

## **Types and Properties of Heating Devices**

**Turobova K. N.**

*National Institute of Art and Design, Named after Kamoliddin Bekhzod  
Teacher of the Department of Design*

**Abstract:** Through the new technologies of the shrines, communicative communication occurs in addition to providing visitors with comfort. The concept of modern heating design of shrines is also distinguished by the fact that it requires an honest creative approach to itself. Research on the factors affecting the solutions of the concept of modern heating design, the search and research of functional interior elements through technologies based on modernity in accordance with the needs and interests of this modern heating.

**Keywords:** Shrine, technology, communicative, modern heating, functional, concept.

In the period 2003 - 2006 by the Cabinet of Ministers of the Republic Uzbekistan the task was set before the specialists of space heating to reconstruct the heating system of the ensemble Al Bukhori in Samarkand. Pilgrims of our republic and guests Uzbekistan complained about the cold during prayer in winter. In this regard, the Cabinet of Ministers of the Republic of Uzbekistan announced a tender.

Many manufacturers of heating devices and systems took part in it. With its unique business plan, the tender was won by the joint venture "AG Tashkent Deutsche Cable". This is an enterprise he proposed a cable heating system. Into the room of the ensemble Al Bukhori, where the rite is performed (namaz is read), the heat coming from the radiators without heating the lower part of the room rose straight up under the domes. Therefore, visitors felt uncomfortable. Developers of the joint venture "AG Tashkent Deutsche Cable took into account all the criteria: from the efficiency of the heating system to its design.

The heating cable consists of a special heating wire and is embedded in the floor under the cement screed. Before installing the cable on the floor, it is erased thermal insulation and reflective material, so that the heat does not go down, but goes up. Thus, a person begins to feel warmth under his feet.

The required temperature (20 ° C - 250C) is set by a thermostat that controls the switching on and off of the heating system, thus ensuring the efficiency of electricity consumption. During the manufacturing process, the cable is covered with a special shield in order to dampen the electromagnetic flux and is considered safe. The cable heating system was built into the Al Bukhori ensemble in 2008 and inconveniences about the cold were prevented.

In the cold season, indoor conditions of thermal comfort are maintained by the heating system. Heating refers to the engineering equipment of buildings. When designing heating, many factors are taken into account, including climatic conditions and the purpose of the premises. The operation of heating devices is characterized by periodicity throughout the year. Let's take this as an example of trademark development Ekkotec-W. About heating of residential premises

Ekkotec-W cable heating systems are distributed in the CIS and adjacent countries of Europe and Asia.

The production base in Russia was founded in 1995. Cable heating systems have several main functions: underfloor heating, room heating, de-icing, heating of pipelines. Underfloor heating is an economical source of heat based on the conversion of electrical energy into thermal energy. The Ekkotec heating cable is evenly split on a flat concrete surface and filled with sand-cement mortar. Any covering is laid on top: tile, carpet, linoleum, laminate. The operation of the system is controlled by an electronic temperature controller.

Temperature sensor the controller is located in the floor, the control panel is on the wall. The floor turns into a single heating panel, from which radiated heat (Radiant Heating) emanates. The air temperature in the room becomes approximately the same throughout the height. Convection air flows and dust circulation stop. A high modern level of safety is provided by special cable designs (double-core shielded), which do not cause an increase in the general electromagnetic background in the working area.

Brand, power	Length	Recommended laying area	Maximum laying area
HBS-250 W	16	1,5M <sup>2</sup>	2M <sup>2</sup>
HBS-350 W	24	2,5M <sup>2</sup>	3M <sup>2</sup>
HBS-500 W	34	3,3M <sup>2</sup>	4,25M <sup>2</sup>
HBS-700 W	38	3,8M <sup>2</sup>	4,75M <sup>2</sup>
HBS-800 W	42	4,2M <sup>2</sup>	5,25M <sup>2</sup>
HBS-950 W	47	4,7M <sup>2</sup>	5,8M <sup>2</sup>
HBS-1050 W	53	5,5M <sup>2</sup>	6,5M <sup>2</sup>
HBS-1250 W	62	6,5M <sup>2</sup>	7,75M <sup>2</sup>
HBS-1500 W	75	7,5M <sup>2</sup>	9M <sup>2</sup>
HBS-1800 W	90	9M <sup>2</sup>	11M <sup>2</sup>
HBS-2200W	105	11M <sup>2</sup>	13M <sup>2</sup>

If we compare the cable heating system with traditional heaters, we get the following:

Cast-iron radiators

- Condensation formation on the wall surface
- High water consumption in the system
- Formation of mold in the corners
- Cold floor
- Formation of a heat cushion on the ceiling
- Inability to integrate into heating systems automatic temperature controllers
- Increase in the cost of radiators in the manufacture of designer radiators
- Contamination of the surface with dust and dirt and the complexity of cleaning
- A large temperature difference in the volume of the room (up to 8 ° C).
- Cold exterior walls
- Lower level of temperature regime
- Expensive installation
- Inability to pump pipes at low pressure in the general system
- Higher air humidity
- The inability to regulate the temperature

- The probability of damage to pipes during installation and the creation of an emergency situation (flooding of neighbors)

## QUESTION AND ANSWER

How much electricity does the "underfloor heating" consume?

No more than 25% of the electrical power (W) of the cable. Practice it shows that the real costs can be even lower.

What thermal insulation materials are used in underfloor heating systems?

The effectiveness of the heat insulator depends on its thickness.

Significant savings (20%) can be achieved with a thermal insulator thickness of 5 mm or more. But it is highly undesirable to lay the heating cable on thermal insulation materials. Due to the heating temperature, the cable may sink into the thermal insulation and stop contacting the concrete. In this case, direct heat transfer to the concrete screed will disappear. The floor in these areas will become unheated.

The air temperature in the "pockets" around the cable can reach critical and destroy its insulation. Therefore, a concrete screed is laid on the thermal insulation, and then a heating cable. Heat insulators with aluminum foil increase savings. But the foil will not fulfill its role as a reflector of radiated heat (Radiant Heating) if a cable and a concrete screed are laid directly on it. It, like an ordinary metal, will carry out direct heat transfer in the opposite direction from the heat source itself, and the reflection effect will disappear. Thermal insulation and aluminum foil they are covered with polymer films or thick paper to prevent contact with aggressive concrete alkali. Is it possible to take one section of cable heating for heating.

The heat exchange and ventilation in the kitchen and bathroom are different, and the temperature controller will correctly regulate the floor temperature of only one room. Therefore, we need two sections of cable heating and two temperature controllers. Is it possible to lay mats on heated areas of the floor?

It is desirable to have the same heat sink along the entire length of one section of cable heating. What factors influence the floor heating temperature?

The floor temperature is influenced by

- cable layout step, thermal insulation of the room, drafts, voltage changes in the power grid, the thickness of the screed, the type of finishing coating.

What temperature will be on the floor surface?

According to European standards, +19°C ...+24°C is considered in "underfloor heating" systems. the norm With more dense cable laying, the temperature can rise to +35 °C.

For your information:

Drafts, poor thermal insulation of the room, carpets, as well as voltage changes in the electric networks significantly affect the results of cable operation.

### **Literature:**

1. Journal The World Best Enerpia Co., Ltd.
2. Исследование эффективности систем отопления/ журнал "Молодой учёный"
3. [http//m.srcyrl.asia-washer.com](http://m.srcyrl.asia-washer.com)
4. [www.floorwarm.net](http://www.floorwarm.net)
5. [http//moluch.ru/archive/89/18191](http://moluch.ru/archive/89/18191)

6. Sultanova Muhayyo Fahriddinovna THE FORMATION OF ART AND ARCHITECTURE OF THE ANCIENT PERIOD // European Journal of Arts. 2023. №1. URL: <https://cyberleninka.ru/article/n/the-formation-of-art-and-architecture-of-the-ancient-period> (дата обращения: 19.09.2023).
7. Latipovich T. A. Styles of Prototyping... Prototyping and about Layout //Middle European Scientific Bulletin. – 2022. – Т. 20. – С. 76-80.
8. Мансуров Я. М. и др. Бугунги кун театр биноларини замонавийлаштириш масалалари //Естественные науки в современном мире: теоретические и практические исследования. – 2022. – Т. 1. – №. 7. – С. 66-72.
9. kizi Salomova F. L., Matniyazov Z. E., Mannopova N. R. Methods of Using Ethnographic Elements in Furniture Design //EUROPEAN JOURNAL OF INNOVATION IN NONFORMAL EDUCATION. – 2022. – Т. 2. – №. 5. – С. 166-170.
10. Nilufar M., Farrukhovna I. N. Basic Provisions and Requirements for the Formation of Interior Spaces of Hotels //European Journal of Life Safety and Stability (2660-9630). – 2021. – Т. 12. – С. 417-420.
11. Furkatovna, Tursunova Shakhnoza. "Packaging evolution and design." (2021).
12. Muhayyo S., Ruzibayevich R. F. Design solutions and development chronology in the construction of business centers. Emergent: Journal of Educational Discoveries and Lifelong Learning (EJEDL), 2 (11), 96–103. – 2021.
13. Ismaildjanovich R. M. The place of landscape architecture, traditional landscape and horticulture in urban planning. – 2021.