Laboratory Automation Instruments & Solutions

The Professional Manufacturer of

Automated Laboratory Instruments& Solutions

Sample preparation

Raykol Group

Company Profile

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Raykol Group is a professional integrated company focusing on R&D, Designing, Manufacturing and technical supporting for automated laboratory Instruments & Solutions. Our systems and components help people automating sample prep in the testing and analysis applications for Food safety, Environmental Science, Agriculture, Pharmaceutical industry and Life science.

We are an ISO 9001:2015 Standard Quality Assessed Company to ensure the quality and reliability of our products and services.

With knowledgeable scientists and experienced engineers, our R&D institute has developed a series of new instruments and solutions dedicated to the modern analytical laboratories.

Raykol Group is committed to bringing maximum value to its customers, in providing both a competitive product and service, but also helping them win and succeed.

CUSTOMER PRIORITY

INNOVATION

SELF- DRIVEN

WIN-WIN COOPERATION

Automated sample preparation solutions

Analytical Chemistry Sample Preparation

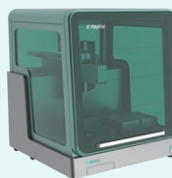**Samples Preparation work- flow solution**

| Liquid preparation | Extraction | Concentration | Purification |

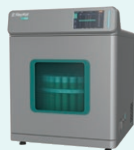## Life Science Sample Preparation
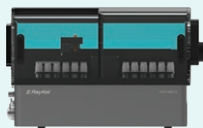
Automated Liquid Handing

Automated DNA/RNA Extraction

Sample Digestion System

Weighing—Adding—Shaking—Digestion—Crushing acid—Fill to volume—Testing

Contents

Analytical Chemistry
Sample Preparation

Fotector Series
Automated Solid Phase Extraction System

RayKol's Fotector series Automated Solid Phase Extraction(SPE) system is an effective and high throughput automated SPE system specially for large-scale samples preparation in modern laboratory. The automated system minimizes operator intervention and provides constant flow of loading and elution of samples and solvents to improve analytical precision.

Typical applications include PAH, PCB, PCDD, PCDF, PFAs, pesticide and veterinary drug residues in food, harmful organic compounds in the environment, poisonous materials in blood and urine etc...

Product Features

Improved recovery, precision and reproducibility

The Fotector sesies use High-precision syringe pump and patented Plunger pole design to achieve precise and constant sample and solvent flow rates for the best recovery and precision.

Multi-channels, High throughput and Effective

The Fotectors series' Multi-chanels processes samples in parallel. All samples start and finish at the same time. Multi-port valve has separate flow paths for each sample to remove cross-contamination.

Flexible Method Development and Optimization

·Run a variety of cartridges such as 1, 3, 6,12 and 20mL cartridges and Immune affinity module which could be applied various types of toxin detection. Loading sample volumes from 20 mL to 4 L.

·Collect the load, wash, and elute steps for analyte breakthrough evaluation.

Fotector Series

Module	Channels	Smaple Tube Rack	Fraction rack	Cartridge
Fotector-02HT	2	20* 20ml Tube 12* 60ml Tube	20* 20ml Tube 12* 60ml Tube	1/3/6/12/20ml
Fotector-04HT	4	40* 20ml Tube 24* 60ml Tube	40* 20ml Tube 24* 60ml Tube	
Fotector Plus	6	60* 20ml Tube 36* 60ml Tube	60* 20ml Tube 36* 60ml Tube	
Fotector-08HT	8	80* 20ml Tube 48* 60ml Tube	80* 20ml Tube 48* 60ml Tube	1/3/6/12ml
FS 360	6	36* 15ml Tube 36* 50ml Tube	36* 15ml Tube 36* 50ml Tube	

ASPE Ultra
Automated Solid Phase Extraction System

ASPE Ultra series automated SPE system is specially used for the larger volume water sample's automatic preparation for the analysis of organic pollutants in drinking water, tap water source water, surface water, sewage, etc.

The system can automatically complete the whole process of filtering, wetting ,loading, rinsing, drying, eluting, concentration, transfer, and constant volume .It can be applied to the pre-treatment, purification and enrichment process of various water quality testing laboratories. Complete automation does not require someone on duty , avoiding contact with toxic reagents to ensure the safety and accuracy of the experiment in the Lab.
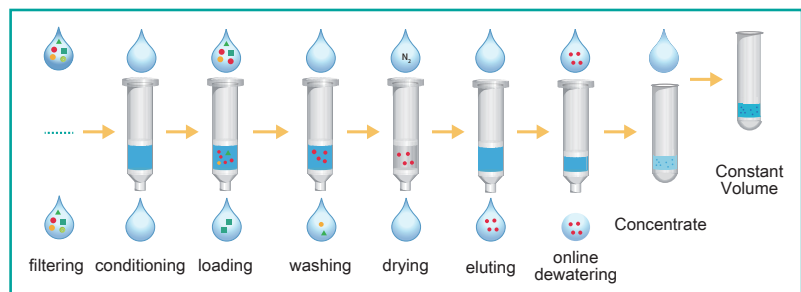
Fotector Series

ASPE Ultra 06 Automated Solid Phase Extraction System
ASPE Ultra 08 Automated Solid Phase Extraction System

Product Features

Fully automated pre-treatment

filtering conditioning loading washing drying eluting online dewatering Concentrate Constant Volume

The whole process automatic sample Pre-treatment

Good Accuracy and reproducibility

·Effectively avoid outer environmental influence

·Light-proof housing design effectively avoiding the influence of the lighting environment on the lightly unstable samples.

·Sealed negative pressure concentration chamber system ensures the vacuum environment of the concentrating process.

Muti-function and Good compatibility

·The instrument is compatible with 1mL, 3mL, 6mL, 12mL SPE cartridges and 25mm, 47mm disk;

·The system has Anhydrous sodium sulfate online dewatering and Multi-row collection design and also has the solvent replacement function, the solvent can be automatically concentrated and replaced.

Auto Extra D10

Automated Disk Solid Phase Extraction System

Auto Extra D10 is a programmable, multipurpose SPE system, capable of processing aqueous samples directly from their original containers. The system automates the entire solid phase Extraction process, especially suitable for various trace organic pollution analysis in large-volume water samples. Use disk for extraction combined with negative pressure sample loading mode significantly improves the efficiency of solid phase extraction and saves the operation time of pre-treatment in the water quality analysis. And the additional automatic cleaning function effectively reduces the residue of the target compound on the bottle ensuring the accuracy and repeatability of the analysis.

Product Features

Sample Handling

·Sample volume range from 20mL~4L, direct sample loading, online filtering , Automatically rinses the sample bottle for best analyte recoveries.
·Suitable for 47mm, 50mm, 90mm Disks or 6mL cartridge.
·Using negative pressure extraction technology, the flow rate is precise and constant, and it also can be adjusted by the vacuum valve.
·Upper and lower level control sensor design avoid loading overflow.

Solvent Handling

·Handles up to 8 solvents for conditioning, washing and elution, and each solvent uses a separate pipeline.
·Collects organic and water waste separately for proper and economical disposal.

Productive and Flexible

·Use up to 10 modules of Extra D10 connect with one software instance allowing 1–10 samples to be run at once, and each module can be independent methods.
·It can be added the online anhydrous sodium sulfate dewatering function.
·All valves and pumps are internal to the system, and it can be operated in a hood or on the bench with exhaust system.

Product Applications

Mainly used to extract the target toxic substances of pesticides, antibiotics, PAHs, PCBs, SVOCs, algal toxins in water samples.

Typical applications: pesticide residues, animal residues, PAHs, semi-volatile organic compounds, PCBs, Herbicides, dioxins, explosives, flame retardants, etc.

Auto EVA series
Automated Parallel Evaporation system

RayKol's AutoEVA series automated parallel evaporation system is a fully automated high-throughput, high-speed, low nitrogen consumption and safe evaporation system for large-volume samples in one run.Utilizing unique liquid level tracing blow technology and consistent heat and controlled gas flow, The system significantly improves productivity with excellent reproducibility and recovery rates. Minimize cross contamination and sample loss by directly concentrating your samples into vials.

Product Features

High-throughput & Efficient evaporation

·Gentle and fast evaporation and precise temperature control.

.Unique designed patented needles to ensure consistent flow.

.Automatically trace the liquid level for evaporation.

.Efficient evaporation with good reproducibility and recovery.

Flexible

·Flexible for different large volumes of samples,the needle is easy to remove and install. Various of sample Tubes and Racks can be optional.

Wide range of applications

·Environmental analysis, food analysis, pesticide/veterinary drug residue analysis, Biochemical analysis, pharmaceutical industry and other fields.

Product Series

Module	Sample Tube Rack
Auto EVA 20PLUS	30 position * 20 mL Tube 12 position * 80 mLTube
Auto EVA 20	20postion* 80 ml Tube
Auto EVA12	12postion * 260ml Tube, 12postion* 65ml Tube With 0.5ml/1.0ml endpoint Volume
Auto EVA 60	60postion * 15ml Tube 60postion * 50/60/80ml Tube
Auto EVA 80	80postion * 15ml Tube 48postion * (15ml -30ml) Tube 48ppstion * 50/60/80ml Tube

Auto EVA Mini
Automated Evaporation system

Auto EVA Mini automated evaporation system is specially designed for the concentration of high throughput small-volume samples processing, suitable for microplates and injection vials. It uses stable and rapid nitrogen blowing and uniform heating to evaporate each well. The concentractor can be compatible with common microplates on the market, such as shallow/deep 96-well microplate, 24-well,48-well microplate. Auto EVA Mini system dry samples quickly by uniquely designed nitrogen needle ensuring the constant flow rate. It commonly used for microplate samples and 1.5ml,2ml vials in chromatographic detection, 1-2mL centrifuge tubes in QuEChERS.

One instrument with multiple applications
(48-well vials for chromatographic analysis , 96-well microplate)

Product Features

Accurate and flexible

·Automatically precisely control the air flow rate of each needle, which can ensure the consistent gas flow rate.
·Equipped with its own switch to shut down gas flow when other rows of microplate wells are not in use to conserve nitrogen gas.
·Adjustable needles can slowly follow the liquid level during concentration, which could stably accelerate the evaporation without sample losing.
·The heating temperature can be precisely controlled from room temperature to 100℃ and temperature difference between each well is not exceed ±1℃.

Good compatibility

·The system with optional heating module to help speed evaporation.
·They system has reserved space to install microplate and vials rack, which compatible with 24-,48-,96-well microplate and 1.5ml, 2ml vials,1-2mL centrifuge tubes in QuEChERS.

Easy of use software Interface

·With 7 inch touch screen, all parameters can be set up and saved. Including temperature, needle tracing speed, etc. And all the methods can be recalled and saved, process can be reproduced.
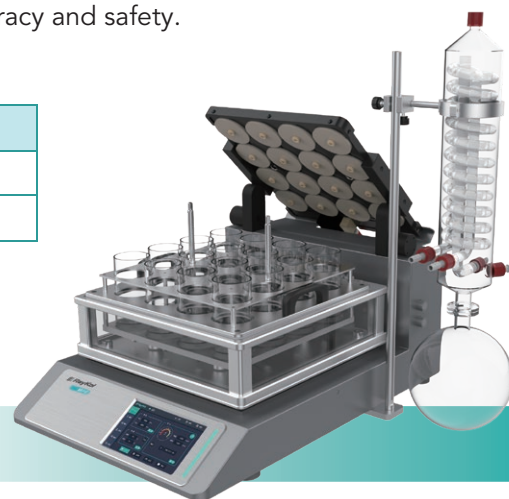
MPE
Automated Vacuum Evaporation System

In environmental pollution analysis and food safety analysis, in order to obtain accurate and reliable detection results for trace analysis, experimenters continue to pursue rapid concentration and no loss sample evaporation technology.

Raykol's MPE High-throughput automated vacuum evaporation system is a truly modern system combined with precise digital vacuum control and consistent precise temperature control system to concentrate multiple samples in parallel increases efficiency, accuracy and safety.

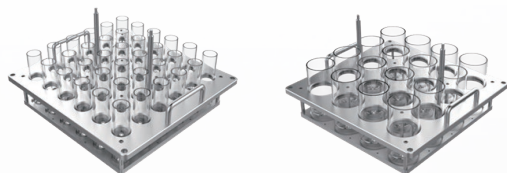| Samples	Evaporating Method	Time
16	Normal Rotary evaporator	320 min
16	MPE	60min

Soil SVOC sample 100mL
(Dichloromethane:Acetone1:1 v:v) concentrate to 1mL

Product Features

Reliable and Efficient

The low-temperature heating system assures consistent and gentle heating of all samples in parallel to prevent the loss of volatile analytes in the sample. The system evaporating process is effective and fast, it could evaporate16 samples with large-volume(100-200 mL) at the same time.

Safe and environmentally friendly

The system has an effective condenser system to recover vapor solvents. The entire corrosion-resistant, PTFE system ensures the safety of users and prevents vapor from leaking into the atmosphere.

Flexibility & Adaptability

The system can accommodate your specific requirements. It can efficiently concentrate up to your predefined residual volume.With interchangeable racks and a wide range of accessories to meet your needs.
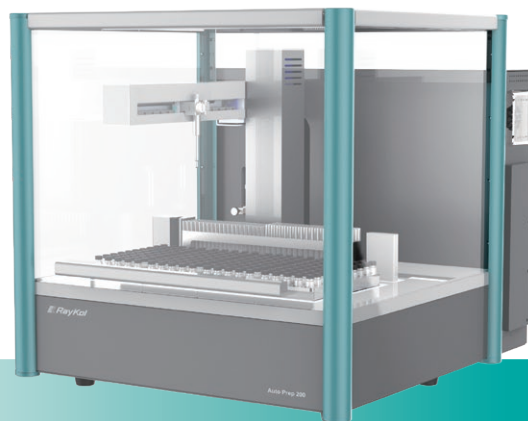
Good visibility

Three-sided transparent glass windows with internal lights greatly improves the visibility of the concentrate process, visually can see the end point easily.
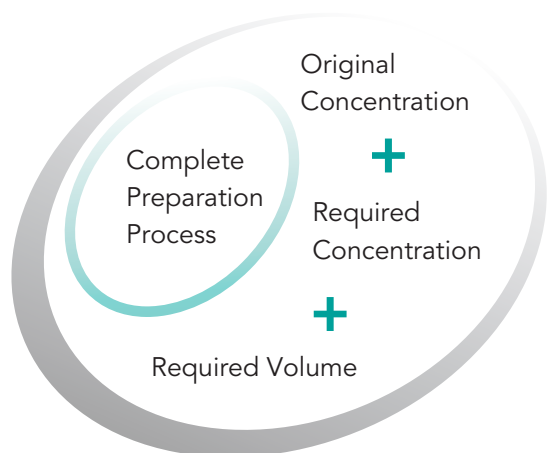
Auto Prep 200
Automated Liquid Handing Station

Auto Prep 200 is an automated system which is design to prepare variety of liquid samples in the laboratory. Its intelligent and automatic preparation process let the experimenters free from the cumbersome and repeat work. The system can automatically do the operations of transfer, dilution, constant and addition, which could be widely applied for the standard calibration curve preparation.

Product Features

Original Concentration

Complete Preparation Process

+

Required Concentration

+

Required Volume

Reliable performance

Fully automatic and programmed operation mode to ensure the consistency and reproducibility of each sample preparation.

Smart and convenient

Intelligent calculation, editing process by batches, effectively avoiding human operation errors, ensuring the accuracy of the curve.

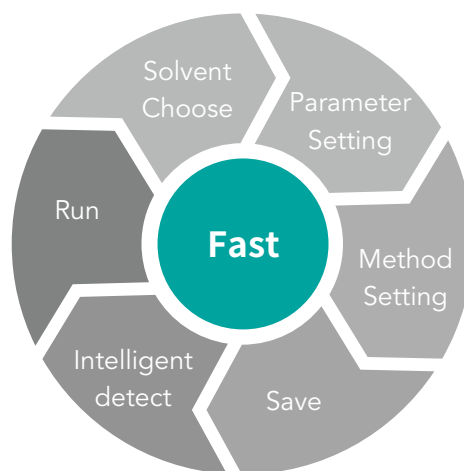### High reliability and accuracy

The high-precision double pump system can automatically select the appropriate syringe for injection during the preparation process.

Automatic calculation, intelligent analysis

Method editing only needs to input the concentration of the original solution, input the required concentration and the required volume, and all concentration calculations and pipetting volume calculations are automatically completed; intelligent prediction analysis, when the dilution ratio is too large, it can automatically calculate as intermediate solution, and complete preparation by step.

Fast & Easy Method Setting

Click to Run—Solvent setting—Parameter setting —Method Setting—Save—Intelligent detect

Solvent Choose

Parameter Setting

Run

Fast

Method Setting

Intelligent detect

Save

AH-series
Automated Homogenizer

With the development of food safety and Bio-medicine,Automated homogenization is a very common sample preparation technique prior to the analysis of agricultural and livestock products, food, pesticide or veterinary drug residue and life science,etc.

AH-Series is an automated high-throughput homogenizer, which completely replaces the tedious, repetitive, time-consuming, and unreliable manual homogenization process. It can process up to 36 samples at one time,significantly increases productivity and dramatically improves workflow in the laboratory.

AH-30 Automated Homogenizer

·8-32 samples

·Automatically rinsing, adding, washing and homogenizing.

·Wifi connection PAD operation

·Graphical interface, easy for use

AH-50 Automated Homogenizer

·12-36 samples

·Automatically rinsing, adding, washing and homogenizing.

·10-inch color touch screen

·Graphical interface, easy for use

Full automated , Start and walk away

The entire homogenization process is completed automatically, including automatic rinsing of the probe, allowing you to proceed with other tasks. All process automation ensures the highest analytical precision.

High throughput & Flexible

AH- seris Multi-Sample Homogenizer supports simultaneous homogenization of up to above 30 samples in a single process ranging from 5mL to 200 mL.The system compatible with different kinds of sample tube and centrifuge tubes in different applications.

Eliminate Cross Contamination

During the homogenization process the generator probes can be automatically rinsed. There are different cleaning methods can be chosen according to different sample to minimize the possibility of cross contamination

Safe and reliable

The workstation has an internal sealed automatic exhaust system, free from the fume hood space, With Fully transparent front door, LED built-in lights, all operating process can be monitored. And It has a stop safety alarm system in case of abnormal condition such as the probe miss-position ,electric motor overheat,sample overload, etc.

Life Science Sample Preparation

Vitae M96
Automated liquid handling workstation

Vitae M96 is a flexible and fully automated Liquid handling system for fast and precise processing of 96-,384-well micro plate . The workstation can automatically complete pipette tip filling,pipetting,dispensing and transferring.The system is fast, efficient, accurate, and cost-effective. It can simplify the tedious and repetitive manual assay process, reduce errors and ensure the accuracy and reliability . VitaeM96 truly empowers you to customize for a variety of applications due to its flexible reconfigure to meet your changing requirements.

Product Features

Three range of pipetting volume	
M96-1000	20-1000μL
M96-200	2.5-200μL
M96-30	0.5-30μL

Better precision and reproducibility
The system 96 channels are highly consistent and precise.

Flexible
Compact designing with small size,maximum expandable to 4 micro plate position.

Good compatibility for different use
Dispensing / PCR system construction / Elisa (microplate coating and washing)

High throughput & Efficient
96-well micro plate and 384-well micro plate 4 times pipetting is carried out simultaneously.
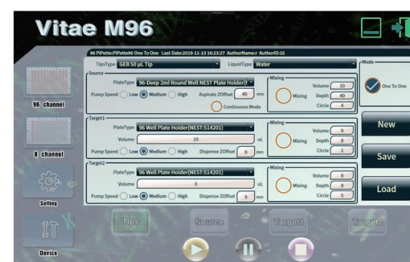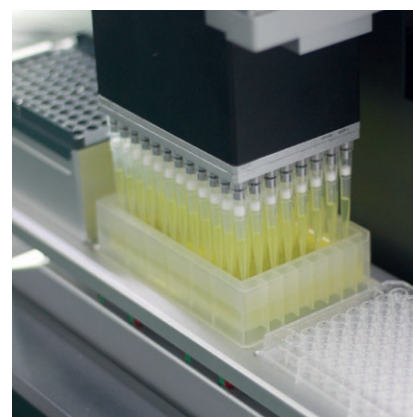
·Piovting®-Multifunctional control software
High automation and easy for use

With program storage, automatic memory function

Automatic recording operating data, compliance with GLP standards.

Vitae 100
Automated Nucleic acid Extraction & Purification workstation

The Vitae 100 automated DNA/RNA extraction and purification workstation is based on magnetic bead separation technology, which can quickly and efficiently prepare nucleic acids from various types of samples, and automatically construct a PCR reaction system. The workstation integrates the entire process of sample processing, nucleic acid extraction, product collection and PCR system configuration into a one-stop station automatic operation. It can effectively reduce operating errors,improve efficiency.

Product Features

Strict pollution prevention
Exhaust system and UV disinfection module, effectively avoid cross contamination.

Flexible and efficient panel design
The system provides a variety of functional modules and suitable components,   allowing users to adjust the required configuration module to meet customers' demand. With up to 9 plates position and a variety of plates with up to 384 wells.

Stable & Accurate
Uniform operation, reduce the error in the experiment process, to improve the accuracy and stability.

Easy- operate software interface
Using the drag-and-drop experimental process design, each action can be independently setting with parameters to meet different experimental demand.
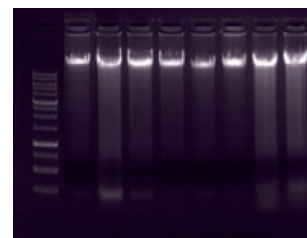
High throughput & Effective
Compatible with automatic liquid processing workstation, 24samples can be processed at one time, 3-5 times faster than manual extraction.

Blood sample (100µL) DNA extraction purity, concentration and yield

No.	1	2	3	4	5	6	7	8
A260	0.615	0.6	0.69	0.625	0.588	0.63	0.678	0.648
A280	0.331	0.319	0.383	0.345	0.306	0.342	0.379	0.354
A260/280	1.86	1.88	1.8	1.81	1.92	1.84	1.79	1.83
Concentration (ug/mL)	30.8	30	34.5	31.3	29.4	31.5	33.9	32.4
Weigt (ug)	3.08	3	3.45	3.13	2.94	3.15	3.39	3.24

Electrophoresis analysis of DNA extracted from blood samples (5µL loading)
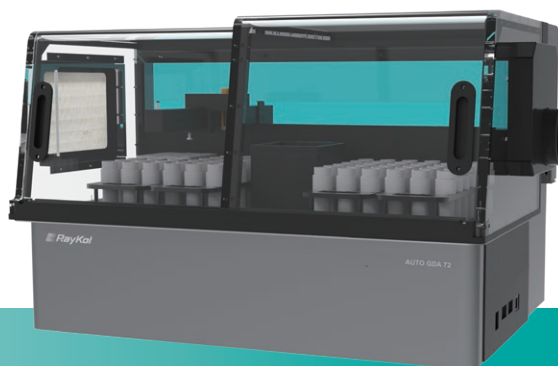
Sample Digestion System

Auto GDA Series
Automated Graphite Block Digestion system

Raykol 's Auto GDA series are a full automated sample digestion system which can automatically complete acid adding , mixing , capping , program setting temperature digestion, acid elimination and also can fill to required volume of all the process . Up to 72 samples can be processed automatically in one batch. And also the instrument system complies with the international wet digestion method and standards.

Fotector Series

Auto GDA -72 Automated Graphite Block Digestion system
Auto GDA -36 Automated Graphite Block Digestion system

Product Features

Accurately dispensing and Automated reagent Management

·With fully enclosed Teflon magnetic mechanical arm, anti-corrosion double peristaltic pump + syringe pump dosing.

·Multiple reagent channels,avaliable for corrosive reagents including HF, HClO4, H2O2, KMNO4 and H2SO4.

·Automated reagent management, reagents added can be added differ?ently for separate vials.

Even heating of every sample

·Double heating module design, surround heating, program heating and cooling.

·The temperature control accuracy is+/- 0.1℃, and the temperature differ- ence between the holes is +/-1℃ at 150℃.

·Intelligent PID temperature control system ensures the stability and accuracy of the instrument.

Product Application

Environment: soil, solid waste, filter cartridge,Heavy metal elements in membranes, sewage, etc.

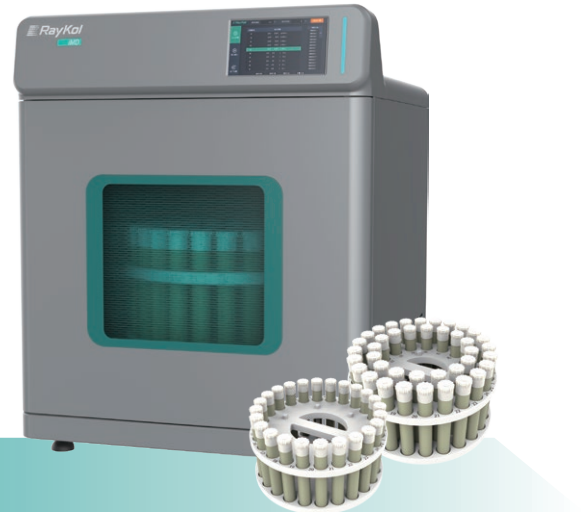**Food:** Heavy metal elements in food, etc.

Agriculture: heavy metal elements in crops, etc.

Others: metal dissolution, medical,Petrochemical industry

iMD24
Microwave Digestion System

Under microwave and closed high temperature conditions, the sample is quickly digested.The iMD 24 microwave digestion system is capable of running 24 vessels,with high-efficiency, safety protection and convenient design, providing customers with more effective and safer products for the laboratory sample pre-treatment for elemental analysis of AAS, AFS, ICP, ICP-MS, etc.

Product Features

Multiple Safeguard

·The digestion vessels inside made from TFM materials, The outer made of aerospace composite materials or modified engineering plastics.

·316L stainless steel thickening chambers with multi-layer corrosion-resistant

·Advanced penetrating mid-infrared temperature measurement technology

·Double-layer explosion-proof door design

·Automatic pressure relief device

·Intelligently judge the abnormal state inside

Efficient and convenient design

·Microwave output method

 Non-pulse continuous high-energy microwave and dual magnetron emission

·Exhaust system

 Using high-power corrosion-resistant vortex centrifugal fan and turbulent high

·Air-cooled design

 Front door automatically lift the sample loading method

·Graphical interface easy of use.

Product Application

Food, environment, agriculture, drugs, cosmetics, fiber, plastic, Bio-engineering, medical, etc.

RayKol