ANALYSIS OF CRITERIA OF MATHEMATICAL MODELS OF CIRCULATING WATERS

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ABSTRACT

In such IAAs, hot and cold heat carriers directly touch each other and then mix. For example, high-temperature steam from the boiler unit is mixed with cold or warm water, and then transferred to consumers. Such IAAs include coolers, deaerators, scrubbers, and other devices.

Keywords: Temperature change, space, Heat flow.

The design of the water cooling apparatus, the adjustment mode of the thermal regime and the hydraulic resistance must meet the requirements of the technological process. The most optimal water cooling device should be compact, light weight, cheap, reliable in operation, less polluting, easy to inspect, clean and repair.

When choosing the material of the water cooling surfaces and components of the device, the following are taken into account:

• the need for long-term use at specified temperatures, physical and chemical properties;

• non-toxicity of heat carriers;

• the material has sufficient thermal conductivity;

• resistance to high pressure and temperature;

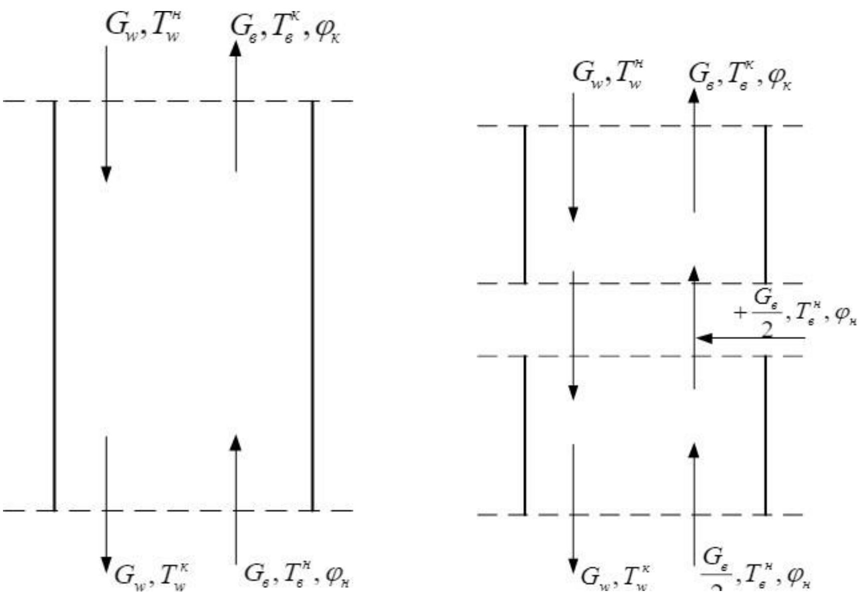
• resistance to chemical and temperature corrosion.

It will not be possible to choose a device design that meets all of the above requirements at the same time. In some cases, it is desirable to take into account important factors. For example, special attention is paid to the stable operation of the water cooling device in conditions of high temperatures or in aggressive environments, etc., its compactness, low weight and low pollution.

A comparison method is used to determine the optimal option from the group of water cooling devices based on the initial basis. Technical-economic comparative options are based on thermal, hydraulic and durability calculations.

If liquid or steam is used on both sides of the water cooling surfaces of the device, it is advisable to choose a double or multi-pipe section water cooling device.

The initial parameters and constants of the interacting flows are set to the algorithm, then the air velocity in the flow part of the cooling tower is calculated, and then the total area of the droplets is determined. Air humidity and enthalpy, evaporation coefficient are determined. We describe the Nusselt number n as the coefficient of heat transfer from water to air, as well as the coefficient of heat transfer from the surface of the droplet.



Calculation scheme for a cooling tower with one air supply. cooling towers supplied with intermediate air

All parameters described above are included in the system of equations, which is calculated on a computer using the MATLAB program for mathematical calculations. As a result of the solution, we get the output parameters of water and air. Next, we calculate the water temperature at the outlet of the cooling tower, and if the results are not satisfactory, the output values are set to the initial values and the calculation process is repeated until the end of the water temperature. the process actually stops changing. This value of water temperature is taken as the final result.

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