



## SILICATE MATERIALS WORKING - IN MANUFACTURING ENTERPRISES TYPES OF HEATING DEVICES USED

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### Annotation

*Different types of ovens and dryers are used in silicate materials production enterprises, and they are mainly distinguished by their recommendations, construction, working order of the furnace device, gas circulation and other features. In today's energy shortage, energy saving is important in the production of silicate materials.*

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Different types of ovens and dryers are used in silicate materials production enterprises, and they are mainly classified based on their recommendation, construction, working order of the furnace device, gas circulation and other features. Heating equipment is generally divided into groups according to the following characteristics:

1. According to the nature of heat treatment, heat devices are divided into dryers that operate at low temperatures and are designed to remove physical moisture, and furnaces that operate at temperatures above 500°C and are designed to carry out complex physical and chemical processes.
2. According to the principle of operation, heat devices are divided into groups that work continuously and periodically.
3. According to the technological sign, heat devices can be divided into the following large groups:
  - a) Furnaces intended for burning powdery and powdery materials. These include kilns used to burn raw materials to obtain cement, lime and other binders, fireclay, magnesite, dolomite, alumina and other refractory materials.
  - b) includes furnaces used for liquefying ore and obtaining glass mass in the production of glass and enamels.
  - c) furnaces intended for firing ceramic products. They include ovens used for cooking household porcelain, refractory materials, construction ceramics, electrotechnical porcelain, and technical ceramics.

g) Dryers used for drying lumpy and powdery materials and semi-finished products. According to the main principle of operation, dryers are divided into two types: atmospheric dryers and vacuum dryers.

In atmospheric dryers, the material is vaporized in air atmosphere or under barometric pressure conditions; is dried with In a vacuum dryer, the pressure of the steam-air mixture is greater than the barometric pressure

dried in an environment with very little moisture and very little air. In both classes of dryers, heat is transferred to materials using different methods. In them, the material moves in a stationary state or in different ways along the dryer. The above-mentioned dryers are divided into groups based on some of their characteristics. can be divided. These signs are:

- the method of movement of the material and the operation cycle of the dryer;
- the method of providing heat to the material being dried;
- organizing the movement of the drying agent;
- type of heat carrier;
- recommended from a technological point of view;

constructive signs;

Depending on the method of movement of the material and the cycle of operation, the dryer is continuously and continuously dyed.

According to the method of heat transfer to the material, there are the following dryers: convective, contact, radiation and high frequency. Depending on the organization of the action of the drying agent, drying with recirculation and without recirculation, drying with hot air, flue gases, depending on the type of heat carrier

There are types of drying with, steam drying and electric drying.

According to technological specifications, they can be recommended for desiccant sand, lumpy soil, coal, refractory materials, nails ceramics and building ceramics, glass and glass crystal materials, binding materials. When dryers are classified according to their design, they are

It is based on the shape of the working area and the way the material moves in it. There are the following main types of dryers: direct flow and counterflow, conveyor, drum, shaft, pneumatic, chambered, iagli, etc. Sanoar. A furnace is for heating items and materials

It consists of a complex of devices. The source of heat in industrial furnaces is the chemical energy of the fuel, the chemical energy of the heated material or electricity is used. Three types of fuel can be used in furnaces:

liquid, solid and gas. Burning of fuel is carried out in furnace devices of the furnace.

An industrial furnace is a complex unit, which generally consists of a working chamber of a furnace or a technological process zone and auxiliary devices. Combustion devices include burners and burners, waste gas heat utilization devices, air blowers, pumps and includes smoke detectors. The main technological process takes place in the working chamber. A heat source is prepared in stoves and burning devices, which sprays the furnace and liquid fuel includes equipment or devices that mix air with fuel. Air and gas are heated in the exhaust gas reuse parts of the furnace. Waste gases materia! drying iar and used for heating, for heating water, for getting water bugle. Blowers and pumps to deliver fuel and air at high pressure to the furnace , extraction devices smoke gases are left to weigh. In addition, industrial furnaces include equipment and fittings for controlling the hydraulic mode of the furnace, equipment for loading and unloading the material, and equipment for controlling and adjusting the furnace. Almost all liquefaction furnaces work in radiation mode, other heat exchangers are fuel. and ovens are heat exchangers. The processes of heating and liquefaction of dispersive material are carried out in furnaces operating in the layered mode. According to technological recommendations, furnaces are divided into types that burn paint-balls and dispersive materials, burn shaken materials, cook with dispersive materials, and produce silicate liquids. According to

the principle of operation industrial furnaces are divided into periodic or cyclic and continuous types. According to their structural structure, they are shaft, rotary, chamber, ring, tunnel and pool. Depending on the type of heat exchange, furnaces are open-fired (i.e., the heated material is heated with a flame gas with heat transfer) and muffled (that is, when the heat of the flame gas is transferred to the material through an intermediate wall) types. In muffle furnaces, the flame gas heats up the intermediate space, and the heated wall transfers its heat to the material by radiation. According to the source of heat release, ovens are divided into flame and electric types. Flame furnaces are mainly used in the silicate industry. Electric furnaces can be classified according to the method of converting electrical energy into thermal energy. They are divided into electron beam, blowing, induction and electrical resistance types. Evaluation of industrial ovens is based on fuel consumption, thermal efficiency or capacity, relative consumption of fuel for burning 1 kg of product, f.i.c. such as based on indicators. Furnaces are subject to the following requirements:

- maximum drying speed;
- high quality indicators of finished material;
- the minimum amount of heat consumption per product unit;
- uniformity of the drying process over the entire size of the dryer;
- easy control of the drying process.

Classification of dryer. According to the operating cycle, the dryer is continuous and periodic. Depending on the type of heat transfer to the material, it is convective, contact, radiation and high frequency. According to the organization of the drying method, the coke drying agent is divided into recirculating and non-recirculating types.

Due to the fact that the sizes and shapes of the silicate products sent for drying are varied and different methods are used in their formation, they place great demands on the drying process. These requirements are met by a multi-zone dryer equipped with dryers that adjust the humidity and temperature of the air in each zone used for drying household items. Suspended trolleys are used to dry insulators and hollow products. In a zone dryer, 4-6 arcs are combined into one bioc, and each of them has separate chain pushers. In separate zones, recirculation of gas is done with the help of fans, and temperature is done with the help of radiators

is increased. Depending on the type of heat carrier, dryers are divided into types of dryers with heated air, flue gas, steam, and electric current dryers. According to the technological description, dryers depend on sand, soil, product drying types. Constructive signs corra tunnel, conveyor, drum, shaft, pneumatic, camera, floor dryer, Bulk and dispersible raw materials are dried in a paint drier with different structures. According to Newton's formula, it is in the form of steam leaving the material

The amount of moisture is proportional to the evaporation surface F:

$$q_{\text{в}} = F$$

Therefore, when drying paint-ball and dispersable material, it is necessary to choose such a method, because the drying agent surrounds every particle and ball. Only in this case, the effectiveness of the drying process will be at a high level.

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