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Shanghai Beyond Machinery Co., Ltd.

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Shanghai Beyond Machinery Co., Ltd.

Complete set of Pharmaceutical/  
Biological fermentation equipment

生物发酵 | 制药成套设备





## Company Introduction



上海本优机械有限公司是一家专业化的科技发展型机械制造企业。公司秉承多年的生物工程装备制造经验，熟悉各类生物发酵的工艺特点和装备结构特点，为生物制药工程、生物营养保健食品工程、生物能源、生物农业、生物材料等大、中型工程提供装备和工程服务。

公司聚集了一批资深生物工程配套的工艺设计、单机结构设计、控制设计工程师，以工艺设计为主线进行生物工程的成套化、精细化设计、制造、工程安装、工艺调试、工艺验证等完整的解决方案。

公司的设计理念：没有最好的装备，只有最符合工艺需求的装备。

为了民族轻工业的更好发展，本优公司愿与同行一起努力尽一份责任和义务，同时热忱欢迎国内外客户光临指导。

Shanghai beyond Machinery Co., Ltd. is a professional science and technology development-oriented machinery manufacturer. With the years of biological engineering equipments manufacturing experiences and the familiar of the process characters and the equipments structure features, our company provides the equipments and engineering services for medium and large sized projects such as the biological pharmaceutical engineering projects, biological nutrition and health food engineering projects, biological energy source, biological agriculture, biological materials, etc.

We gather a group of sensor experienced process designing engineers, individual machines designers, control designing engineers, taking the process design as the essentials, to provide the complete precise solutions which including the designing, manufacturing, installation and commissioning, as well as the process validation.

Company design concept: There aren't the best equipments meeting the process requirements, but the most suitable ones.

For the better development of national light industry, Beyond is willing to work together with counterparts, and contribute a responsibility and obligation, at the same time, warmly welcome customers from domestic and abroad to visit our company for guidance.



### 交钥匙工程 Turn-key Project

- ◆ 生物发酵系列
- ◆ 提取系列
- ◆ 浓缩系列
- ◆ 纯化分离系列
- ◆ 醇沉/回收系列
- ◆ 无菌列管式超高温杀菌机(UHT)
- ◆ 不锈钢容器系列
- ◆ CIP清洗系列
- ◆ 自动化控制
- ◆ 不锈钢管阀件、卫生级泵系列
- ◆ Biological fermentation series
- ◆ Extracting series
- ◆ Concentrating series
- ◆ Purification and separation series
- ◆ Alcohol precipitation/recovery series
- ◆ Aseptic tubular UHT sterilizer
- ◆ Stainless steel vessels series
- ◆ CIP cleaning series
- ◆ Automation control
- ◆ Stainless steel sanitary pipe valves and pumps







精品工程  
Excellent Project





## 生物反应器 Bioreactor



### ◆ 工艺类别

微生物发酵、抗生素发酵、核酸发酵、酶发酵、酵母发酵、曲发酵。

### ◆ Process types

Microbial fermentation, antibiotic fermentation, nucleic acid fermentation, enzyme fermentation, yeast fermentation, starter fermentation.

### ◆ 发酵类别

耗氧发酵、兼气发酵、厌氧发酵。

### ◆ Fermentation types

Oxidation fermentation, facultative fermentation, anaerobic fermentation.

### ◆ 物料类别

液态发酵、半液态悬浮发酵、固态发酵。

### ◆ Material types

Liquid state fermentation, semi-liquid state fermentation, solid fermentation.

### ◆ 装料系数

70~75%

### ◆ Coefficient of charge

70~75%

### ◆ 通气比

1~2vvm

### ◆ Ventilation ratio

1~2vvm

### ◆ 高径比

2~2.5

### ◆ Height-diameter ratio

2~2.5

### ◆ 培养基灭菌

实消、连消、UHT连消等多种形式。

### ◆ Culture medium sterilizing type

Actual sterilization, continuous sterilization, UHT continuous sterilization, etc.

### ◆ 菌种类别

真菌、细菌、纹线菌

### ◆ Culture types

fungus, bacterium, actinomycetes.

### ◆ 扩培类别

单罐发酵、多级发酵、盘式发酵

### ◆ Culture expanding types

Single tank fermentation; multi-stage fermentation, disk-type fermentation.

### ◆ 罐体系列

10L、20L、30L、50L、100L、200L、300L、500L、1m<sup>3</sup>、2m<sup>3</sup>、3m<sup>3</sup>、5m<sup>3</sup>、10m<sup>3</sup>、20m<sup>3</sup>、30m<sup>3</sup>、50m<sup>3</sup>、80m<sup>3</sup>、100m<sup>3</sup>、200m<sup>3</sup>，可以定制。

### ◆ Tank series

10L, 20L, 30L, 50L, 100L, 200L, 300L, 500L, 1m<sup>3</sup>, 2m<sup>3</sup>, 3m<sup>3</sup>, 5m<sup>3</sup>, 10m<sup>3</sup>, 20m<sup>3</sup>, 30m<sup>3</sup>, 50m<sup>3</sup>, 80m<sup>3</sup>, 100m<sup>3</sup>, 200m<sup>3</sup>, or customized.

## 罐体结构

### Tank structure

◆ 按ASME洁净设备标准进行设计、制造，同时满足《压力容器》规范要求。

◆ Design and manufacture as to the ASME clean equipment standard, also comply with requirement of Pressure Vessel.

### ◆ 内表面处理

机械抛光至Ra < 0.4 μm后进行镜面处理。

### ◆ Inner surface treatment

Mechanical polishing Ra < 0.4 μm, and then mirror treatment.

### ◆ 外表面处理

机械抛光至Ra < 0.6 μm后进行亚光处理。

### ◆ Outer surface treatment

Mechanical polishing Ra < 0.6 μm, and then matt treatment.

### ◆ 无死角处理

内筒体焊缝与内表面同时抛光处理，结构件均采用满焊焊接，焊后抛光处理。内盘管采用消除应力结构。

### ◆ No blind corner treatment

The inner welding line and the inner surface being polished, and accessories adopting the full length welding, and then polishing, inner coil pipe using the stress eliminating structure.

### ◆ 紧固件结构

所有紧固件采用双头螺栓平衡双盖形螺母，垫片采用PTFE材料进行密封。

### ◆ Fastener structure

All fasteners using the bolt stud balancing double acorn nuts, PTFE material as gasket seal.

### ◆ 机械密封

采用可冲洗、灭菌的带收集盘的机封，保证摩擦屑不落入罐内，密封形式：干、湿型，单端面或双端面。

### ◆ Mechanical seal

Using the washable, sterilized collection plate equipped mechanical seal fixed and moving ring friction sleeve, to keep the friction debris from following into the tank, seal type: dry or wet type, single side or dual seal.

### ◆ 换热形式

全夹套、蜂窝夹套、半圆管夹套、内盘管、内列管。

### ◆ Heat exchange types

Full jacket, dimple jacket, semicircle-pipe jacket, inner coil, inner tubulation.

### ◆ 搅拌形式

各型涡轮搅拌、宽叶搅拌、桨式搅拌、导流搅拌等。

### ◆ Mixing types

Turbine stirring, wide blade stirring, paddle stirring, deflector stirring, etc.

### ◆ 减速机电机

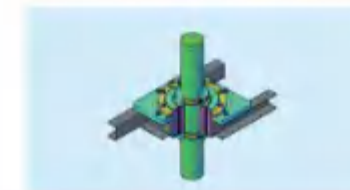
RF斜齿轮、FAF平行轴斜齿轮、SAF涡轮斜齿轮，二级能效变频电机。

### ◆ Reducer motor

RF helical gear, FAF parallel shaft helical gear, SAF turbine helical gear, two stage energy efficiency variable frequency motor.



四宽叶旋浆式搅拌器



磁推力轴承



斜叶涡轮搅拌器



直叶涡轮搅拌器



## 管道系统 Piping system



### ◆ 工艺管道

采用ASME卫生级内外抛光洁净管道，氩气气体自动焊接，内窥镜检测。

### ◆ Process piping

It adopts ASME sanitary grade internal and external polished clean pipe. It is welded automatically with argon gas, endoscope inspection.

### ◆ 阀门

与罐体连接的阀门均采用双膜片隔膜阀，蒸汽、压缩空气阀门均采用截止阀和卫生级球阀。

### ◆ Valves

The valves which are connected with tanks are using double membrane combination diaphragm valve. The steam valves and compressed air valves are using stop valve and sanitary ball valves.

◆ 出料采用双膜片隔膜式罐底阀，可以在取样前进行灭菌。

◆ Double membrane diaphragm type tank bottom valve at the product outlet to sterilize before sampling.

### ◆ 在线灭菌

采用经0.5 μm钛棒过滤器过滤的洁净饱和蒸汽。

### ◆ Online sterilization

Adopting the clean and saturated steam which is filtered by 0.5 μm titanium rod filter.

### ◆ 取样方式

取样采用隔膜式无菌取样阀，可在取样前进行在线灭菌，取无菌样。

### ◆ Sampling methods

Adopting the diaphragm type aseptic sampling valve, to do the on-line sterilization, and take aseptic sample.

### ◆ 接种方式

火焰环式、差压式。

### ◆ Inoculation methods

flame ring type, differential pressure type.

### ◆ 移种

管道可全程灭菌，管道上设置温度计进行灭菌检测。

### ◆ Subcultivation

The pipes can be sterilized during the whole progress, the thermometer on which to detecting the sterilization.

### ◆ 补料方式

蠕动泵、计量杯等。

### ◆ Subcultivation

Peristaltic pump, measuring cup, etc.

### ◆ 多级扩培系统移种

移种分配站进行多管路分配移种，隔膜阀组合移种阀阵移种等多种移种形式。

### ◆ Multi-stage culture expanding system subcultivation

Subcultivation distributor to do the multitubes distribution subcultivation, diaphragm valve combination subcultivation valve manifolds subcultivation, etc.





## 多联式实验型发酵机组

### Multi-coupled experimental fermentation system



#### 气体处理

#### Gas treatment

#### 蒸汽处理

#### Steam treatment

##### ◆ 压缩空气、氮气、二氧化碳气体处理

1  $\mu\text{m}$  气体总过滤器、0.1  $\mu\text{m}$  气体预过滤器、0.01  $\mu\text{m}$  气体精密过滤器三级除菌过滤，滤膜材质：PTFE

##### ◆ Compressed air, nitrogen, carbon dioxide treatment

1  $\mu\text{m}$  gas total filter, 0.1  $\mu\text{m}$  gas prefilter, 0.01  $\mu\text{m}$  gas precision filter, three-level aseptic filtration. The material of filter membrane is PTFE.

##### ◆ 蒸汽处理

1  $\mu\text{m}$  总过滤器、0.5  $\mu\text{m}$  终端过滤器二级过滤，滤材：钛棒

##### ◆ Steam treatment

1  $\mu\text{m}$  total filter, 0.5  $\mu\text{m}$  ultimate filter, two-level filtration. The filter material is titanium rod.



## 控制系统 Control system



### ◆ 温度控制

罐体设置温度传感器，夹套或内盘管进出口设置冷却水、恒温水自动控制阀，自控触摸屏可以设定控制温度及冷却水开、关和恒温水开、关温度，自控状态下，控制模块按控制程序自动切换调节。

### ◆ Temperature control

Temperature control: There are temperature sensors on the tanks, automatic control valve of cooling water and thermostatic water at the inlet and outlet of the jacket or inner coil pipe. Control temperature, start and stop temperature of cooling water and the thermostatic water can be set on automatic control touch screen. Under the self-control condition, the control modular can be switched and adjusted according to the control program.

### ◆ 温度控制

温度控制精度:  $\pm 0.1^{\circ}\text{C}$

### ◆ Temperature control

temperature control precision is  $\pm 0.1^{\circ}\text{C}$ .

### ◆ PH控制

罐体设置PH电极，自控触摸屏可以设定发酵的PH值以及补酸、补碱的开始、停止的PH值，同时可以设定酸、碱蠕动泵的转速，在自控状态下，控制模块按控制程序自动控制酸、碱蠕动泵进行调节PH。

### ◆ PH control

There is the PH electrode on the tank. User can set the fermentation PH value, and the PH value of acid and alkali refilling's start and stop, at the same time, user can set the speed of acid and alkali peristaltic pump. Under the condition of self-control, the control modular controls acid and alkali peristaltic pump to adjust the PH according to the control program.

### ◆ 控制精度

控制精度:  $< 0.2$

### ◆ Control precision

control precision is  $< 0.2$



### ◆ DO控制

### ◆ DO control

### ◆ 设置

- ①罐体设置DO溶氧电极;
- ②搅拌机采用变频电机及搅拌转速检测;
- ③气体管道设置进气自控调节阀和涡街流量计;
- ④排气管道设置排气调节阀。

### ◆ Setting

1. There is DO (dissolved oxygen) electrode on the tank;
2. The mixing motor is adopting variable-frequency and with the mixing speed testing;
3. The gas pipe is loaded with automatic control regulating valve and vortex flowmeter;
4. Exhaust gas pipe is loaded with venting regulating valve.

### ◆ 调节顺序

调节搅拌电机频率(转速)、通气流量、排气流量(罐压)

### ◆ Sequences adjustment

Adjust the frequency(speed) of mixing motor, ventilation flow, venting flow (the pressure of tanks).

◆ 自控触摸屏可以设定默认搅拌电机供电频率，一般设置在35-40Hz之间，在自控状态下，控制模块按程序自动调节搅拌供电频率。

◆ User can set the power supply frequency of default mixing motor on automatic control touch screen. The frequency is usually between 35 and 40 Hz. Under the condition of self-control, the control modular can automatically adjust power supply frequency of mixing according to the control program.

◆ 自控触摸屏可以设定通气流量及通气流量上下限值，在自控状态下，控制模块按程序自动调节通气调节阀控制通气流量。

◆ User can set the ventilation flow and its upper and lower limits on the automatic control touch screen. Under the condition of self-control, the control modular can automatically adjust regulating valve of ventilation to control the air flow according to the control program.

◆ 自控触摸屏可以设定发酵罐压，一般设置在0.02-0.05MPa之间，在自控状态下，控制模块按程序自动调节排气调节阀控制排气流量。

◆ User can set the pressure of fermentation tank on the automatic control touch screen. The pressure is usually between 0.02 and 0.05MPa. Under the condition of self-control, the control modular can automatically adjust regulating valve of ventilation to control exhaust gas flow according to the control program.

### ◆ 控制设定

系统设置三级权限设定:

三级权限: 操作领班设定, 只能设定当前生产参数。

二级权限: 生产技术管理设定, 只能设定当前批号生产参数。

一级权限: 技术总工设定, 可以设定全面工艺参数。

### ◆ Control setting

Three levels permission is set in the system. Junior-level permission: Operating foreman can only set the parameters of present manufacturing; Senior-level permission: production technical manager can only set the manufacturing parameters of present batch; Superior-level permission: chief technical engineer can fully set process parameters.

### ◆ 追溯管理

所有生产过程参数, 均自动进行存盘, 并可以按权限进行查阅和打印。

### ◆ Review management

All production process parameters are automatically saved and can be read and printed according to the authority.

### ◆ 系统保护

自控系统采用UPS进行不间断供电。

### ◆ System protection

Automatic control system uses UPS for uninterrupted power supply.





## 验证文件 Qualification files

### ◆ 设计确认 (DQ)

#### ◆ Design Qualification

#### ◆ 设备设计确认方案

设备设计、制造的确认方案

#### ◆ Equipments design proposal confirmation

Confirmed proposal of equipments designing, and manufacturing.

#### ◆ 外配设备设计选型确认方案

设计选型技术参数确认方案

#### ◆ Outsourcing equipments selection proposal confirmation

Confirmed proposal of designing selection technical parameter.

#### ◆ 工艺流程 (PID) 设计确认方案

工艺流程、管阀配置

#### ◆ Process and Instrumentation Diagram (PID) designing confirmation

Process flow, pipes and valves configuration.

#### ◆ 控制设计选型确认方案

变频器、检测仪表、执行仪表、PLC模块、气动元件、电气元件

#### ◆ Control designing type-selection proposal confirmation

Frequency converter, detection instruments, execution instruments, PLC module, pneumatic components, electrical components.

#### ◆ 设计确认报告

包含设计依据, 依据的执行判定。

#### ◆ Design confirmation report

Including the design basis, and its execute judgment.

### ◆ 制造现场验收 (FAT)

#### ◆ Factory acceptance test (FAT)

#### ◆ 验收方案

表面处理、材质证明、制造工艺、焊缝评定、水压试验、装配公差等验收。

#### ◆ Acceptance scheme

Acceptance for surface treatment, material certificate, manufacturing process, weld joint judgment, hydrostatic test, assembly tolerance etc.

#### ◆ 验收报告

表面处理、材质证明、制造工艺、焊缝评定、水压试验、装配公差等检测判定。

#### ◆ Acceptance report

Test and judge of surface treatment, material certificate, manufacturing process, weld joint judgment, hydrostatic test, assembly tolerance etc.

### ◆ 安装现场验收 (SAT)

#### ◆ Site acceptance test (SAT)

#### ◆ 验收方案

外观、完整性、准确性、随机文件、监检文件、合格证等收集、整理、造册等。

#### ◆ Acceptance scheme

Collection, organizing, and filing of appearance, completeness, accuracy, random file, inspection documents, certificate of quality, etc.

#### ◆ 验收报告

外观、完整性、准确性、随机文件、监检文件、合格证等收集、整理、造册的判定。

#### ◆ Acceptance report

Judgment of collecting, collating, filing for appearance, completeness, accuracy, random file, inspection documents, certificate of quality, etc.

### ◆ 安装确认 (IQ)

#### ◆ Installation Qualification (IQ)

#### ◆ 平面布置定位、基础固定、标高确认

Layout orientation, foundation fixing, elevation confirmation.

#### ◆ 管道布置定位、标高、坡度、规格确认

Piping layout orientation, elevation, slope, specification confirmation.

#### ◆ 阀门形式、规格、安装部位、介质流向确认

Valve types, specification, installation location, medium flow direction confirmation.

#### ◆ 机械传动、机械运转、密封确认

Mechanical transmission, mechanical operation, seal confirmation.

#### ◆ 检测仪器的有效性、安装部位、完整性、准确性确认

Checking the validity of the instrument, installation location, integrity and accuracy confirmation.

#### ◆ 执行机构的有效性、安装部位、准确性确认

The effectiveness of the executing agency, installation location, accuracy confirmation.

### ◆ 运行确认 (OQ)

#### ◆ Operation Qualification (OQ)

#### ◆ 传热状态性能确认

加热、冷却的时间、控制精度、恒温的平稳性、滞后性能确认。

#### ◆ Heat transfer performance qualification

Heating and cooling time, control precision, stability of constant temperature, lagging performance qualification.

#### ◆ 搅拌混合性能确认

均质时间性能、混合(溶解)性能、滞后性能确认。

#### ◆ Mixing performance qualification

Homogenizing time performance, mixing (dissolving) performance, lagging performance qualification.

#### ◆ 清洗性能确认 (CIP)

清洗性能、无残留性能确认。

#### ◆ Cleaning performance confirmation(CIP)

Performance confirmation of cleaning performance, no residue performance.

#### ◆ 灭菌性能确认 (SIP)

罐体灭菌性能、管道灭菌性能确认。

#### ◆ Sterilization performance confirmation(SIP)

Confirmation of sterilization performance of tanks, sterilization performance verification of pipes.

#### ◆ 控制性能确认

温度控制性能、搅拌控制性能、通气控制性能、罐压控制性能、压力控制性能、pH控制性能、记录准确性能确认。

#### ◆ Control performance qualification

Qualification of temperature control performance, mixing control performance, aeration control performance, tank pressure control performance, pressure performance, pH control performance, records accuracy performance.



## 多功能提取罐 Multifunctional Extraction Tank

◆ 提取罐主要用于中药材、动植物、化工原料的常压、加压水煎、温浸、热回流、渗漉、芳香油收集及有机溶剂回收等多种工艺操作。

◆ The extraction tank is applied for several process operations, such as water decoction, zwarm-immersion, thermal circumfluence, filtration and collation and aromatic oil collection of traditional Chinese medicine, propagation and chemical raw material, and recycling of organic solvent.

### ◆ 企业提供

正锥式、斜锥式、直筒式、蘑菇式及倒锥式等多种型式。静态单罐提取、多功能提取(包括回收回流及芳香油收集装置)、搅拌动态提取(包括防爆搅拌系统)、强制循环动态提取(包括循环泵、循环管道)等多种提取方式。

### ◆ We provide

Various structure types: tapered type, oblique-cone type, cylinder type, mushroom type, inverted cone type and so on. Various extraction types, such as: static state single-tank extracting, multi-function extracting, (including recovery, recycle and aromatic oil collection devices), dynamic extracting in mixing state (including anti-explosion mixing system), forced circulation dynamic extracting (including circulation pump and circulation pipeline).



TQ-D 倒锥型 Upside-down taper type



TQ-Z 直锥型 Vertical wimble

### TQ-D/TQ-Z系列技术参数 Technical parameters

型号规格 Model specification	TQ-D-0.5	TQ-D-1.0	TQ-D-2.0	TQ-D-3.0	TQ-D-6.0	TQ-D-8.0	TQ-Z-1.0	TQ-Z-2.0	TQ-Z-3.0	TQ-Z-6.0	TQ-Z-8.0	TQ-Z-10
容积Volume (L)	750	1200	2300	3400	6400	8500	1200	2300	3200	6300	8500	11000
罐内设计压力 (Mpa) Design pressure inside tank	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
夹层设计压力 (Mpa) Design pressure inside jacket	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
压缩空气压力 (Mpa) Compressed air pressure	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7
加料口直径 (mm) Feeding inlet diameter	150	200	200	300	350	400	400	400	400	500	500	500
加热面积 (㎡) Heating area	2.0	3.2	5.3	6.8	8.5	10.5	3.0	4.7	6.0	7.5	9.5	12
冷凝面积 (㎡) Condensing area	5	8	6	10	12	16	6	8	10	12	16	20
冷却面积 (㎡) Cooling area	0.5	1	1	1	2	2	1	1	1	2	2	3
过滤面积 (㎡) Filtration area							3	3	3	5	5	6
排渣门直径 (mm) Sludge gate diameter	800	1000	1200	1500	1700	1900	800	800	800	1000	1000	1000
耗能 (kg/h) Energy consumption	145	195	258	300	552	728	245	325	345	645	720	850

企业秉承国内传统提取罐制造标准，从使用的安全性、操作的简便性、符合GMP的规范性等多方面加以改进。

◆ 出渣门采用三气缸旋转式自锁快开门，单气缸启闭，双气缸旋转推动锁紧圈锁紧，斜面模块自锁。解决压缩空气气源压力不稳引起的渗漏或脱钩事故。

◆ 出渣门密封圈采用特殊形状，确保液柱静压力或罐内压力越高，密封越可靠，使用寿命长。

◆ 罐内壁镜面抛光，焊缝圆角过渡，不挂料，易清洗。

◆ 全方位CIP清洗器、防爆视镜、视镜、快开轻便式卫生投料口、捕沫器等配置确保操作简便。

Enterprise follows domestic traditional extracting tank manufacturing standard, and improves in the aspects of operating safety, convenience, and GMP regulations conformity.

◆ Deslagging adopting the 3-cylinder rotary self-lock quick open, single-cylinder open and close, two-cylinder rotating and pushing the clamp ring to be clamped tightly, and then the inclined wedge block self-locked. It can prevent the leakage or unhooking incidents due to the unsteady pressure of compressed air.

◆ Special shape of deslagging seal ring is used at the slag door to guarantee the static pressure of liquid column, as the higher static pressure of liquid column, the more reliable sealing performance, then longer serve life.

◆ Mirror polishing in the inner tank layer, circular arc transition at welding joint without bridging, easy to clean.

◆ All-directional CIP cleaning, anti-explosion lamp and sight glass, quick-opening light type sanitary material feeding inlet, mist eliminator and so on, these devices are adopted to support the easy operating.



TQ-M 蘑菇型 Mushroom type



TQ-T 直筒型 Vertical cylinder type

### TQ-M/TQ-T系列技术参数 Technical parameters

型号规格 Model specification	TQ-M-1.0	TQ-M-2.0	TQ-M-3.0	TQ-M-6.0	TQ-M-8.0	TQ-M-10	TQ-T-1.0	TQ-T-2.0	TQ-T-3.0	TQ-T-6.0	TQ-T-8.0	TQ-T-10
容积Volume(L)	1200	2300	3200	6300	8500	11000	1200	2300	3200	6300	8500	11000
罐内设计压力 (Mpa) Design pressure inside tank	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
夹层设计压力 (Mpa) Design pressure inside jacket	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
压缩空气压力 (Mpa) Compressed air pressure	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7	0.6-0.7
加料口直径 (mm) Feeding inlet diameter	400	400	400	500	500	500	400	400	400	500	500	500
加热面积 (㎡) Heating area	3.0	4.7	6.0	7.5	9.5	12	3.0	4.7	6.0	7.5	9.5	12
冷凝面积 (㎡) Condensing area	6	8	10	12	16	20	6	8	10	12	16	20
冷却面积 (㎡) Cooling area	1	1	1	2	2	3	1	1	1	2	2	3
过滤面积 (㎡) Filtration area	3	3	3	5	5	6	3	3	3	5	5	6
排渣门直径 (mm) Sludge gate diameter	800	800	800	1000	1000	1000	800	1000	1000	1000	1000	1000
耗能 (kg/h) Energy consumption	245	325	345	645	720	850	245	325	345	645	720	850



## RH对偶式热回流提取浓缩机组

### Dual Formula Hot Reflux Extraction Evaporator



#### ◆ 设备说明

#### ◆ Equipment descriptions

- ◆ 机组由提取罐、过滤器、药液泵、加热器、蒸发器、冷凝器、冷却器、油分离器、工控机等组成。
- ◆ The unit is composed of extracting tank, filter, liquid pump, heater, evaporator, condenser, cooler, oil separator, heater and industrial control computer etc.
- ◆ 中药经浸泡加热后，浸出液由泵从提取罐底部泵入外加热器加热。多余药液切向进入提取罐底部回流，起到局部搅拌作用。
- ◆ After dipping and heating, the leaching liquid of traditional Chinese medicine will be pumped into the external heater for heating from the bottom of extracting tank. The extra liquid will enter into the bottom of extracting tank to reflux and play its partial mixing effect.
- ◆ 提取液由加热器加热后，经分离浓缩器闪蒸分离。二次蒸汽切向进入提取罐，一方面把热量传给提取罐内溶剂，一方面起搅拌作用。余气一路进入冷凝器冷成溶剂，回流进入提取罐。一路进入冷凝液升温器进行热交换，使冷凝液温度接近提取罐溶液沸点，余气进入冷凝器。由于溶剂回流量大，药材与溶剂中含溶质的密度保持高梯度，溶质快速溶出。
- ◆ After the extracting flash liquid is heated by the heater, it will be evaporated instantly and separated by the separation concentrator. The secondary steam will enter into the extracting tank, transmit the heat to the solvent in the extracting tank, and also play mixing effect. The residual air will enter into the condenser and become solvent; and after reflux it enter into the extracting tank. It will enter into the heater for condensed liquid to carry out heat extracting tank. It will enter into the heater for condensed liquid to carry out heat exchange and make the temperature of condensed liquid approximate to the boiling point of solution in the extracting tank. Then the residual air enter into condenser. As the solvent has large reflux quantity, the density of solute in the medicine and solvent keeps high gradient, and the solute will be rapidly dissolved.
- ◆ 由于是一面提取，一面浓缩，且浓缩液不断排出，流程时间大大缩短，仅需4-6小时。
- ◆ The extraction and concentration are synchronous with continuous discharge of concentrated liquid, thus, the process is greatly reduced and only requires 4-6 hours.
- ◆ 整个机组由工控机控制，操作程序，加热温度、蒸发温度、回流温度、系统真空压力，提取罐溶剂液面，浓缩液浓度，蒸发浓缩罐液面均能设定和控制，使工艺流程运行可靠、稳定、安全。
- ◆ The whole unit is controlled by industrial control computer, through which, heating temperature, evaporation temperature, reflux temperature, system vacuum pressure, liquid and liquid level of evaporation concentrating tank can be set and controlled. Thus the technology process can be operated reliably, stably and safely.
- ◆ 该机组不但具有中草药（干品）提取浓缩的优良功能，还具有强大的能保持鲜活风味的植物鲜品低温提取浓缩功能。如鲜花、芦荟等鲜品的提取浓缩。它已在中药厂、保健品厂等工厂的实际应用中，显示了它强大的功能优势。该机也可用于天然调味品、食品添加剂中有关动物、海洋生物的提取浓缩。
- ◆ The unit not only has good functions for extraction and concentration of traditional Chinese medicine and Chinese herbal medicine (Dry product), but also has powerful functions for extraction and concentration of fresh plant products at low temperature with fresh flavor preserved, such as the extraction and concentration of flower and asparagus etc fresh products. It has applied in traditional Chinese medicine factories and health product factories, which show its powerful function advantages. The equipment is also applicable to the extraction and condensation of natural condiments and food additives concerning animals and halobios.



- ◆ 整个机组由工控机控制，操作程序，加热温度、蒸发温度、回流温度、系统真空压力，提取罐溶剂液面，浓缩液浓度，蒸发浓缩罐液面均能设定和控制，使工艺流程运行可靠、稳定、安全。
- ◆ The whole unit is controlled by industrial control computer, through which, heating temperature, evaporation temperature, reflux temperature, system vacuum pressure, liquid and liquid level of evaporation concentrating tank can be set and controlled. Thus the technology process can be operated reliably, stably and safely.
- ◆ 在综合性能方面处于国内领先地位。它是与国际天然植物药品接轨的现代化工艺装备。我公司也生产普通的手动控制机组，或半自动控制机组，可满足不同客户的需要。
- ◆ As to the comprehensive performance, it is at the leading position in domestic. It is modernized technology equipment keeping pace with international natural plant medicine. Our company can also produce ordinary manual control unit or semi-automatic control unit to satisfy different requirements of customers.
- ◆ 因工艺性能好，收膏率提高。且机组能适应真空、常压、正压工艺操作的水提和醇提，特别适应热敏性物料的低温提取、浓缩。机组工艺流程布局合理、紧凑、外形美观、污染小，符合GMP要求。机组在高效、节能、多功能等方面具有很大优势。
- ◆ With good technology performance, the ointment-collecting rate is enhanced. Water or alcohol solvent distillation in conditions of negative pressure, normal pressure and positive pressure, especially low-temperature distillation of heat sensitive materials can be made. The process flow of the unit has reasonable and compact layout, beautiful appearance and low pollution, which is in accordance with GMP requirements. The unit has many advantages such as high efficiency, energy saving, multifunction.

## 渗漉罐

### Percolation Tank



#### ◆ 设备说明

#### ◆ Equipment descriptions

- ◆ 本设备适用于中药、食品、化工等行业的渗漉操作。
- ◆ The equipment is suitable for percolation operation in traditional Chinese medicine, food, chemical industry and etc.
- ◆ 本设备由筒体、锥体、椭圆形封头(或平盖)、气动出渣门、气动操作台等组成，具有溶剂分布均匀，出渣方便等特点。
- ◆ The equipment is composed of tank body, taper body, oval seal head (or flat cover), pneumatic residue discharging door, pneumatic operation bench and etc. It has such characteristics as equal solvent distribution and convenient residue discharging etc.
- ◆ 渗漉法是往药材粗粉中不断添加浸取溶剂使其渗过药粉，从下端出口流出浸取液的一种浸取方法。渗漉时，溶剂渗入药材的层渗漉法是以往药材层中不断添加浸取溶剂使溶剂由上而下穿过药材层中溶解大量的可溶性物质，浓度增加，密度增大后向下移动，与上层的浸取溶剂或稀浸液置换位置，造成良好的浓度差，使扩散较好地自然进行，故浸取效果优于浸渍法，提取也较完全。
- ◆ The percolation method is to add continuously leaching solvent into the rough powder of medicine materials to make it filtrate the medicine powder, and then the leaching liquid will flow from the bottom outlet. During the percolation, the layer percolation method of solvent's filtering into the medicine material is to add continuously leaching solvent into the medicine material layer to make the solvent pass through the medicine material layer from top to bottom and dissolve large amount of soluble matters. After that, the concentration increases, and it will move downward after the density increases. The leaching solvent at the upper layer or the thin leaching liquid will exchange the position and produce good concentration difference to make the scattering carried out smoothly. Thus, the leaching effect is better than the dipping method, and the extraction will be comparatively complete.



## 强制循环蒸发器

### Forced Circulation Evaporator



#### ◆ 性能特点

#### ◆ Performance characteristics

- ◆ 全套系统设计合理美观、运行稳定、高效节能，蒸汽耗量低；  
◆ Beautiful appearance, reasonable design of a full set of system, stable operation, high efficiency and energy saving, low steam consumption;
- ◆ 浓缩比大，强制循环式，使粘度较大的料液容易流动蒸发，浓缩时间短；  
◆ Concentration ratio high, forced circulation type, make high viscosity liquid to easy flow for evaporation, short time of concentration;
- ◆ 特殊设计经简单操作可实现切换改效，以适应不同产品的生产；  
◆ Special design through simple operation can be switched to change effect, in order to adapt to the production of different products;
- ◆ 蒸发温度低，热量得到充分利用，料液受热温和，适用于热敏性物料的浓缩；  
◆ Low evaporation temperature, heat is fully utilized, the liquid material is heated gently, suitable for heat-sensitive materials concentration;
- ◆ 蒸发器通过强制循环，在管内受热均匀，传热系数高，可防止“干壁”现象；  
◆ Through forced circulation in evaporator, heating evenly in the pipe, high heat transfer coefficient, which can prevent the "dry wall" phenomenon;
- ◆ 料液进入分离器再分离，强化了分离效果，使整体设备具有较大的操作弹性；  
◆ Liquid be separated once again after enters the separator, strengthen the separation effect; make the whole device has a wide operating elasticity;
- ◆ 整套设备结构紧凑，占地面积小，布局简单流畅，代表了大型成套蒸发设备的发展方向；  
◆ The whole device has compact structure, small occupation area, simple structure and smooth, represent large sets of evaporation equipment development direction;
- ◆ 连续进出料，料液液位与所需浓度可实现自控；  
◆ Continuous feeding, feed liquid level and the required concentration can be controlled;
- ◆ 蒸发量：根据客户要求设计。  
◆ Evaporation: design according to customer's requirement.



#### ◆ 适用范围

强制循环式单效、双效、三效及多效蒸发器，适用于高浓度、高粘度，含不溶性固形物等食品、制药、化工、生物工程、环保工程、废液回收等行业进行低温浓缩。

#### ◆ Applicable range

Using of scope: Forced circulation type of single, double, three effect and multi-effect evaporator, suitable for high concentration, high viscosity, containing insoluble solids such as food, pharmaceutical, chemical, biological engineering, environmental engineering, waste recycling and other sectors of the low temperature concentration.



#### ◆ 系统组成

各效加热器、各效分离器、冷凝器、循环泵、效间泵、真空及排水系统、分汽缸、操作平台、电器仪表控制柜及阀门、管路等系统组成。

#### ◆ System components

System composition: heater of each effect, the separator, condenser, circulating pump, pump between effects, vacuum pump and water drainage system, steam distribution cylinder, operation platform, electric instrument control cabinet and valves, piping system.

#### 技术参数：(蒸发量根据客户需要设计) Technical parameters (evaporation according to the customer need to design)

型号 Model	BYQX-2-3	BYQX-2-5	BYQX-2-10	BYQX-2-20	BYQX-2-30
水份蒸发量(kg/h) water evaporation(kg/h)	3000	5000	10000	20000	30000
生蒸汽消耗量(t/hr) Steam consumption(t/hr)	1.2-1.65	2-2.75	4-5.5	8-11	12-16.5
生蒸汽压力(Mpa绝压) Steam pressure(Mpa)	0.4-0.8				
吨蒸汽蒸发水量(吨) water evaporation/1 ton steam	1.8- 2.5				
外形尺寸(长X宽X高)m External size(LXWXH)m	6.7X4.4X8.6	7.2X4.8X11.5	8.5X5.4X11.5	9.6X6X13.5	13X6.5X13.5



## MVR 蒸发器 MVR Evaporator



### ◆ 性能特点

#### ◆ Performance characteristics

- ◆ 没有废热蒸汽排放，节能效果十分显著，相当于10效蒸发器。  
◆ No waste heat steam emissions, energy-saving effect is very significant, which is equivalent of 10 effect evaporator.
- ◆ 运用该技术可实现对二次蒸汽的逆流洗涤，因此冷凝水干物含量远低于多效蒸发器。  
◆ Using this technology can achieve to countercurrent washing of secondary steam, therefore the dry matter content in condensed water is far lower than the number of evaporator.
- ◆ 采用低温负压蒸发(50-90℃)，有利于防止被蒸发物料的高温变性。  
◆ Using low temperature negative pressure evaporation (50-90 °C), help to prevent the degeneration resulted from high temperature evaporation.
- ◆ MVR 蒸发器是传统多效降膜蒸发器的换代产品，是在单效蒸发器的基础上通过对二次蒸汽逆流洗涤及再压缩重新利用。凡单效及多效蒸发器适用的物料，均适合采用MVR 蒸发器，在技术上具有完全可替代性，并具有更优良的环保与节能特性。MVR 蒸发器技术由于其节能效果显著，70年代开始在国外迅速发展，现已广泛使用，应用于工业废水处理及乳品、制糖、淀粉、氧化铝、造纸、己内酰胺、海水淡化、炼焦厂(回收二氧化硫生产硫氨)、盐化工等很多生产领域。
- ◆ MVR evaporator is a substitute of traditional multi-effect falling-film evaporator, is based on single effect evaporator through the reuse of the secondary steam countercurrent washing and recompression. All material that applicable for single effect and multi-effect evaporator, are suitable for use in the MVR evaporator, technically have the substitutability. It has perfect characteristics of environmental protection and energy saving. Because of its significant energy-saving effect, MVR evaporator technology started rapid development in foreign countries at the beginning of 70's, now is widely used, which is used in industrial wastewater treatment and dairy, sugar, starch, alumina, papermaking, caprolactam, seawater desalination, coking plant (recovery of sulfur dioxide production sulfur ammonia), salt chemical industry, and other many production areas.

### ◆ 适用范围

机械蒸汽压缩MVR或MVC(Mechanical Vapor Compression)蒸发器，其原理是利用蒸汽压缩机压缩蒸发产生的二次蒸汽，提高二次蒸汽热量和温度，压缩后的蒸汽打入蒸发器作为热源，再次使其原液产生蒸发，从而达到不需要外部鲜蒸汽，依靠蒸发器系统自循环来达到蒸发浓缩的目的。通过PLC控制系统、组态软件等工程软件来控制系统温度、压力、马达转速，保持蒸发器稳定、高效智能运行。

### ◆ Applicable range

Mechanical vapor compression MVR or MVC (Mechanical Vapor Compression) evaporator, the principle is to use the secondary steam which is produced through compressing the steam by the steam compressor, secondary steam heat and temperature is increased by the compressor, steam compressed into the evaporator as the heat source, again makes the raw material liquid start evaporation, so there is no need to rely on external fresh steam, just need to rely on the evaporator system itself circulating to achieve the purpose of evaporation. Through the PLC control system, configuration software and engineering software to control the temperature, pressure, speed motor system, maintain stable, intelligent and efficient operation of the evaporator.

#### 技术参数: (蒸发量根据客户需要设计) Technical parameters (evaporation according to the customer need to design)

型号 Model	BYMVR-0.5	BYMVR-1	BYMVR-1.5	BYMVR-2	BYMVR-5	BYMVR-10	BYMVR-15
蒸发量 Evaporation capacity	500kg/Hr	1000kg/Hr	1500kg/Hr	2000kg/Hr	5000kg/Hr	10000kg/Hr	15000kg/Hr
进口饱和蒸汽量(kg/Hr) Inlet saturated steam capacity(kg/Hr)	500	1000	1500	2000	5000	10000	15000
进口饱和温度(°C) Inlet saturation temperature(°C)	55.295	71.631	82.109	90	90	90	90
出口温升(°C) Outlet temperature(°C)	12.590	14.145	15.185	16.000	16.000	16.000	16.000
出口饱和温度(°C) Outlet the saturation temperature(°C)	67.885	85.776	97.294	106.000	106.000	106.000	106.000
进口饱和压力kPa(A) Inlet saturation pressure kPa (A)	15.975	33.441	51.567	70.117	70.117	70.117	70.117
出口饱和压力kPa(A) Inlet saturation pressure kPa (A)	28.432	59.596	91.921	125.029	125.029	125.029	125.029
压缩比 Compression ratio	1.780	1.782	1.783	1.783	1.783	1.783	1.783
电机功率kw Motor power (kw)	40	55	75	95	132	550	640
	0.795	0.7971	0.7985	0.7997	0.7997	0.7997	0.7997
出口容积流量 (m <sup>3</sup> /h) Outlet volume flow (m <sup>3</sup> /s)	22.736	22.795	22.837	22.87	22.87	22.87	22.87
	4X4X10	6X4.5X12	8X5.5X14	8X5.5X14	9.5X6X15	12.6X6.5X17	13.6X7X17



## WZY单效蒸发器 WZY Single-effect Evaporator



- ◆ 外循环单效蒸发器，由加热器、蒸发器、分离器等组成，凡与物料接触部件均采用不锈钢制作，本装置适用于制药、食品、化工、轻工等行业液体物料的蒸发浓缩。本设备浓缩时间短，蒸发速度快，能较好地保持热敏性物料不被破坏。
- ◆ The external circulating single-function evaporator is made up of heater, evaporator, separator, and so on, of which parts contacting with materials shall be made of stainless steel. The equipment applies for evaporation and condensation of liquid materials in the industries such as pharmacy, foodstuff, chemical, light industry and so on. The equipment has the characteristics of short time for condensation, fast evaporation and preventing the thermal sensitive materials from been damaged preferably.

### 技术参数 Technical parameters

规格 Specification	型号 Model	WZY-500	WZY-1000	WZY-1500	WZY-2000
蒸汽耗量 Steam consumption(kg/h)		500	1000	1500	2000
蒸发量 Evaporating capacity(kg/h)		500	1000	1500	2000
酒精回收能力 Recycling capacity of alcohol(kg/h)		300	600	900	1200
耗水量 Water consumption(t/h)		6	10	15	20
耗电量 Power consumption(kw)		5.5	7.5	9	11
使用真空度 Useful vacuum degree(MPa)		0.08	0.08	0.08	0.08
蒸汽压力 Steam pressure(MPa)		0.09	0.09	0.09	0.09
浓缩液比重 Specific weight of concentrated solution					
酒精浓度 Concentration of alcohol					
外形尺寸 Dimension(m)		2.5×1.3×2.8	3×1.4×3	3.3×1.4×3.5	2.5×1.3×2.8

### ◆ 系列单效蒸发器有三种型式

#### ◆ There are three kinds of types for the series single-function evaporator

- ◆ 普通型WZY，用于水溶液的蒸发。  
◆ Conventional type WZY, applies for water solution evaporation.
- ◆ 酒精回收型WZYH，用于酒精溶液的蒸发，较大的冷凝冷却面积，确保酒精回收，回收浓度达到70-85%，酒精损耗率<5%，酒精回收后温度<40℃。  
◆ Alcohol recycling type WZYH, applies for alcohol solution evaporation, which has bigger condensing and cooling area to make sure alcohol recycling. The recycling concentration can reach as much as 70-85%, attrition rate of alcohol is less than 5%, and temperature after alcohol recycling is not more than 40℃.
- ◆ WZYS收膏型，用于单效蒸发及收浓膏。在单效正常蒸发后，关闭加热室与蒸发室连接喷管及循环管的阀门，将料液全部进入蒸发室，通过蒸发室的直接夹套加热，进行常压式减压浓缩，提高物料的浓缩比重至1.35-1.45。  
◆ WZYS paste obtained type, applies for single-function evaporation and obtaining the condensate paste. After normal evaporating of single-function, shut down the valves of circulation tube and the one of connecting nozzle between heating and evaporating chamber, in order to make feed liquid enter into the evaporating chamber with the whole and heat by the sheaf in the evaporating chamber directly, then condense with decompression in the normal pressure mode, for the purpose of enhancing the concentration rate of material up to the range 1.35-1.45.

## SJNⅢ三效节能浓缩器 SJN III Series Triple-effect Concentrator



### ◆ 用途

本浓缩器适应于中药、西药、葡萄糖、淀粉、味精、食品、化工等液体料的浓缩，尤其适用于热敏性物类的低温真空浓缩。

### ◆ Use

The concentrator adapted to traditional Chinese medicine, western medicine, dextrose, amyllum, monosodium glutamate, foodstuff, chemical industry and other liquid material concentration shrinkage, especially for the low temperature heat-sensitive species in vacuo.

### ◆ 设备特点

- ◆ 各加热室列管、冷凝器列管、中间联接管道采用ISO标准内外抛光镜面管，保证物料畅通流动，无阻滞，加热室无结垢堵塞现象，减少结垢及清洗次数，提高生产效率。
- ◆ Each heating chamber tube, condenser tube, the intermediate connecting pipes are used inside and outside the ISO standard polished mirror surface of the pipe, to ensure the smooth flow of material, non-coking heating chamber clogging, reducing fouling and cleaning times, improve production efficiency.
- ◆ 本浓缩器采用三效同时蒸发，二次蒸汽得到反复使用，既节省了锅炉的投资，又节约能源消耗，耗能量与其他浓缩相比降低70%。
- ◆ The concentrator uses three effect evaporator while secondary steam to get reused, saving investment of boiler, but also save energy consumption, the energy consumption is 70% lower compared to other concentrators.

### ◆ Characteristics

- ◆ 本浓缩器采用外加热自然循环与负压蒸发方式，具有蒸发速度快，浓缩比重大，密闭收膏。
- ◆ The concentrator adapt exterior heating natural circulation and vacuum evaporation, it has features of high evaporation speed and high concentration than the major, receive paste in closed condition.
- ◆ 可回收酒精浓度80°左右。
- ◆ Concentration of recoverable alcohol around 80°
- ◆ 可以间歇或连续进料浓缩，一次成膏。
- ◆ It can feed material intermittent or continuously, reach concentration by once.

### 技术参数 Technical parameters

规格 Specification	型号 Model	SJN-500	SJN-1000	SJN-1500	SJN-2000	SJN-3000	SJN-5000	SJN-8000
蒸发量 Evaporating capacity(kg/h)		500	1000	1500	2000	3000	5000	8000
耗汽量 Air consumption(kg/h)		≤200	≤400	≤600	≤800	≤1200	≤2000	≤3200
外形尺寸 Dimension (L×W×H)(m)		5×1.3×3	6.5×1.5×3.3	7×1.7×3.5	7.5×2×4	8×2×4.5	7.8×2×4.3	9×2.5×5
循环耗水量 Circulating water consumption(t/h)		5	10	13	15	18	25	40
蒸发温度 Evaporating temperature(°C)	一效 First effect	85-95		真空度 Degree of vacuum (Mpa)		0.02-0.04		
	二效 Second effect	70-80		0.05-0.06				
	三效 Third effect	55-65		0.08-0.09				

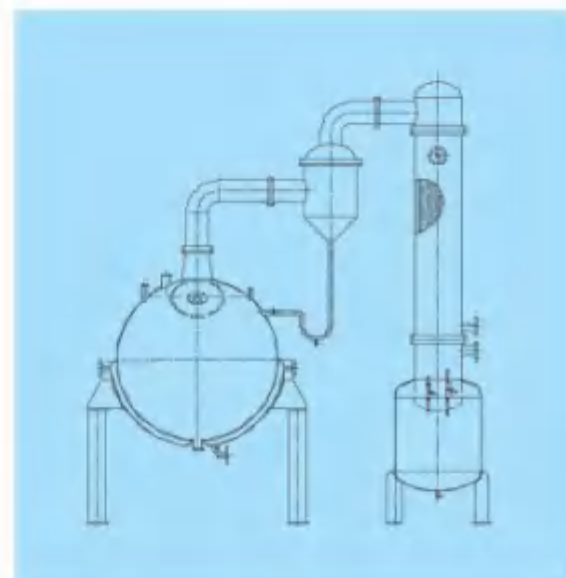


## QN球形浓缩锅

### QN Sphere Concentrating Tank



◆ 本设备适用于中药、西药、食品、葡萄糖、果汁、糖果、生物制药、化工等液料的真空浓缩、结晶、收膏、蒸馏、酒精回收等功能。浓缩比重1.35-1.45。本设备主要浓缩锅主体、汽液分离器、冷却器、受水器等四个主要部分组成，材料全部采用SUS304制造，确保生产过程符合GMP标准。本设备采用减压浓缩，故而浓缩时间短，对热敏性材料不会破坏其有效成份。



◆ The equipment is applied for the solution function such as vacuum concentration, crystallization, paste finished, distillation, alcohol recycling etc., in the industries such as Chinese medicine, western medicine, foodstuff, dextrose, juice, candy, pharmaceutical, chemical industry and so on. Condensing specific weight is from 1.35 to 1.45. Besides, the equipment is made up of four important parts which are main body of condensing boiler, gas liquid separator, cooler and water tank. the material of which are all supported by SUS 304 to make sure meet GMP standard during the production. Because of decompression condense mode applied in the equipment, the condensing time is very short and the available compositions of thermal sensitive material shall not be damaged.

#### 技术参数 Technical parameters

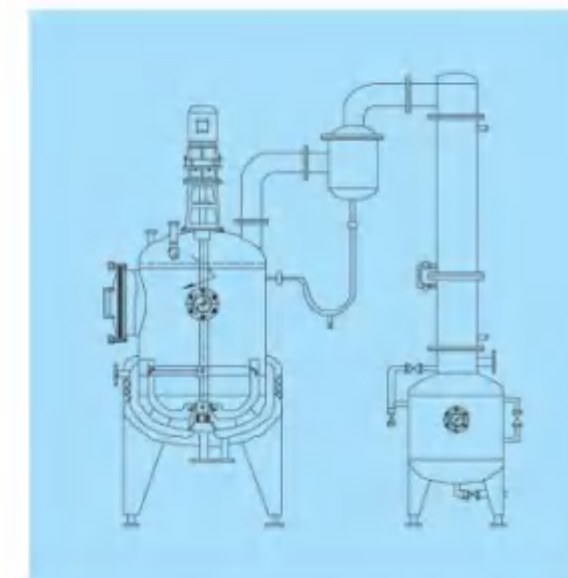
规格 Specification	型号 Model	QN-250	QN-500	QN-700	QN-1000	QN-1500	QN-2000
蒸发量 Evaporating capacity(kg/h)		80	110	150	200	280	410
公称容积 Nominal capacity(L)		250	500	700	1000	1500	2000
夹层压力 Pressure of interlayer(MPa)							
真空度 Vacuum degree(MPa)							
加热面积 Heating area(m <sup>2</sup> )		1.0	1.5	2.7	3.1	4.0	5.0
冷凝面积 Condensate area(m <sup>2</sup> )		3.0	4.0	5.0	8.0	12.5	18.0
设备重量 Weight of equipment(kg)		415	625	780	950	1700	1900
外型尺寸 Dimensions(mm)		1000×1000×2300	2100×1200×2500	2200×1400×2500	2000×1500×2700	3000×1600×4800	3600×1900×4000

## ZJN真空减压浓缩器

### ZJN Vacuum Decompressing Concentrator



◆ 本设备主要适用于制药、食品、保健品、口服液、果汁、化工、轻工等工业液体物料的浓缩蒸馏，并可用于回收酒精及其它溶剂的简单回提。本设备全部采用不锈钢材料制造，结构紧凑，形式美观，本设备由冷凝器、冷却器、气液分离器、浓缩罐、接管、受液槽六个部件，浓缩罐为夹套结构，冷凝器为列管式，冷却为蛇管式，浓缩比重达1.35-1.45。



◆ This equipment mainly used for concentration and distillation in pharmacy, food, healthcare, oral liquid, juice, chemical and light-industry industries, can recollect alcohol and simple extraction of other solution. The equipment is totally made of stainless steel with compact structure and beautiful shape, six parts of which are condenser, cooler, gas-liquid separator, condense tank, connecting tube and fluid receiving bath. further more ,the condensing tank is supported as sheaf structure, the consenser is in tube mode and the cooler is in coil mode, while the condensate specific gravity reaches as much as 1.35-1.45.



#### 技术参数 Technical parameters

规格 Specification	型号 Model	ZJN-300	ZJN-500	ZJN-700	ZJN-1000
蒸汽压力 Pressure of steam(MPa)		0.15	0.15	0.15	0.15
真空度 Vacuum degree(MPa)		0.08	0.08	0.08	0.08
加热面积 Heating area(m <sup>2</sup> )		1.1	1.45	1.8	2.3
冷凝面积 Condensing area(m <sup>2</sup> )		3	3.2	3.6	4.5
冷却面积 Cooling area(m <sup>2</sup> )		0.6	0.7	0.85	1.1
受槽容积 Receiving bath(L)		76	100	125	140
外型尺寸 Dimension(mm)		1700×1000×3000	2100×1200×3200	2400×1300×3400	2400×1300×3720



## JC酒精沉淀罐

### JC Alcohol Precipitation Tank



- ◆ 本设备适用于中药、口服液、食品、保健品、化工等行业的酒精沉淀。酒精沉淀罐系醇沉(亦称换溶或醇析)旧工艺新开发的专用设备。主要用于中药水煎液经浓缩后的溶液进行冷冻或常温酒精沉淀的操作,也可用于中药醇提后,对浓缩液进行水沉的操作。
- ◆ Extraction LP mainly used for alcohol precipitation in the industries such as Chinese herbs, oral liquid, food, health care products, chemicals and so on. Alcohol precipitation tank is specialized new developed equipment from the old process in the production of alcohol precipitation(also known as ethanol deposition)mainly used for concentrated Batocera horsfeldi Hope freezing or normal temperature or alcohol precipitation, or for the concentrated herbals alcohol extraction.

#### 技术参数 Technical parameters

规格 Specification	型号 Model	JC-300	JC-500	JC-1000	JC-1500	JC-2000	JC-3000	JC-8000
容积 Cubage(m <sup>3</sup> )		0.3	0.5	1.0	1.5	2.0	3.0	6.0
换热面积 Heat exchanging area(m <sup>2</sup> )		1.8	3.0	4.5	6.5	7.5	8.5	13
工作温度 Operating temperature		常温 -- -15℃ Normal temperature:15℃						
夹层压力 Pressure of interlayer		0.25MPa						
罐内压力 Pressure in the tank		0.01MPa						
传热系数 Coefficient of heat transmission		150-200kJ/m <sup>2</sup> h℃						
搅拌功率 Mixing power(KW)		0.75	0.75	1.5	2.2	2.2	3.0	5.0
搅拌转速 Mixing speed(r/min)		250	250	160	125	125	125	125
设备重量 Weight of equipment(kg)		512	1250	1480	1750	1880	2200	4000

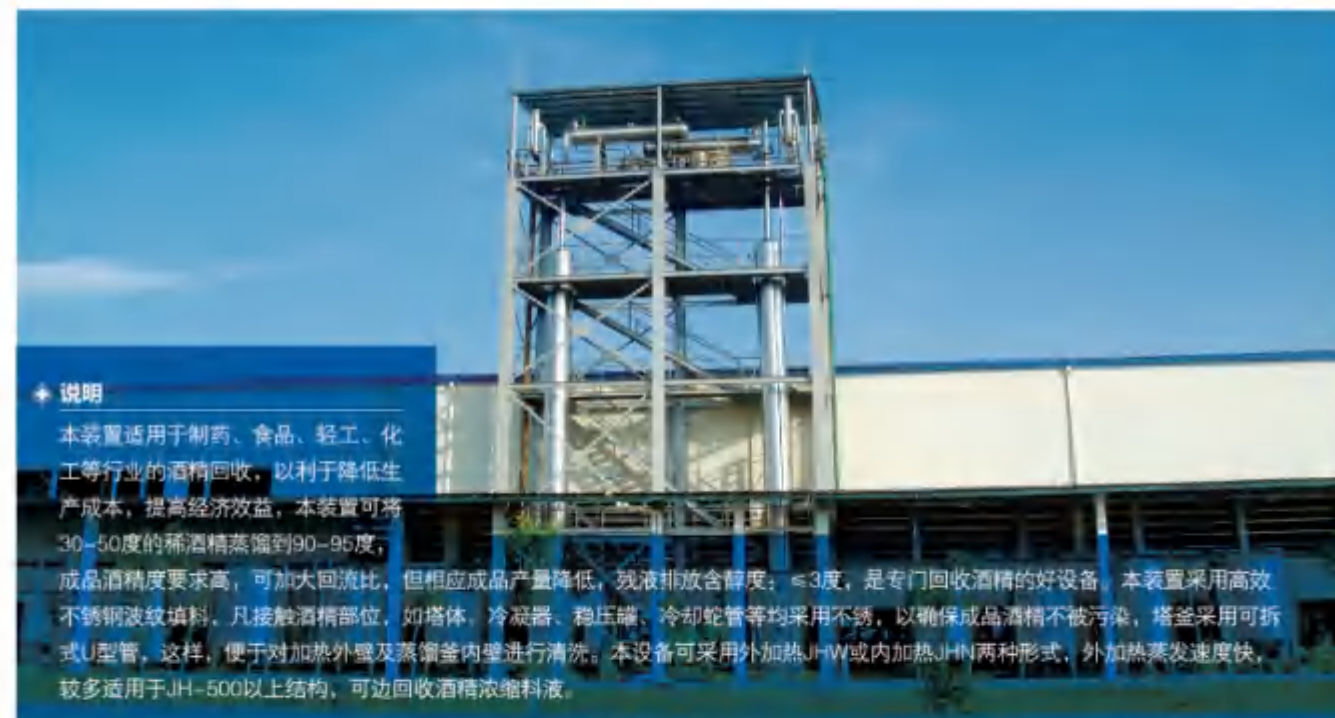
我们提供普通侧出液(JCS)型沉淀罐,还可根据用户要求,提供浮球上出液(JCF)型装置,即利用浮球始终浮在清液面,通过压缩空气或真空,将清液从罐顶排出,以方便操作。

We are supplying with the normal side-discharged solution(JCS)type of deposit tank, and also with the floating ball top-discharged solution(JCF)device, which takes the floating ball floating on the clear solution and discharges the clear solution from top of the tank to keep convenient operation by compression air or vacuum, according to the requirements of clients.



## JH酒精回收塔

### JH Alcohol Recovery Tower



#### ◆ 说明

本装置适用于制药、食品、轻工、化工等行业的酒精回收,以利于降低生产成本,提高经济效益,本装置可将30-50度的稀酒精蒸馏到90-95度,成品酒精度要求高,可加大回流比,但相应成品产量降低,残液排放含醇度:≤3度,是专门回收酒精的好设备。本装置采用高效不锈钢波纹填料,凡接触酒精部位,如塔体、冷凝器、稳压器、冷却蛇管等均采用不锈,以确保成品酒精不被污染,塔釜采用可拆式U型管,这样,便于对加热外壁及蒸馏釜内壁进行清洗。本设备可采用外加热JH-W或内加热JH-N两种形式,外加热蒸发速度快,较多适用于JH-500以上结构,可边回收酒精浓缩液。

#### ◆ Instruction

The equipment is applied for the alcohol recycling in the industries such as pharmacy, food, light industry, chemical and so on, for the purpose of reducing production costs and enhancing the economic benefit. The equipment is such a great device for recycling alcohol to distill rare alcohol at temperature of 30-50 degree up to 90℃-95℃, and because of high alcohol degree requirement for the finished product, the circumfluence rate may be enhanced but with result of decreased output of relative finished product, the mellow degree in the residue liquid ≤3degree.

This equipment adapt high efficiency stainless steel corrugated padding material, all surface that touch with alcohol such as tower body, condenser, pressure stabilizer tank, cooling coil pipe are made of stainless steel, to ensure finished alcohol product not be polluted. At the same time, u shape tube so that the heating external wall and distilling chamber inside can be cleaned. There are two kinds of modes for the equipment to adopt. That is external heating JH-W or inner heating JH-N, of which the external heating is mainly subject to JH500 structure or more with high speed of evaporation and both alcohol recycling and condensing may be finished.

#### 技术参数 Technical parameters

规格 Specification	型号 Model	JH-200	JH-300	JH-400	JH-500	JH-600	JH-800
塔容积 Cubage of tower(L)		640	1220	1450	2300	2500	3200
塔身高度 Height of tower(mm)		6000	7000	7000	7000	7500	7500
高位罐容积 Cubage of high-position tank(L)		300	400	650	8000	1000	1500
冷凝面积 Condensing area(m <sup>2</sup> )		5	9	11	22	25	36
冷却面积 Cooling area(m <sup>2</sup> )		1	1.5	2.2	6	8	15
换热面积 Heat exchanging area(m <sup>2</sup> )		3.0	6	6.5	17	25	32
回收能力 Recycling capacity(kg/h)		45-50	90-100	150-160	280-300	420-440	600-620
回收浓度 Recycling concentration(%)		90-95%					
填料形式 Filler mode		不锈钢波纹填料					
设备重量 Weight of equipment(kg)		1100	1900	2300	3800	4500	6800
外形尺寸 Dimensions(mm)		2300x700x7300	2600x800x7500	2500x1000x7500	3000x1200x9000	3500x1400x10000	4200x1800x14000



## 无菌列管式超高温杀菌机(UHT) Tubular UHT sterilizer



### ◆ 西门子触摸屏PLC全自动控制

### ◆ Siemens PLC Full-Auto control with touch screen

◆ 适用范围：可用于果汁、茶饮料、乳饮料或类似产品进行连续灭菌。可连接均质机、脱气等设备。

◆ Mainly used for aseptic filling packing types products, such as Tetra paper brick, Tetra paper Pillow, aseptic soft plastic bag, aseptic PET bottles, especially used for liquid milk and juice.

### ◆ 工艺参数

- 1) 5℃→65℃(均质)→137℃(3-5S)→20℃-25℃, 适用于无菌包装;
- 2) 5℃→65℃(均质)→115℃/125℃(5-15S)→88℃-90℃, 适用于热灌装;
- 3) 5℃→65℃(均质)→115℃/125℃(5-15S)→75℃-78℃, 适用于中温灌装;

### ◆ Technical

- 1) 5℃→65℃(homogenizer)→137℃(3-5S)→20℃-25℃, for aseptic filling;
- 2) 5℃→65℃(homogenizer)→115℃/125℃(5-15S)→88℃-90℃, for hot filling;
- 3) 5℃→65℃(homogenizer)→115℃/125℃(5-15S)→75℃-78℃, for middle temperature filling;

◆ 管式杀菌机可用来对各种液态食品、饮料进行热处理,与其它种类的杀菌机相比有如下优点:

◆ Tubular sterilizer performs the hot processing on the liquid foods and beverage. Compared to the other model, it has the following characteristics:

- 1、热效率高,可达90%的热回收效率;
- 2、加热介质与物料温差小,换热管采用了波纹管,换热效率高,结垢少,增长了杀菌机的工作时间。
- 3、自动化程度高,从设备的CIP清洗、设备自杀菌到物料杀菌整个过程可实现自动控制、记录。
- 4、杀菌温度控制精确可靠,蒸汽压力、流量,物料流量等都严格自动控制。
- 5、物料管内壁采用先进技术抛光和自动焊,管道设计实现完全自动清洗,设备全过程自杀菌,确保系统无菌性。
- 6、系统安全性强,系统配件皆选用性能好可靠性高的产品,蒸汽,热水,物料等都有压力保护措施和报警系统。
- 7、系统可靠性高,主要部件如物料泵、热水泵,各类阀门,控制系统的电气元件和执行元器件都是世界名牌。
- 8、自身SIP系统。

1. High heat efficiency, 90% of heat can be reused after the product be processed;
2. Temperature difference between the product and the heating medium is small, so the heating is gentle;
3. It is of high degree automatic, can automatically control the CIP cleaning, self sterilizing, and the whole procedures steps; all the procedures are recorded and controllable;
4. It is of precise and reliable sterilizing temperature control; all the affecting factors such as steam pressure, steam flow rate, product flow rate are all controllable;
5. The inside of the tubular adopts advanced polish procedure, all tubes can perform fully cleaning, self sterilizing ensures the system at aseptic state;
6. The system is strong safety, the fittings all adopts reliable materials;
7. The system is of high reliable, main parts such as product pump, hot water pump, all kinds of valves, elements of the electrics are all of world known brands.
8. With self SIP.

## 智能型大孔树脂吸附机组 Intelligent Macroporous Resin Adsorption Unit



### ◆ 特点

根据现在使用的固定床树脂柱存在着产生壁流、沟流,树脂利用率不高等缺点,本机组具有下列特点:

### ◆ Characteristics

Considering such disadvantages that exist in the application of fixed resin pillar as it will happen product wall flows, ditch flows, resin utilization is not high, this machine has the following characteristics:

- ◆ 实现了自动控制;
- ◆ Realizes control automatically;
- ◆ 设计了新型柱体结构和新型结构的物料布料装置,避免了壁流现象;
- ◆ New pillar construction design and material distribution device to avoid wall flow phenomenon;
- ◆ 物料可定时正向、逆向流动吸附,解决了树脂装填不均及气泡造成的沟流和干锥现象;
- ◆ Material can be set flow timely in forward line or contrary flows to adsorb, solving the phenomenon of ditch flows or dry wimble due to un-even resin filling and bubble;
- ◆ 树脂顶部、底部吸附层移动较均匀,柱内树脂基本能达到吸附平衡,提高了树脂的利用率;
- ◆ The resin coping, bottom adsorbs layer moves evenly, the resin inside the pillar able to adsorb in balance, increases utilization of resin;
- ◆ 可实现树脂柱单柱连续吸附操作和多柱连续吸附操作。可作为固定使用,也可和为模拟移动床使用。
- ◆ Can realize single pillar continuous adsorb and multi-pillar continuous adsorb operation. Can be used fixed or as analog moving beds.

### ◆ 用途

本机组为固定床树脂柱联合机组,可用于高等院校、科研机构、药厂、医院等作为新产品开发、新工艺技术参数的确定、中间试验、药液纯化精制之用。

树脂吸附分离技术是采用特殊的吸附剂,从中选择性地吸附其中的有效部分,去除无效成分的一种分离纯化新工艺。经大孔树脂吸附技术处理后所得到的精制物,可使药效成分高度富集,杂质少;可有效地去除吸潮成分,有利于多种剂型的生产、增强产品的稳定性;可有效地去除重金属。大孔树脂吸附分离工艺所得提取物体积小,不吸潮,容易制成外型美观的各种剂型,尤其适用于颗粒剂、胶囊剂、片剂等的生产。

### ◆ Application

The group is combined units of fixed bed resin column. It is used in confirmation, middle test and refine of liquid medicine's purification of altitude academy, scientific research, pharmaceutical factories and hospitals. Resin absorption separation technology is using special absorbing media to select the effective part in the medicine and remove useless components. After the process, the effective components can be more concentrated. The moisture can also be removed in the machine to strength the stability of the medicine. This machine can also remove heavy metal from the medicine. The product after resin absorption separation technology has a advantages of small size and no absorbing moisture so that can be made to different types of medicine, specially suitable for the production of capsule, tablets etc.

### ◆ 树脂柱结构

该树脂柱结构的设计良好,合理的高径比,精密的进出口流体分布装置,配备自动装填系统和空气压缩气接口,保证了树脂柱装填效果和填料再生效果,为高效分离提供了保障。

型号——在分离过程里引入计算机自动监控技术,实现生产程控化、检测自动化、输送管道化,提高装备的可靠性和重复性。单柱用可编程控制器控制,多柱采用PLC控制系统,配备触摸屏人机界面,进行程序操作,在线监控机组的运行状态,对设备进行自动控制。基于先进的DCS分布式控制策略编写的工作站,实现对泵、阀门和各种在线检测器的控制和数据采集,能够方便完成多柱串联、并联操作,保证工艺的稳定性 and 准确性。

手动型——设备管路进行了优化设计,操作简单,方便,可根据客户要求进行多柱、大体积设计。

### ◆ Application

The group is combined units of fixed bed resin column. It is used in confirmation, middle test and refine of liquid medicine's purification of altitude academy, scientific research, pharmaceutical factories and hospitals. Resin absorption separation technology is using special absorbing media to select the effective part in the medicine and remove useless components. After the process, the effective components can be more concentrated. The moisture can also be removed in the machine to strength the stability of the medicine. This machine can also remove heavy metal from the medicine. The product after resin absorption separation technology has a advantages of small size and no absorbing moisture so that can be made to different types of medicine, specially suitable for the production of capsule, tablets etc.



## 反应罐 Reactor



- ◆ 系列不锈钢反应罐是医药、化工等领域常用的反应设备之一，它是一种在一定的温度和压力下，借助搅拌器将一定体积的两种(或多种)液体与固体或液体进行混合，促进其化学反应的设备，通常伴随有热效应，由换热装置将所需热量输入或将生成热量移出。
- ◆ SS reactor tank is one of normal use reactor equipments in pharmaceutical and chemical fields, at certain temperature and pressure, through agitator mixes two kinds of volumes certain (or many kinds of) liquids, solids or liquids, promotes its chemical reaction, usually with thermal heat effect. Inputs required heat energy by heat exchanging device or shifts forming heat energy.
- ◆ 搅拌形式多用锚式或框式，确保物料在短时间内混合均匀。
- ◆ Type of agitation more uses anchor or frame type which ensures equal and even mixture in short time.
- ◆ 搅拌转速多配以变频调速，设有温度显示或控制。
- ◆ Speed of agitation more matches frequency conversion with temperature of display and control.

## 结晶罐 Crystallizer



- ◆ 结晶罐上安装0.22um呼吸器。
- ◆ The respirator of 0.22um is installed on the crystallizer.
- ◆ 晶罐能承受121℃高温灭菌消毒，配备卫生级压力表。
- ◆ The crystallizer can bear 121℃ high temperature sterilization and disinfection with sanitary pressure meter.

- ◆ 结晶罐采用进口304或316L不锈钢制作，内壁采用机械抛光或电解镜面抛光，外壁采用304全焊接结构保温，外表面采用镜面或亚光处理。
- ◆ The crystallizer uses imported SUS304 or SUS316L material for fabrication, with inner wall of mechanical polishing or electrolytes mirror polishing, outer wall of all welded structural insulation, outer surface of mirror or matt.
- ◆ 罐体对外接口采用卫生快开接头。
- ◆ Outer connection of the crystallizer adopts sanitary quick connector.
- ◆ 结晶罐带有温度监控装置，2个视镜，清洗球及氮气进口、温度计口等接口。
- ◆ The crystallizer has temperature monitor device, two sight lights, cleaning ball and inlet of Ni, temperature connection, etc.
- ◆ 轴的密封采用特殊的卫生级机械密封设计，确保物料不受污染。
- ◆ Seal of shaft adopts special sanitary mechanical seal design which insures they are not polluted.
- ◆ 结晶罐可采用变频调整装置，搅拌轴转速调节范围大。
- ◆ The crystallize uses adjustment device of frequency conversion with big range adjustment of shaft speed.

## 专用美拉德反应釜 Special Maillard Reaction Type Reaction Kettle



### ◆ 美拉德反应罐优点

- ◆ 本系统机组全部采用优质不锈钢材料，符合食品卫生要求；
- ◆ This system is completely made of High Quality Stainless Steel, under the food hygienic requirements;
- ◆ 连续流加，自动排料，实现连续可控美拉德反应，提高反应效率；
- ◆ Continuous feed, automatic slag discharge, can realize continuous and controllable Maillard Reaction, improve the reaction efficiency;
- ◆ 复合搅拌系统解决了美拉德反应罐使用过程中不易清洗，产品易结焦等问题；
- ◆ Compound mixing system resolved the issues during use process of Maillard Reaction kettle, such as difficult for cleaning and easy-coking etc.
- ◆ 香气回收装置有效避免了以往在骨素的美拉德反应过程中产生香味物质的损失。
- ◆ Fragrance recovery device effectively avoid the loss of fragrance occurred during ossein Maillard Reaction process.

### ◆ Advantages

- ◆ 蛋白质、脂肪、氨基酸、肽、糖等物质，在高温下产生热反应，生成具有浓郁肉香味的物质的专用反应。是肉香呈味物的专用生产设备。也可进行其他反应。也能作小型的调配罐用。本设备带专用搅拌机，配有配套冷凝器作为热回流用。夹套可接蒸汽加热，也可接冷却水快速冷却，外有保温层。
- ◆ It is the reaction kettle for such substances as protein, fat, amino acid, peptide, sugar and so on to produce the substances full of strong and intense fragrance of cooked meat after thermal reaction under high temperature. It is a special device for producing substances full of cooked meat. It can be used for other reaction or used as a small preparation tank. The equipment has its special blender, and is provided with condenser for heating and reflux. The jacket can be connected with steam for heating, and with cooling water for quick cooling. Heat preservation layer is provided outside.



## CX型全自动层析分离机组

### CX Model Automatic Chromatography Separating Unit



#### ◆ 系统组成及其特点

##### ◆ System components and characteristics

#### ◆ 自动化控制系统

基于先进的DCS分布式控制策略编写的色谱工作站, 实现对泵、阀门和各种在线检测器的控制和数据采集, 能够方便完成多柱串联、并联操作, 保证工艺的稳定性 and 准确性。

#### ◆ Automatic control system

The chromatogram working station that is compiled on the basis of the advanced DCS distributed control strategy can realize control and data collection of pumps, valves and various online detectors, conveniently complete the multi-column series and parallel operation and guarantee the stability and accuracy of technology.

#### ◆ 中药专用在线检测系统

包括流量、压力、温度、PH值(选配)、电导率(选配)等常规过程参数的检测和利用紫外光谱(选型)、近红外光谱(选型)对中药有效部位(或成分)含量的实时检测。

#### ◆ Special online test system for traditional Chinese medicine

Including the test of regular process parameters such as flow, pressure, temperature, PH value(optional) and electric conductivity (optional) etc and real-time test of content of effective parts(or components) of traditional Chinese medicine through ultraviolet spectrum(optional) and near-infrared spectrum (optional).

#### ◆ 层析柱结构

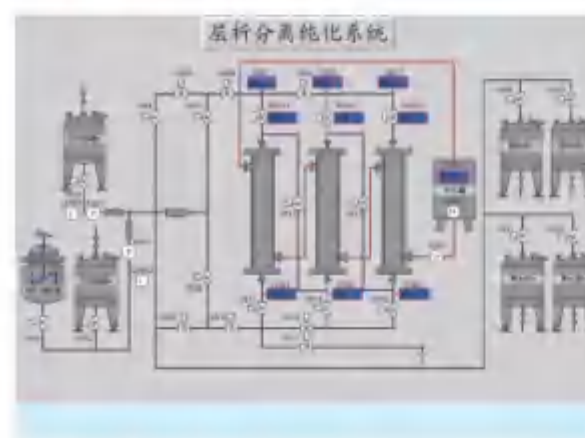
该层析柱结构的设计良好, 合理的高径比, 精密的进出口流体分布装置, 配备自动装填系统和空气压缩气接口, 保证了层析柱装填效果和填料再生效果, 为高效分离提供了保障。

#### ◆ Structure of chromatography column

The structure of chromatography column is well designed with reasonable height-diameter rate. The precise inlet and outlet fluid distributing device is equipped with automatic filling system and air and chromatography column and the regeneration effect of filler so as to provide guarantee for the high efficiency separation.

#### ◆ 控制界面

##### ◆ System control interface



#### ◆ 功能、特点

广泛应用于废水处理, 蛋白质、酶、单糖、多糖和植物有效成分等的提取和精制。

#### ◆ Functions and characteristics

It is widely used for waste water treatment, extraction and refining of protein, enzyme, monosaccharide, amylose and plant effective components etc.

#### ◆ 色谱分离技术在天然产物分离纯化中的应用

在中药分离纯化中应用较多的色谱分离技术主要有吸附色谱和离子交换色谱。吸附色谱包括反相色谱技术(C18反相填料)和正相硅胶色谱技术; 离子交换色谱主要用于带电荷的化合物的分离纯化。目前色谱分离技术在黄酮类、生物碱、苷类、有机酸类、多糖类等中药有效成分的精制中发挥着越来越重要的作用。

#### ◆ Application of chromatographic separation technology in the separation and purification of natural products

The chromatographic separation technology mostly applied in the traditional Chinese medicine separation and purification can be mainly divided into adsorption chromatography and ion exchange chromatography. The adsorption chromatography includes reverse phase chromatography (C18 filler) and normal phase silica gel chromatography. The ion exchange chromatography is mainly used for separation and purification of compounds with electric charge. Currently, the chromatographic separation technology has played more and more functions in the refining of effective components of Chinese medicine such as flavone, alkaloid, glycoside, organic acids and amylase etc.

◆ 该机组是专门为制药行业工业规模的目标化合物提纯而设计研发的。该制备液相色谱柱, 具有极高的样品负载能力, 这在较低成本的情况下提高纯化产物的制备量提供了可靠的保障。

◆ The unit is specially designed, researched and developed for the purification of targeted compound in pharmaceutical industry. The preparative liquid chromatographic column has super high sample loading capacity which has provided reliable guarantee for enhancing the preparative quantity of purification products with lower cost.

#### ◆ 层析分离的特点

操作条件温和(常温, 一般为常压); 混合物一次通过即可同时得到多个纯组分; 可精密分离, 得到高纯度的产物。本机组融入现代计算机自动化控制技术、工艺参数在线检测技术, 对传统的手动层析设备进行升级改造, 提高装备的可靠性和重复性, 该设备易于层析工艺的放大, 解决工业化生产问题。

#### ◆ The characteristics of chromatography separation are as follows

The operation condition is moderate (normal temperature, and normal pressure generally); the mixture can obtain multiple pure components at one time; precise separation is available so as to obtain products of high purity. Combining modern computer automatic control technology and technical parameter online detection technology, the unit has upgraded and reformed the traditional manual chromatography equipment to enhance the reliability and repetition. The equipment is easy for magnifying the chromatography technology to solve the problem of industrialized production.

#### ◆ 天然产物分离纯化的应用

小试工艺的开发, 中试工艺的放大研究, 植化标准品、对照品的制备等, 广泛用于分离酚类、萜类、生物碱、氨基酸、甾体、萜类、黄酮类、醛类、有机酸、苷类、糖类、核苷类等纯品。如: 紫杉醇、茶多酚、银杏黄酮、竹叶黄酮、维生素E等。

#### ◆ Application of separation and purification of natural products

Development of small-scale test technology, magnifying research of pilotscale test technology, preparation of phytochemical standard products and contrasting products. Widely suitable for separating phenol, aldehyde, alkaloid, amino acid, steroid, terpene, flavone, quinine, organic acid, glycoside, polysaccharide, nucleoside and pure products. Such as: paclitaxel, tea polyphenol, ginkgo flavone, bamboo leave flavones and vitamin E, etc.



## 智能型CIP清洗系统 Intelligentized CIP System



### ◆ 应用领域

目前，智能型CIP就地清洗系统广泛应用于生物发酵、制药等对清洗要求较高的行业，以达到卫生无菌的效果。

### ◆ Application

At present, Intelligent CIP system is widely used in biological fermenting and pharmaceutical industries with high requirement of clean to reach sanitary and sterilization effect.

### ◆ 设备说明

适用于乳品、饮料、酒类、农副产品加工等行业的设备和管道的清洗。

### ◆ Equipment specification

It is applicable for cleaning of equipments and pipes in industries of dairy, beverages, alcohol, agricultural and sideline products.

### ◆ 系统组成

智能型CIP系统为一中央集成系统，包含注射水罐、CIP罐、板式换热器、管道过滤器、送液泵、回液泵、温度控制仪、液位控制仪、电导率检测仪、PLC触摸屏、控制柜及系统管阀件等组成。

### ◆ System includes

Intelligent CIP system is a central integration system including WFI tank, CIP tank, plate heat exchanger, piping filter, transfer pump, loop liquid pump, temperature controller, level controller, conduct inspection instrument, PLC touch screen, control cabinet and piping and valves etc.

### ◆ 工作原理

通过设置程序(程序可调)由CIP清洗系统自动配制清洗液，经气动控制阀与送液泵、回液泵来完成清洗液的输送及回流循环清洗、排放、回收整个清洗过程。通过电导率检测仪及PLC触摸屏组成的控制系统达到了自动在线清洗。

可根据工艺情况选择：单罐式、双罐式、分体式  
还可以选择：智能型、手动型

### ◆ Operational principle

Through set programming (adjustable programming), CIP system makes automatically preparation clean liquid, via pneumatic control valve and transfer pump and loop liquid pump finishing transfer of clean liquid and whole clean process of circulation circle clean and drain and recovery. Through conduct inspection instrument and PLC constituting control system reaches auto online clean.

According to process condition choose: Single tank type, double tanks type, separate body type.  
Also choose: intelligent and manual

### ◆ 设备说明

CIP清洗系统由酸液罐、碱液罐、热水罐、纯水罐、回水罐、消毒水罐以及浓酸罐、浓碱罐和换热器、进程泵及相应阀门管件组成。可按工艺需求配置相应罐，在一般场合只需使用酸液罐、碱液罐、热水罐三罐制的CIP系统就可满足清洗要求。

我公司生产的CIP系统具有安全、节能、高效、操作维护方便等特点。主要有：1、手动CIP站；2、半自动CIP站；3、自动CIP站系统；4、自动配料前处理系统自动CIP，更为先进、自动化程序，可靠性、安全性更高，可以实现整条生产线信息数据的采集、交换并可以完成他们之间的联动。

以上CIP的结构方式有联体和分体两种方式；这两种结构的CIP的加热方式各有四种加热方式：板式加热、列管加热、盘管加热、直通加热；联体的CIP系统有从一回路到三回路、罐容积从1T到5T的各种规格。分体式的CIP系统有从一回路到六回路、罐容积从1T到10T的各种规格。

### ◆ Equipment specification

The CIP cleaning system is composed of the acid tank, alkali tank, hot water tank, ure water tank, back water tank, disinfectant water tank, thick acid tank, thick alkali tank, heat exchanger, process pump, and corresponding valve and pipe. the tanks can be allocated according to process requirements, generally, the CIP system that only consist of the acid tank, alkali tank an hot water tank can meet the requirements for cleaning.

The CIP system produced by our company has such features as good safety, energy saving, high efficiency, convenient operation and maintenance etc. mainly including: 1. manual CIP station; 2. semi-automatic CIP station; 3. automatic CIP station system; 4. automatic CIP in the automatic dispensing pre-treatment system, which is more advanced with higher degree of automation, reliability and safety. Data acquisition and exchange of the whole production line can be realized for linkage of all equipment.

The structures of CIP include joint type and split type. The CIP systems of the two types of structures have four heating modes: plate heating, tubular heating, coil heating and through heating. The CIP system of joint type has specifications from one-loop to three-loop with tank volume from 1T to 5T. The CIP system of split type has specifications from one-loop to six-loop with tank volume from 1T to 10T.



## 自动化控制 Automatic Control



自动化控制系统解决了传统中药制药生产过程中工艺过程及装备落后；自动化程度低；质量控制水平低；缺乏在线监测手段等问题。

Automatic control system resolved issues for the traditional Chinese pharmaceutical manufacturing, such as outdated process and equipment, low grade of automation level, low quality control level, lack of in line monitoring measure etc.

### ◆ 自动化控制的优点

- ◆ 工艺状态的实时监控管理；
- ◆ 过程整定使控制过程更加完美；
- ◆ 简单易懂的操作界面,操作方便；
- ◆ 过程参数在线监测/实时显示并记录存档；
- ◆ 实时在线分析/在线解决问题和历史查询；
- ◆ 加强生产数据管理,保证产品质量；
- ◆ 自动化工程实施后,人力成本大大节省。

### ◆ Advantages of automatic control system

- ◆ Real time control management of process status.
- ◆ Process setting make process control be more perfect.
- ◆ Simple and easy application interface for convenient operation
- ◆ Process parameter is detected on line ,real-time displayed, be saved as a file.
- ◆ Real time analysis on line and solve the problem in-place and history search.
- ◆ Strengthen management of production data, ensure the production quality.
- ◆ After automatic control executed, labor cost is greatly saved.

## 不锈钢管阀件/卫生级泵系列 Stainless Steel Sanitary Pipe And Valves

