

浙江亞光科技股份有限公司
ZHEJIANG YAGUANG TECHNOLOGY CO., LTD.

过滤洗涤干燥机/API生产线整体解决方案

专业的制药装备和整体方案供应商

AGITATED NUTSCHE FILTER DRYER/
API PRODUCTION LINE OVERALL SOLUTION
Professional pharmaceutical equipment and overall solution supplier

地址: 温州经济技术开发区滨海园区滨海三道4525号
电话: 0577-86906886
传真: 0577-86906900
邮箱: sales@china-yaguang.com

Address: No.4525, Binhai Rd3, Binhai Zone, Economic-Technical
Development Area, Wenzhou City, Zhejiang Province, P.R.China
Tel: +86-577-86906885
Fax: +86-577-86906900
E-mail: sales@china-yaguang.com
P.C.: 325025

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中文网



English website



公司拥有一个省级研发中心，中心具有一、二级压力容器及ASME设计资质。凭借着扎实的技术基础，先进的管理理念和优秀的企业文化，亚光公司一路稳步向前，努力将公司打造成一流的面向全球的专业制药工艺方案服务商。

Yaguang has a provincial R&D center with manufacturing licenses of D1, D2 pressure vessel in China. With the solid technical foundation, advanced management concepts and excellent corporate culture, Yaguang is developing with a steady pace and being a global professional pharmaceutical process program supplier.

Advanced technology and excellent quality facilitate the development of pharmaceutical and chemical equipment in China



人力资源 Human Resource

公司始终把人才培养作为企业发展的基础，通过多层次、多形式、多渠道的培训，全方位培养各级各类人才；亚光招贤纳士，不断引进经验丰富的中高级人才，加大人才储备力度，讲究专业门类齐全、重视理论与实践经验并行，以雄厚的技术实力，为客户提供“诚信公正，优质高效”的服务。

Our company always regards talent cultivation as the foundation for enterprise development. Through trainings at various levels, in multiple forms and from varied channels, we cultivate all kinds of talents. Yaguang continuously introduces experienced senior and intermediate talents, enhances talent storing, reinforces combination of theory and practical experience and provides customers with services of "sincerity, fairness, high quality and high efficiency" with our powerful technical strength.



生产实力 Production Strength

市场竞争的基础，离不开生产实力，离不开完善先进的硬件设施。深知硬件设施重要性的亚光，在同行业内率先引进国外先进的生产设备，几年来更先后投入资金对硬件设施进行更新换代，以国际化的生产设施生产出符合GMP标准的高端优质产品。

The basis of market competition, inseparable from the production capability, and can not do without an advanced hardware facilities. Fully aware of the importance of hardware facilities, Yaguang takes the lead in the introduction of foreign advanced production equipment in the industry; during recent years Yaguang has further invested in updating the hardware facilities, to produce high-end quality products with the internationalized production facilities to meet the GMP standard.



生产实力 Production Strength

先进的高、精、尖
设备保证了高品质的产品
The sophisticated
equipment bring up high
quality products



产品和服务 Products and Services

产品

- 1、清洗机系列：主要产品有药用胶塞清洗机、铝盖清洗机等。为胶塞清洗机国家行业标准起草单位。
- 2、固液分离和粉体处理系列：主要产品有无菌溶解罐、结晶罐、过滤洗涤干燥机、粉碎机、混合机、自动称量分装系统等。其中过滤洗涤干燥机为国家行业标准起草单位。
- 3、溶媒回收：精馏床。

Products

1. Washing machine series: The main products include medical rubber stopper washing machines, aluminum cap washing machines and etc. Yaguang is the drafting unit of national industrial standard of rubber stopper /aluminum cap washing machines.
2. Solid-liquid separation and powder treatment series: The main products include Aseptic Dissolving Tanks, Crystallizing Tanks, Agitated Nutsche Filter Dryer, Comminutor, Mixers, Automatic Weighing and Split-charging Systems. Yaguang is the drafting unit of national industrial standard of pharmaceutical Agitated Nutsche Filter Dryer.
3. Solvent recovery: Distillation Bed.

服务

设备的设计、制造、安装、调试及技术支持。

Services

Design, manufacturing, installation, commissioning and technical support for the equipment.



过滤洗涤干燥机

Agitated Nutsche Filter Dryer

亚光公司自2001年成功开发出第一台无菌原料药过滤洗涤干燥设备，伴随着中国制药工业的逐步发展而不断改进和完善，形成两大系列近40种规格产品。公司为该产品国家行业标准起草单位。

应用范围

- ◆药品生产中间体及无菌原料药
- ◆生物制药
- ◆精细化工
- ◆印染行业
- ◆食品行业
- ◆电子行业

功能

- ◆进料：
- ◆过滤：在真空或加压状态下实现固液分离。
- ◆滤饼平料：搅拌桨叶反向旋转将滤饼表面的裂缝抹平，避免清洗溶剂沿裂缝短路。
- ◆调浆和清洗：通过旋转喷球使清洗液均匀喷洒在容器内，可实现内部清洗和物料清洗。通过升降搅拌桨叶搅拌将滤饼和清洗液混合，使物料得到充分洗涤。
- ◆干燥：在真空状态下，搅拌桨叶正向旋转将滤饼逐层刮松，设备加热系统均匀加热湿滤饼，使溶剂加速蒸发，物料充分干燥。
- ◆在线取样：在干燥过程中可以通过取样阀进行物料取样检验；
- ◆侧出料：干燥完毕后，搅拌桨叶正向旋转，刮松并推动物料从设备侧出料口自动卸料。
- ◆CIP与SIP。

The Agitated Nutsche Filter Dryer has formed two major series of about 40 specifications since 2001. We are the drafting unit of national industrial standards of Pharmaceutical Agitated Nutsche Filter Dryer.

Application

- ◆Intermediates for pharmaceutical and sterile API
- ◆Biological pharmacy
- ◆Fine chemical industry
- ◆Printing and dyeing industry
- ◆Food industry
- ◆Electronics industry

Functions

- ◆Feeding.
- ◆Filtration: Solid-liquid separating is carried out under condition of vacuum or pressurization.
- ◆Filter Cake smoothing: The agitator rotates anticlockwise to smooth the crevices of the cake surface so as to avoid short circuit of solvent meet the crack.
- ◆Slurry Mixing and Washing: The cleaning solution can be sprayed on the cake surface evenly by the rotating spray ball, which can carry out inner cleaning and filter cake cleaning. By raising and lowering the agitator, the cake and the cleaning solution can be mixed so as to clean the cake adequately.
- ◆Drying: In the case of vacuum, the agitator rotates clockwise to heat and scrape the cake loosely. The heating system of the equipment heats the wet filter cake to vaporize solvent, then dry the material fully.
- ◆Sampling on Line: Take sample by sampling valve during drying process.
- ◆Side Discharge: After drying the agitator shall rotate clockwise to scrape and propel powder out of the discharge valve nozzle automatically.
- ◆CIP and SIP.

无菌级过滤洗涤干燥机

Sterile Agitated Nutsche Filter Dryer

结构示意图 Structural Diagram



无菌级过滤洗涤干燥机

Sterile Agitated Nutsche Filter Dryer

产品特点

- ◆设备的设计与装配严格按照国家GMP与美国FDA要求进行，完全符合药品生产工艺要求，系统安全、稳定、可靠。
- ◆设备材质严格控制。与物料直接接触的零部件均选用无毒、耐腐蚀的奥氏体不锈钢(316L、304、904L、316Ti、321)、哈氏合金、双相钢 2205材质，PTFE、FFKM或EPDM等密封材料。滤网采用金属烧结网，避免产生纤维，常用材质为 316L，C22等。
- ◆与物料直接接触的设备内表面平整、光滑、无死角，易于清洁和消毒。
- ◆设备不对装置之外的环境构成污染，并妥善采取防尘、防漏、隔热、防噪音等措施。全封闭的工作状态，电机、减速机、升降装置不锈钢外罩防护，夹套回流道加保温棉隔热或保冷，大大减少热损失与外界发生热量交换以及对环境的影响。
- ◆严格采用安全可靠的防爆电器，并设有消除静电的滑轮及其他安全联锁功能、保险装置。
- ◆与物料接触内表面均为电化学抛光，设备内表面Ra≤0.4，外表面Ra≤0.8。
- ◆搅拌轴和侧出料阀杆装有波纹管保护。
- ◆采用特殊设计的取样法，可在密闭真空状态下在线取样，在线清洗，灭菌。
- ◆三合一罐内设置360度喷淋的清洗喷淋球，用于在线清洗。清洗球可以采用符合FDA要求的360度旋转式喷淋球或固定式喷淋球。
- ◆干法双端面机械密封，氮气保护与冷却。
- ◆粉尘捕集器可CIP。

基本参数 Basic Parameters

型号 Model	过滤面积(m²) Filtering Area	内径(mm) Inside Diameter	公称容积(m³) Nominal Volume	滤饼高度(mm) Filter Cake Height	桨叶提升高度(mm) Blade Lifting Height	电机功率(kW) Motor Power	净重(kg) Net Weight	总高(mm) Total Height
DN325	0.08	325	0.04	100	120	0.37	600	2050
DN400	0.125	400	0.07	120	150	0.55	860	2550
DN500	0.19	500	0.15	140	160	2.2	1500	3000
DN600	0.28	600	0.22	180	200	2.2	1700	3300
DN650	0.3	650	0.28	180	200	2.2	1850	3400
DN800	0.5	800	0.46	200	220	3	2250	3500
DN1000	0.8	1000	0.95	220	250	5.5	3500	3800
DN1200	1	1200	1.2	250	300	7.5	4900	4000
DN1400	1.5	1400	1.9	300	350	11	6500	4500
DN1600	2	1600	2.59	300	350	15	7500	4500
DN1800	2.5	1800	3.2	350	400	15	10000	4700
DN2000	3	2000	4.5	400	450	18.5	11700	5100
DN2300	4	2300	6.4	400	450	22	12800	5200
DN2600	5.3	2600	9	400	450	22	17000	5600
DN2800	6	2800	10.5	450	500	30	21000	5800
DN3000	7	3000	12	500	550	37	24000	6000

Features

- ◆The design and assembly of the equipment are carried out strictly following national GMP and US FDA requirements, and fully conforming to pharmaceutical production process requirements. The system is safe, stable and reliable.
- ◆The equipment materials are strictly controlled. The parts that directly contact materials are made of non-toxic and corrosion-resistant sealing material such as austenitic stainless steel(316L, 304, 904L, 316Ti, 321), Hastelloy, Dual phase steel 2205 material, PTFE, FFKM or EPDM etc. The filter screen adopts metal sintering screen made of 316L, C22 etc.
- ◆The interior surfaces of the equipment that directly contact materials are flat and smooth without dead corner for the convenience of cleaning and sterilizing.
- ◆The equipment does not pollute the external environment, and the measures of dust prevention, leakage prevention, heat insulation and noise prevention are properly adopted. Under the fully closed working status, the motor, speed reducer and lifting device are protected by stainless steel outer covers, The return duct in jacket adopts heat preservation cotton to insulate, can greatly reduce heat loss, heat exchange with the outside environment and the influence on the surroundings.
- ◆Safe and reliable explosion-proof electrical appliances are adopted. The pulleys that can eliminate static electricity and other safe interlocks and safety devices are allocated.
- ◆The inner surface in contact with the material is electrochemically polished, the inner surface of the equipment Ra≤0.4, the outer surface≤0.8.
- ◆The blending shaft and lateral discharging valve stem are installed with metal bellows.
- ◆Adopt specially designed sampling valve, which can sample, clean and sterilize on line under closed vacuum condition.
- ◆360° spraying cleaning spray balls for CIP are equipped in the tank. The balls can adopt 360° rotary spray ball or fixed spray ball meet the requirements of FDA.
- ◆Dry-process double-face mechanical seal, nitrogen protection and cooling.
- ◆Dust capture device with CIP function.

过滤洗涤干燥机推料cRABs

Agitated Nutsche Filter Dryer Pushing cRABs

注：

- 1、 过滤洗涤干燥机在下文中都用“三合一”代替；
- 2、 过滤洗涤干燥机推料cRABs在下文中都用“cRABs”代替。

概述

浙江亚光公司研发生产的过滤洗涤干燥机推料cRABs安装在指定的过滤洗涤干燥机出料端对侧。用于清理三合一出料完毕后搅拌桨与烧结网安全间隙之间的余粉，利用推料耙手动将余粉推至出料口侧（推料耙由不锈钢杆和聚四氟乙烯旋转头组成）。此cRABs安装于洁净度为B级无菌洁净厂房。

产品特点 Features

1、操作箱体 Operation box

- ◆主体由不锈钢316L、304及符合GMP要求的卫生材料组成，与物料接触部分表面处理：内表面光洁度Ra≤0.6。
- ◆上翻式操作门：配置感应式挡板组可以有效防止操作人员的误操作；、空气弹簧支撑、门体主材质为抗冲击、透明度高的优质钢化玻璃和优质304不锈钢组成。操作口采用美国进口中性化操作手套，手套材质HYPALON，耐高温，耐酸碱，耐臭氧，使用专用手套口密封联接。
- ◆管口配置：清洗口、氮气吹干口、VHP灭菌入口及出口、排水口。

2、回风箱 Air return box

- ◆由优质304不锈钢板和框架组成，侧板可拆卸，方便回风箱内清理卫生。

3、洁净单元（风机箱+高效箱）Clean Unit (Fan Box + HEPA Box)

- ◆风机箱顶部设补偿送风及过滤单元，循环送风，进风口设粗效过滤器。
- ◆防爆风机将板式粗效过滤器过滤后的风送入静压风箱内，再通过0.3 μm微粒过滤效率为99.995%的H14高效过滤器后进入RABS内部，高效过滤器的出风侧带均流膜，从而保证RABS内部环境达到A级。
- ◆腔体内部循环送风，配有高效率防爆风机。
- ◆配2个压差检测及安全报警装置；配有PAO发雾口及PAO检测口。可以完成在线高效过滤器压差检测，测定高效过滤器的完整性；内外环境压差检测，实测内部环境压力。

Note:

1. Agitated Nutsche Filter Dryer are replaced by "ANFD" in the following context.
2. Agitated Nutsche Filter Dryer Pushing cRABs are replaced by "cRABs" in the following context.

Summary

The cRABs which is developed and manufactured by AGT is installed on the opposite side of the discharge end of ANFD. It is used to clean up the remaining powder between the agitator and the safety clearance of filtering net after discharging. The remaining powder is manually pushed to the discharge side by the pushing rake (the pushing rake is composed of stainless steel rod and PTFE rotary head). The cRABs is installed in the sterile clean workshop with class B cleanliness.

- ◆The main body is composed of stainless steel 316L, 304 and hygienic materials meeting GMP requirements. The surface treatment of the contact part with the materials : the inner surface Ra ≤0.6.
- ◆Up-turn operation door: equipped with induction baffle group can effectively prevent misoperation; air spring support, door body main material is impact-resistant, transparent high-quality toughened glass and high-quality 304 stainless steel composition. Operator uses neutral operation gloves imported from USA. The glove material is HYPALON. It has high temperature resistance, acid and alkali resistance, ozone resistance and sealing connection with special glove mouth.
- ◆Nozzle configuration: cleaning nozzle, nitrogen blowing nozzle, VHP sterilization inlet and outlet, drainage outlet.

- ◆It is composed of high quality 304 stainless steel plate and frame. The side plate can be disassembled to facilitate cleaning and sanitation in the return air box.

- ◆The top of the fan box is equipped with compensating air supply and filtering units, circulating air supply, and coarse filter at the air inlet.
- ◆The explosion-proof fan feeds the air filtered by the plate-type coarse filter into the static pressure air box, and then enters the RABS through the H14 HEPA filter with a filtration efficiency of 99.995% at 0.3 um. The air outlet side of the HEPA filter is equipped with a current sharing membrane, thus ensuring that the internal environment of RABS reaches A level.
- ◆Circulating air supply inside the chamber is equipped with high efficiency explosion-proof fan.
- ◆It is equipped with two pressure differential detection and safety alarm devices, and PAO fog and PAO detection ports. It can complete on-line pressure difference detection of high efficiency filter, measure the integrity of high efficiency filter, test the pressure difference between internal and external environment, and measure the pressure of internal environment.

过滤洗涤干燥机推料cRABs

Agitated Nutsche Filter Dryer Pushing cRABs

4. 传递桶 Transfer bucket

- ◆操作箱侧面配置RTP传递桶，可以快速并且环境无暴露的完成工器具或者取样瓶的传递。
- ◆传递桶主体由S316L制成，对接口由POM工程塑料及多道EPDM密封条组成。
- ◆箱体内部设置可以快速开启及关闭的内门。
- ◆The RTP transfer bucket is arranged on the side of the operation box, which can transfer the tools or sampling bottles quickly and without exposure to the environment.
- ◆The main body of the transfer bucket is made of S316L, and the docking port is composed of POM engineering plastics and multi-channel EPDM seals.
- ◆The inner door of the box body can be quickly opened and closed.

5. 与三合一对接 Docking with ANFD

- ◆安装在三合一出料阀对面，与三合一推料口法兰以螺栓的方式连接锁紧，且两对接法兰之间安装软四氟材质的密封条。
- ◆Installed on the opposite side of the ANFD discharge valve, the ANFD pushing port flange is bolted and locked, and a soft PTFE sealing strip is installed between the two butt flanges.



化工级过滤洗涤干燥机

Chemical Agitated Nutsche Filter Dryer

功能：

在正压或负压下进料、过滤、打浆和洗涤，对滤饼进行平料、干燥，在线取样、刮粉、自动出料、CIP。

Functions：

Under positive pressure or negative pressure, carrying out feeding, filtering, pulping and washing, filter cakes smoothing and drying, online sampling, powder scraping, automatic discharging, CIP.

产品特点：

- ◆可以在同一容器内进行过滤、洗涤和干燥全过程连续操作(亦可以在同一罐内进行过滤、洗涤、放料连续操作)。
- ◆利用搅拌对滤饼充分洗涤，洗涤效果突出。
- ◆利用搅拌对滤饼加热干燥，干燥速度快。
- ◆自动出料，避免污染。
- ◆具有在线清洗功能。
- ◆整个操作过程可在氮气保护下进行，安全可靠。
- ◆底座不可拆卸，过滤板为分块式烧结网或滤布，适用于非无菌原料药的生产。
- ◆与传统的离心机、抽滤罐相比，更加符合GMP和FDA的生产要求。

Features：

- ◆The whole process of filtering, washing and drying can be continuously carried out in the same vessel (it can continuously filter, wash and discharge without drying)
- ◆Sufficient washing of filter cakes with agitating, which has an outstanding effect.
- ◆Heating and drying of filter cakes with agitating, which has a fast drying speed.
- ◆Automatic discharging, avoiding pollution.

- ◆Provided with CIP function.
- ◆The whole operation process can be carried out with safety and reliability under the protection of nitrogen gas.
- ◆The bottom cannot be removed. The filterplate is made of sectioned sintered mesh or filter cloth, which is suitable for production of non-sterile API.
- ◆Compared with the traditional centrifugal machine and suction filtration vessel, it better conforms to GMP and FDA requirements.

基本参数 Basic parameters

型号 Model	过滤面积(m²) Filtering Area	内径(mm) Inside Diameter	公称容积(m³) Nominal Volume	滤饼高度(mm) Filter Cake Height	桨叶提升高度(mm) Blade Lifting Height	电机功率(kW) Motor Power	净重(kg) Net Weight	总高(mm) Total Height
DN1200	1	1200	1.28	250	300	7.5	4150	3850
DN1400	1.5	1400	1.9	300	350	11	5300	4500
DN1600	2	1600	2.8	300	350	11	5800	4500
DN1800	2.5	1800	3.2	350	400	15	7800	4600
DN2000	3	2000	4.9	350	400	18.5	8300	4600
DN2300	4	2300	6.4	350	400	22	10000	4600
DN2600	5.3	2600	8.8	450	500	30	12600	5100
DN2800	6	2800	11	450	500	30	14000	5300
DN3000	7	3000	12	500	550	30	18500	5750
DN3200	8	3200	14	500	550	37	20000	6000
DN3600	10	3600	18	500	550	45	26000	6000



旋转式过滤洗涤干燥机

Rotary Filtering Washing and Drying Machine



应用范围：

本装置适合于制药或中间体原料药行业，可以满足GMP要求，也可用于精细化工产品的小试和中试过程特别是易燃、易爆、有害溶剂的工艺过程。

Scope of application：

This device is suitable for pharmaceutical or intermediate API industry which meets the GMP requirement. It can also be used for small and middle level test processes of fine chemical products, especially for flammable, explosive, hazardous solvent process.

产品特点：

- ◆本设备是将物料在同一罐体内完成结晶、过滤、洗涤、真空干燥，自动出料等全部工序，整个工作过程中物料无需转运。
- ◆完全符合国家新版GMP和美国FDA要求。
- ◆具有产品收率高、节能环保和降低劳动强度等特点。

Features：

- ◆This equipment can accomplish the crystallization, filtering, washing, vacuum drying, automatic discharging, and other processes of material in the same tank. the whole process don't need to transfer operation.
- ◆It fully meets national new version of GMP and U.S. FDA requirements,
- ◆It has the characteristics of high product yield, energy saving and environmental protection and reducing labor intensity.

功能：

结晶：
结晶时，根据物料工艺要求在夹套内通入加热或冷却介质，以控制物料结晶温度。同时通过螺带搅拌和罐体的摇摆速度以保持结晶液的均匀度。

过滤：
结晶过程结束后，反转设备筒体对物料进行压滤或者负压真空抽滤。

洗涤：
通过CIP装置使清洗液均匀地喷洒在容器内，实现对物料和设备内部清洗。

干燥：
过滤结束后，夹套通入加热介质同时罐体进行360° 旋转，对物料进行真空干燥。

Features：

Crystal：
Feed heating or cooling medium into jacket in terms of the process requirements so as to control the crystallization temperature of the material during crystallization. Meanwhile, keeping the uniformity of crystal liquid is via the screw ribbon agitating and the tank swing speed.

Filtering：
After the crystallization, reverse the cylinder for pressure filtration of material or negative pressure vacuum leaching.

Washing：
Spray the washing liquid evenly to the inner tank via CIP device; it will be completely washing the material and inner tank of the equipment.

Drying：
After the filtration, the jacket is passed into the heating medium, the tank rotates 360° , and the material is vacuum dried.

基本参数 Basic parameters

型号 Model	过滤面积(m²) Filtering Area	内径(mm) Inside Diameter	容积(L) Volume	滤饼高度(mm) Filter Cake Height	电机功率(kW) Motor Power	净重(kg) Net Weight	安装尺寸(mm) Installation Dimensions (长Length × 宽Width × 高Height)
YG600	0.28	600	160	80	4	1200	2400 × 2300 × 2300
YG800	0.5	800	260	100	5.5	1800	2600 × 2400 × 2600

翻转式过滤干燥机

Turnover Type Filtering and Drying Machine



概述

浙江亚光科技股份有限公司研发生产的翻转式过滤干燥机适用于对医药中间体、高纯度化学品、特种固体物质的过滤、洗涤和干燥。可实现全过程为封闭的连续操作。设备硬件系统、操作系统、软件资料的设计开发完全依照国家的相关标准、GMP及FDA规范。

Summary

The turnover type filtering and drying Machine developed and manufactured by AGT is suitable for filtering, washing and drying pharmaceutical intermediates, high purity chemicals and special solid substances. It can realize continuous operation with closed whole process. The design and development of equipment hardware system and operating system software data are in accordance with the relevant national standards, GMP and FDA specifications.

产品特点

- ◆在同一容器内完成过滤、洗涤和干燥过程连续操作，使产品质量得到充分保障。
- ◆特殊设计的搅拌器，利于物料的洗涤和干燥。
- ◆采用篮式过滤器，过滤面积大，适用于特殊物料的过滤操作。
- ◆搅拌轴采用波纹管技术。
- ◆采用独特的出料方式，出料彻底，收率高。
- ◆具有CIP和SIP能力。

功能

- 过滤：**
将罐体旋转到“过滤”工位后，在真空或加压状态下实现固液分离；
- 洗涤：**
将罐体旋转到“洗涤”工位后，打开溶剂进口，可实现对物料的清洗。
- 干燥：**
将罐体旋转到“干燥”工位后，在真空状态下，搅拌桨叶正向旋转翻动物料，设备加热系统均匀加热物料，使溶剂蒸发。
- 出料：**
待物料干燥完成后，将罐体旋转到“出料”工位，打开固体卸料口自动卸料。

Product characteristics

- ◆The continuous operation of filtration, washing and drying in the same container ensures the product quality.
- ◆The special designed agitator is beneficial to the washing and drying of materials.
- ◆Basket filter with large area is suitable for filtering operation of special materials.
- ◆The mixing shaft adopts bellows technology.
- ◆Unique discharging method is adopted, with thorough discharging and high yield.
- ◆Capability of CIP and SIP

Features

- Filtering**
After the tank body is rotated to the "filter" station, solid-liquid separation is realized in vacuum or under pressure.
- Washing**
After the tank body is rotated to the "washing" station and the solvent inlet is opened, the material can be cleaned.
- Drying**
After tilting the tank to the "drying" station, in vacuum, the impeller blade rotates forward to turn over the animal material, and the equipment heating system uniformly heats the material to evaporate the solvent.
- Discharging**
After material drying is completed, the tank body is tilted to the "discharging" position, and the solid discharging outlet is opened for automatic discharging.

基本参数 Basic parameters

型号 Model	过滤面积(m²) Filtering Area	滤篮内径(mm) Filter basket inner dia	全容积(m³) Total Volume	搅拌提升高度(mm) Blade Lifting Height	电机功率(kW) Motor Power	净重(kg) Net Weight	设备总高(mm) Total Height
FWD50	0.38	380	67	80	0.75	730	2300

注：可根据用户特殊要求进行设计和制造。
Note: It can be designed and manufactured according to the special requirements of users.

单锥干燥/混合机

Conical Dryer/Mixer

概述

单锥干燥/混合机是浙江亚光公司针对无菌原料药快速干燥与混合而开发的新一代产品。本产品在传统单锥混合干燥设备的基础上，增加了氮气脉冲，混合更加快速均匀；在螺带搅拌上增加加热功能，大大提高了干燥的效率。高效、节能、安全，更加适合药品生产的要求。

Summary

Conical Dryer/Mixer is a new generation product developed by AGT for rapid drying and mixing in sterile APIs. The new product adopts Nitrogen pulse, which makes mixing having higher speed and more uniformity; the heating function on the spiral belt mixer can achieve higher drying efficiency. High efficient, energy saving, safety, meets higher requirement of pharmaceutical production.

工作原理

本机由电机减速机驱动双螺带搅拌器旋转，带动物料沿锥形桶壁旋转并自下而上提升，物料达到最高点由于重力作用，自动流向漩涡中心回到筒体底部。物料在锥形筒体内强制加热相互扩散、对流和掺混，使物料作全方位的不规则往复运动，完成物料同螺带和筒壁进行高频率的热交换，在短时间达到混合干燥的目的。

Working Principle

The machine is driven by a motor gear box by double spiral mixer. The material is rotated along the conical barrel wall and lifted from the bottom to the top. When the material reaches the highest point, it automatically flows to the center of the eddy and returns to the bottom of the barrel body due to the action of gravity. The material is forced to heat and diffuse, convection and mix in the conical barrel, which makes the material move irregularly in all directions, completes the high-frequency heat exchange between the material and the spiral belt and the barrel wall, and achieves the purpose of mixing and drying in a short time.

结构 Structure

单锥干燥/混合机主要由以下部分组成 Main components :

• 传动系统	Drive system
• 搅拌系统	Mixing system
• 锥形罐体	Conical body
• 出料阀	Discharge valve
• 取样阀	Sample valve
• 电控系统	Electric control system



应用领域 Applications :

药品、生物制品、精细化工、食品等行业粉体的混合与干燥。

Powder mixing and drying on pharmaceuticals, biological products, fine chemicals and food industry.

单锥干燥/混合机

Conical Dryer/Mixer



螺带 Spiral belt



出料阀 Discharge valve



取样阀 Sampling valve

结构特点 :

- ◆罐体无菌全密闭结构设计，内部结构简洁无死角，特别适合易燃易爆、有毒或剧毒、不允许有污染或无菌要求的食品、生物制品、药品等的物料混合干燥。
- ◆先进的单锥螺带搅拌式结构，充装率高，可达70%以上，节省占地面积和使用成本。
- ◆锥形罐体，出料顺畅无残留。
- ◆自动化程度高，大大减轻劳动强度和节省人工成本。
- ◆罐体、封头、搅拌均可加热，加热面积大，加热效率高，大大节省工作时间。
- ◆螺带的设计采用双支点定位结构，径向摆动量小，保证螺带与桶壁更小的安全间隙，同时减轻对机械密封的损害。
- ◆采用特殊设计的取样阀，可在密闭真空状态下在线取样，在线清洗、灭菌。
- ◆带氮气吹扫的出料阀，气体浮动式密封结构，结构简洁无死角，完全符合GMP和FDA的洁净生产要求。

Structure characters :

- ◆Fully closed sterile structure of tank, with concise and no dead corner of inner structure, it is especially well with mixing and drying of material of flammable and combustible, toxic or highly toxic, pollution not allowed or sterile required food, biological products, pharmaceuticals.
- ◆Advanced conical spiral belt mixer structure, high filling ratio of more than 70%, can save occupied area and cost.
- ◆Conical tank, smooth discharge without residue.
- ◆High automation, greatly reduce labor intensity and save labor costs.
- ◆Tank, cover and agitator can be heated, large heating area and high heating efficiency, greatly save the working time.
- ◆Adopting double pivot location structure of spiral belt design, smaller radial swing parameter, smaller safety space between spiral belt and tank surface, and the damage to mechanical seal can also be reduced.
- ◆The specially designed sampling valve can be used for on-line sampling, on-line cleaning and sterilization under closed vacuum condition.
- ◆Discharging valve with nitrogen purging, adopts gas floating seal structure, concise and no dead corner, completely conforms to the clean production requirements of GMP and FDA.

生产工艺 Process flow :



单锥干燥机
Conical Dryer

基本参数 Basic parameters

型号 Model	全容积(L) Full volume	物料容积(L)(最大) Material Volume (L) (Mix)	规格 Specification	支耳中心*设备总高度 Ear Center * Total height of equipment
GHF-100-700	200	100	DN700	Φ 1020*2150
GHF-150-800	270	150	DN800	Φ 1090*2300
GHF-200-850	340	200	DN850	Φ 1170*2400
GHF-300-1000	540	300	DN1000	Φ 1320*2700
GHF-500-1200	900	500	DN1200	Φ 1580*3100
GHF-1000-1500	1750	1000	DN1500	Φ 1880*3600
GHF-1500-1700	2550	1500	DN1700	Φ 2120*4000
GHF-2000-1900	3600	2000	DN1900	Φ 2320*4400
GHF-2500-2000	3900	2500	DN2000	Φ 2420*4550
GHF-3000-2100	4500	3000	DN2100	Φ 2580*4700

注：可根据用户特殊要求进行设计和制造。
Note: It can be designed and manufactured according to the special requirements of users.

单锥混合机
Conical Mixer

基本参数 Basic parameters

型号 Model	全容积(L) Full volume	物料容积(L)(最大) Material Volume (L) (Mix)	规格 Specification	支耳中心*设备总高度 Ear Center * Total height of equipment
HF-100-700	200	100	DN700	Φ 1020*2150
HF-150-800	270	150	DN800	Φ 1090*2300
HF-200-850	340	200	DN850	Φ 1170*2400
HF-300-1000	540	300	DN1000	Φ 1320*2700
HF-500-1200	900	500	DN1200	Φ 1580*3100
HF-1000-1500	1750	1000	DN1500	Φ 1880*3600
HF-1500-1700	2550	1500	DN1700	Φ 2120*4000
HF-2000-1900	3600	2000	DN1900	Φ 2320*4400
HF-2500-2000	3900	2500	DN2000	Φ 2420*4550
HF-3000-2100	4500	3000	DN2100	Φ 2580*4700

注：可根据用户特殊要求进行设计和制造。
Note: It can be designed and manufactured according to the special requirements of users.

分装称重轧盖系统
Split-Charging Weighing and Capping System



系统特点：

- ◆原料药粉的转运方式：真空管道转运、SBV阀和IBC料桶转运、无菌密闭袋转运。
- ◆原料药粉的分装送料方式：直线振动器送料。
- ◆送料装置下料口装有最先进的粉尘收集器，以减少对分装区环境的污染。
- ◆新型轧盖装置采用气动结构更为简单，有效的解决了旋刀式轧盖机在轧盖过程中铝屑的产生。适用于15L和30L铝桶。
- ◆系统符合中国GMP2010年版，EU-GMP及FDA的要求。

Characteristics：

- ◆The transfer methods of API powder include the vacuum pipeline transfer, SBV valve and IBC bucket transfer and sterile sealing bag transfer.
- ◆The split-charging feeding methods of API powder: linear vibrator feeding.
- ◆The discharge port of feeding device is equipped with the most advanced dust collector, which could reduce the environmental contamination in the split-charging area.
- ◆The pneumatic structure of the new capping device is simpler, and the production of aluminium chip in the cap rolling process of the rotary knife cap rolling machine is effectively solved. Suitable for 15L and 30L aluminium barrels.
- ◆The system meets the requirements of the GMP 2010 edition of China, EU-GMP and FDA.

分装称重轧盖系统

Split-Charging Weighing and Capping System

全自动分装称重轧盖系统的开发设计目的主要是解决无菌API以及无菌制剂生产企业中人工进料、出料、分装的情况。整个系统是在密闭状态及洁净环境中进行的，避免了物料与人的直接接触和周围环境对其的污染，满足无菌药品现代化生产所需的边处理、边精确包装的要求，极大地提高了生产效率及对人、产品的保护该系统主要应用于无菌原料药三合一、冻干机、单锥、双锥后处理无菌隔离分装称重轧盖。

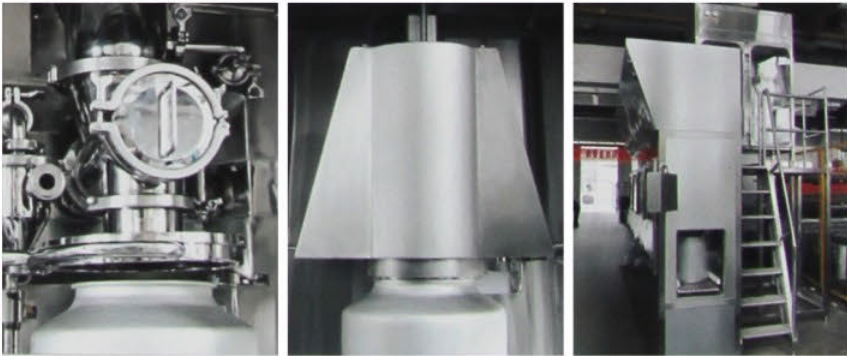
工作原理：

该系统在全密闭的百级层流环境下对原料药进行高精度分装及密闭轧盖。分装结构由带有称重模块的提升装置与送料装置出料口进行对接出料；在送料装置下料口装有粉尘收集器，以减少对分装区环境的污染；轧盖装置采用全自动弹簧内收缩原理对铝瓶进行密闭封口；全程采用PLC闭环控制电控系统，以达到全自动精确定位分装，称重、轧盖。

The full-automatic split-charging weighing and capping system is designed for the main purpose of solving the situation of manual feeding, discharging and packing in aseptic API and aseptic products manufacturing enterprises. The whole system is carried out in a closed and clean environment. It avoids the direct contact between materials and people and the pollution of the surrounding environment. It meets the requirements of the modern production of sterile drugs for edge treatment and accurate packaging. It greatly improves the production efficiency and the protection of people and products. The system is mainly applied to the sterile production. ANFD API, freeze-dryer, conical mixer/dryer and double-cone post-treatment aseptic isolation, sub-loading, weighing and rolling cap.

Working Principle：

The system is applicable for the high precision split-charging and sealed capping of the API in the totally-enclosed laminar flow environment. Split-charging device discharges by docking the lifting device with weighing module and discharge port of feeding device. The discharge port of feeding device is equipped with a dust collector, which could reduce the environmental contamination in the split-charging area. The capping device caps aluminum bottles with the principle of full-automatic spring contraction. The whole process adopts the PLC closed-loop control of electronic control system so that the system could automatically split-charge, weigh and cap accurately.



负压密闭隔离器 (Isolator)

Negative pressure sealed isolator

工作原理：

主要有不锈钢腔体、负压风机、空气净化装置组成，隔离器密闭设计，进风采房间的风或者空调系统的风经筒式高效（H14）过滤，排风经 PUSH-PUSH组合高效（H14）过滤后排至室外，保证隔离器腔体内的有毒成分不外泄到环境中从而对操作人员身体造成伤害。

Working Principle：

Mainly composed of stainless steel box, negative pressure fan, air purification device, isolator closed design, air inlet ventilation or air conditioning system of air cylinder type HEPA (H14) filtering, exhaust air through PUSH-PUSH combination HEPA (H14) filtering and discharging to the outdoor, to ensure that the toxic components in the isolator chamber do not leak out to the environment and does harm to the operator's body.



特点

- ◆独特的进排风高效过滤装置-PUSH-PUSH结构。
- ◆舱内温度、相对湿度、压力等多参数监控系统。
- ◆主操作仓的运行压力为-75~-150Pa，传递仓的运行压力为-50~-100Pa。压力是相对于周围房间的压力。
- ◆隔离器内部设计全部为圆弧过渡，全部采用R15半径内部圆角，保证不积料且便于清洁，无排水死角。
- ◆可选配RTP传递装置，SBV阀，连续袋，热合、手套捡漏、支持VHP灭菌。
- ◆运行系统手动控制或自动控制。
- ◆集成水、气两用水枪。

应用领域：

负压称量隔离器主要用于高活性/细胞毒性/抗肿瘤原辅料称量、分装、包装等操作，在D级环境下使用，OEB等级3~4，隔离器为多舱、双舱、单舱体结构，隔离器的内表面可通过舱体内的清洗水枪进行灭活。舱体底部的最低点设计有排水口。设备采用PLC结合触摸屏的方式对系统运行进行控制。多舱体负压称量隔离器包括缓冲区、操作区、过滤装置、清洁系统及控制系统组成。

Characteristic

- ◆Unique air intake and exhaust HEPA filter device-PUSH-PUSH structure.
- ◆Multiparameter Monitoring System of Temperature, Relative Humidity and Pressure in the Box.
- ◆The operating pressure of the main operating box is -75 to -150Pa, and that of the transfer box is -50 to -100Pa. Pressure is the pressure relative to the surrounding room.
- ◆The interior design of isolator is all arc transition, all of which adopt internal corner of radius R15 to ensure no material accumulation, easy cleaning and no drainage dead angle.
- ◆Optional RTP transfer device, SBV valve, continuous bag, heat closure, glove leak detection, support for VHP sterilization.
- ◆Manual or automatic control of operation system.
- ◆Integrated water gun for water and air.

Applications：

Negative pressure isolator is mainly used for high activity/cytotoxicity/anti-tumor raw materials weighing, split charging and other operations. It is used in class D environment, OEB grade 3-4, The isolator has multi-cabin, double-cabin and single-cabin structure. The inner surface of the isolator can be inactivated by water gun cleaning in the cabin. The lowest point at the bottom of the cabin is designed as a drainage outlet. The equipment uses PLC and touch screen to control the operation of the system. The multi-cabin negative pressure weighing isolator consists of buffer, operation area, filter device, cleaning system and control system.