

LPG High Speed Centrifugal Spray Dryer



. Working principle and configuration options:

The solution, emulsion, suspension liquid or slurry are sprayed into fine beads in the hot air, going down from the top of the drying chamber to the bottom, the water will be evaporated to and the product becomes powder or granular product.

Induce hot air from the top of drying tower, at the same time, pump the material liquid to the top of the tower by screw pump or peristaltic pump, the feeding solution becomes into fine beads or small droplets through the atomizer. When the droplets meet the high temperature hot air, the water will be evaporated immediately, and the material liquid is dried into dry product in a very short time, the product is discharged from the bottom of the drying tower, or from the cyclone (depend on the configuration). When the hot air contacts with the droplets, the temperature declines significantly, and the humidity increases greatly, and then will be exhausted by exhaust fan. The fine powder in the air will be collected through different separating devices

There're different fine powder separation and recovery devices, such as cyclone (the common type and various combination type), bag filter, cyclone + bag filter, cyclone + wet scrubber, and bag filter + wet scrubber etc. We should different fine powder separation and recovery devices as per the characteristics of product and requirements of customer.

Depend on the product features and requirements, we might install secondary drying and cooling system (such as ZLG vibration fluid bed or pneumatic transportation), formulation system or powder sieving system etc after the spray dryer, or dehumidifier.

. Features of our equipment:

The designs of our spray dryer are advanced in China, as well as worldwide. If we compare the important parameters of our spray dryers and some famous brand in the world, such as final moisture content, color, flavor, particle size, solubility and bulk density etc, they are very close, or sometimes, ours are even a little better. A lot of customers have achieved their desired results with our equipment.

. Notes for Order:

1. Liquid material name and physical properties: solid contents (or moisture contents), viscosity, surface tension, PH value, etc. If there's any other liquid, such as organic solvent, please specify the name and percentage clearly.
2. Product characteristics: final moisture content required, the range of particle size, and heat sensitive temperature etc.
3. Special requirements (if any): range of specific bulk density, color, and flavor etc.
4. Working capacity (kg/h or ton/h). If the capacity is based on per day, per month or per, please also indicate the working hours.
5. Heat source: it could be the pressure of steam, electricity, coal, oil, natural gas, LPG and other combustible materials.
6. Control requirements: the way to control the air inlet temperature, liquid supply system, pneumatic hammer etc, and the type of the system control (normal push button type, PLC+HMI, and PC system etc)
7. Fines collection type: depending on the product characters and environment protection requirements, we have following options, cyclone, bag filter, wet scrubber and their combinations.
8. Other special requirements: dimensions of the workshop, height limit and special electricity requirements etc.

Note: Customers might provide part of the above mentioned aspects. Other requirements, we should decide after making trials, or after technical discussion with the customer, or as per our experience

. Applications

Food Industry: whole milk powder, cocoa milk powder, milk substitute, egg white (yolk), etc. armpit prion, Oats, chicken juice, instant tea, seasoning meat, protein, soybean, peanut protein, protein hydrolyzate, etc. Corn syrup, corn starch, glucose, pectin, maltose, potassium sorbate, pumpkin powder, etc.

Pharmaceutical products: Chinese traditional medicine extract (herb extract), medicine colloid, yeast, vitamins, antibiotics, amylase, lipase, etc.

Plastics resin: AB, ABS emulsion, urea-formaldehyde resin, phenolic resin, dense plastic (urea) formaldehyde resin, polyethylene, polyvinyl chloride, etc.

Detergent: advanced washing powder, normal washing powder, soap powder, soda powder, emulsifiers, brighteners, phosphoric acid agents.

Chemical Industry: Sodium fluoride (potassium), alkaline dyestuff and pigment, dye intermediates, Mn3O4, formic silica acid, catalyst, sulfuric acid agent, amino acids, silica, etc..

Ceramic: aluminum oxide, ceramic tile material, magnesium oxide, talc, etc.



. Technical parameters

Specification	LPG-5	LPG-25	LPG-50	LPG-100	LPG-150	LPG-200
Air Inlet temperature	140-550 ° C (depend on the product to be dried, and URS)					
Air exhaust temperature	60-120 ° C (depend on the product to be dried, and URS)					
Nominal water evaporation capacity (Kg / h)	5	25	50	100	150	200
Heating method	High-pressure steam, or steam + electricity, or any kinds of fuel (diesel, natural gas, liquefied petroleum gas or coal, etc.), or solid fuel (any combustible material). Please specify.					
Drying tower diameter (mm)	1100	1800	2150	2560	2860	3200
Overall Dimensions (m)	2×1.4×2.2	5×3×4	6×4×5	8×4×6	8×5×7	10×5×8
Product yield	95-99.9% depend on the properties of the product and configurations					

Specifications	LPG-300	LPG-500	LPG-600	LPG-750	LPG-1000	LPG-2000
Air Inlet temperature	140-550 ° C (depend on the product to be dried, and URS)					
Air exhaust temperature	60-120 ° C (depend on the product to be dried, and URS)					
Nominal water evaporation capacity (Kg / h)	300	500	600	750	1000	2000
Heating method	High-pressure steam, or steam + electricity, or any kinds of fuel (diesel, natural gas, liquefied petroleum gas or coal, etc.), or solid fuel (any combustible material). Please specify.					
Drying tower diameter (mm)	3600	4300	4500	5000	6000	7600
Overall Dimensions (m)	Design as per configuration of the plant and URS					
Product yield	95-99.9% depend on the properties of the product and configurations					

Specifications	LPG-3000	LPG-5000	LPG-8000	LPG-10000	LPG-12000	LPG-15000
Air Inlet temperature	140-550 ° C (depend on the product to be dried, and URS)					
Air exhaust temperature	60-120 ° C (depend on the product to be dried, and URS)					
Nominal water evaporation capacity (Kg / h)	3000	5000	8000	10000	12000	15000
Heating method	High-pressure steam, or steam + electricity, or any kinds of fuel (diesel, natural gas, liquefied petroleum gas or coal, etc.), or solid fuel (any combustible material). Please specify.					
Drying tower diameter (mm)	8500	10000	13000	14500	16000	18000
Overall Dimensions (m)	Design as per configuration of the plant and URS					
Product yield	95-99.9% depend on the properties of the product and configurations					

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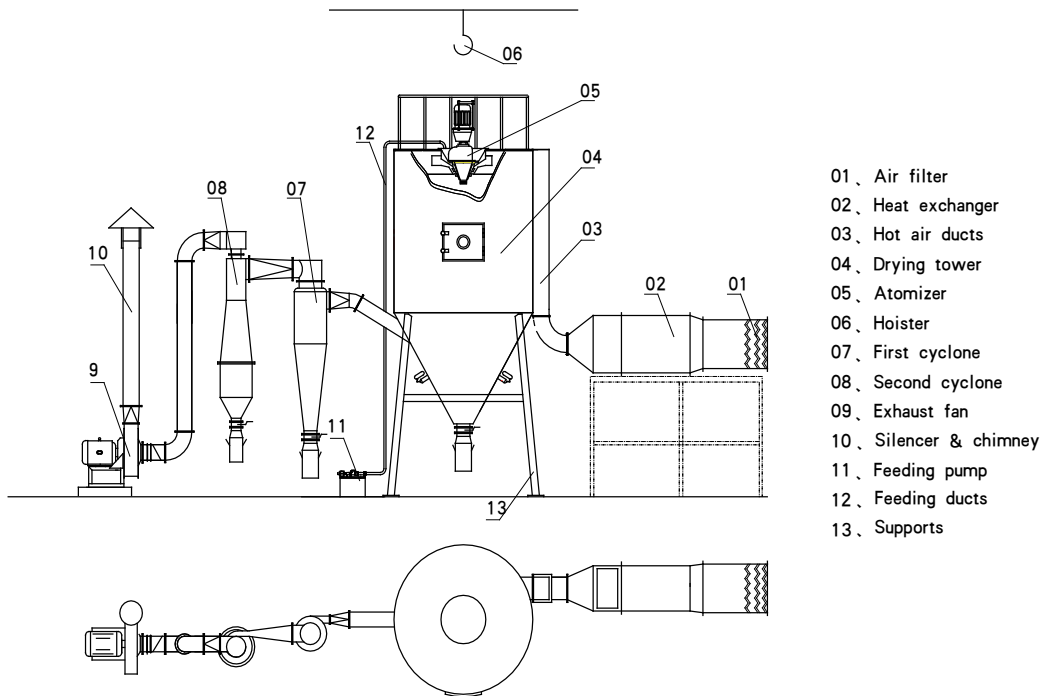


Remarks:

1. Nominal water evaporation capacity: It is calculated according to the inlet air temperature of 350° C, and the exhaust air temperature of 85-90° C.
2. Standard specification: The specifications listed above are named based on nominal water evaporation capacity.
3. Process specifications: For specific equipment, we normally name the equipment as per the specific processing parameters and requirements. For the products which heat sensitive temperature is more than 110° C, the process specifications is about the same with the standard specifications. For most food or the other products which heat sensitive temperature is normally low, the process specifications are about equivalent to 2-3 times of the standard specifications. Such as LPG2000 for drying food, the drying tower is about equivalent to the standard one of LPG4000 or of LPG6000 (vary as per the properties of the product). For the products with high heat sensitive temperature, the inlet air temperature could be up to 450° C or even higher, the process specification is smaller than the standard specifications. But the requirements of the drying tower and relative configurations should be higher if the air inlet temperature is more than 450° C
4. Product yield: We provide a variety of fines collection and product recovery devices as per customer requirements and product characteristics, so to ensure it meets customer requirements.
5. Test: We have the most advanced trial facilities in China to make trials for the customers, so to ensure that the equipment reaches the customer requirements in the contract.
6. Configuration: Please refer to the flowcharts and instructions
7. Advanced design: we are considering the customer's requirements, low investment, low running cost and energy saving when we make a design. If we compare our machines and some other machines, the special feature is that our machine is design for energy saving. For the medium and large specification equipment, the thermal efficiency of our design is normally around 37 - 50%, i.e., around 2.0-2.7kg of steam to evaporate 1 Kg water

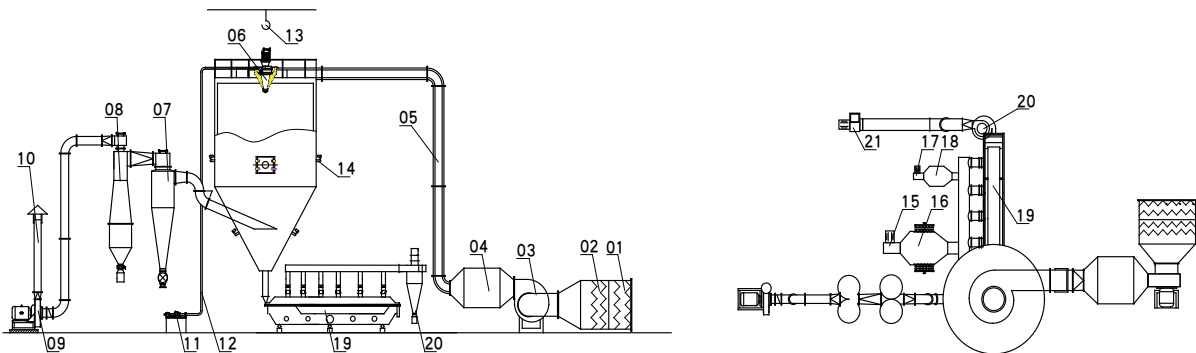
. Flow chart:

. Normal flowchart





.Flowchart with second drying and cooling



- 01 Pre and post filter; 02 High efficiency filter; 03 Blast fan; 04 Heat exchanger; 05 Air inlet ducts; 06 Atomizer;
 07 First cyclone; 08 Second cyclone; 09 Exhaust fan; 10 Silencer & chimney; 11 Feeding pump; 12 Feeding ducts;
 13 Hoister; 14 Pneumatic hammer; 15 Hot air blast fan; 16 Heat exchanger; 17 Cooling air blast fan; 18 Dehumidifier;
 19 Vibration fluid bed; 20 Cyclone of vibration fluid bed; 21 Exhaust fan of vibration fluid bed

.Optional Configurations

1. Pneumatic transfer and cooling: Some production need to be transported to distant packaging workshop, it is suggested to use pneumatic transfer + cooling.

2. Fine powder return for granulation and agglomeration with re-combination: For the system that require fine powder return for granulation or agglomeration with re-combination, we have different configurations for different processes of different products. Please contact us for further information.

3. Configurations: The configuration of equipment is designed generally based on product characteristics, process requirements, energy supply and other requirements, such as environmental protection requirements or height restrictions and other specific requirements. The real configuration might be changed flexibly according to customer requirements.

3.1: Heat source: electricity, electricity + steam; high pressure steam; direct hot air furnace; indirect hot air furnace; and thermal oil furnace etc. The fuel of the furnaces might be any kinds of fuel (diesel oil, heavy oil, natural gas, LPG or coal, etc.), or solid fuel (any combustible material). Please specify when to finalize an order.

3.2: The air inlet could be direct air inlet, and also could be waste heat recovery air inlet

3.3: The exhaust system could be single cyclone, two-stage cyclone, bag filter, wet scrubber or their combinations. 3.4: Others: We also provide a variety of special configurations according to the process or customer requirements, such as inner wall cooling, conical part cooling, product cooling, scraper, sweeper or some special types drying tower.