

Importance of Refrigeration and its Types

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Refrigeration is an art of maintaining a system/object at a temperature lower than ambient temperature or surroundings. Refrigeration is used in every day to day life. Foodstuffs are stored at congenial temperature for preventing them from spoilage. The spoilage is reduced as micro-organisms are inactive at lower temperature and thus spoilage is reduced. In medicinal field, different medicines are stored at refrigerated temperature preventing them from spoilage. Also refrigeration is utilized to maintain a given volume of space at comfortable temperature. During summer the required space is maintained at lower temperature than ambient temperature for comfort. While during winter the required space is maintained at higher temperature than ambient temperature for comfort. For achieving refrigeration different types of refrigeration are available.

In vapour compression refrigeration system, refrigeration is obtained by giving electric power to compressor and mainly liquid type of refrigerant is used. In vapour absorption refrigeration system, refrigeration is obtained by supplying heat energy to generator (heat receiving device from external source and does the work in place of compressor in compression refrigeration system). It has both refrigerant (liquid type) and absorbent (solid type). In gas cycle refrigeration system, gas type refrigerant is used. Ejector type refrigeration system is a modified form of vapour compression refrigeration system where ejector is used in place of compressor. Here mainly water as refrigerant is used. Lastly thermoelectric refrigeration system is there which works on thermoelectric effect (evolution of heat at one junction and absorption of heat at other junction after passing electric current through a circuit of a thermocouple). Thermocouple is an electrical device which consists of two dissimilar electrical conductors thus forming an electrical junction.

The COP (coefficient of performance) i.e. performance index of refrigeration are different for different refrigeration types. COP of compression refrigeration system is always more than 1 and higher than absorption system. COP of gas cycle is higher than compression refrigeration system. COP of ejector type is upto 0.3 and for thermoelectric refrigeration system typically between 0.3 to 0.7.

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