

» Probe into Paper Tube production Technology and Operation flow of Heat pump Paper Tube Dryer

» Summary

With the further development of China's economy, paper tube products become an indispensable industrial product in human production and life. Paper tubes are tubular object made of paper. Most of the paper tubes are spiral paper tubes and seamless paper tubes. The paper tubes are ubiquitous in life and are used in many occasions, such as: toilet paper tube, food paper tube, chemical fiber paper tube, polyester paper tube, industrial spinning paper tube, etc. This paper discusses the paper tube production process after-treatment of paper tube drying technology.

» Introduction

In the past, the traditional drying system of coal, firewood and electric heating was used in the production of paper pipe. Its energy consumption is high, the pressure of environmental protection is high, even the hidden danger of temperature is difficult to control the fire, the structure is complex and so on. To improve the atmospheric environment and save energy is the development direction of drying industry in China and a trend of industry guidance in the future.

- Brief introduction of Paper Tube production and processing Technology:
- Tools / raw materials
- A batch of raw paper
- A tube winder
- A pipe cutter
- A set of wagons
- A set of Dryfree dryer in Nanchang
- A groove machine



» Methods / steps

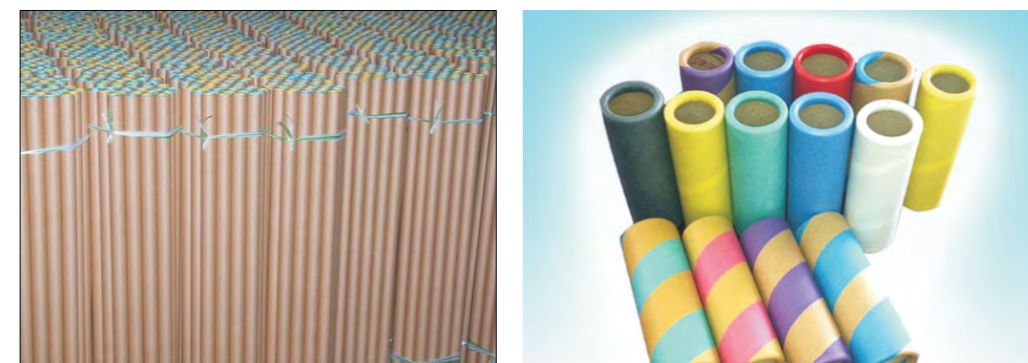
- Material paper cutting: the sand pipe paper with a uniform thickness, low moisture content and smooth appearance is used as the main body paper, and the impregnated paper is selected as the surface paper; according to the size of the specifications required for the manufacture of Dongguan high-end paper pipe, The paper tape of the required size is obtained by placing the sand tube large roll and the surface paper large roll in the cutting machine.
- Reel tube: the paper tape after glue is wound into tube on the enthusiastically coiled pipe machine.



- Rough cutting: after the paper tube is placed on the coated resin and passed through the air dryer at a uniform speed, it is roughly cut into a section of paper pipe of a certain length.
- Fine cutting: extruded paper tube according to the required size development rough cutting, after cutting and the end of the paper tube finishing.



- Dry paper pipe: put the paper pipe section into Nanchang Dryfree heat pump paper pipe drying room, open the dryer power, close the oven door, set the drying parameters and start the dryer until the water content of the paper pipe is lower than 12%.
- Tape glue: how many layers of paper tape and through the groove disposal of the surface paper tape in sequence from top to bottom layer of dislocation superposition rule into parallel into the tape coating machine, The outer surface of the main paper tape and the surface paper tape is evenly coated with a layer of paper tube used specially for glue.
- Extrusion: after cooling the dry section of the paper pipe to room temperature, one by one put into the preheated to 150-280 °C temperature of the molding mold to develop internal extrusion molding, in order to make the outer surface of the paper tube has been coated resin to fully solidify; The molding temperature of the mould is 150-280 °C.
- Groove detail processing: the surface paper belt is placed into the groove machine to handle the groove details on both sides of the paper belt.



» In the past paper tube production drying problems:

- In the past, the paper tube production mostly used the traditional drying method-electric heating drying, microwave drying method, it has the following problems:
- The heating temperature is too high. Traditional drying technology, heating temperature is not easy to control. The general heating temperature is about 75-90 °C, but the drying temperature must not exceed 70 °C.
- The unevenness of the drying temperature by electric heating results in the burning of the paper tube near the electric heating, while the paper tube which is far from the electric heating has not been dried, and the drying time is too long. With microwave drying equipment, the cost of microwave drying equipment is too high, and it occupies the area of workshop, and the microwave energy consumption is great, and the drying effect is not satisfactory at the same time.
- The energy consumption is large. In the traditional drying process, the thermal efficiency is low, which is about 30-60. In the drying process, the heat of evaporation is about 36%, and the loss of waste gas is about 58%. The heat loss of dry material and dryer is 2% and 2% respectively, and the thermal efficiency is only 40.
- There is a hidden danger of safety, because the temperature control instability is often easy to lead to fire.

» Air energy heat pump paper tube dryer advantages:

- Energy conservation
Energy saving is the starting point and the main advantage of heat pump application.
- Good quality of dry products
Heat pump drying is a mild drying method, close to natural drying. The evaporation rate of surface moisture is close to that of internal moisture moving to the surface, so that the quality, color and grade of dried articles are good.
- Drying parameters are easy to control and can be adjusted in a wide range
In the process of heat pump drying, the temperature, humidity and circulation flow of circulating air can be accurately and effectively controlled, and the range of temperature adjustment is -20 °C 100 °C (plus auxiliary heating device), and the range of relative humidity adjustment is 15% and 80%. Suitable for drying heat sensitive materials.
- Environment-friendly
Material drying not only requires improving product quality and saving energy consumption, but also environmental friendly. Based on the same evaluation criteria, heat pumps have a small impact on global warming compared with electrically released CO2. Environmental friendliness is the advantage of heat pump drying. At present, the application of heat pump to reduce CO 2 emission is advocated in foreign countries, and it will be applied further.
- Environmental benefits
There is no pollution to the environment, creating a clean and harmonious working environment and production environment, laying the foundation for the sustainable development of the enterprise, making a strong impetus for the future of the enterprise and the technological innovation and the adjustment of the industrial structure. It is in line with the law of coordinated development between human and nature and the economy.

» Conclusion

The use of heat pump drying technology marks a new direction and a new field for dehydration drying of industrial products. It has a strong impact and challenge to the traditional drying methods and equipment of industrial products. At the same time, the application of heat pump technology is in line with the national and local governments to promote energy conservation and emission reduction, low-carbon production and life, comply with the development of the times, it is irresistible, in both economic and social effects played a major role. It is a good example for enterprises to implement and promote the goal and action of sustainable development, which is persuasive and beneficial to the people.

» PAPER TUBE DRYER

