

# WASTE HEAT RECOVERY FOR RECIPROCATING COMPRESSORS

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In many important industries (oil and gas, process gases, chemical process engineering) multi-stage reciprocating compressors are used, especially for high pressure ratios. The gas is compressed in multiple consecutive stages and cooled after each stage in order to reduce the maximum process temperatures. The rejected heat is often dissipated to the environment and the usable part — the exergy — is lost. The aim of this paper is to show how the waste heat potential of reciprocating compressors can be used. For this purpose, the waste heat available per stage is quantified for different compression scenarios. Based on this, the processes for the waste heat recovery suitable for the temperature range of the discharge gas as heat source are presented — in particular, the structure, working principle and characteristics of the waste heat recovery system. It is shown that the waste heat can be used flexibly for different purposes (heating, power generation, cold supply). The potential of the possible methods of waste heat recovery can be estimated with the aid of the given efficiencies of the respective energy conversion processes.

**Keywords:** reciprocating compressor, waste heat recovery, heating, thermoelectric generator, organic Rankine cycle, absorption refrigerator.

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