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THE MOST IMPORTANT FACTOR IMPROVING DRY DRUM MACHINE: APPLYING NEW TECHNOLOGY

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Abstract

In thermal treatment of granular materials, most heat and mass exchange processes are used - absorption, heat exchange, burning, burning, drying, catalytic processes with the help of dispersed catalysts, driving, adsorption, dissolution of solids and crystallization processes.

Keywords: dryer drum, distribution degree, average residence time, load degree, mineral fertilizer, nozzle, material.

Introduction

The analysis of the results was carried out to identify the influence of the initial temperature and the consumption of the drying agent on the process. Let us first evaluate the influence of temperature on the nature of the drying process. In order for the dryers to be developed to be widely used in industry, first of all, it is necessary to create reliable equations for their calculation and design. Among these equations, it is very important to determine the heat and material balance equations that determine the thermal treatment process and the energy that goes into the drying process. The purpose of the dissertation work can be expressed as follows: 1. Analysis of the literature on drying dispersed materials in drum dryers. 2. Study of heat exchange between the heating inner surface of the drum and the dispersed material layer. 3. Carrying out theoretical and experimental studies in the process of heat treatment and drying of dispersed materials in the studied device [1-4]. We assumed that the distribution of materials in the cross-section of the drum is not affected by the angle of inclination of the drum and the speed of the heating agent. To study the distribution of material on the cross-sectional surface, the work of one nozzle was studied. The nozzles work independently of each other, and assuming that the distribution function of the material from one nozzle of a certain shape is the same for nozzles of the same shape, it is clear that the nozzle system will remain the same in operation. are installed. At the department "Technological machines and equipment" of the Fergana

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Polytechnic Institute laboratory drum dryer was developed Ø 0.58×6.0 meters for drying mineral fertilizersand experiments were carried out.Figure 1 shows a structural diagram and Figure 2 shows a photo of the experimental setup. The experiments were carried out in two stages. The temperature, pressure, and relative humidity of the ambient air were preliminarily determined. Before the start of the experiment, the required heating power was determined by the consumption of the drying agent and its temperature, and the corresponding sections of the heater were connected on the control panel. The material to be dried was pre-moistened with water to a predetermined moisture content. The product is crushed in the drum and passes through the crushed product to the fan. The fan drives the crushed product through the pipe to the cyclone. In the cyclone, the crushed product is separated from the dust and falls into containers. The opening and closing of the containers is controlled by a handle [5-9]. The rotation movement is transmitted to the drum from the electric motor. The electric motor and the universal drum are attached to the frame. As well as, I can add that, agriculture and farms, along with this, the development of entrepreneurship is a particularly urgent issue. Therefore, rationalization and inventiveness are being carried out in various fields, namely agriculture, industry, electricity and robotics. Reduces manual labor and increases work productivity, leading to an increase in efficiency. If the diameter of the holes in the sieve is increased, the work efficiency of the drum increases. The reason behind this that, resistance to the product is reduced. The time spent by the knives and hammers for cutting and crushing is reduced. Therefore, the performance of the device changes according to the law of arithmetic progression. It has been experimentally studied several times that the performance of the drum depends on the increase in the diameter of the holes of the sieve with the increase in the speed of rotation of the drum. Many studies have been carried out to determine the optimal parameters of these factors. However, the data presented on the nature of the distribution of the material in the dryer and the time parameters are different and sometimes contradict each other. Researchers have proposed and studied various designs of drum nozzles. The movement of particles inside the rotating drum depends on the design of the packing and its operating parameters. This creates big problems in theoretical modeling of the movement of dispersed materials. The movement of particles in the drum is very complex, with the particles sliding and rolling in the nozzle

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itself, and when the particles fly out of the nozzle, they hit each other and move unevenly due to contact with the moving air stream. After that, particles flying out of the nozzle fall into the lower part of the drum and collide with a layer of moving material. Although the simplicity, high efficiency and versatility of the design of drum dryers allow them to be widely used in various sectors of the national economy, there are issues such as uniform distribution of the dried material in the hot air stream, rational use of hot air and minimization of energy consumption still require research. following negative consequences:

First, the uneven dispersion of material from the nozzles in the dryer creates open areas in the rain of product to be distributed across the drum. The formation of this zone contributes to the free passage of the hot air flow and therefore reduces the amount of heat received by the material to be dried and reduces the intensity of the drying process.

Secondly, the presence of an open zone along the cross section of the dryer increases the coolant consumption, which in turn increases the removal of fine particles of the material by the coolant flow, which leads to an increase in the temperature of the exhaust gases and inefficient coolant consumption during drying.

In the device, the material enters with the flow of the heat carrier, and the sorbent with the heat carrier moves against the flow of the sprayed material.

$$\tau = \frac{0,294L_б}{D_б n^{0,9} tg\alpha}$$

Based on research by S.J. Friedman and W.P. Marshal, E.B. Arruda proposed an improved equation for determining the residence time: D - the dryer diameter (m), and Lt - its length (m), α - in radians, NR - in rpm.

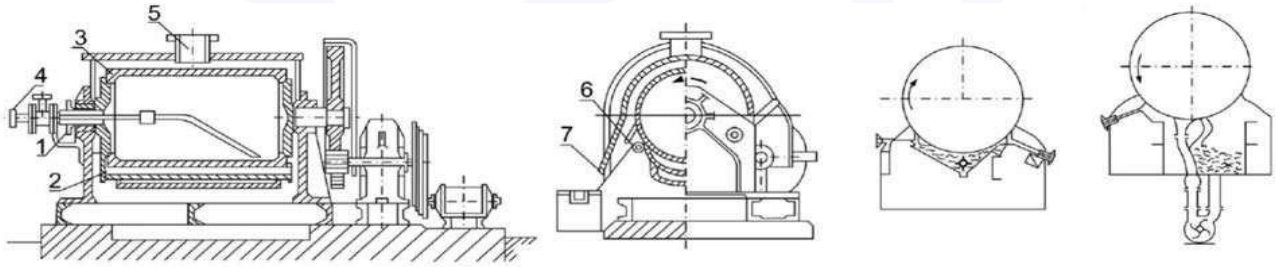

Figure:1. Scheme of a single-roll vacuum drying device: a - installation scheme (front and side view); b - method of supplying liquid material to the roller; v - method of delivery of pasty adhesive material; 1- input and output of steam; 2- circle; 3- roller; 4- condensate outlet; 5- a nozzle for exiting the steam-air mixture or connecting the device to the vacuum system; 6- knife; 7- auger.

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Conclusion

The main advantage of drum dryers is their advantage over other dryers in their use due to their simplicity of construction and high efficiency with small dimensions. The first, due to their simplicity, makes it possible to prepare the equipment in mechanical workshops in the conditions of production enterprises, and the second, in the process of modernization of production, they can be installed anywhere in the technological line and used in chemically toxic and dangerous production conditions.

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