

GAS COMPRESSORS

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A gas compressor is a mechanical device that increases the pressure of a gas by reducing its volume. Turbo compressors are most popular. It in comparison with other compressors is more economic, easier in service and cheaper. But centrifugal compressors can have not great efficiencies; around 80% polytrophic therefore a decrease of operating costs for these machines is an important task for government of any country.

Turbo compressors (centrifugal compressors) concern to machines of dynamic compression. Air strikes into impeller, rotating with the big speed, is braked on specially designed volute. At braking air is compressed.

Centrifugal compressors consist of rotor and stator parts. The main details of rotor are shaft and impeller (rotating disk) to increase the velocity of the gas. The main details of stator are diffuser, body, bearings, seals. A diffuser (divergent duct) section converts the velocity energy to pressure energy. In the case of centrifugal compressors, commercial designs currently do not exceed a compression ratio of more than a 3.5 to 1 in any one stage. Since compression generates heat, the compressed gas is to be cooled between stages. Main characteristics of centrifugal compressors : flow rate, pressure ratio, rotor speed rotation, gas temperature before a compressor, mass flow rate of an gas, dimension, weight.

Flow channels of turbomachines have complex geometrical form, fluid or gas flow have three-dimensional characteristics. Mathematic models for calculation of viscous gas or fluid turbulent flow in turbomachine channels are quite complicated.

There are many options for the "prime mover" or motor which powers the compressor: gas turbines; steam turbines or water turbines are possible for large compressors; electric motors are cheap and quiet for static compressors; diesel engines or petrol engines are use for portable compressors.

Turbomachines find wide application almost in all of the industry branches. Turbines, turbo-compressors and dynamic pumps constitute such an essential part of power equipment on many plants, that it is possible to state that the work of these plants would be impossible without these units. Gas compressors are used in such applications: in pipeline transport of purified natural gas to move the gas from the production site to the consumer; in petroleum refineries, natural gas processing plants, petrochemical and chemical plants, and similar large industrial plants; in refrigeration and air conditioner equipment; in gas turbine systems to compress the intake combustion air. It's one of effective ways of heating our houses.