PRACTICAL APPLICATIONS OF HEAT PUMPS IN FOOD INDUSTRY

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Ensuring a reliable, economical and sustainable energy supply as well as protecting the environment and climate are important global challenges of the 21st century. Renewable energy and improving energy efficiency are the most important steps to achieve these energy policy goals. While impressive efficiency gains have already been achieved in the past two decades, energy use and CO_2 emissions in manufacturing industries could be further reduced if the best technologies available worldwide were applied. Heat pumps have become increasingly important in the world as a technology to improve energy efficiency and reduce CO_2 emissions. In particular, industrial heat pumps (IHP) offer various opportunities for all types of production processes and operations.

In the food industry there is a wide variety of heat sources and potential users; thus, there are various applications for industrial heat pumps such as: drying and dewatering; evaporation; washing, cleaning; cooking; sterilization, pasteurization. A central technology needed to improve energy efficiency is the application of heat pumps to recover heat from waste streams to raise temperatures, replace steam and, in some cases, simultaneously provide process cooling. Classic applications of high temperature heat pumps in food processing include:

• Food drying and washing processes, where the cold side of the heat pump captures the latent heat in the exhaust stream as well as the sensible heat to provide hot and dry incoming air, water or steam at the required temperature;

• The process of heating or cleaning water by improving the waste heat from a waste heat stream or from a refrigeration system;

• Pasteurization where the heat pump can provide heating and cooling functions to replace steam.

Keywords: heat pump, renewable energy, compressor, temperature, heat transfer.

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