

IMPROVEMENT OF COMPRESSOR REFRIGERATION CYCLE BY MEANS OF TWO-PHASE EJECTOR

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One of the most important loss in the refrigeration system is caused by the throttling process. It appears that this loss is very important even at moderate temperature lift. A number of practical solutions are possible to reduce it. One of the most promising is the application of two-phase ejector to recovery of expansion work. The idea of compressor refrigeration device equipped with the ejector and liquid separator is presented in Fig. 1.

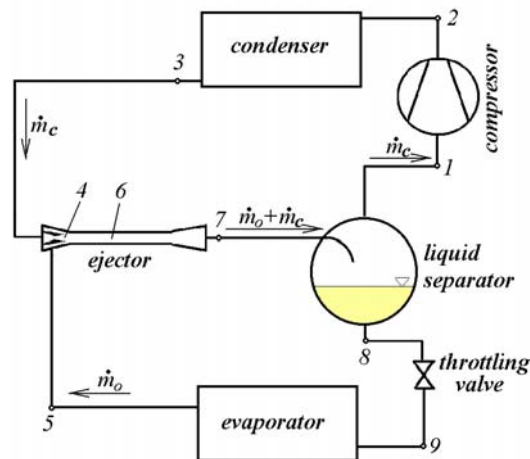


Fig. 1. Schematic diagram of compressor refrigeration device equipped with two-phase ejector.

The pressure drop between condensation pressure and liquid separator pressure is partly used for suction and compression of vapour leaving of evaporator which strongly reduce the throttling loss. The motive fluid is the condensate which partly evaporates in the motive nozzle of the ejector. The mixing shock occurs in the mixing chamber of the ejector which causes pressure rise. Additional compression of the two-phase system occurs in the diffuser.

The own model of combined compressor-ejector refrigeration cycle was presented in the paper. This model enables to calculate flow ratio of sucked vapour and motive liquid as well as increase of COP due to application of the two-phase ejector.

Testing stand for investigation of the two-phase ejector for refrigerants is described in the paper. The results of our own experimental investigation of the two-phase ejector working with refrigerant R 123 are presented. The effect of compression ratio and flow ratio on the ejector efficiency is showed.