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THE ENVIRONMENTAL ASPECT OF THE USE OF HEAT PUMPS

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Modern human life is impossible without industry. We produce all kinds of household items, use transport to move, electricity to improve the quality of life, but few people think about how this affects our lives in the long term.

The main problem of human activity is that it violates the quality of our habitat zone – the Earth. Industry, thermal power plants, waste affect the climate, human health and the future prospects of a quality life.

Our main task is to use energy and resources that are finite as efficiently as possible. This can be done by introducing energy-efficient technologies: LED lighting, recuperation, nuclear power on a closed cycle, alternative energy sources. It is about recovery that we will talk about.

Simplistically, recovery is the process of using useful energy, which, usually, is simply “thrown away”. A good example of recuperation is indoor ventilation: in winter, cold air replaces warm air, which is extremely inefficient. We can use heat exchangers, which, before releasing warm air from the room, will warm up the cold air with them. Thus, we will need to spend less energy to heat the premises.

But how can the efficiency of this technology be increased? We can use heat pumps. These are devices that allow you to “move” heat using third-party energy. Due to their design features, they allow you to extract the maximum amount of useful energy from the air, earth or water.

The heat pump consists of a compressor, a condenser, a desiccant filter, a capillary tube and an evaporator. The compressor creates pressure in the condenser, due to which the freon heats up, when the excess heat goes away, the freon condenses and becomes a liquid, then it passes through a filter dryer, where it is cleaned of mechanical impurities and water. It passes through a thin copper tube

(it creates resistance for the compressor). After the liquid freon enters the evaporator, it expands sharply and begins to evaporate. And, since heat is absorbed during the evaporation of any substance, the evaporator cools down. Freon turns into a gaseous state and enters the compressor. The cycle closes.

Advantages of heat pumps:

They “move” existing heat, rather than create it (burning or heating by electricity). Using a small amount of energy, we can move 4-5 times more heat. This opens up huge opportunities in the modernization of heating systems of residential buildings, ventilation systems and food storage.

It is due to the small amount of energy consumed that heat pumps are much more environmentally friendly than traditional heating methods: burning coal, methane, firewood and heating with electricity. During the entire period of operation, they do not emit any harmful substances, and do not require frequent repairs under the right working conditions.

However, there are disadvantages:

High cost due to low demand and lack of large production facilities in the Republic of Belarus. A complex process of installing contours, checking them for tightness, drilling wells.

If the circuit is damaged, freon leakage is possible, which has a high greenhouse effect (hundreds and thousands of times stronger than from carbon dioxide).

Old heat pumps run on freons dangerous to the ozone layer, which contain chlorine and bromine molecules. However, these freons are banned for production all over the world, and they are being actively replaced with ones that are safe for the ozone layer.

The use of heat pumps for energy conservation is an important step towards sustainable development and environmental protection. They can significantly reduce energy costs and reduce harmful emissions into the atmosphere. In the future, we will see more and more applications of heat pumps in various industries and sectors of the economy.

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