

TRENDS IN THE DEVELOPMENT OF DRYING TECHNOLOGY

Adjustment and control of moisture levels in materials through drying is a critical process in the manufacture of many types of products.

Drying may be defined as the vaporization and removal of water or other liquids from a solution, suspension, or other solid-liquid mixture to form a dry solid. It is a complicated process that involves simultaneous heat and mass transfer, accompanied by physicochemical transformations. Drying occurs as a result of the vaporization of liquid by supplying heat to wet feedstock, granules, filter cakes and so on. Based on the mechanism of heat transfer that is employed, drying is categorized into direct (convection), indirect or contact (conduction), radiant (radiation) and dielectric or microwave (radio frequency) drying.

There are different methods of drying which depend upon many factors. For example, gases may be dried by passing them through solutions such as calcium chloride or by passing them over absorbent materials such as silica gel. Air is sometimes dried by passing it over refrigerating coils which remove water or ice out of it. A great variety of drying operations has led to a great many devices used. They may be classified as rotary, drum, vacuum, spray, etc. driers. This classification is based on the form in which material to be dried is handled through the process.

Improvement in drying technology involves:

- 1) technical and economic indicators (decrease energy consumption, process of transfer of productivity, decrease hardware size, processor control field);
- 2) taking into account environmental aspects (minimizing consumption energy, reduction of harmful emissions in the atmosphere safety of production);
- 3) improvement of product quality (homogeneity of drying, minimization chemical changes in the product, preservation of food value) [1].

Trends in the development of drying technology lies in the intensification of the drying process due to: an increase in the area separation surface for heat transfer and mass transfer; using high-frequency heating; drying overheated steam; increase free flow turbulence; application: fluctuations and vibrations, two-phase drying agent, acoustic field of high sound pressure level, ultrasound area, high-frequency heating, electrokinetic phenomena, synergistic effects, multi-stage drying process.

REFERENCES

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