



TO MODERN HEAT EXCHANGERS REQUIREMENTS AND METHODS OF INTENSIFICATION OF THE PROCESS AND THE CALCULATION OF PROMISING CHASE PROFILES.

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Annotation. This article explores the issues of process intensification in shell-sulfur heat exchangers used in industrial enterprises. On the basis of the laying of existing problems, the application of ribbed structures in shell-bearing devices and its effect on the processes of productivity and heat exchange were transferred from a multi-stage Ridge laying.

Key words: Shell-pipe, intensification, acceleration, heat, heat flow, temperature, corrosion.

Introduction

Modern heat exchangers must meet the following technical requirements;

- intensification of the heat exchange process, ensuring the transfer of the required amount of heat from one environment to another with the acquisition of the final temperature;
- the working environments of the device must be effective and reliable in various homogeneous aggregate states of the given thermodynamic parameters (pressure, temperature and yield) and heat exchanger product;
- device chests and working surfaces must be resistant to various homogeneous chemicals used during the cleaning period;
- it is necessary to extend the life of the working bodies of the device;

Currently, experts are faced with problems that can be combined into three main groups in the development of improved heat exchangers:

First group: the problems in this group are related to the life of heat exchanger devices, in which heat exchanger surfaces are subjected to pollution, corrosion, as well as thermomechanical loads in the temporary modes of operation of heat exchanger devices. All of these problems affect heat transfer (heat transfer number or heat transfer coefficient) properties.

Second group: this group includes contact details of heat exchangers and problems of compactification of them. In this case, it is important to create compact constructions in order to ensure the intensity of the process.





Third group: these are problems of increasing the upper limit of the heat or cold agent.

In order to increase the efficiency and compactness of heat exchanger devices, it is necessary to develop mainly new schemes, create new promising methods and constructions of heat transfer, including the intensification of vortex and circulating current in the device's working chutes.

Currently, there is a lot of research on these problems. In general, profiling heat-exchanging bladder surfaces provides a transition from laminar flow in the bladder to turbulent flow. This in turn makes it possible to intensify the thermal conductivity. Such a method affects the rapid renewal of the flow boundary layer and turbulence. The change in the profile of the working quince adds massively to the increase in heat exchanger faces. This in turn ensures an increase in the coefficient of heat and causes hydraulic resistance to rise in the device. In addition, the Reynolds number also increases this condition increases the natural turbulence of the flow. It should be noted that the use of structures that generate vortices and circular currents in the internal chutes of a heat exchanger device reduces the contamination of the chutes.

When creating intensified methods of heat exchange and applying it to practice, the technical conditions of the process and the characteristics of the long-term operation of heat exchanger devices are considered. In order to achieve a complete solution in providing intensity, it is also necessary to consider the following:

1. Increase the heat transfer power of the agent without changing the power of the heat exchanger agent transmitting pump or the hydraulic resistance of the device;

2. Reducing the temperature difference between heat exchanger products without changing the structural dimensions of the device and the number of zones;

3. Reducing its constructive parameters while maintaining the heat exchanger agent capacity and the level of hydraulic resistance of the device;

4. Reducing the power of heat exchanger surfaces while maintaining the specified power in the heat exchanger device;

5. The creation of energy-efficient constructions of promising listed quivers. 1; factors 2 and 4 serve to save the energy spent on the process. Factor 3, on the other hand, will save resources (metal consumption and a decrease in the cost of the device). Factor 5 is general, in which each working parameter of the heat exchanger device must be boholized. This factor is a convenient and simple



way to intensify the heat exchange process. Most of the research work currently underway is also aimed at intensifying the process and minimizing the energy expended by changing the profile of the chours.

Results of the analysis:

The main purpose of accelerating the operation of shell tube heat exchangers is to equalize the thermal resistance on both sides of the heat exchanger surface. This can be done in two ways.

1) multiplying the heat exchange surface F , for example, preparing the surface on the side of the heat carrier agent with a small heat transfer coefficient α to be faceted.

2) increase the value of the heat-giving coefficient α by correctly selecting the hydrodynamics of the heat-carrying agent.

When the second method is used, the thermal resistance of the boundary layer on the heat exchange surface decreases. From the studies it is known that one of the main factors that prevents heat transfer is considered the boundary layer resistance. In order to improve heat exchange, it is necessary to lose zones of movement in the inter-pipe space. To do this, at the exit of the heat carrier agent from the inter-turbo space or at the entrance to it, the distributor.

Various turbulizers can be used to speed up heat exchange. Turbulizers heat-carrying media on the outer surface of the tubes will put the boundary layer in a vortex state or destroy it. As a result, the thermal resistance decreases, and the heat-giving process accelerates. For example, when using tubes with volumetric ditches on the outer surface (figure 1.1), the heat-giving coefficient in the head between the turbans increases by 2 times.

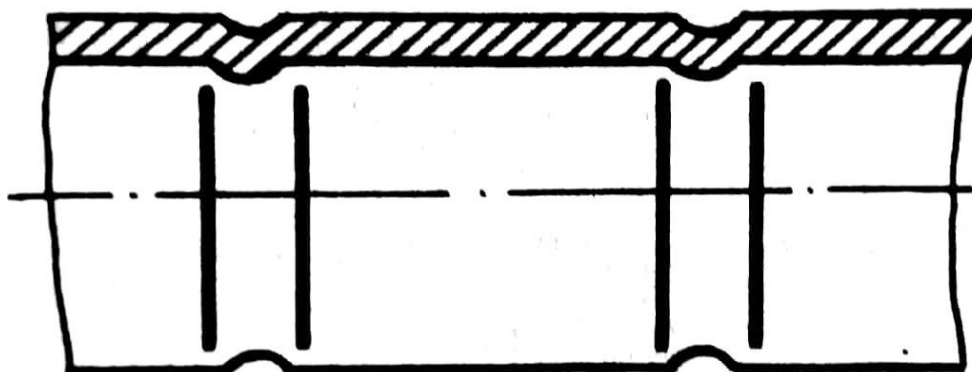


Figure 1.1. Ring-shaped ditch groove.

In a gas-liquid heat exchanger, the coefficient of heat transfer (a_s) on the liquid side can reach up to $5 \text{ kW}/(\text{m}^2 \cdot \text{K})$. On the gas side, however, (a_g) does not exceed $0.1 \text{ kW}/(\text{m}^2 \cdot \text{K})$. The use of flat tubes in such heat exchangers leads to an

increase in the mass and size of the device. For this reason, the surface of the tubes on the side of less efficient heat-carrying agents (gases, liquids with greater viscosity) is made rimless.

Turbalarni qirrali qilib tayyorlanganda quyidagi tenglikka ahamiyat berilishi kerak:

$$\alpha_g F_g = \alpha_s F_s \quad (1.1)$$

in this α_g va α_s – coefficient of heat transfer on the side of gas and liquid
; F_g va F_s – heat exchange surface on the side of the gas and liquid.

The use of promising Amber profiles is a simple and effective way to enhance heat transfer. Currently, in most cases, discrete two-or three-dimensional recesses are used, which are applied evenly, which are part of the heat exchange surface, as elements of the structure of the profile of the inner quince, confusing channels in the form of a diffuser, wave-forming elements (in the form of a wall). It is also effective to use wire and other additives to change the porphyry of the surface. There are almost an infinite number of possible hyometric configurations for profile elements on the surface of the Quire. This can also be seen from the R & D work done on this Soha.

Conclusion

The state of application of annular bulges, which are smoothly performed on the inner surface of the pipes of accelerating wall heat exchange, is considered by scientists to be the most effective. In recent times, the acceleration of thermal amlashination using twisted tubes has attracted the attention of many researchers. It is such pipes that at a comparable rate of increase in hydraulic resistance appear to be the most promising solution to the problem of accelerating heat exchange both on the outer surface of the pipes and inside them. But it is precisely the question of optimizing hydraulic resistance that remains complicated.

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