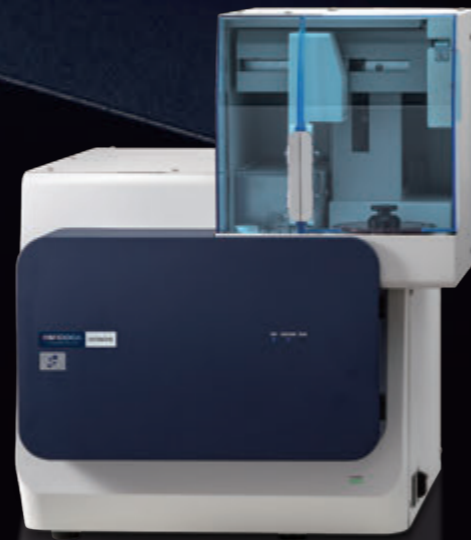
A variety of plastic and rubber are used in electrical and electronic equipment. It is expected that a large number of samples need to be tested. Therefore, screening equipment is needed to help manufacturers test products quickly and simply on the factory floor.

HM1000A

Thermal Desorption MS (Screening Device for Phthalates)



Quick

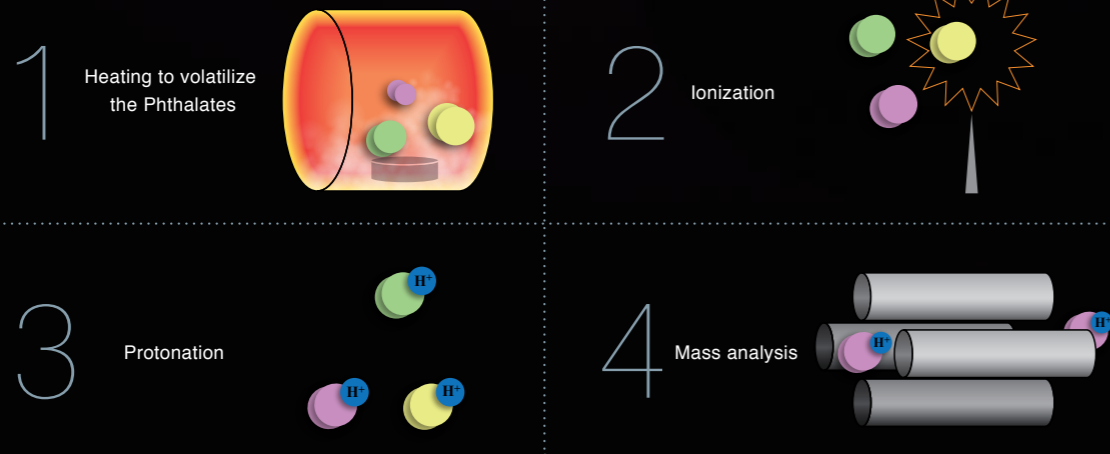


Simple

High-speed measurement Measurement at a rate of less than 10 minutes!

Vaporized compounds are ionized and directly analyzed by a mass spectrometer enabling high-speed measurement. (Separation column is not required)

[Outline]



Easy operation from sample preparation to analysis!

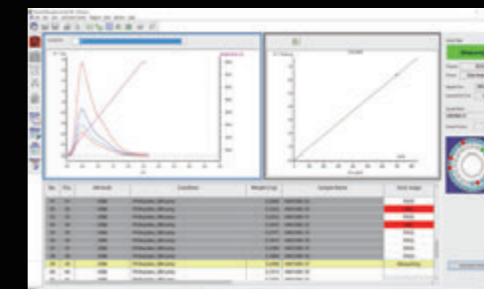
Place the sample in the sample pan and position it on the sample tray. Next, by following simple software steps, measurements will be started by the autosampler. The autosampler diagram is displayed on the software and the progress of measurements and the results (PASS/FAIL judgment) can be verified easily.



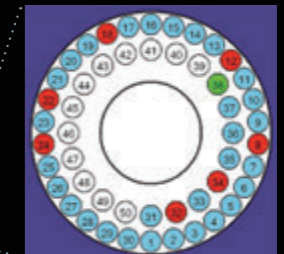
Sample pan



Sample tray (Max load : 50)



Software image



Sample tray status (Image)
(□: PASS □: FAIL)

The autosampler lets you measure up to 50 samples in 8 hours.

The accurate and smooth performance of the autosampler (standard equipment) allows continuous automatic analysis of up to 50 samples. During the analysis, operators are free to engage in other tasks, resulting in a streamlined operation and reducing workloads.



Low operating costs! No need for expensive helium gas.

Nitrogen gas is used as the carrier gas. Using a nitrogen gas generator (option available in Japan or locally sourced), a power source is the only utility required for operation. Helium gas and liquid nitrogen are not needed, which helps keep operating costs low.

Nitrogen gas generator (option available in Japan, or locally sourced)

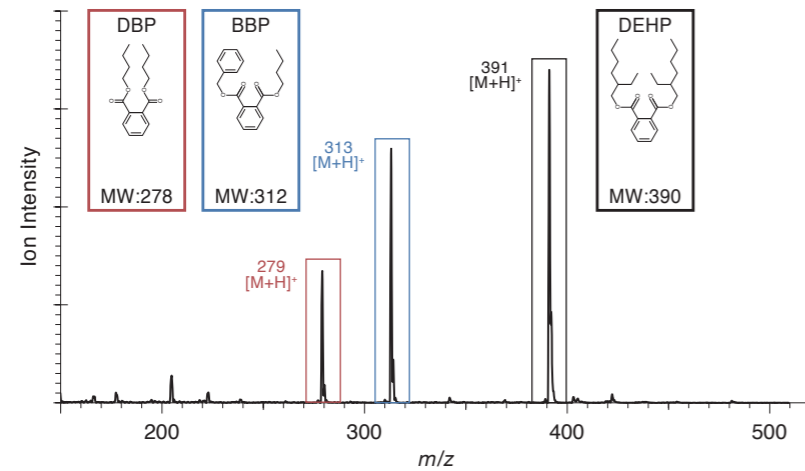


Measurement examples

Measurement using scan mode

The m/z value obtained from analyzing the sample can be used to estimate the component that is contained in the sample.

Mass spectrum of sample containing 1000 mg/kg of Phthalates



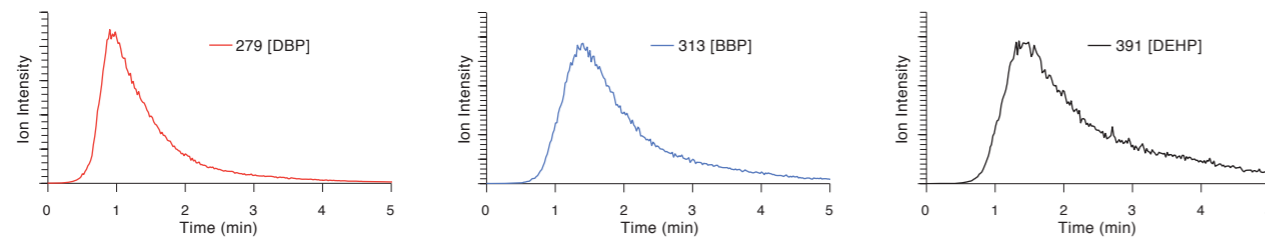
A peak will appear at molecular weight +1 for each phthalate after protonation.
*Measurement of total Phthalates is required for DBP and DIBP (both are at $m/z=279$)

Measurement using SIM mode

The concentration of the Phthalates contained in the sample can be estimated using the ion intensity profile and can be compared to the regulations acceptable limit.

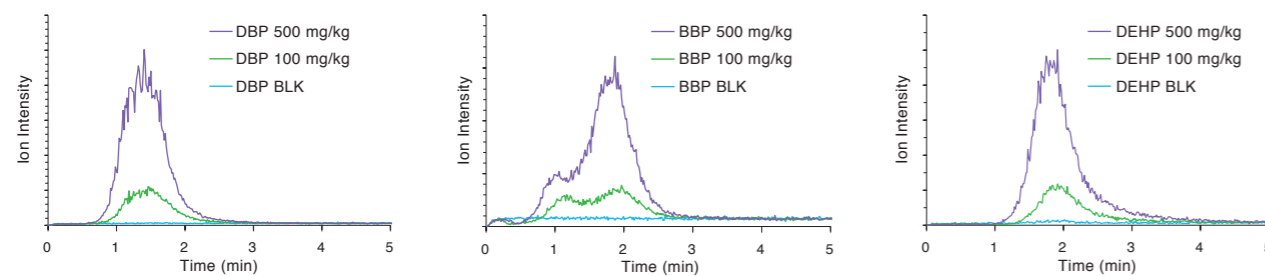
Ion intensity profiles of DBP, BBP, DEHP

The measuring sample : Certified Reference Material NMIJ CRM 8152-a



*Each protonated-Phthalate will be monitored using its m/z value.

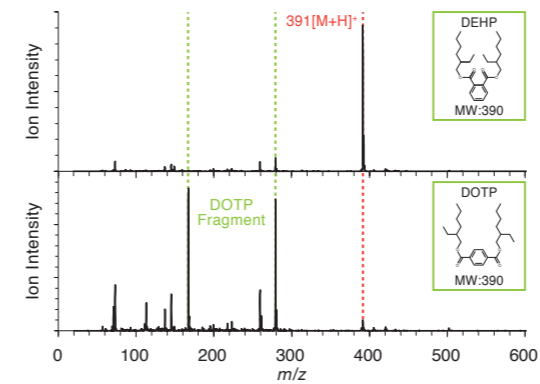
Ion intensity profiles of blank, 100 mg/kg and 500 mg/kg of Phthalates.



The results verify that the HM1000A has the necessary sensitivity to be an effective screening device to aid compliance with the RoHS directive. (Maximum content allowed under the RoHS is 1000 mg/kg)

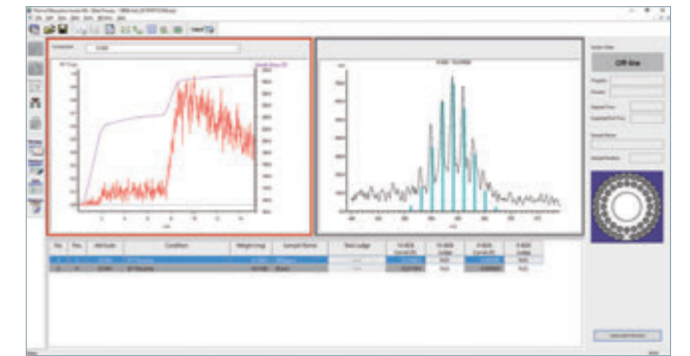
Application

Separation of Isomers (DEHP and DOTP)



In order to separate the isomers (DEHP and DOTP) DOTP can be fragmented, enabling the conclusive identification of DEHP.

Assessment of brominated flame retardants(PBDE)



In a sample that is shown by XRF to contain bromine, the presence of PBDE can be confirmed by analysis with the HM1000A.

Specifications

General Specifications

Measuring object	· Phthalates (DBP/DIBP, BBP, DEHP) · Brominated flame retardants (DBDE)
Sample weight	0.2 mg±0.04 mg
Sample form	Solid, Powder
Autosampler	Max.50 samples
Mass detection	Ion source: APCI (Atmospheric Pressure Chemical Ionization)
	Mass spectrometer: Quadruple mass filter
	Measurement mode: · Scan mode · SIM (Selected Ion Monitoring) mode (Max. 20channels)

Configurations

Basic Configurations	HM1000A · Main Body (Export Model) · Accessories
Consumable items	· Sample pan · Discharge needle · O-ring for a needle holder
Option available in Japan or locally sourced	· Personal Computer Set · Nitrogen gas generator

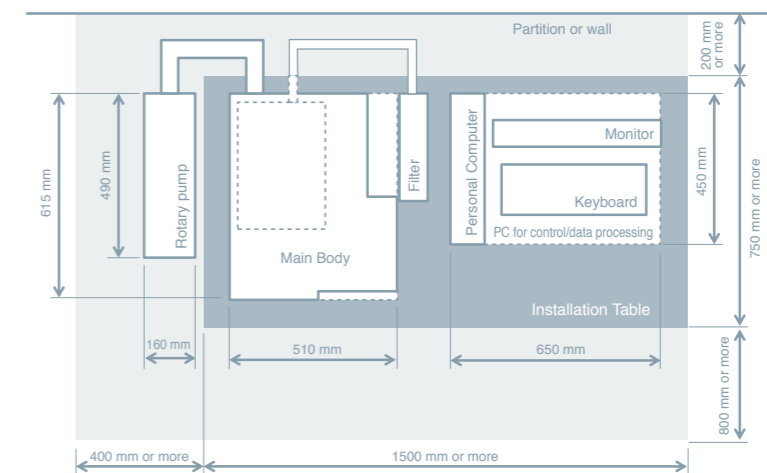
Dimensions and weight

Main body	510 mm (W) ×615 mm (D) ×615 mm (H), 85 kg
Rotary pump	160 mm (W) ×490 mm (D) ×265 mm (H), 29 kg

Electric specifications

Input supply voltage	AC200 V to 240 V±10% single phase, 50/60 Hz, 2 kW
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Set-up Space



*Detailed specifications will be defined under an official specification sheet.