RayKol

Knowledge Optimized Laboratory

RayKol Group Product Catalogue

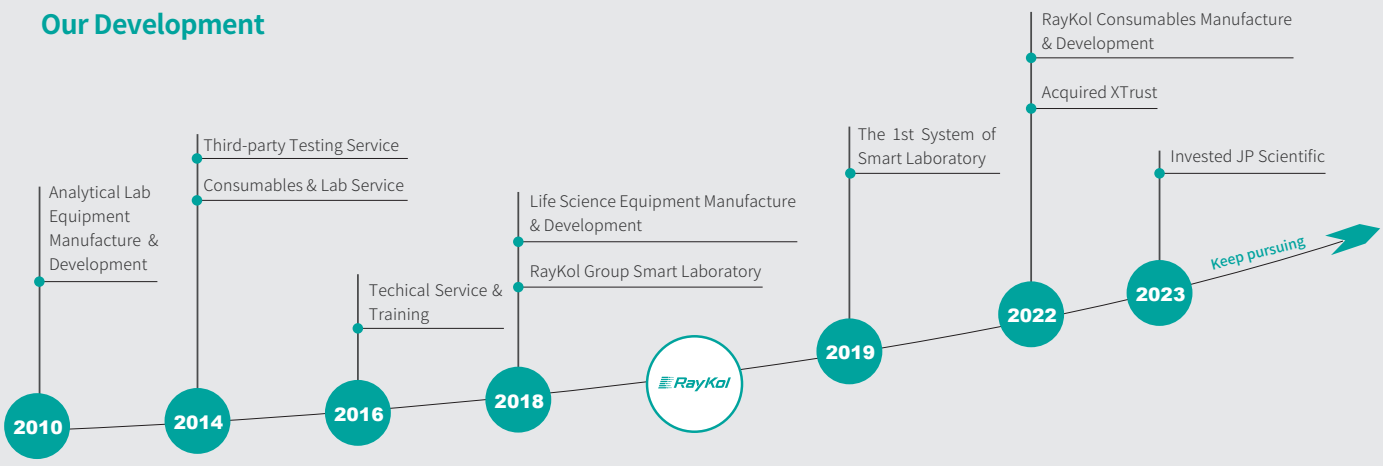
Automated Nitrogen & Vacuum Evaporation Systems

RayKol Group Corp., Ltd

About RayKol

RayKol Group(Xiamen) Corp., Ltd. is a professional manufacturer and solution provider of smart automated laboratories, dedicated in improving the performance of the testing and inspection industry. The core business covers five major fields: environmental testing, food safety, pharmaceutical analysis, life science, and new energy materials. The customer groups include government agencies, research institutes, private sectors and commercial laboratories. RayKol´s market share ranks among the top in the industry of laboratory automation solution. With high quality products and services, RayKol Group is really glad to help with customer´s needs.

Our Development



Comprehensive ISO certified

SGS Certified Supplier

MPE Pro
Automated Vacuum Parallel Evaporator

MPE Pro Automated Vacuum Parallel Evaporator, not only remains the features of MPE series, but also integrates with more functional modules for automation. It can perform high-throughput vacuum evaporation with precise vacuum gradient control, to minimize the risk of analyte lose caused by over boiling. MPE Pro can bring better user's experience by minimal operating steps, user would only need to place the sample tubes, close the cover plate then click to start the evaporation. It's capable of automatic sealing and endpoint determination; with the automatic condensation recovery system MPE ASR, it can reach higher automation in use and operation for lab workflow.

Product Feature

- Up to 12, 20, 48 samples processing per batch
- Available in various pressure control modes: manual decreasing, programmed decreasing, frequency-invert decreasing.
- Able to support 20-step gradient pressure control, with frequency-invert pump as optional configuration, to reach smooth gradient changing for vacuum.
- Separate flow path control, selectable in channel numbers and positions.
- Use with flange-side sample tubes for clear sealing.
- Optional IR module for 1mL endpoint detection.
- With a 3L solvent receiving bottle, and ⩾ 5L condensation module, to accommodate large volume requirement.
- For solution mixed with high and low boiling point solvents, MPE ASR can discharge the low boiling point solvent first to avoid interference for following procedure.

Product Configuration

MPE Pro 20 IR

- Sensors to detect 1mL endpoint for all 20 positions
- Able to switch on/off for 20 positions individually

Compatible Sample tube

250mL stemmed sample tube, flange-sided	65mL stemmed sample tube, flange-sided

MPE Pro 48 Standard

- Batch evaporation for max. 48 samples
- Large capacity with efficient evaporation

Compatible Sample tube

65mL stemmed sample tube, flange-sided	70mL round-bottom sample tube, flange-sided

MPE Pro 20 Standard

- Batch evaporation up to 20 positions
- Compatible with a wider range of sample tubes

Compatible Sample tube

380mL flat-bottom sample tubes, flange-sided, brown	320mL round-bottom sample tube, flange-sided
250mL stemmed sample tube, flange-sided	70mL round-bottom sample tube, flange-sided
65mL stemmed sample tube, flange-sided	

MPE Pro 12 Standard

- Batch evaporation for max. 12 samples
- Specialized in large-volume samples

Compatible Sample tube

800mL flat-bottom sample tube, flange-sided, brown

MPE Pro 20 Separate

- Individual opening from the cover plate on each position
- Able to remove each position separately during the evaporation

Sample tube

380mL flat-bottom sample tubes, flange-sided, brown	320mL round-bottom sample tube, flange-sided
250mL stemmed sample tube, flange-sided	70mL round-bottom sample tube, flange-sided
65mL stemmed sample tube, flange-sided	

Must-Have Configuration for all MPE Pros

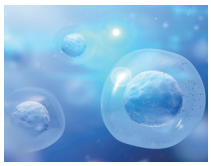
MPE ASR Automated Solvent Recovery Unit

Vacuum Diaphragm Pump Kit

Cooling Circulating Water Machine Kit

Application



For sample volume 40-500mL
Using 250mL, 320mL, 380mL, 65mL, 70mL, 800mL glass tubes

| Textile

Determination of prohibited azo dyes for textiles

| Food

Determination of peroxide value in food

Determination of acid in food

Determination of 500 pesticides and related chemicals in fruits and vegetables by GC-MS

| Soil

Determination of semi-volatile organic compounds in soil and sediments by GC-MS

Determination of organochlorine pesticides in soil and sediment by GC-MS

| Environment

Determination of dioxin in ambient air and exhaust gas waste in environment

Determination of dioxin in solid waste

Application Case - Determination of acid and peroxide value in foods

To evaporate the filtered extract using MPE Pro with 380mL or 800mL sample vials

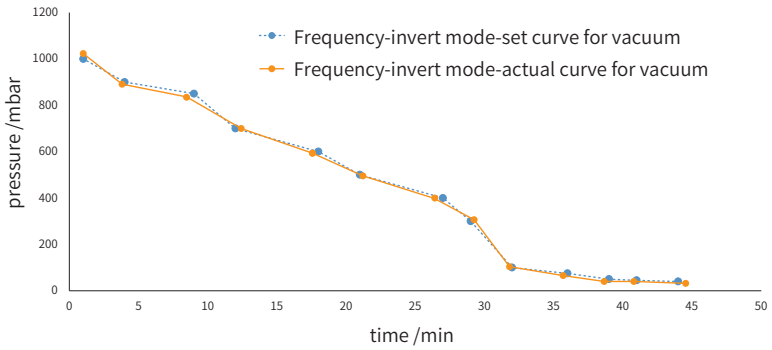
Sample grinding >>> Sample Weighing >>> Soaking/Soxhlet extraction Petroleum Ether (150-500mL) >>> Filtration >>> Evaporation for extract

Soaking Extraction 12h+

Filtration

MPE Pro

MPE ASR
Automatic Condensing Waste Discharge System



Product Feature

- Versatile Condensation Receiving Module
  For mixed solvent with high and low boiling point in evaporation, automatic condensing waste discharge system can discharge low-boiling solvent first, to avoid interference with the subsequent samples.
- Precise Pressure Control
  Available in various built-in pressure-decrease modes: manual, programmed, frequency-conversion. Flexible to different requirements: able to support for 20-step gradient control, with optional frequency-conversion pump, able to control gradient change of pressure smoothly.

Application Fields

Aqueous sample concentration in the analysis for food, water, environment, residual pesticides and verterinary drugs, life science, pharmaceuticals




Auto EVA series
Automated Evaporation System

Auto EVA 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, AutoEVA will automate your evaporation. The system significantly improves productivity with excellent reproducibility and recovery rates. Minimize cross contamination and sample loss by directly concentrating your samples into vials. Users can monitor the real-time concentrating process with touch-screen device, making the whole operation easy and convenient. It is a good sample concentration equipment system in the laboratory.

Product Feature

- Batch processing for evaporation simultaneously
- Total 6 channels for nitrogen blowing, each channel can be switched on/off separately
- Efficient evaporation with water bath heating under nitrogen blowing
- Utilize high-strength diameter-reduction nitrogen blowing needles for good consistency on flow rate and evaporation.
- Needle following liquid level during evaporation, adjustable descending rate
- Quick-disassembled design for each nitrogen blowing needle module, easy to clean and use.
- Flexible in application with a wide range of sample racks
- With front window at the sink and internal light, easy to observe
- Touch screen for software control and parameter setting

Product Configuration

Main unit	Sample rack	Must-Have
 Auto EVA series	60-position rack for 10/20mL-test tubes (16*100/150mm)	 Auto EVA-G Nitrogen Generator
	60-position rack for 60/80mL test tubes (30*120/150mm)	
	60-position rack for standard 10mL cone-bottom centrifudge tubes	
	60-position rack for 25mL test tubes (20x150mm)	
	60-position rack for 15mL centri-fudge tubes (17*144mm)	
	100-position rack for 10/20mL test tubes (16*100/150mm)	

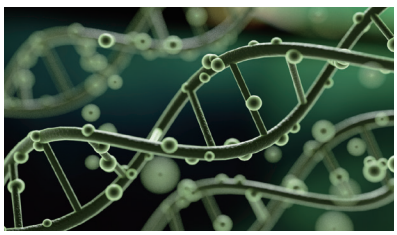
Application

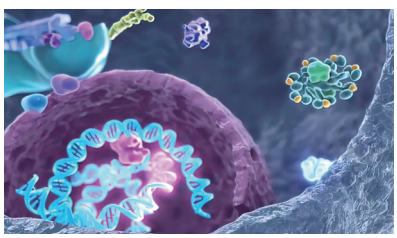
Environment
Sample concentration in analysis of water, soil and gaseous samples

Food
Sample concentration in detection of pesticide and veterinary drug residues

Other fields
Biochemical analysis, pharmaceuticals, polymer materials





Auto EVA 80
Automated Evaporation System

Auto EVA 80 Automated Evaporation System is the lastest upgrade of previous concentration solution Auto EVA 60 integrated the features of Auto EVA 60, upgraded Auto EVA 80 high-throughput nitrogen evaporator continues to have needle following function, tomaintain optimal distance between needle tins to liquid level: also to ensure gas above samples always guarded by positive-pressurenitrogen gas, to avoid any oxygen and moist from the air, hence, to achieve eficient and parallel concentration to all samples

Product Feature

- Large batch evaporation, simultaneously up to 80 samples
- Total 8 channels of nitrogen blowing, can separately switch on or off
- Needle following liquid level during evaporation, adjustable descending rate
- Quick-disassembled design for each nitrogen blowing needle module, easy to clean and use.
- Three-sided transparent glass sink, to maximize viewing area for clear observation
- Utilize high-strength diameter-reduction nitrogen blowing needles for good consistency on flow rate and evaporation
- Software control for water bath filling

Product Configuration

Main unit	Sample rack	Must-Have
 Auto EVA 80 (80 positions)	80 position sample rack (for ≦20mL tubes)	 Auto EVA-G Nitrogen Generator
	80 position sample rack (for 15mL centrifuge vials, 17mm)	
	48 postion sample rack (for 15mL centrifuge vials, 14-16mm)	
 Auto EVA 80 (48 positions)	48 position sample rack (for tubes with 28-30mm in diameter)	
	48 postion flexible sample rack (for tubes with 16-22mm in diameter)	
	48 position sample rack (for 15mL glass tubes, 15mm)	

Application

For sample volume 5 – 40mL, using various kind of glass tubes or centrifuge vials

| Food

Determination of multiple residual pesticides in plant-derived foods

Determination of multiple residual pesticides and related chemicals in grains

| Soil

Determination of semi-volatile organic compounds in soils and sediments by GC-MS

Determination of organochlorine pesticides in soils and sediments by GC-MS

Determination of PAHs in soils and sediments by GC-MS

Determination of 47 organophosphorous and pyrethroid pesticides in soils and sediments by GC-MS

| Water Quality

Determination of PAHs in water – LLE-SPE-HPLC

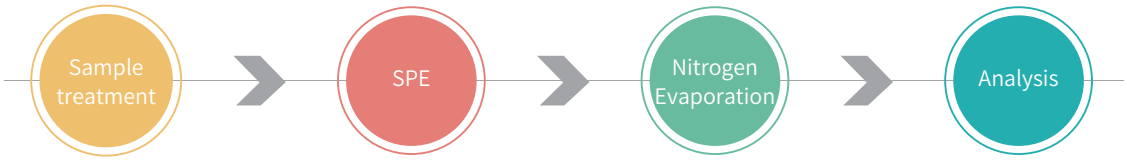
Determination of nitroaromatics in water by GC

Determination of organochlorine pesticides and chlorobenzenes in water by GC-MS

Determination of PCBs in water by GC-MS

Determination of phenols compounds in water by GC-MS

Application Case – Determination of perfluorinated compounds in water



Fotector series
Automated Solid Phase Extraction

Auto EVA 80
Automated Evaporation System

Target Compound	Background Concentration (ng/L)	Spiked Concentration (ng/L)	Mean (ng/L)	Standard Deviation	RSD (%)	Average Spiked Recovery Rate (%)
Perfluorobutanoic Acid	4.03	5.00	8.53	0.293	3.4	90.0
	4.03	10.00	13.30	0.169	1.3	92.3
	4.03	50.00	44.00	2.199	5.0	80.0
Perfluoropentanoic Acid	ND	5.00	5.36	0.242	4.5	107.0
	ND	10.00	9.54	0.488	5.1	95.4
	ND	50.00	52.50	1.800	3.4	105.0
Perfluorohexanoic Acid	1.50	5.00	6.46	0.126	2.0	99.1
	1.50	10.00	11.80	0.404	3.4	103.0
	1.50	50.00	48.10	1.041	2.2	93.1
Perfluoroheptanoic Acid	1.26	5.00	6.35	0.201	3.2	102.0
	1.26	10.00	11.70	0.531	4.5	105.0
	2.01	50.00	56.70	2.290	4.1	109.0
Perfluorooctanoic Acid	3.64	5.00	8.23	0.410	5.0	91.9
	3.64	10.00	12.90	0.675	5.2	92.6
	3.64	50.00	57.20	4.270	7.5	107.0
Perfluorononanoic Acid	1.86	5.00	7.30	0.232	3.2	109.0
	0.91	10.00	9.62	0.391	4.1	87.1
	1.86	50.00	49.90	2.540	5.1	96.0
Perfluorodecanoic Acid	ND	5.00	5.50	0.473	8.6	110.0
	ND	10.00	12.10	0.585	4.8	121.0
	ND	50.00	51.60	1.420	2.8	103.0
Perfluorobutanesulfonic Acid	ND	5.00	6.12	0.185	3.0	122.0
	ND	10.00	12.10	0.302	2.5	121.0
	ND	50.00	56.90	5.210	9.2	114.0
Perfluorohexanesulfonic Acid	ND	5.00	6.07	0.186	3.1	121.0
	ND	10.00	10.90	0.251	2.3	109.0
	ND	50.00	51.90	3.930	7.6	104.0
Perfluoroheptanesulfonic Acid	ND	5.00	6.04	0.449	7.4	121.0
	ND	10.00	13.00	1.180	9.1	130.0
	ND	50.00	56.20	5.900	11	112.0
Perfluorooctanesulfonic Acid	ND	5.00	5.66	0.202	3.6	113.0
	ND	10.00	11.30	0.818	7.3	113.0
	ND	50.00	55.10	2.800	5.1	110.0

Auto EVA 12
Automated Evaporation System

Auto EVA 12 is a nitrogen blow-down evaporation system that provides automated evaporation of up to 12 samples in parallel with end-point detection. The system adopts the vortex airflow technology,which can rapidly and gently evaporate the samples in parallel. Equipped with end-point detection sensor, the system can automatically detect the endpoint, which can efficiently concentrate up to your predefined residual volume with either 0.5 mL or 1.0 mL end-point stems.

Product Feature

- Uniform water bath heating with vortex flow for parallel evaporation
- Separate control on each sample position
- Adjustable flow rate, available in gradient setting for nitrogen consumption
- Adjustable nitrogen blowing angle
- Able to detect the 0.5mL or 1mL endpoint with sensor
- Software control for water bath filling
- Three-sided transparent glass sink, to maximize viewing area for clear observation
- Available in sprinkle rinsing module to rinse off possible residues on the inner wall of sample tube, to enhance the recovery rate.

Product Configuration

Main unit	Sample rack	Must-Have
 Auto EVA 12A  Auto EVA 12E	250mL stemmed glass tube	 Auto EVA-G Nitrogen Generator
	60mL stemmed glass tubes Adapter kit for 60mL glass tubes	

Application

For sample volume less than 200mL
Using 60mL and 250mL stemmed glass tubes

| Food
Determination of Vitamins A, D, E in foods

| Soil
Determination of semi-volatile organic compounds in soils and sediments

Application Case - Determination of microplastics in soils

To evaporate the extract under 40℃ to 0.5mL endpoint, then reconstitute to 1mL with dichloromethane

HPFE series
Pressurized Fluid Extraction System

Auto EVA 12
Automated Evaporation System

Auto EVA mini
Automated Evaporation System

RayKol Auto EVA Mini automatic parallel 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 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.

Product Feature

- Adjustable gas flow, precise control
- Total 4 channels for nitrogen blowing, separate control on/off on each channel
- Needle following liquid level during evaporation, adjustable descending rate
- Heating temperature range for block from ambient to 100℃
- Built-in 7 inch touch screen for software control and parameter setting

Product Configuration

Main unit	Sample rack	Must-Have
 Auto EVA mini 24	Rack for 2mL GC vials, 24 positions	 Auto EVA-G Nitrogen Generator
	Rack for 2mL centrifuge vials, 24 positions	
	Rack for 5mL centrifuge vials, 24 positions	

Application

For sample volume less than 5mL
Using 2mL chromatography vials, 2mL, 5mL centrifuge vials

Food

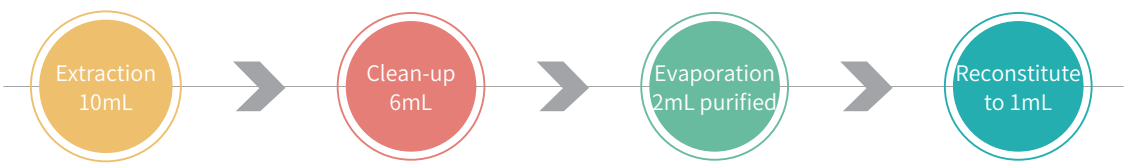
Environment

Biology

Pharmaceutical

Application Case - Determination of 208 pesticides and their metabolite residues in plant-derived foods – GCMS Using QuEChERS method

To evaporate the 2mL purified extraction to nearly dry then reconstitute 1mL before analysis



Auto EVA mini
Automated Evaporation System

Auto EVA-G
Nitrogen Generator

iG series is designed to carter for the requirement of evaporator applications. The gas is produced and separated by composite hollow fiber membrane which selectively removes the oxygen, moisture, particles, trace organic substance and PAEs, obtaining high purity nitrogen gas. The IG series gas generator is a fully automated, low noise, safe and reliable system. The simple operation system minimizes operator involvement and, improves your lab works efficiency.

Product Feature

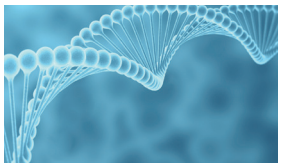
- Gas is supplied on demand with the system automatically adjust the gas production
- Utilize pressure difference produced by the composite hollow fiber membrane, the air is quickly separated
- into different compounds and collected in to storage system
- Combination of air compressor, moisture filter, gas stock and separation system
- Installed in required environment and serviced in accordance with maintenance, what you need is just to turn it on or off
- The utilization of membrane greatly reduces the work load of the compressor and extent the working life

Application

Food

Environment

Biology



Pharmaceutical

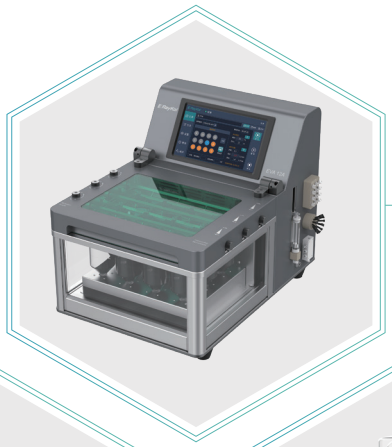
Selection Guide

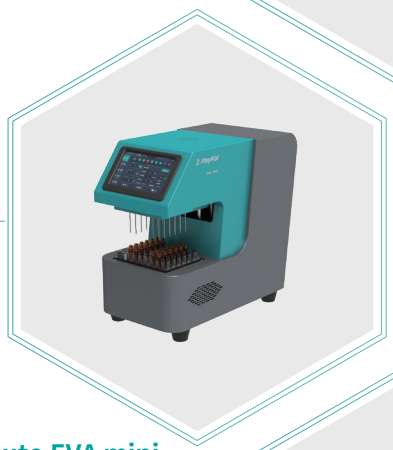
Auto EVA 60 High throughput and Easy

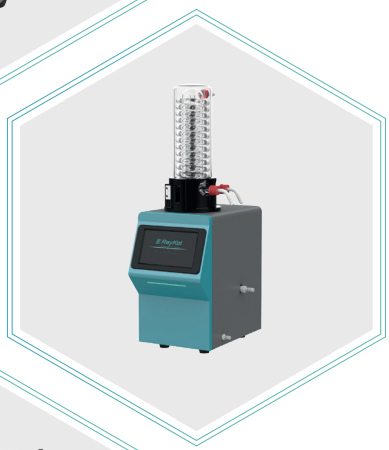
- Max. 100 samples per batch
- Needles tracing liquid level
- Flexible in combination
- Modular designs

Auto EVA 12 Large volume & Endpoint Detection

- Max. 12 samples per batch
- Efficient, fast, parallel
- Transparent in 3 side
- Sprinkle flushback for high recovery







Auto EVA mini
Specialist in mini volume

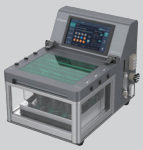
- Compact design
- Hollow design for good visual
- Needles following liquid level
- Easy to use

Auto EVA 80
High performance & Large batch

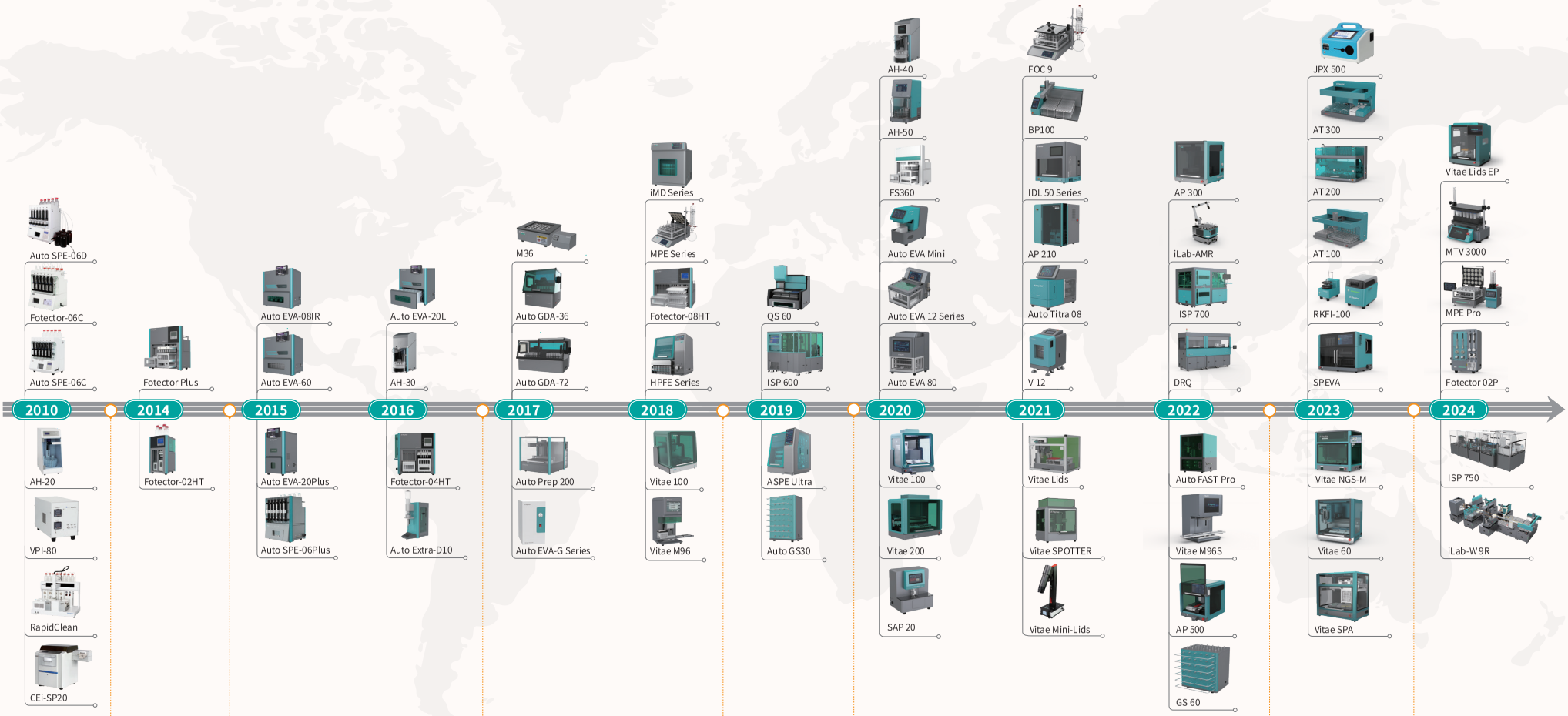
- Multichannel design，up to 80 samples per batch
- Transparent water bath
- Good parallelism in blowdown
- Compatible and flexible sample rack

MPE Pro
High-throughput Vacuum Parallel Evaporator

- Max. 12/20/48 samples per batch
- Max. available to 800mL sample vials
- Gently gradient pressure decrease
- User-friendly design in hardware and software

Product	 Auto EVA series	 Auto EVA 80	 Auto EVA mini	 Auto EVA 12	 MPE Pro
Sample capacity	60/100/36	80/48	24	12	12/20/48
Sample volume	⩽ 40mL	⩽ 40mL	⩽ 5mL	⩽ 200mL	⩽ 400mL
Evaporation	Nitrogen blow	Nitrogen blow	Nitrogen blow	Nitrogen blow	Vacuum
Heating	Water bath	Water bath	Metal bath	Water bath	Water bath
Nitrogen blowing angle	Vertical	Vertical	Vertical	Angled	-
Liquid level tracing	✓	✓	✓	-	-
Endpoint detection	-	-	-	✓	Optional
Sample tube rinsing	-	-	-	Sprinkle rinsing	Flushback rinsing
Gradient pressure	-	-	-	-	✓
Solvent recovery	-	-	-	-	✓

Product Development



RayKol Group

RayKol Instrument Group

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