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## NUMERICAL STUDY OF HEAT TRANSFER INTENSITY IN SHELL TUBE HEAT EXCHANGERS

*Annotation:* Today, every state wants to use economic and economic and innovative technologies, and the existing enterprises and organizations conduct efficiency and distinguishes from opponents. With this goal, the whole world wants to achieve high efficiency in all areas, using new innovations. Digital organization of heat transfer in shell pipes is one of such effective innovations.

*Key words:* heat exchange, microparticles, convection and radiation.

Heat transfer is a spontaneous process of heat transfer from a warmer body to a colder body; a set of processes associated with the chaotic motion of microparticles that cause energy to be transferred from one body to another without microscopic work. Heat exchange takes place through thermal conductivity, convection and radiation. The heating surface is called the heat transfer surface.

In heat exchange, a working medium is a liquid or gas (vapor). The theory of heat transfer is part of the theory of energy transfer and, along with technical thermodynamics, forms the theoretical basis of thermal engineering. Heat transfer occurs in steam boilers, steam and gas turbines, and furnaces. In nature, there is a continuous heat exchange. Theoretical and practical issues of heat transfer are studied in heat engineering.

Crust exchangers (or) Heat exchangers are invented in the use of thermal power plants in the beginning of the thermal power plants, where the water mixed in high pressure is distilled. In the future, the invention began to be used to create

an evaporator and heating structures. For years, the shell and tube heat exchange device has been improved, the design was not very difficult, now it has an opportunity to clean individual elements. Often, they began using similar systems in the production of oil refining and in the manufacture of household chemical products, as the products of these areas have a large number of mixtures. Their sediment requires simply the inner walls of the heat exchanger from time to time.

As we can see in the provided diagram, the shell and tubular heating exchange consists of a set of tubes located in its camera and set on the board or grill. The housing is not actually the name of the entire camera welded from at least 4 mm (or the features of the work environment), in which the sheet is welded, in which contain small tubes and boards. The material used for the council is usually sheet steel. The tubes are connected through pipes, as well as access to the room and exit, there are drains and divisions for condensation.

The volume of the thermal exchange varies depending on the number of pipes and the diameter of them. So, if the heat transfer surface is about 9,000 square meters. m., Heat exchange rate of 150 MW, an example of this steam turbine. A crustacean tube heat exchange includes the welding pipes to planks and lids, they may vary, as well as the bending of the body (in the form of a letter of V). The following types of devices are given in practice.

Another feature of the device is the distance between the pipe should be 2-3 times more than their intersections. Therefore, the heat transfer ratio is small and it contributes to the effectiveness of the entire heat exchange.

Deficiency is a fast pollution of plates due to the smaller of the gaps between them. If thermal carriers are well filtered, the heat exchanger runs a long time. The fine particles cannot be detained abrasive plates and the liquid Turbulization also prevents sediment accumulation.

Based on the name, the heat exchanger is a device designed to transfer the resulting heat to the heated facility. In this case, the refrigeration water is a designed design above. The operation of a crustacean tube is that the cold and hot environment moves around the shells and the heat exchange occurs in the void

between them. Devices require periodicals and control of work. The parameters such as temperature are measured by their access and exit values. If the efficiency decreases, you should check the status of the surfaces. Salt fields affect the thermodynamic settings of heat exchangers, especially heat exchanging. Malakal cleaning is carried out in chemically, as well as using the transformation of ultrasounds vibrations and cooling streams.

Repairs shell and tubular hardware consists mainly of sealed tubes, which worsens their technical characteristics.

Shell and tubular heat exchanger is widespread due to the following positive qualities.

- resistance to mechanical stress and water collection;
- low requirements for clean instruments;
- High reliability and endurance;
- broad;
- Opportunity to apply in different sanctions.

Disadvantages of this type of model include:

- low heat conductivity coefficient;
- important dimensions and high metal consumption;
- Metal consumption is high price due to increased;
- the need to use devices with large margin due to connecting the damaged tubes during repair;

Condensate fluctuations change heat transmission on horizontal devices without linear. Shell and tubular heat exchangers have a low heat conductivity coefficient. These are partly corpus spaces that are 2 times larger than the common intersection of pipes. The tiger allows candles to increase the speed of fluid and improve heat transmission.

Cooling water passes in Annulus and is given through the heated tools. Similarly, it can also be cooled. The effectiveness of thermal transmitting is provided through the creation of the number of pipes or the creation of external cooling water.

Currently, the industry uses different types of heat exchangers. Each of them has its advantages and disadvantages. Particular attention should be paid to equipment such as shell and tube heat exchangers.

One of the main advantages of such devices is their low cost. Compared to other types of equipment, shell and tube devices, for example, are much cheaper than plate or rib devices. The cheapness of these devices depends on their simple design. Heat is transferred from one medium to another through pipes. The transmission of the clean medium is done directly through the housing.

An important advantage of shell and tube heat exchangers is that they can withstand the high pressures of various environments involved in the heat exchange process.

Another plus of these devices is that they continue to operate even when medium-strength compression shocks are made. This is an important and very important characteristic that should be taken into account when choosing a particular type of heat exchanger.

In addition, advantages such as the ability to continue working in the event of a breakage of one or more internal tubes should be emphasized. If such a situation arises, the overhaul can be delayed for a period of time if necessary, as the equipment can continue to operate without significantly reducing efficiency.

The advantage of piped devices is that they can adapt to any environment, sea or river water, petroleum products, oils, chemically active environments and so on. Regardless of the specific type of work environment, the reliability of the devices will be so high.

However, despite the significant advantages of shell tubular heat exchangers, significant shortcomings cannot be overlooked. For example, the large size and complexity of installation and maintenance. In addition, the heat transfer efficiency of these devices is low.

Today, the production of heat exchangers is carried out by many companies. You can get acquainted with the products of this or that company on the relevant website, where you can immediately order the device you like and need. So you

can save not only time but also energy, because now you do not have to spend precious hours on the road, search the store and walk in the shopping malls, consult a specialist of INEN, Hawle, Orbinox brands and so on. , Broen, Auma.

Now we will consider the technical characteristics and principle of operation of shell-tube heat exchangers, as well as the characteristics of the selection when calculating and purchasing their parameters.

Heat exchangers provide the process of heat exchange between liquids where the temperature of each is different. At present, the shell tube heat exchanger has found its success in various fields: chemistry, oil, gas. There are no difficulties in production, they are reliable and have the ability to develop a large heat exchange surface in a single apparatus. They got their name because of the presence of a housing that hides the inner pipes.

The main advantage of organizing a numerical study of heat transfer intensity in shell tube heat exchangers is that it achieves efficiency in terms of time and accuracy. In such an observation, the process can be monitored remotely using a computer, digital technology.

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