PLG Series Continual Plate Dryer
PLG 系列盘式连续干燥机

概 述

盘式连续干燥机是一种高效的传导型连续干燥设备，其独特的结构和工作原理决定了它具有热效率高、能耗低、占地面积小、配置简单、操作控制方便、操作环境好等特点。广泛适用于化工、医药、农药、食品、饲料、农副产品加工等行业的干燥作业。在各行业使用实践中深受好评。可分为常压、密闭、真空三大类型；1200、1500、2200、3000等各种规格；A（碳钢）、B(接触物料部分不锈钢)，C在B的基础上、增加蒸汽管路、主轴及支架为不锈钢，筒体和顶盖内衬不锈钢)三种材质，干燥面积4～180m^2，共几百种型号的系列产品，并能提供与之相配套的辅助设备，可满足用户对各种物料进行干燥的需要。

Description

PLG Series Continual Plate Dryer is a kind of high effective conducting and continuous drying equipment. Its unique structure and operating principle determine that it has advantages of high heat efficiency, low energy consumption, small occupying area, simple configuration, easy operating and control as well as good operating environment etc. It can be widely used in drying process in the fields of chemical industry. Pharmaceuticals, agricultural chemicals, foodstuff, fodder, process of agricultural and sideline product setc, and is well received by various sectors in their practical usage. Now there are three big categories, named normal pressure, closed and vacuum styles; 1200, 1500, 2200 and 3000 sizes and so on; and three kinds of materials, namely A(carbon steel), B(stainless steel used for those all parts where materials are contacted)and C(on the basis of B to add stainless steel materials for vaporpipes, main shaft and support, and stainless steel linings for cylinder body and top cover). With a drying area being from 4 to 180 square metres, now we have hundreds of models of series products and various kinds of auxiliary devices available to meet requirements of drying materials for customers.

应 用

该干燥设备主要应用于医学中间体、农药、化工、医药、食品、饲料等行业粉粒体物料的干燥、冷却。

㈠有机化工:聚氯乙烯树脂、聚四氟乙烯树脂、反丁烯二酸、蒽醌、硝基蒽醌、对氨基苯酚、三聚氰胺、氰尿酸、对氨基苯黄酸、抗氧剂168、色酚AS、硬脂酸盐、苯胺、硝基苯胺、双季戊四醇、氯化石腊、甲酸钙、三乙烯二胺、苯亚磺酸钠、间苯二甲酸、二甲酯五磺酸钠、硫脲、油溶性苯胺黑染料、酸性黑染料等有机化工原料和中间体。

㈡无机化工:轻质碳酸钙、活性碳酸钙、纳米级超细碳酸钙、碳酸镁、氢氧化铝、白碳黑、碳酸锶、碳酸钡、碳酸钾、立德粉、保险粉、硫酸钾、微球催化剂、氢氧化镁、硫酸铜、硫酸镍、镍酸铵、钼酸钠、氯化钠、氯化钾、氯化钙、氟化钠、冰晶石、氧化铁红、氧化铁黄、氢氧化锂、氢氧化镍、氢氧化锆、碳酸钙、硫磺等。

㈢医药、食品:氨苄青霉素、邓盐、左旋苯甘氨酸及中间体、头孢氨噻、头孢三嗪、安乃近、西咪替丁、维生素B、维生素C、药用偏硅酸镁、咖啡因、茶、花提取物、银杏叶、巧克力粉、淀粉、玉米胚牙芽等原料药及医药中间体。

㈣饲料、肥料:碳酸钾、生物钾肥、蛋白饲料、饲料用金霉素、麸皮、酒糟、粮食、除草剂、纤维素、饲料磷酸氢钙等。

Application

It is especialized for drying and cooling powder materials like medicinw, agraculturemedicine,chemicalindustry,foodstuff,feedstuffandsoon.

(1)Organic chemical industry: Polyvinyl chloride, teflon resin, fumaric acid, anthraquinone, nitroanthraquinone, amino phenol, melamine, cyanogen uric acid, amino benzene xanthognic acid, antioxidant 168, color phenol AS, stearate, aniline, nitrophenylamine, double pentaerythritol, chlorination paraffin wax, calcium formiate, three ethylene diamidogen, benzene sulfinic acid sodium, benzene.m. dicarboxylic acid, dimethyl ester pentathionic acid sodium, thiourea, oil soluble aniline black dyestuffs, erie black dye and so on organicindustrialchemicalsandintermediate.

(2Inorganic chemical industry: Light quality calcium carbonate, active calcium carbonate, nanometer level superfine calcium carbonate, magnesium carbonate, aluminum hydroxide, white carbon black, strontium carbonate, barium carbonate, carbonic acid armor, lithopone, insurance powder, potassium sulfate, microballoons catalyst, magnesium hydroxide, cupric sulfate, nickel sulfate, nickel sour ammonium, sodium molybdate, sodium chloride, potassium chloride, calcium chloride, sodium fluoride, cryolite, oxidized iron oxide red, lithium hydroxide, nickelous hydroxide, zirconium hydroxide, calciumcarbonate, sulfurandsoon.

(3)Medicine, food: Ammonia animal pen penicillin, Deng Yan, laevo-rotatory benzene glycine and intermediate, spore ammonia sai, spore three qin, An Naijin, west onamot for bulk drugs and medicine intermediate and so on Ding, Vitamin b, Vitamin c, for medicinal purposes leaning magnesium silicate, caffeine, tea, flowered extraction, gingko leaf, chocolate powder, starch, corn embryotoothbud.

(四)Feed, fertilizer: The potassium carbonate, the biological potassium fertilizer, the protein feed, the feed use the aureomycin, the bran, the distiller's grain, the grain, the weed killer, the cellulose, the feed calcium hydrogen phosphateandsoon.

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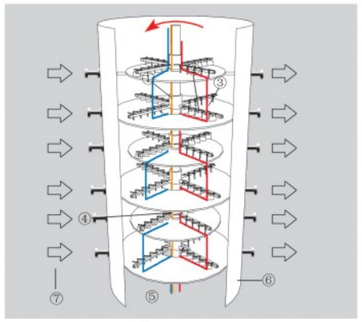
特 点

（一）调控容易、适用性强
1.通过调整料层厚度、主轴转速、耙臂数量、耙叶型式和尺寸,使干燥过程达到最佳。
2.每层干燥盘皆可通入热介质或冷介质、对物料进行加热或冷却，物料受热均匀，温度控制准确、容易。
3.物料的停留时间可以精确调整。
4.物料流向单一、无返混现象、干燥均匀、质量稳定、不需再混合。
（二）操作简单、容易
1.干燥器的开车、停车操作非常简单
2.停止进料后，传送物料的耙叶能很快地排空干燥器内的物料。
3.通过特殊的大规格检视门的视镜，可以对设备内进行很仔细的清洗和观察。
（三）能耗低
1.料层很薄，主轴转速低，物料传送系统需要的功率小、电耗少。
2.以传导热进行干燥，热效率高，能量消耗低。
（四）操作环境好，可回收溶剂，粉尘排放符合要求
1.常压型：由于设备内气流速度低，而且设备内湿度分布上高下低，粉尘很难浮到设备顶部，所以顶部排湿口排出的尾气中几乎不含有粉尘。
2.密闭型：配备溶剂回收装置，可方便地回收在湿气体中的有机溶剂。溶剂回收装置简单，回收率高，对于易燃、易爆、有毒和易氧化的物料，可用氮气作为载湿气体进行闭路循环，使之安全操作。特别适用于易燃、易爆、有毒物料的干燥。
3.真空型：在真空状态下操作的盘式干燥器，特别适用于热敏性物料的干燥。
（五）安装方便，占地面积小
1.干燥器整体出厂，整体运输，只需吊装就位，安装定位非常容易。
2.由于干燥盘层式布置、立式安装，即使干燥面积很大，占地面积也很小。

Features

(1) Easy control, wide application.
1. Regulate thickness of materials, rotating speed of main shaft, number of harrow's arm, style and sizes of harrows achieve best drying process.
2. Each layer of drying plate can be fed with hot or cold media individually to heat or cold materials and make temperature control accurate and easy.
3. Dwell time of materials can be accurately adjusted.
4. Single flowing direction of materials without return flowing and mixing, uniform drying and stable quality, no re-mixing is required.
(2) Easy and simple operation.
1. Start stop of dryer is quite simple
2. After material feeding is stopped, they can be easily discharged out of the dryer by harrows.
3. Careful cleaning and observation can be carried inside the equipment through large-scale viewing window.
(3) Low energy consumption.
1. Thin layer of materials, low speed of main shaft, small power and energy required for conveying system of materials.
2. Dry by conducting heat so it has high heating efficiency and low energy consumption.
(4) Good operation environment, solvent can be recovered and powder discharge meet the requirements of exhaust.
1. Normal pressure type: as low speed of air flow inside the equipment and moisture being high in upper part and low in lower part, dust powder couldn't float to the equipment, so there is almost no dust powder in tail gas discharged from the moist discharge port on the top.
2. Closed type: equipped with solvent recovery device that can recover organic solvent easily from moist-carrier gas. The solvent recovery device has simple structure and high recovery rate, and nitrogen can be used as moist-carrier gas in closed circulation for those subject to burning, explosion and oxidation, and poisonous materials in order for safe operation. Especially suitable for drying of flammable, explosive and poisonous materials.
3. Vacuum type: if the plate dryer is operating under vacuum state, it is particularly suitable for drying heat sensitive materials.
(5) Easy installation and small occupying area.
1. As the dryer is in a whole for delivery, it is quite easy to install and fix at site only by hoisting.
2. As drying plates being arranged by layers and installed vertically, it takes a small occupying area though drying area is large.



1.温物料 Lukewarm material
2.耙臂 Trailing arm
3.耙叶 Rake leaves
4.干燥盘 Rake leaves
5.主轴 Spindle
6.外壳 Shell
7.加热或冷却介质 Heating and cooling medium

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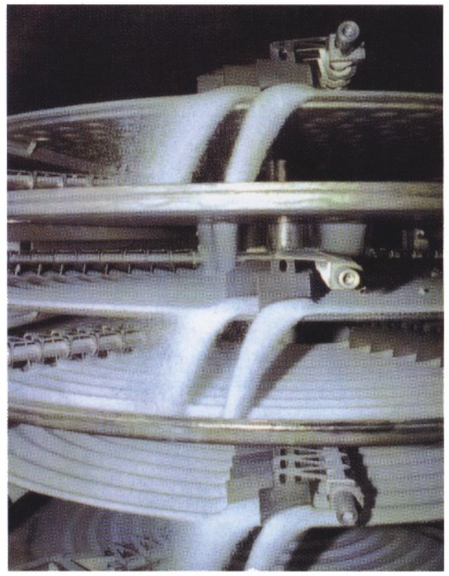
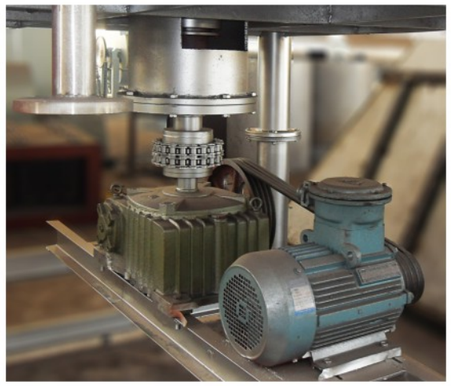
技术特性

（一）干燥盘
1.设计压力：一般为0.4MPa，最大可达1.6MPa。
2.最高使用压力：一般≤0.4MPa，最高可达1.6MPa。
3.加热介质：蒸汽、热水、导热油、干燥盘温度100℃时使用热水加热，100℃～150℃时用≤0.4MPa饱和水蒸汽或者过热蒸汽加热，150℃～320℃时用导热油加热。
（二）物料传送系统
1.主轴转速：1～10转分，电磁或变频无极调速。
2.耙臂：每层干燥盘上有2～8支固定在主轴上的耙臂。
3.耙叶：绞接在耙臂上，能随盘面上下浮动保持接触，有多种形式。
4.碾滚：对易结块和需要粉碎的物料，在适当位置配加碾滚，可以强化传热和干燥过程。
（三）壳体
有常压、密闭、真空三种型式
1.常压型：圆筒或八棱柱型，有整体和对开两种结构。加热介质进出口主管道可以在壳体内，也可以在壳体外。
2.密闭型：圆筒型壳体，能承受5Kpa内压，加热介质进出口主管道可以在壳体内，也可以在壳体外。
3.真空型：圆筒型壳体，设计压力为-0.096Mpa，加热介质进出口主管道在壳体内。
（四）空气加热器
一般在配置引风机时使用，以防潮湿的空气进入主机影响干燥效果。





Features of Technology

1.Drying plate
(1)Designing pressure: general is 0.4MPa, Max. can reach 1.6 Mpa.
(2)Work pressure: general is less then 0.4Mpa, and Max. can reach 1.6 Mpa.
(3)Heating medium: steam, hot water, oil. When the drying plates' temperature is 100℃, hot water can be used; when 100℃~150℃, it will be saturated water steam ≤0.4Mpa or steam-gas, and when 150℃~320℃, it will be oil.

2.Material transmission system
(1)Main shaft revoluton:1~10 rpm, electromagnetism or frequency stepless speed requlating.
(2)Harrow arm: There are 2 to 8 pieces arm that be fixed on the main shaft on each layer.
(3)Harrow's blade: Spliced on the harrow arms, float together with the surface of the plate to keep contact. There're various of types.
(4)Roller: for the products easily agglomerate, or with the requirements of grinding, the heat transfer and drying process might be reinforced by placing roller(s) at the appropriate place(s).

3. Shell
There're three types for option: normal pressure, sealed and vacuum
(1)Normal pressure: Cylindrical shell or eight prismatic type, with whole body and split structure. The main pipes of inlets and outlets of heating medium can be inside the shell, or outside the shell.
(2)Sealed: Cylindrical shell, could bear the interior pressure of 5KPa, the main ducts of the inlet and outlet of heating media might be inside of the shell or outside.
(3)Vacuum: Cylindrical shell, could bear the exterior pressure of -0.096MPa. The main ducts of inlet and outlet is inside of the shell.

4. Air heater:
Normal used with the application of draft fan, incase the wet air enters, to increase drying efficiency.

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原　理

湿物料自加料器连续地加到干燥器上部第一层干燥盘上，带有耙叶的耙臂作回转运动，使耙臂连续地翻抄物料。物料沿指数螺旋线流过干燥盘表面，在小干燥盘上的物料被移送到外缘，在大干盘上的物料向里移动并从中间落料口落入下一层小干燥盘中。大小干燥盘上下交替排列，物料得以连续地流过整个干燥器。中空的干燥盘内通入加热介质，加热介质形式有饱和蒸汽、热水和导热油，加热介质由干燥盘的一端进入，从另一端导出。已干物料从最后一层干燥盘落到壳体的底层，最后被耙叶移送到出料口排出。湿汽从物料逸出，由设在顶盖上的排湿口排出，真空型盘式干燥器的湿汽由设在顶盖上的真空泵口抽出。从底层排出的干物料可直接包装。通过配加翅片加热器、溶剂回收冷凝器、袋式除尘器、干料返混机构、引风机等辅机，可提高其干燥的生产能力，干燥膏糊状和热敏性物料,可方便地回收溶剂，并能进行热解和反应操作。

Principle

Wet materials are fed continuously to the first drying layer on the top of the dryer. They will be turned and stirred by harrow arms when the arm rotates and drop down to the outer edge of the large drying plate along the exponential helical line. On the small drying plate they will be moved to its outer edge and drop down to the outer edge of the large drying plate underneath, and will be moved inward and drop down from its central hole to the small drying plate on the next layer. Both small and large drying plates are arranged alternately so as materials can go through the whole dryer continuously. The heating media, Which could be informs of saturated steam, hot water or heat conducting oil will be led into hollow drying plates from one end to the other end of the dryer. The dried materials will drop from the last layer of the drying plate to the bottom layer of the shell body, and will be moved by rakes to the dischargeport. The moisture escapes from materials and will be removed from the moist discharge port on the top cover, or sucked out by the vacuum pump on the top cover for vacuum-type plate dryer. The dried materials discharged from the bottom layer can be packed directly. The drying capability can be raised up if equipped with supplementary devices such as finned heater, condenser for solvent retrieval, bag dust remover, return and mix mechanism for dried materials and drawing fan etc. Solvent in those dried paste and heat sensitive materials can be easily retrieved, and thermal decomposition and reaction can be also carried out.

技术参数　Technical parameters

规格 Type	外径 Diameter (mm)	高度 High (mm)	干燥面积 Area of dry (m^2)	功率 Power (Kw)
1200/4	1850	2608	3.3	1.1
1200/6		3028	4.9	
1200/8		3448	6.6	1.5
1200/10		3868	8.2	
1200/12		4288	9.9	
1500/6	2100	3022	8.0	2.2
1500/8		3442	10.7	
1500/10		3862	13.4	
1500/12		4282	16.1	
1500/14		4702	18.8	3.0
1500/16		5122	21.5	
2200/6	2900	3262	18.5	3.0
2200/8		3682	24.6	
2200/10		4102	30.8	
2200/12		4522	36.9	4.0
2200/14		4942	43.1	
2200/16		5362	49.3	5.5

规格 Type	外径 Diameter (mm)	高度 High (mm)	干燥面积 Area of dry (m^2)	功率 Power (Kw)
2200/18	2900	5782	55.4	5.5
2200/20		6202	61.6	
2200/22		6622	67.7	7.5
2200/24		7042	73.9	
2200/26		7462	80.0	
3000/8	3800	4050	48	11
3000/10		4650	60	
3000/12		5250	72	
3000/14		5850	84	
3000/16		6450	96	
3000/18		7050	108	
3000/20		7650	120	13
3000/22		8250	132	
3000/24		8850	144	
3000/26		9450	156	
3000/28		10050	168	15
3000/30		10650	180	

注：部分参数设计时视不同物料有所调整，以设计为准。

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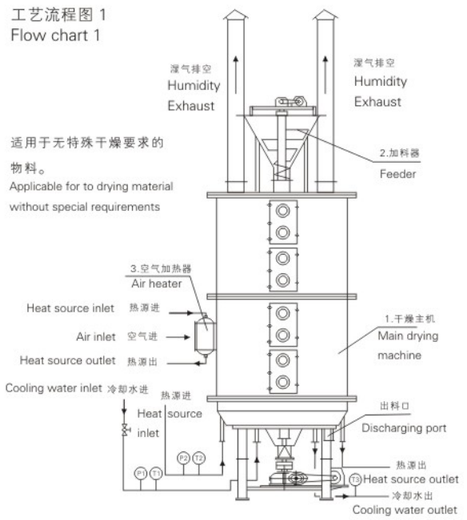
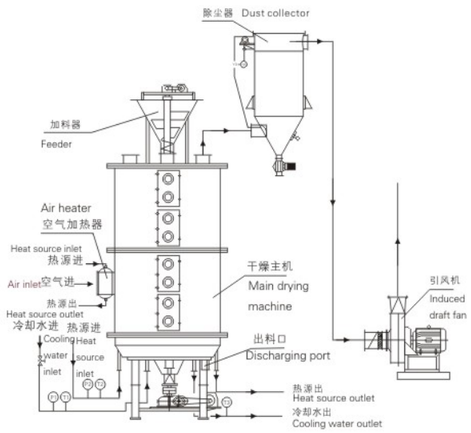
流程图 Flow chart

工艺流程图 1
Flow chart 1



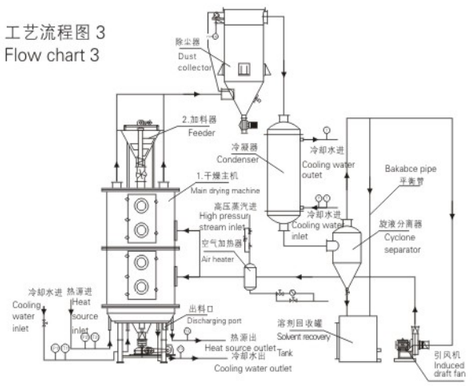
工艺流程图 2
Flow chart 2



备注: 一般在蒸发量较大的情况下才配备空气加热器，以增大干燥效率。
Remarks:to enhance drying efficiency,air heater is normally applied for high evaporation capacity

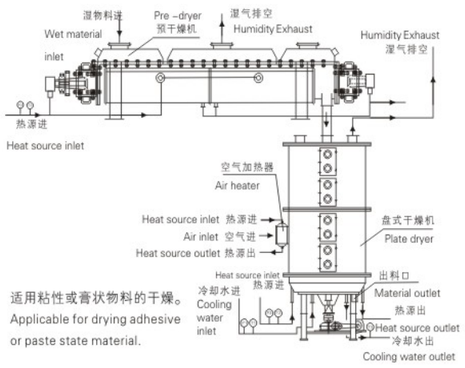
适用干燥物料的粉末需要回收或具有一定的有害粉末。
Applicable for drying material with requirement of power recovery or the powder is toxic

工艺流程图 3
Flow chart 3



适用于对干燥过程中所蒸发出来的溶剂进行回收或是对干燥所用气体要求不能外泄的场合。
Applicable for the drying process with solvent recovery or without leakage of evaporated gas.

工艺流程图 4
Flow chart 4



适用粘性或膏状物料的干燥。
Applicable for drying adhesive or paste state material.

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PZG Series Vacuum Plate Dryer
PZG 系列真空盘式干燥机

概 述 Description

物料加入真空型盘式干煤机，由于物料在真空状态下沸点降低并随着耙叶的不断翻炒，物料表面不断更新，从而大大加快了干燥速率，湿空气由真空泵抽出。此型设备主要针对热敏性、有毒性、易氧化或需溶剂回收物料的干燥。

Material feeds into vacuum disk type drier. Because boiling point of material will fall under the state of vacuum and along with the paddle turning over continuously, the surface of material will be changed continuously. Therefore it speeds up drying rate greatly. The wet air will be pumped by vacuum pump This equipment is mainly used for drying heal sensitive material, toxic material，material that is easy to oxidize or needs to recover solvent.

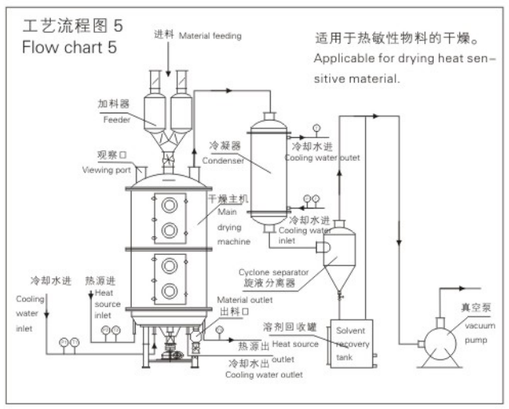
特 点 Features

◇ 在真空状态下，保持物料连续或半连续进、出料。
◇ 密闭型操作，特别适应于有毒物料或易氧化物物料的干燥。
◇ 可方便地回收载湿气体中的有机溶剂。
◇ 能耗低、效率高、安全方便、物料不易污染。

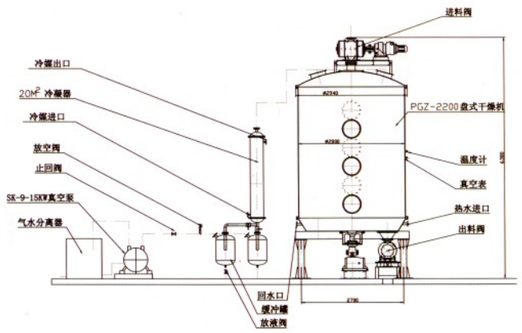
◇ Under the state of vacuum, can keep material to feed and discharge continuously.
◇ Closed operation，particularly it is suitable for drying material that has toxicity or is easy to oxidize.
◇ It is very convenient to recover organic solvent in wet gases.
◇ Low energy consumption，high efficiency，safe and convenient，material is not easy to pollute.

流程图 Flow chart

工艺流程图 5
Flow chart 5



适用于热敏性物料的干燥。
Applicable for drying heat sensitive material.



结构示意图

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