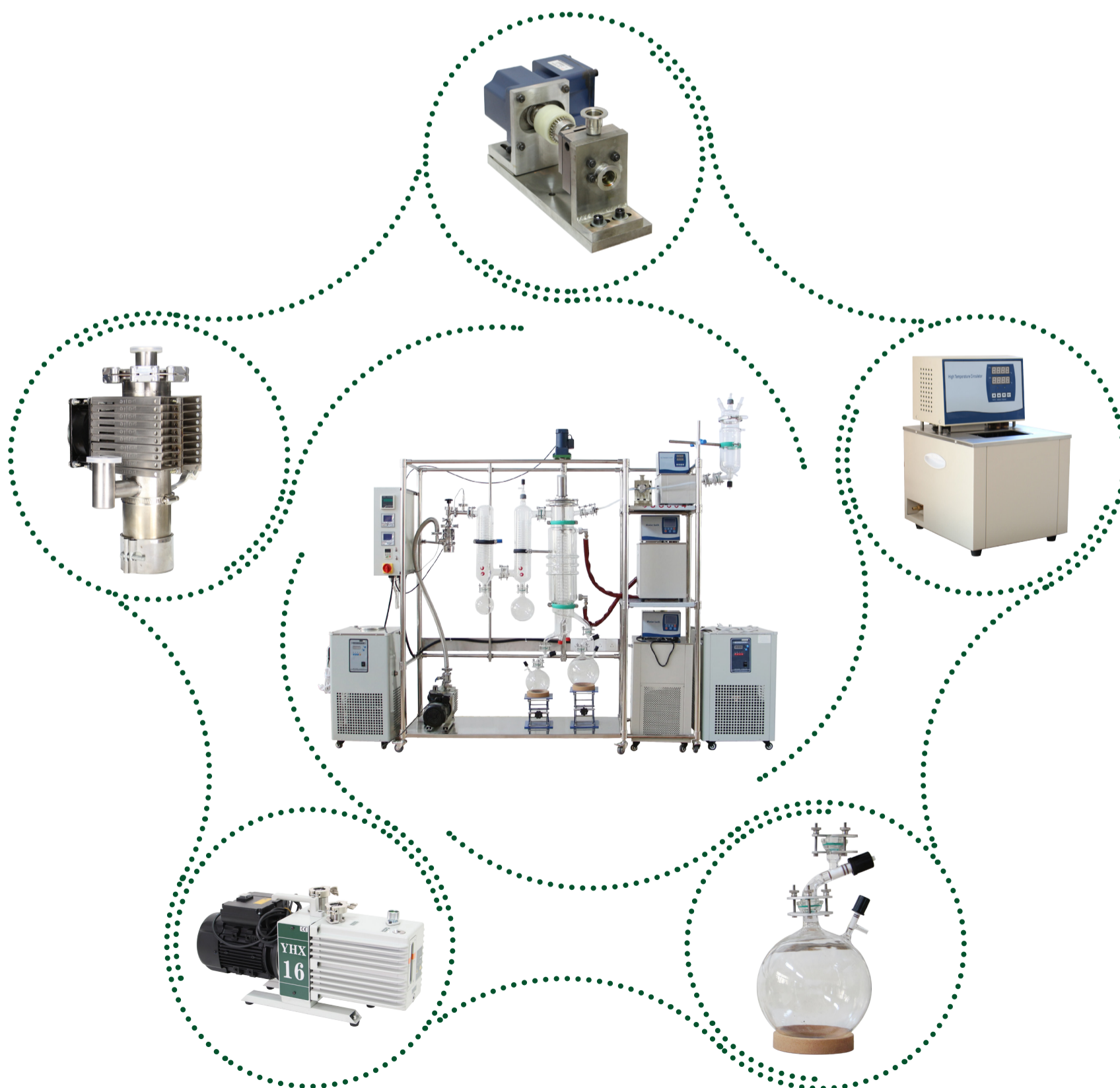


*Turnkey solution for distilling
plants oil concentrates*

分子蒸馏系统

Short Path (Molecular) Distillation System

- 广泛应用于植物精油提纯领域
 - 为客户提供整套解决方案，为客户节约成本&时间
 - 多种可选套装，符合不同需要客户
 - 系统设计智能化，实现连续作业，产能高效
- Widely used in distilling & purifying plants oil concentrates
 - Turnkey package provided for saving costs, energy and time of clients
 - Multiple options of different packages fit for different production needs and purchase budgets
 - Intelligently designed system to realize non-stop operation for high production rate



分子蒸馏系统

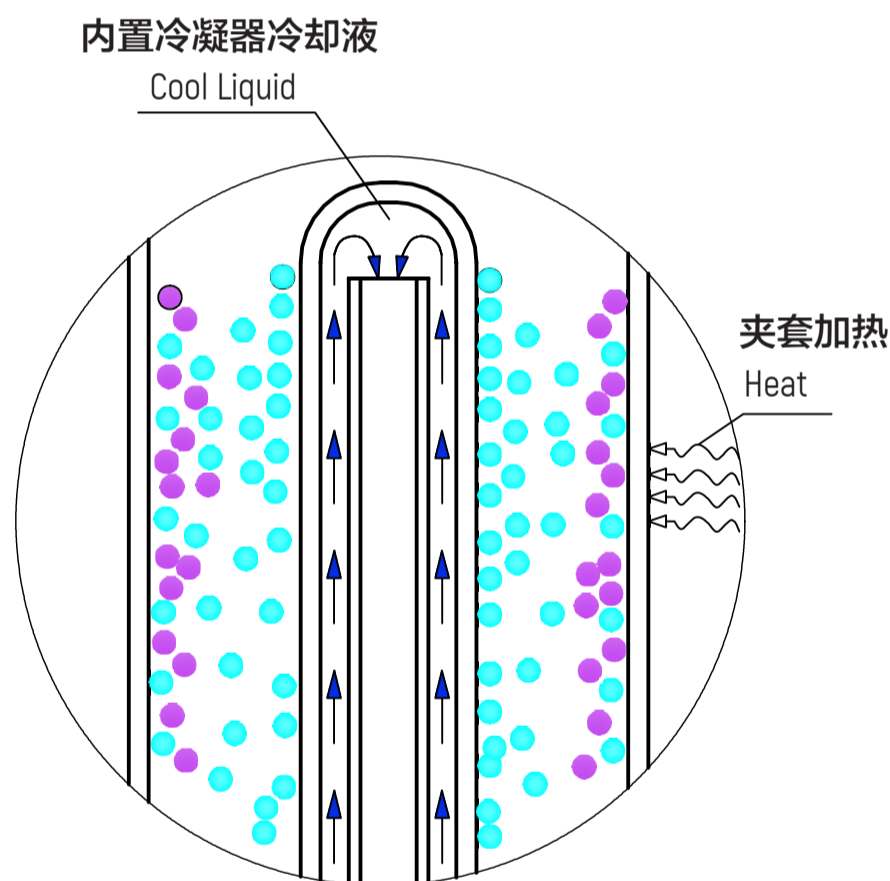
Short Path (Molecular) Distillation System

什么是分子蒸馏？

What is Short Path (Molecular) Distillation?

分子蒸馏是一种特殊的液-液分离技术，它不同于传统蒸馏依靠沸点差分离原理，而是靠不同物质分子运动平均自由程的差别实现分离。

Short Path (Molecular) Distillation is a special liquid-liquid separation technology, which is different from the traditional distillation by boiling point difference separation principle, but by different substances molecular movement of the average free path difference to achieve separation.



分子蒸馏的反应过程

Process of the Short Path (Molecular) Distillation

分子蒸馏的反应过程是指在一个设计为高真空的装置内，分子可以从热液中逸出，在与其他分子碰撞之前，直接到达内置冷凝表面而冷凝，从而液化，达到分离。该原理适用于热敏感，高沸点和高分子量的材料的提纯。

The process of Short Path (Molecular) Distillation when carried out in an apparatus designed for high vacuum in order to allow the molecules escape from the warm liquid into a cooler surface inside a condenser before coming in contact other molecules and finally settle down into the liquid is known as molecular distillation. This method is applied to purify heat sensitive, high boiling point, and high molecular weight materials.

分子蒸馏系统

Short Path (Molecular) Distillation System

分子蒸馏的优势

Advantages of the Short Path (Molecular) Distillation

分子蒸馏被认为是最安全的分离方式，它可以用来提纯热稳定性差的分子以及低挥发性、高沸点的相关化合物。在高真空环境下，分子蒸馏的特点是蒸馏温度低，物料受热时间短，可快速进行分离。

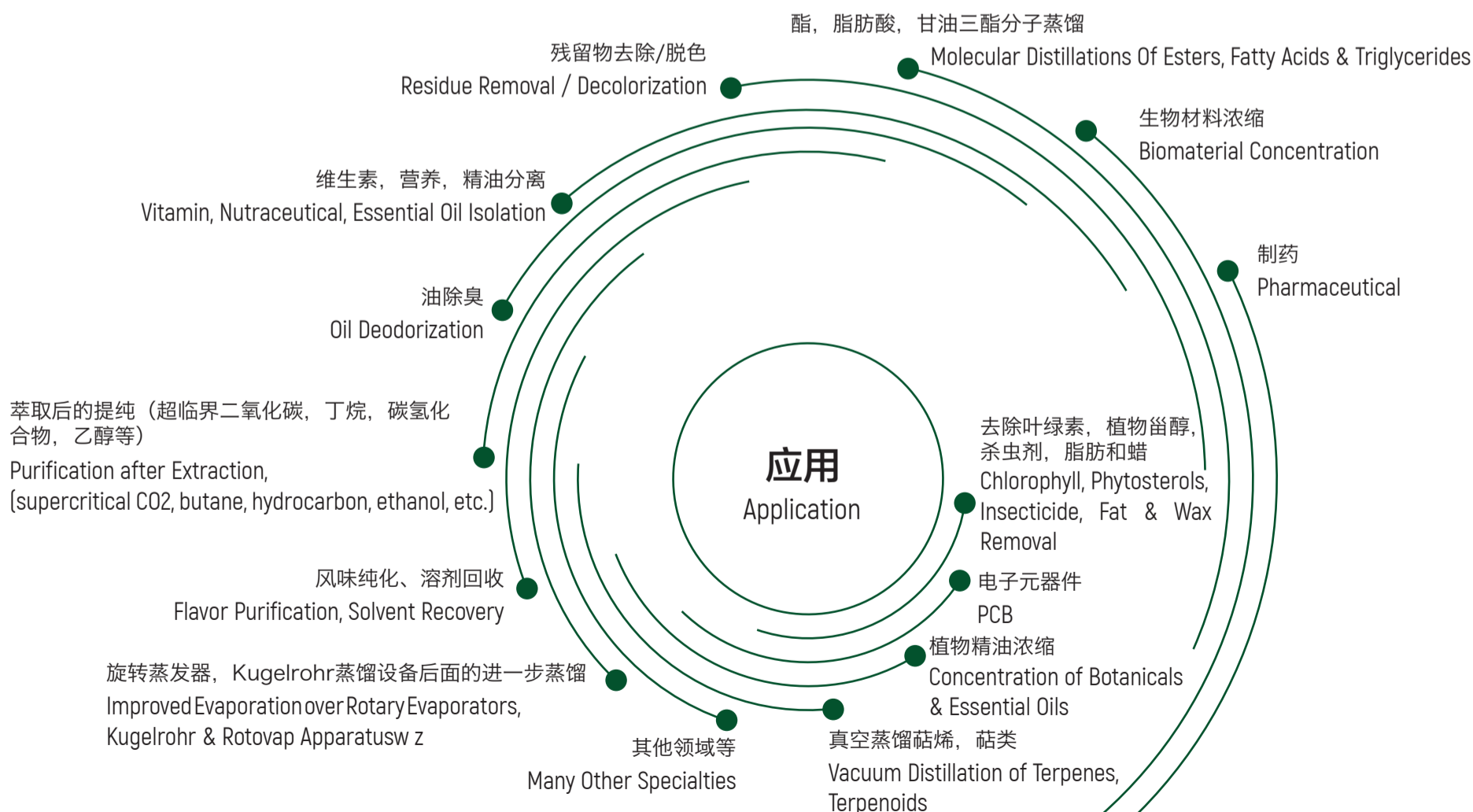
Molecular distillation is considered as the safest mode of separation and to purify the thermally unstable molecules and related compounds with low volatility and elevated boiling point. The process distinguishes the short residence time in the zone of the molecular evaporator exposed to heat and low operating temperature due to vacuum in the space of distillation.

应用

Application

分子蒸馏用于分离高沸点、热敏和易氧化的物质。

Molecular Distillation is applied for separation of high boiling point, heat-sensitive and readily oxidizable materials.



分子蒸馏系统

Short Path (Molecular) Distillation System

分子蒸馏应用实践案例：植物油提纯领域

A Case Study of Application of Short Path (Molecular) Distillation in Plant Oil Distillation

分子蒸馏应用于从植物精油中蒸馏出具有高价值的高纯度提纯物，例如，精炼植物类精油，得到高纯度金黄提纯物，其提纯物可以被注入到各种可食用产品或高纯度精油中制成电子烟或其他产品。

Molecular Distillation is also applied for creating a high value clear distillate from Plant Oil Concentrates, for example, refine plants concentrates into a golden clear distillate that can be infused into a variety of edible products or fine oils to be used in vape cartridges or other products.



分子蒸馏系统

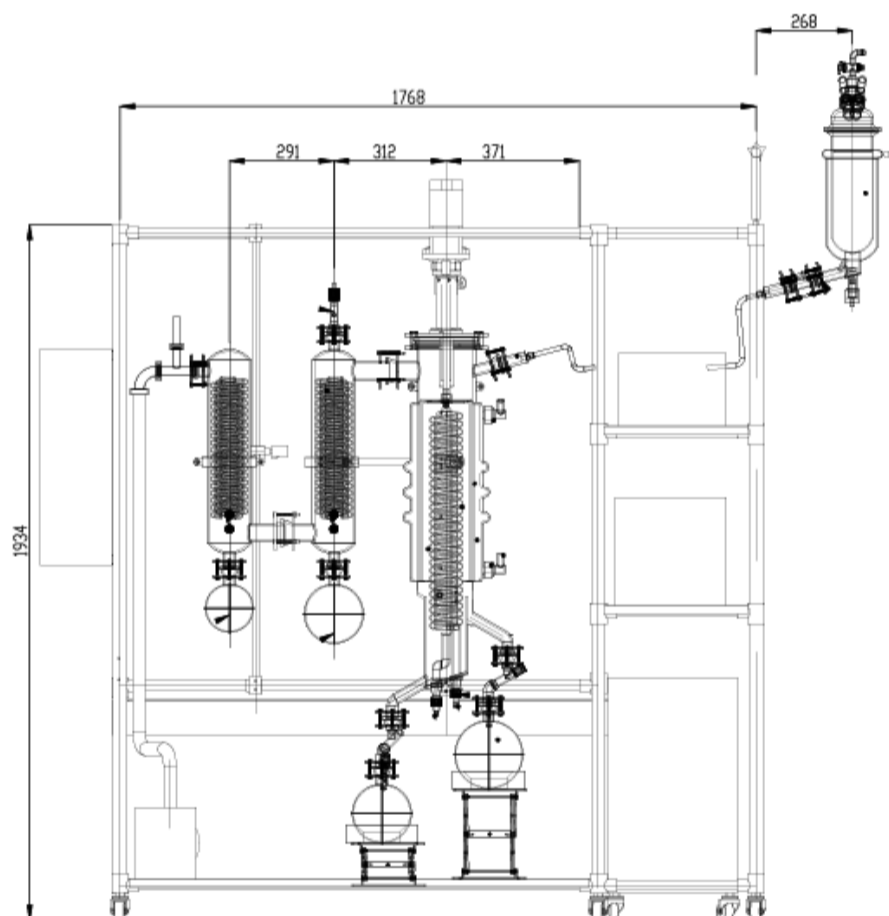
Short Path (Molecular) Distillation System

分子蒸馏系统

Our Short Path (Molecular) Distillation System

利用分子蒸馏的工作原理，我们的YMD系列短程分子蒸馏系统是一种高效的植物精油提纯设备，用以获得高纯度的精油。

Taking advantage of molecular distillation working principle, our YMD series Short Path (Molecular) Distillation System is a high efficient apparatus for distillation of plant oil concentrates, to get high grade concentrates.



- 玻璃部件均为自主生产，生产灵活性大，可完全根据客户要求定制
- 自主研发的磁力密封部件，可保证系统内维持最大真空度，蒸发高效
- 可选配全自动加料出料系统，为客户提高产能，节约人力
- 根据不同客户的生产需求和采购预算，为客户提供一站式整套解决方案

- Glassware parts are self-manufactured, with great flexibility in production, and can be completely customized according to customer requirements.
- Magnetic seal components are independently developed to ensure maximum vacuum in the system and efficient evaporation
- Optional automatic feeding and discharging system for customers so as to increase production capacity and save manpower
- According to different customer's production needs and purchase budget, we provide customers with turnkey solutions

分子蒸馏系统

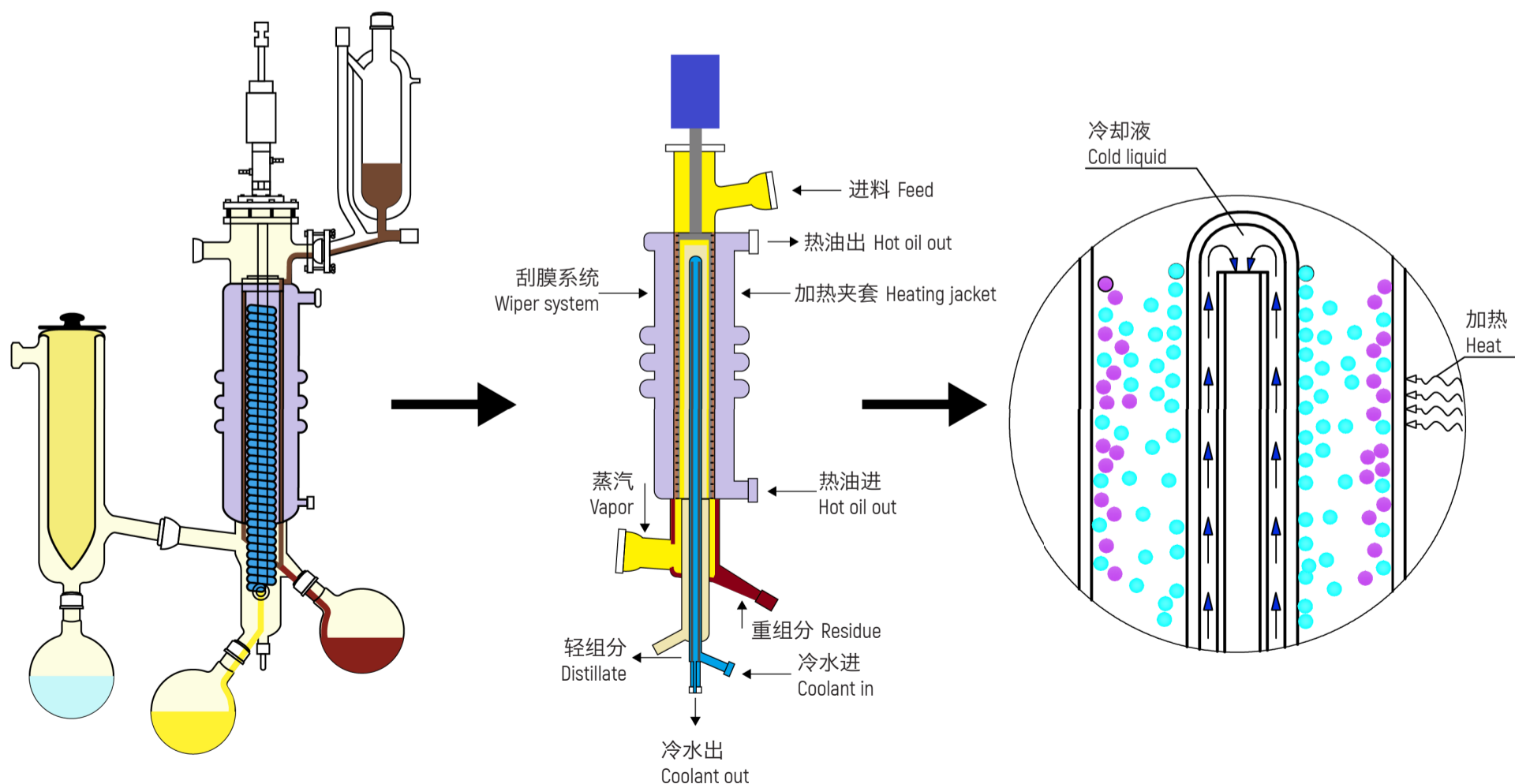
Short Path (Molecular) Distillation System

工作流程

Working Process

物料从进料瓶被传送到主夹套蒸发器中，夹套里有持续的加热，刮膜器将料液刮成一层极薄、呈湍流状的液膜，并以螺旋状向下推进。在机身的中心是一个与加热面距离非常近的内置冷凝器，为蒸汽分子从加热表面移动到冷凝面提供了一个短程。在下降过程中，料液中较轻（低沸点）的物质开始汽化，移动到内部冷凝器并冷凝，变为液体下流到轻组分接收瓶。较重的物质（如叶绿素，盐，糖，蜡）不会蒸发，而是会沿着主蒸发器流入重组分接收瓶。

Feed material is delivered from a feed flask into the main jacketed evaporator, having heating from the jacket, and a diagonally slotted wiper mechanism forcing liquid around and downward in a thin film on the inside. In the center of the body is a closely positioned internal condenser, providing a short path for vapor molecules traveling from the heated surface to the condenser surface. During the journey downward, lighter (lower boiling point) fractions of the liquid begin to vaporize, move to the internal condenser and condense, falling down as a liquid into a well that captures and separates the distilled liquid which flows into the Distillate receiving flask. Heavier residue material (like chlorophyll, salts, sugars, heavy wax) does not evaporate and instead travels the length of the main evaporator body and flows into the Residue receiving flask.



分子蒸馏系统

Short Path (Molecular) Distillation System

套装构成

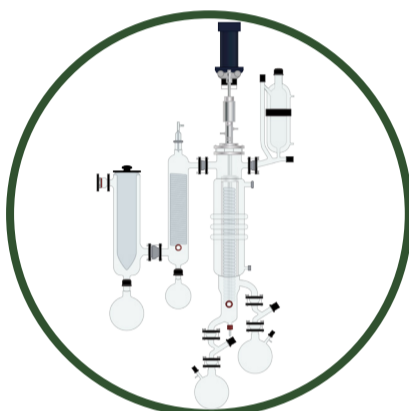
Turnkey Package

上海远怀实业为您提供整套分子蒸馏解决方案。

YHCHEM is now offering turnkey packages for short path molecular distillation units.

主蒸发器

- 夹套蒸发器 (内含冷凝器)
 - 直径: 60/80/100/150/200毫米有效蒸发面积: 0.06-0.35平方
 - 处理量: 250-5000克/小时
- 外置冷凝器 (选配)
- 夹套加料罐
- 轻组分收集瓶 (选配: 连续出料模块)
- 重组分收集瓶 (选配: 连续出料模块)
- 干冰冷阱 (选配: 盘管冷阱)
- 磁力耦合驱动搅拌 (含电机)
- 不锈钢雨刷 (四氟搅拌桨)

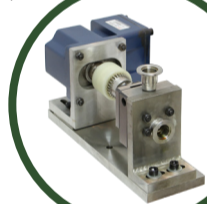


Main distiller

- Jacketed Glass Barrel with Internal Cooling Condenser
 - Diameter: 60mm/80mm/100mm/150mm/200mm
 - Effective Evaporation Area: 0.06-0.35m²
 - Processing Rate: 250-5000gram/hour
- External condenser (Optional)
- Jacketed Feeding Vessel with Lid
- Distillate Receiving Flask (Optional: Continuous collection module)
- Residue Receiving Flask (Optional: Continuous collection module)
- Dry ice cold trap (Optional: Cooling coils cold trap)
- Magnetic drive rotation with motor
- Stainless steel wiper with PTFE blade

加料 & 出料系统 Feeding & Discharging system

- 自动连续加料&出料齿轮泵 (带加热) (选配)
 - Gear pump for automatic and continuous feeding (Optional)
- 传输压力: 0.8 兆帕
 - Transmission pressure: 0.8 Mpa
- 速率: 15-900毫升/分钟
 - Pump rate: 15-900 ml/min
- 转速: 50-3000转/分钟
 - Speed rate: 50-3000 RPM
- 功率: 120瓦
 - Power: 50W
- 电压: 220/110伏
 - Electricity: 220V/110V



控制系统 Control system

- 数显真空计 (0.01帕至1个标准大气压), 皮拉尼类型
 - Digital High Vacuum Gauge (0.01pa-1atm), Pirani Type
- 变频调速控制器 (控制转速)
 - VFD Speed Controller for Rotation Motor
- 加热带温度控制器
 - Two Temperature Controllers for Heating Tapes
- 扩散泵开关 (选配)
 - Two switches for Diffusion pump (Optional)
- 主电源开关
 - Main Power switch
- 电压: 220V
 - Electricity: 220V



- 加热循环器 (配套加料罐)
 - Heating Circulator for Feeding Vessel
 - 加热温度范围: 室温至300摄氏度
 - Temperature Range: RT-300°C
 - 电压: 220V
 - Electricity: 220V



- 加热循环器 (配套夹套蒸发器)
 - Heating Circulator for jacketed glass barrel
 - 加热温度范围: 室温至300摄氏度
 - Temperature Range: RT-300°C
 - 电压: 220V
 - Electricity: 220V



- 加热&制冷循环器 (配套内置冷凝器)
 - Heating/cooling Circulator for internal condenser
 - 加热温度范围: 室温至100摄氏度
 - Temperature Range: RT-100°C
 - 电压: 220V
 - Electricity: 220V



- 选配 Optional
- 制冷循环器 (配套外置冷凝器)
 - Cooling circulator for external condenser
 - 浴槽体积: 10升
 - Bath volume: 10L
 - 最低温度: 零下32摄氏度
 - Lowest temp: -32°C
 - 速率: 20升/分钟
 - Pump rate: 20L/min
 - 电压: 220V
 - Electricity: 220V



- 选配 Optional
- 制冷循环器 (配套盘管冷阱)
 - Cooling circulator for coil condenser
 - 浴槽体积: 5升
 - Bath volume: 5L
 - 最低温度: 零下80摄氏度
 - Lowest temp: -80°C
 - 速率: 20升/分钟
 - Pump rate: 20L/min
 - 电压: 220V
 - Electricity: 220V

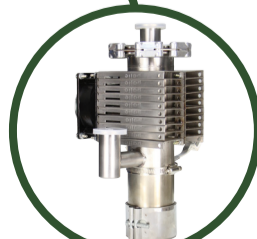
真空系统 Vacuum system

- 真空泵
 - Vacuum pump
- 速率: 9立方英尺/分钟
 - Pump Rate: 9CFM
- 最大真空度: 4×10^{-4} 毫巴
 - Ultimate Partial Pressure: 4×10^{-4} mbar
- 电压: 220V
 - Electricity: 220V



真空系统 Vacuum system

- 扩散泵 (选配)
 - Diffusion pump (Optional)
- 直径: 100 毫米
 - Diameter: 100mm
- 泵速: 300升/秒
 - Pump rate: 300Lps
- 加热功率: 700瓦
 - Heating Power: 700W
- 电压: 220V
 - Electricity: 220V



分子蒸馏系统

Short Path (Molecular) Distillation System

产品特性

Features

- 停留时间短（几秒钟即可分离成功，而不是几小时）
- 工作压力低至0.1Pa（100Pa = 1mbar）。高真空确保低蒸馏温度因此可以进行非常高效的蒸馏。
- 夹套设计使其加热高效，保温性强。
- 玻璃部分由高硼酸硅玻璃制成，气密性好，易于观察蒸发和分离过程
- 可连续蒸馏，无需中断
- 蒸馏温度低
- 高蒸发率
- 多种型号可供选择（夹套蒸发器直径：60mm，80mm，100mm，150mm和200mm），适合客户小试生产，中试生产或规模生产。工业级（蒸发器直径 \geq 200mm）型号可根据要求定制。
- 根据客户对玻璃部分和支架的要求灵活设计
- 即插即用的一站式服务，提供技术支持。
- 多种套装选择：根据客户的生产需要，设计了基础套装，和三种升级套装供客户选择。
- Short residence time (separation is finished in seconds, instead of hours.)
- Low operating pressures to 0.1Pa (100Pa=1mbar). The very low operating pressure ensures very low distillation temperature and therefore a very gentle distillation is possible.
- Jacket design for efficient heating & excellent heat preservation
- Made of high borosilicate glass with great air tightness, easy for viewing evaporation and separation process
- Continuous distillation process
- Low distillation temperature
- High evaporation rates
- Wide choice of models (Diameter: 60mm, 80mm, 100mm, 150mm and 200mm), fit for clients at starting point, pilot production or scale production. Industrial grades (\geq 200mm) products are available upon request.
- Flexible design as clients' requirement for glass ware and support frame
- Turkey package which is plug-and-play, technical supports available.
- Multiple sets: one standard set and three advanced sets as clients' production need

产品参数

Specification

型号 Model	YMD-060	YMD-080	YMD-100	YMD-150	YMD-200
蒸发器直径 Barrel diameter(mm)	60	80	100	150	200
加料速率 Feeding rate (g/hr)	250-500	500-750	750-1500	1500-3000	3000-5000
加料罐容积 Feeding flask volume(L) <small>*容量可按客户需求定制 Customizable volume as clients' needs</small>	1	1.5	2	2	5
有效蒸发面积 Effective evaporation area(m ²)	0.06	0.1	0.15	0.24	0.35
电机功率 Motor Power	90	120	120	120	200
最大转速 Maximum speed(rpm)	500				
轻组分收集瓶 Distillate receiving flask <small>*容量可按客户需求定制 Customizable volume as clients' needs</small>	1L	1L	2L	3L	5L
重组分收集瓶 Residue receiving flask <small>*容量可按客户需求定制 Customizable volume as clients' needs</small>	1L	1L	2L	3L	5L
工作温度范围 Operation temperature	Up to 200°C				
电压 Electrical requirement	220V/50-60Hz				

分子蒸馏系统

Short Path (Molecular) Distillation System

可选套装

Available Packages

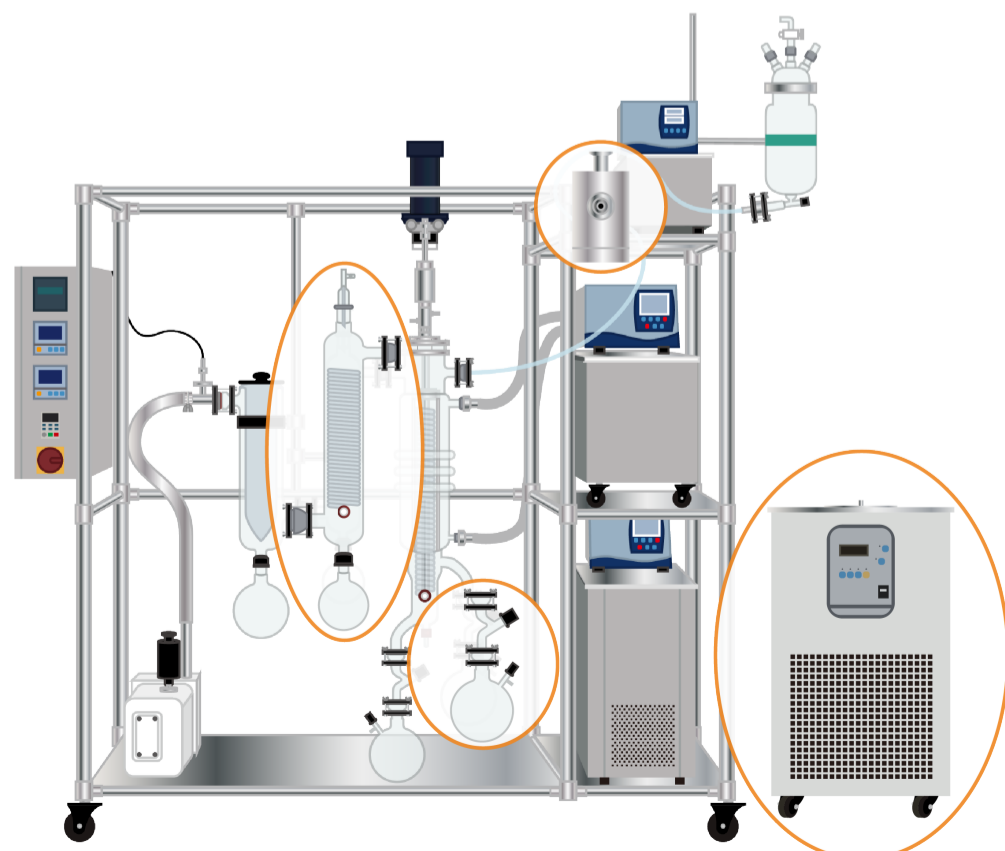


标准版

Standard Set

1. 夹套加料罐 (带手动加料阀门)
2. 磁力耦合驱动搅拌 (含电机)
3. 夹套蒸发器 (内含冷凝器)
4. 干冰冷阱
5. 加热循环器 (配套加料罐)
6. 加热循环器 (配套夹套蒸发器)
7. 加热&制冷循环器 (配套内置冷凝器)
8. 真空泵
9. 控制系统
10. 接收瓶 (轻组分, 重组分)

1. Jacketed feeding flask with manual feeding valve
2. Magnetic drive rotation with motor
3. Jacketed glass barrel with internal condenser
4. Dry ice cold trap
5. Heating circulator for jacketed feeding vessel
6. Heating circulator for jacketed glass barrel
7. Heating/cooling Circulator for internal condenser
8. Vacuum pump
9. Control system
10. Receiving flasks (Distillate and Residue)



升级版 I

Upgraded Set I

标准版基础之上添加如下功能区块

- ★ 1. 连续出料模块 (轻组分, 重组分)
- ★ 2. 自动连续加料齿轮泵
- ★ 3. 外置冷凝器 (收集萜烯)
- ★ 4. 制冷循环器 (配套外置冷凝器)

Standard set plus

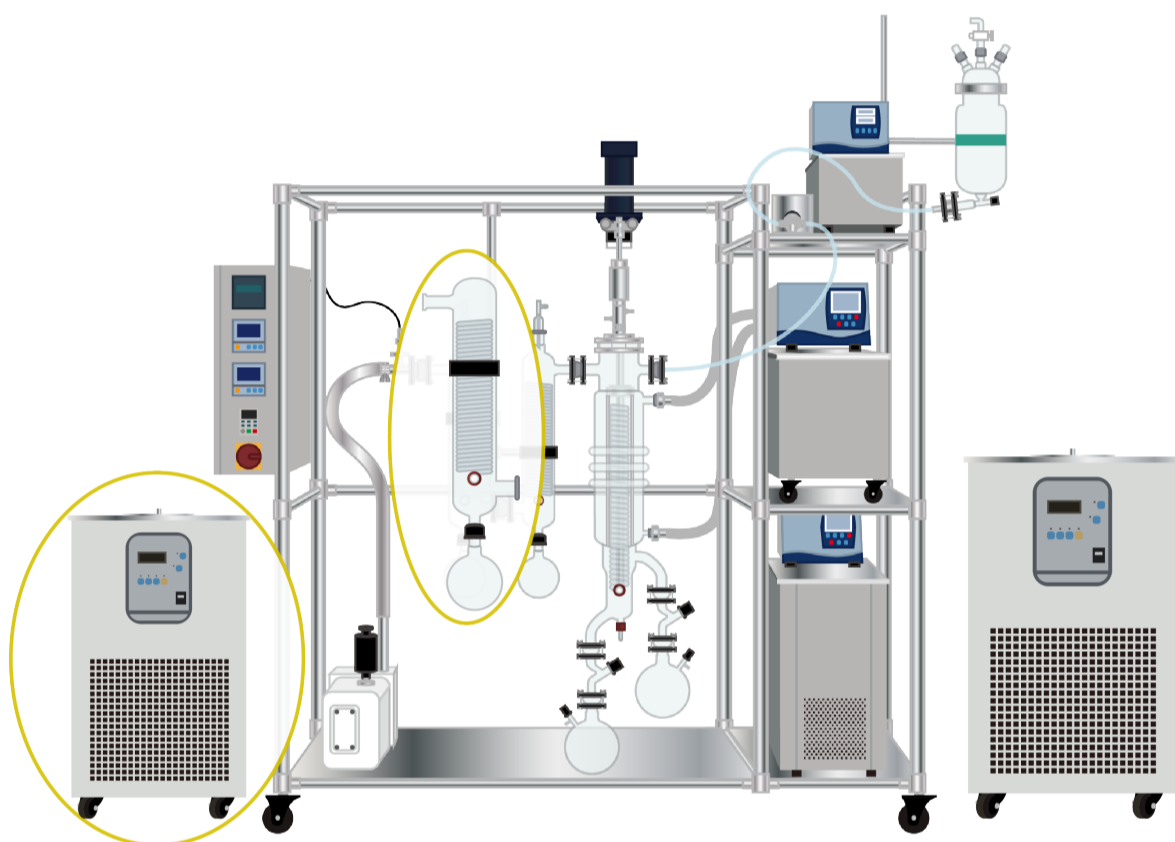
- ★ 1. Continuous collection module (Distillate and Residue)
- ★ 2. Gear pump for automatic and continuous feeding
- ★ 3. External condenser for collecting Terpenes
- ★ 4. Cooling circulator for external condenser

分子蒸馏系统

Short Path (Molecular) Distillation System

可选套装

Available Packages



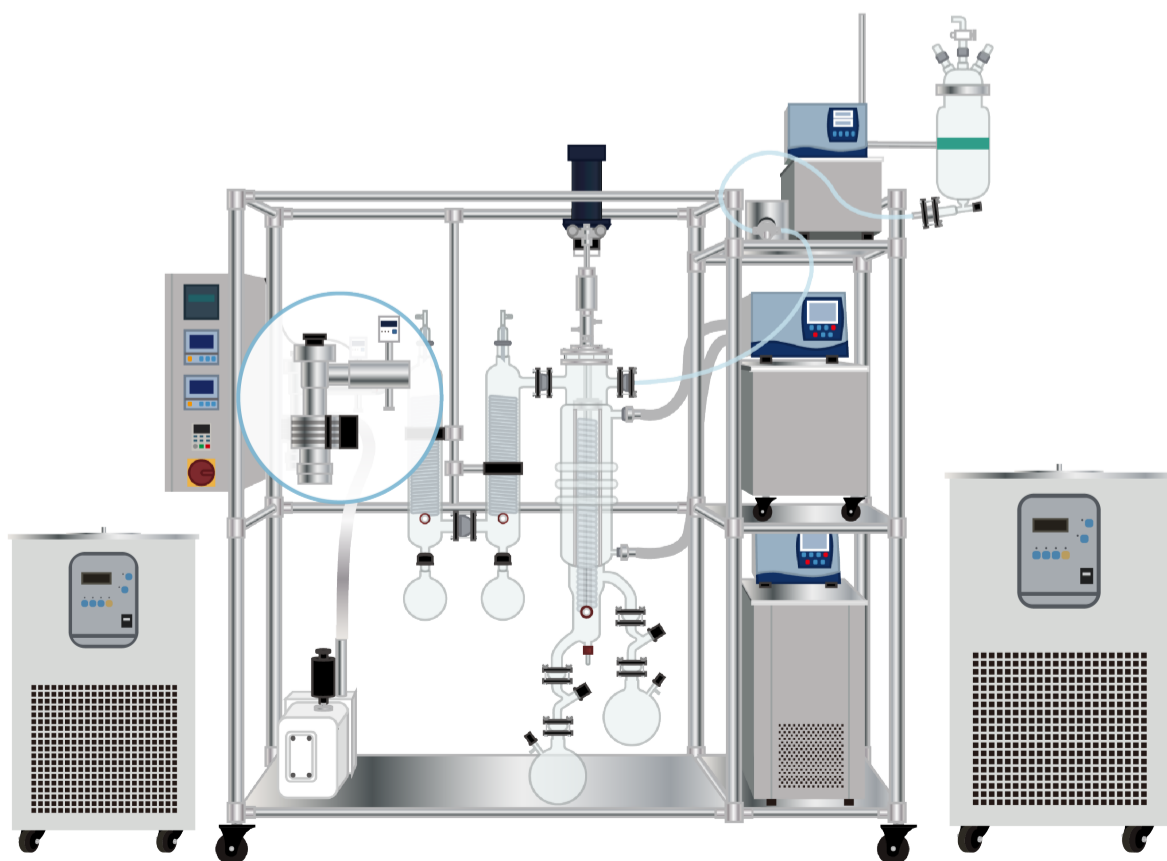
升级版 II Upgraded Set II

标准版基础之上添加如下功能区块

- ★ 1.连续出料模块 (轻组分, 重组分)
- ★ 2.自动连续加料齿轮泵
- ★ 3.外置冷凝器 (收集萜烯)
- ★ 4.制冷循环器 (配套外置冷凝器)
- ★ 5.盘管冷阱
- ★ 6.制冷循环器 (配套盘管冷阱)

Standard set plus

- ★ 1.Continuous collection module (Distillate and Residue)
- ★ 2.Gear pump for automatic and continuous feeding
- ★ 3.External condenser for collecting Terpenes
- ★ 4.Cooling circulator for external condenser
- ★ 5.Cooling coils cold trap
- ★ 6.Cooling circulator for cooling coils cold trap



升级版 III Upgraded Set III

标准版基础之上添加如下功能区块

- ★ 1.连续出料模块 (轻组分, 重组分)
- ★ 2.自动连续加料齿轮泵
- ★ 3.外置冷凝器 (收集萜烯)
- ★ 4.制冷循环器 (配套外置冷凝器)
- ★ 5.盘管冷阱
- ★ 6.制冷循环器 (配套盘管冷阱)
- ★ 7.扩散泵

Standard set plus

- ★ 1.Continuous collection module (Distillate and Residue)
- ★ 2.Gear pump for automatic and continuous feeding
- ★ 3.External condenser for collecting Terpenes
- ★ 4.Cooling circulator for external condenser
- ★ 5.Cooling coils cold trap
- ★ 6.Cooling circulator for cooling coils cold trap
- ★ 7.Diffusion pump

分子蒸馏系统

Short Path (Molecular) Distillation System

不锈钢分子蒸馏系统

Stainless Steel Short Path (Molecular) Distillation System

我们还可以根据客户生产需要为客户制作不锈钢分子蒸馏解决方案。

一套完整的不锈钢短程蒸馏装置包括:

- 短程蒸发器
- 加热系统
- 进料系统
- 冷却系统
- 真空系统
- 物料收集单元

We also can provide turnkey solution for Stainless Steel Short Path (Molecular) Distillation System as clients' production need.

A complete set of Stainless Steel Short Path(Molecular) Distillation system includes:

- Short Path evaporator
- Heating system
- Feeding system
- Cooling system
- Vacuum system
- Material collection unit



规格型号

Specification

型号 Model	蒸发面积 Evaporation Area m ²	进料量 Feeding Rate L/h	进料方式 Feeding Method	物料接收方式 Receiving Method	设备高度 Equipment Height
YMD-06S	0.06	1-3	压差针阀调节 Adjustment made by differential pressure needle valve	玻璃接收瓶 Glass receiver	2000
YMD-1S	0.1	5-12	高精度齿轮泵 High-precision gear pump	玻璃接收瓶 Glass receiver	2350
YMD-1S-2	0.1	5-12	高精度齿轮泵 High-precision gear pump	连续出料泵 Continuous discharge pump	2100
YMD-2S	0.2	10-25	高精度齿轮泵 High-precision gear pump	不锈钢储罐 Stainless steel storage tank	2650
YMD-2S-2	0.2	10-25	高精度齿轮泵 High-precision gear pump	连续出料泵 Continuous discharge pump	2650
YMD-5S	0.5	20-60	高精度齿轮泵 High-precision gear pump	不锈钢储罐 Stainless steel storage tank	3300
YMD-5S-2	0.5	20-60	高精度齿轮泵 High-precision gear pump	连续出料泵 Continuous discharge pump	3100
YMD-10S	1	50-120	高精度齿轮泵 High-precision gear pump	不锈钢储罐 Stainless steel storage tank	4450
YMD-10S-2	1	50-120	高精度齿轮泵 High-precision gear pump	连续出料泵 Continuous discharge pump	4250
YMD-15S	1.5	60-180	高精度齿轮泵 High-precision gear pump	连续出料泵 Continuous discharge pump	4500
YMD-20S	2	100-200	高精度齿轮泵 High-precision gear pump	连续出料泵 Continuous discharge pump	5000
YMD-30S	3	100-300	高精度齿轮泵 High-precision gear pump	连续出料泵 Continuous discharge pump	6200
YMD-50S	5	200-500	高精度齿轮泵 High-precision gear pump	连续出料泵 Continuous discharge pump	7500