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SUPERHIGH FREQUENCY MODEL OF ACTIVATION AND GRAIN DRYING BY ACTIVE AERATION

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Reducing moisture conditioning and to bring raw and wet grain to steady state storage - the main purpose of drying.

In general terms during drying understand the process of dewatering materials. This complex process consisting of heat transfer hot air grain, moisture movement within the grain to the surface, evaporation in peripheral layers each weevil, moving a pair of peripheral layers of the grain to the surface and in the intergranular space, removing it from the grain mass.

Increasingly effect of microwave fields used in drying grain. However, the mode of microwave processing using high power magnetrons has some disadvantages, such as overheating, uneven heating, cracking material. You must also take into account the time of microwave processing technology as an important parameter. On it depends installation performance and power inputs for drying. In this regard identified the following ways to step drying grain active ventilation using microwave electromagnetic field, reducing power magnetrons tanning; of the conditions for the smooth processing of corn in the microwave reactor core; determine the conditions of grain through the core.

Increasing the speed of drying grain can achieve an increase in water vapor pressure gradient material which is dried, and reduced temperature gradient through the use of alternate heating grains in the area of microwave activation and its active ventilation.

Harnessing the power of the electromagnetic field of ultrahigh frequency is one of the ways of intensifying the process of drying of bulk materials. Thus the rapid rise in temperature inside the material, which is characteristic of microwave heating, increasing pressure of water vapor appears that excess vapor pressure inside the material in relation to the pressure medium. Gradient overpressure dramatically

intensifies the drying process, as the pair move occurs by molecular diffusion and by filtration through pores and capillaries material.

In theory there are several ways similarity determination criteria. We use a way to bring the physical process equations to dimensionless form. It is based on known physical properties of equations, which is that all members of the equation have the same physical process dimension against major units. The method is applicable not only to algebraic but also to differential and integral equations as differentiation and integration operations do not affect the uniformity of the equation. The presence of heterogeneous functions in equations does not affect the homogeneity of the equation as a whole, as against the size of equation heterogeneous functions are dimensionless coefficients. The equation after division by beloved of its members is reduced to dimensionless form. Lowering the characters of differentiation and integration in dimensionless equations States, the expression that is considered to be of similarity.

The analysis describing the process layer convective drying grain of accepted assumptions. Based on the assumptions resulted reduced system of differential equations that reflect the law of conservation of energy in the drying process; law of conservation of matter; laws of heat and moisture, respectively. Differential equations together with initial and boundary conditions offer different similarity criteria that make it possible to make a generalization of individual experiences and use them to explore other studies.

To describe the process used heat and moisture criterion equation derived from the system of differential equations. Using experimental results obtained criterion equation for calculating the period of drying grain in a thick layer to the desired final moisture content at a constant rate of air.

In order to describe the processes that occur in seed corn when it is exposed to microwave field without convective drying method used to determine the integral analogues of integral expressions.

Present criterion complete system of equations describing the process heat and moisture in the grain layer with microwave activation and active ventilation. To ensure the permanence of a criterion, criterion differential equation is replaced by

dependence. As a result of determined system of equations describing the change in temperature and humidity of the grain layer in microwave activation, activated drying grain and grain drying active ventilation. This system contains a qualitative nature, but makes it relatively evaluate the efficiency of the microwave.

The resulting criteria models of microwave activation and grain drying active ventilation allows to evaluate the efficiency of the microwave field to increase the intensity of drying grain active ventilation.

It is carried out analysis of descriptive process of convective drying of grain layer with accepted assumptions. On the basis of given assumptions it is suggested system of differential equations which reflect law of energy conservation in drying process; matter conservation law; laws of heat exchange and moisture exchange. Differential equations together with initial and boundary conditions define various criteria of similarity which allow to make syntheses of individual experiences and use them for studying of other researches.

To describe process of heat and moisture exchange is used criteria equations, received on basis of system of differential equations. Using results of experiments it is received criteria equations to calculate drying grain term in thick layer to set final humidity at constant air speed.

In order to describe processes which occur in grain when it is affected by super high frequency without convective drying, method of integrated analogs for definition of integrated expressions is used.

It is given full system of criteria equations which describe process of heat and moisture exchange in grain layer at super high frequency of activation and active ventilation. To ensure constancy of one of criteria, criteria equations is replaced with differential dependence. As a result , certain system of equations which describes change of temperature and humidity of grain layer at super high frequency of activation, drying of activated grain and drying of grain active aeration. This system contains qualitative character but allows to evaluate efficiency of use of super high frequency.

Received initial model of super high frequency of activation and drying of

grain by active aeration allows to estimate effective use of super high frequency to increase intensity of grain drying by active aeration.