PRODUCTION AND APPLICATION OF BASALT MATERIALS

Karimov Rustamjon Ibragimovich
Andijan State technical institute, Andijan Uzbekistan.
Tel: +99 899 441 73 07
karimovrustambek82@gmail.com

Abstract: This article presents the theoretical basis for obtaining thermal products from rocks used in construction. The stages of production of basalt products, the advantages and disadvantages of basalt products, as well as the future role of this product and what basalt itself is are explained in detail.

Key words: basalt, lava, physical method, mold, oxidation, coating, glass, structure, plastic, density.

Introduction: Basalt is an ecological material. It is a type of stone that is melted at temperatures between 1400-2000°C to produce fibers, which are then processed into a cotton-like state. The advantage of basalt is its ability to insulate both heat and cold, as well as being resistant to moisture. Importantly, it does not produce mold or bacteria. Mold generally forms at the junction of heat and cold, where moisture accumulates, so by insulating the walls of multi-story buildings, the internal surfaces will not develop mold. After installing basalt fiber cladding on walls, the effect will start to be visible within 7-8 days as the wall itself begins to warm up. Basalt fiber coatings are widely used in construction, chemicals, oil-gas, and energy sectors.

Materials and Methods: Basalt is a volcanic rock that solidifies into a durable material when lava cools. The production of continuous basalt fiber is performed using a single-phase technology, which allows for cost-effective production, similar to glass fiber production costs. During production, basalt rock is crushed into 5-20mm pieces and melted in furnaces at temperatures ranging from 1400°C to 1600°C. The chemical composition of basalt mainly includes

silicon, aluminum, iron, calcium, and magnesium, which contribute to its durability and long-lasting properties. Basalt fibers are resistant to moisture and have high thermal conductivity.

Results and Discussion:

Application in Construction

Basalt's strength makes it widely used in foundation construction, reinforcing concrete and asphalt. Basalt fibers are applied in modern foundation and barrier construction due to their high rigidity and solid structure. The material's use ensures the long-term durability of constructions. Its high heat resistance makes it suitable for use in fire-resistant materials, such as basalt mats and slabs for industrial installations, furnaces, and power stations exposed to high temperatures.

Insulation Materials

Basalt's heat resistance and good acoustic insulation properties make it an ideal material for barriers and insulation. Basalt fibers are used to manufacture various insulation materials, especially in power plants and industrial facilities.

Environmental Advantages

Basalt is an environmentally friendly material. It is naturally abundant, requires low energy for processing, and is long-lasting. Moreover, its production generates minimal harmful waste, making it an environmentally friendly option. Additionally, basalt materials are recyclable, further reducing their ecological impact.

Conclusion: Basalt materials play a significant role in construction. Their heat resistance and environmental sustainability make them increasingly popular as modern construction materials. The use of basalt in construction not only enhances economic efficiency but also ensures ecological sustainability. As a result, the

potential for further development and expansion of basalt material applications in the construction industry is high.

References

1. Numanovich A. I., Ravshanbek o'g'li R. R. BASALT FIBER CONCRETE PROPERTIES AND APPLICATIONS //Spectrum Journal of Innovation, Reforms and Development. – 2022. – Т. 9. – С. 188-195.

2. Дадаханов, Н. К., & Каримов, Р. И. (2024). РАЗРАБОТКА НОВОГО КОНСТРУКЦИЯ ВЫТЯЖНОГО ПРИБОРА И ИССЛЕДОВАНИЕ ЕГО РАБОТЫ DEVELOPMENT OF A NEW EXHAUST DESIGN DEVICE AND RESEARCH OF ITS WORK. TADQIQOTLAR. UZ, 30(1), 66-71.

3. Karimovich, D. N., & Ibrahimovich, K. R. (2024). DEVELOPMENT OF A NEW DESIGN OF AN EXHAUST DEVICE AND STUDY OF ITS OPERATION. JOURNAL OF ENGINEERING, MECHANICS AND MODERN ARCHITECTURE, 3(2), 10-14.

4. Ibrahimovich, K. R., & Nurmamatovich, R. T. (2025). USE OF WASTE PAINT MATERIALS. Science, education, innovation: modern tasks and prospects, 2(2), 67-69.

5. Karimovich, D. N., & Ibragimovich, K. R. (2024). OPTIMIZATION OF PARAMETERS OF A LINE OF SPINNING OF SPINNING MACHINES. TADQIQOTLAR, 30(1), 72-79.

6. Adaxamjonovich, O. Z. A. (2024). PRODUCTION OF COMPOSITE MATERIAL USING INDUSTRIAL WASTE. *AMERICAN JOURNAL OF MULTIDISCIPLINARY BULLETIN*, *2*(3), 129-136.