АНАЛИЗ СВОЙСТВ СОВРЕМЕННЫХ ОБЛИЦОВОЧНЫХ МАТЕРИАЛОВ

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Аннотация: В этой статье представлена подробная информация о типах и областях применения современных настенных энергоэффективных строительных материалов.

Ключевые слова: *энергоэффективный, современный материал, плотный, изотермический, гидрофобный, стекловолокно, вспененное стекло, эковата.*

ANALYSIS OF THE PROPERTIES OF MODERN FACING MATERIALS

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Anotation: this article shows detailed data on the types and areas of application of modern wallbop energy-efficient building materials.

Keywords: *energy efficient, modern materials, dense, isothermal, hydrophobic, fiberglass, foam glass, ecovata.*

Average density p_m, kg / m3, physical quantity determined by the ratio of the mass of the material to all the volume it occupies, including pores and spaces in it: $p_m = m_e / V_e$

here m_e ,V_e - the mass and volume of the material in a dry and natural state, respectively

The size of the average density varies depending on the porosity and humidity of the material and is used to calculate its porosity, thermal conductivity, heat capacity, strength, as well as to design warehouses, load-bearing and transport operations. For masonry materials, the smallest value of the average density with the desired consistency is required. Average density factor, kg/m3:

- for products of devorbop ceramics per hour-1400.....1600,
- for light concretions with a porous filler-950..... 1400,
- for portioned ceramics and cellular concrete-400.....800,
- for wood and lignomineral products-1000.....1400.

Porosity G‘,%, - the degree of filling the volume of the material with pores:

$G' = (1 - p_m/p)100$,

here p_m,p real and average density, respectively, kg / m3

The value of the total porosity for modern wallbop materials%: for Silicate bricks-10......15, for ceramic bricks-25......35, for light concretions-55......85. In terms of providing thermal insulation properties, closed small pores are recommended for wallbop materials, which are evenly distributed over the entire volume of the material.

Space, % - the level of filling the material volume with technological gaps. The gaps (air gaps) in the composition of wallbop building materials are created by both technological and constructive methods.

The volume of gaps in hollow ceramic brick is 13...33%, the volume of gaps in ceramic stones is 25...40%, the volume of gaps in silicate bricks is 20...40%, the size of the gaps in the wallbop Stones is 25...30%, the volume of gaps in large porous concrete-40...60%.

The moisture content of the material is determined by the amount of moisture in the mass of the material in a dry state. The moisture content of the material depends on the material itself (porosity, hygroscopicity) and the environment (air humidity, contact with water). The indicator of the output moisture for wallbop materials is %: for foam and aerated concrete - 15...35, for arbolit - 20...35, for ceramzite concrete -15...18, for wood and mineral blocks-7...8. Hygroscopicity is the property of porous materials to absorb a certain amount of water with an increase in environmental humidity. Hygroscopic humidity,%: for wood -12...18, for cellular concretions-up to 20 percent, for arbolite -10...15, for wallbop ceramic material-5...7. Capillary moisture-the ability of materials to absorb moisture as a result of their rise through capillaries. The lift height of water in a porous material is determined by the following formula:h = 2ϭcosφ(p/(rqp),

where ϭ is the surface tension of water,

J / m2;

φ is the extreme angle of wetting,

°; R-capillary radius,

m; q-acceleration of gravity,

m / s2; P-water (liquid) density, t / m3

The ability to moisturize through capillary suction should be taken into account when using wall-shaped materials, especially in the sokol part of buildings. Capillary moisture reduces or prevents the waterproofing layer between the foundation and the wall structure, as well as the hydrophobization of the latter. Moisture permeability is the property of a material to provide moisture to the surrounding air. The relative humidity of the ambient air is characterized by the amount of water lost by the material per day at a temperature of 60% and 20°C. Moisture permeability is of great importance for wall panels and blocks, for wet wall plasters, in the process, the construction of the building has high humidity, and due to moisture permeability under normal conditions, they dry out to an air-dry state (equilibrium moisture). Water resistance is a property of maintaining the strength of a material in conditions of complete saturation with water. Water resistance is characterized by a softening coefficient:

$$K\text{р} = R\text{н}/R\text{с}$$

where RH, Rc is the force at the moment of compressing the material in a water-saturated and dry state, MPa, respectively.

Devorbop materialiar kr > 0.8. da is water resistant. If for a material this figure is less than 0.8, it cannot be used in conditions with high humidity. Frost resistance is a property of a water-saturated material to withstand several alternating freezes and melts without signs of deterioration, significant decrease in strength and weight loss. In terms of frost resistance, wallbop materials will have brands F15,F25,F35, F50. Minimum allowable brand F25 for ordinary wallbop materials. The numbers denote the number of cycles with variable freezing (4 hours) and thawing (4 hours). A single cycle consists of 8 hours. Vapor and gas permeability-the property of the material to absorb water vapor or gases (air) when a pressure difference occurs on opposite surfaces. The vapor or gas permeability of a material is characterized by a coefficient of vapor and gas permeability, equal to the amount of steam or gas per liter passing through a layer with a thickness of 1 m and an area of 1 m2:

$$Kr = a\ Vp/(St\Delta p)$$

where a is the thickness, m is; VP-mass of gas with density p, kg; S-field, m2; t-Time, s; Δr-pressure difference, Pa. Gas permeability coefficient, kg / (m s-Pa): for cement-sand plasters per hour-0.02; for ceramic brick-0.35; for high porous materials-10.

Wallbop materials must have a certain permeability so that the wall “breathes", i.e.natural ventilation occurs. In winter, the movement and air conditioning of the Steam occurs from high humidity to the lowest, thereby creating conditions of deterioration.Vapor-permeable materials should be located on the side of the barrier with a high content of water vapor in the air. Thermal conductivity is the property of transmitting heat flow through the thickness of a wallop material when there is a temperature difference on the surfaces that limit the material. Thermal conductivity, Vt / (m - °C), is determined experimentally by registering the heat flux passing through the material and calculating the thermal conductivity by the following formula:

$$\lambda=Q\delta/(St\ \Delta t)$$

where Q is the amount of heat, J; δ is the thickness of the material sample, m; S-sample area, m2; T is the transition time of Heat Flow, s; Δt is the temperature difference of materials on opposite surfaces, °C

Conclusion In this article, scientific research has been carried out on the development of the prospect of energy efficient building materials in the production of modern wallop building materials. As a result of the results carried out, heat insulation materials were used to reduce the thermal conductivity coificent and efficient resources.In the article, a thin-tiled thermal insulation material basalt Fiber is made of.

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