ALTERNATIVE METHODS OF COOLING CIRCULATING WATER

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ABSTRACT

The way water cools occurs mainly inside a solid body, as well as between two solid bodies that are in contact with each other. Heat conduction can also occur through a layer of liquid or gas, but in general, liquids and gases (with the exception of liquid metals) are very poor conductors of heat.

Keywords: Temperature change, space, Heat flow.

Let’s see the heating of a homogeneous isotropic body. Objects that have the same physical properties in all directions are called isotropic objects. During the heating of such an object, the temperature at its various points changes over time, and the heat spreads from the high-temperature area to the low-temperature area. The sum of the temperature values at all points of the considered space at the same time is called the temperature field. The temperature field is expressed by the following equation:

$t=f(x,y,z,\tau)$

bu yyerda x,y,z – nuqta koordinatalari; τ - vaqt.

If the temperature of a body is a function of coordinates and time, then the temperature field is non-stationary:

$t=f(x,y,z,\tau)$; $\partial t/\partial\tau\neq0$

If the temperature of an object is a function of coordinate only and does not change over time, then the temperature field is stationary.

$$t=f(x,y,z);\ \partial t/\partial\tau=0$$

The temperature field can be a function of three, two, and one coordinates and is called three-, two-, and one-dimensional, respectively. A surface with the same temperature at all points is called an isothermal surface.

Since two different temperatures cannot exist at the same point in space, different isothermal surfaces never intersect. All of them end on the surface of the body or are completely located inside it. The temperature of the object changes only in the directions that cross the isothermal surfaces (Fig. 1).

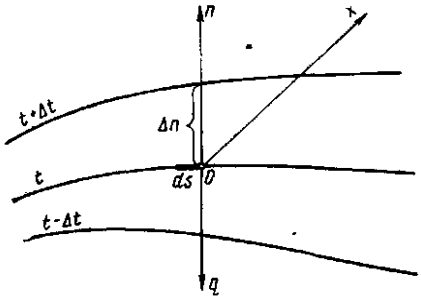

Figure 1. Isotherms. Regarding the concept of temperature gradient

In this case, the largest temperature change per unit length is in the direction n normal to the isothermal surface.

The ratio of the temperature change t to the normal distance n on the isotherm is called the temperature gradient:

$$\lim \left[\frac{\Delta t}{\Delta n}\right]_{\Delta n \to 0} = \frac{\partial t}{\partial n} = \text{grad}t$$

Temperature gradient is a vector directed along the normal to an isothermal surface. Its direction towards the temperature increase is considered a positive direction. Like other types of water cooling, the process of heat transfer takes place only when the temperature at different points of the body is not the same, i.e. gradt 0. The amount of heat passing through an arbitrary surface per unit of time is called the heat flux Q. The vector of heat flow is always directed to the side of temperature decrease.

REFERENCES:

1. Jaloliddinova Nozima Doniyorjon Qizi, Sultonov Ro‘Zmatjon Anvarjon O‘G‘Li Renewable sources of energy: advantages and disadvantages // Достижения науки и образования. 2019. №8-3 (49). URL: https://cyberleninka.ru/article/n/renewable-sources-of-energy-advantages-and-disadvantages (дата обращения: 01.12.2023).

2. Султонов Рузиматжон Анваржон Угли, Кодиров Хусанхон Мунаввархон Угли, Мирзалиев Бобурбек Бахтиёрович Выбор механических двигателей электрического тока, используемых в системе электропривода // Проблемы Науки. 2019. №11-2 (144). URL: https://cyberleninka.ru/article/n/vybor-mehanicheskih-dvigateley-elektricheskogo-toka-ispolzuemyh-v-sisteme-elektroprivoda (дата обращения: 01.12.2023).

3. Султанов Рузимаджон Анваржон Угли Рекомендации по выработке электроэнергии и компенсации потерянной энергии с помощью системы охлаждения электродвигателей // Вестник науки и образования. 2019. №19-3 (73). URL: https://cyberleninka.ru/article/n/rekomendatsii-po-vyrabotke-

elektroenergii-i-kompensatsii-poteryannoy-energii-s-pomoschyu-sistemy-ohlazhdeniya-elektrodvigateley (дата обращения: 01.12.2023).
4. Usmonov Shukurillo Yulbarsovich, Sultunov Ruzimatjohn Anvarjohn O‘G‘Li, Kuchkarova Dilnoza Toptievna Research potential of energy saving pump unit and hydraulic network // Проблемы Науки. 2019. №12-1 (145). URL: https://cyberleninka.ru/article/n/research-potential-of-energy-saving-pump-unit-and-hydraulic-network (дата обращения: 01.12.2023).
5. Usmonov S. Y. Analysis of Working Modes of Well Pumping Equipment Eectr //Central Asian Journal of Theoretical and Applied Science. – 2022. – Т. 3. – №. 11. – С. 119-125.
6. Yulbarsovich U. S., Nurillaevich M. N. FREQUENCY CONTROL OF POWER EQUIPMENT DURING SECONDARY STEAM GENERATION IN THE PRODUCTION UNIT //PRINCIPAL ISSUES OF SCIENTIFIC RESEARCH AND MODERN EDUCATION. – 2022. – Т. 1. – №. 6.
7. Karimov, N. U. ugli. (2023). SPEED CHECK OF ASYNCHRONOUS MACHINES BY CHANGING THE FREQUENCY. Educational Research in Universal Sciences, 2(15), 743–746. Retrieved from http://erus.uz/index.php/er/article/view/4880
8. Karimov , N. U. ugli. (2023). ANALYSIS OF THE INFLUENCE OF MOISTURE ON TRANSFORMER COILS. Educational Research in Universal Sciences, 2(15), 747–750. Retrieved from http://erus.uz/index.php/er/article/view/4881