MANGAN INDUSTRIAL GROUP

REGENERATIVE FLOW TURBOMACHINES (RFC & RFP)

The regenerative flow compressor (RFC) is a turbomachine that permits a head equivalent to that of several stages of a traditional machine of comparable tip speed, but at low flow rate. The flow through the rotor of this machine is helical superimposed on tangential flow through its annular / flow channel and hence the fluid passes through the vanes a number of times. This repetitive action of the impeller blades on the fluid, in effect, “multistaging” accounts for a high head per stage.

A regenerative flow compressor has a similar performance characteristic to those of a positive displacement turbomachines for duties requiring a high head at low flow rate, but the isothermal efficiency of RFC is usually less than 50 %. The low efficiency arises from various losses which are directly related to the geometry and operating principle of the machine.

Advantages

- No surge and stall instability
  - Absence of wear
  - Oil free opereation
  - Operating under cavitation (RFP)
  - Continuous flow
  - Simplicity of construction
  - Compact size and low maintenanc

Essential components

- Impeller (rotor) with blades
- inlet port exit port
- stripper
- flow channel

Applications

- Petroleum industries
- Chemical industries
- Power industries
- Food processing industries
- Nuclear industries
- Aerospace industries

RFCs have been proposed for use in hydrogen gas pipelines and as helium compressors for cryogenic applications in space vehicles. They can also be used as natural gas pipeline compressors.

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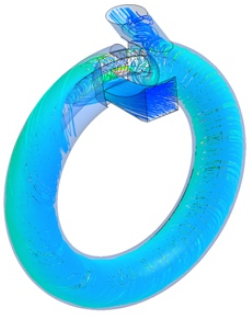
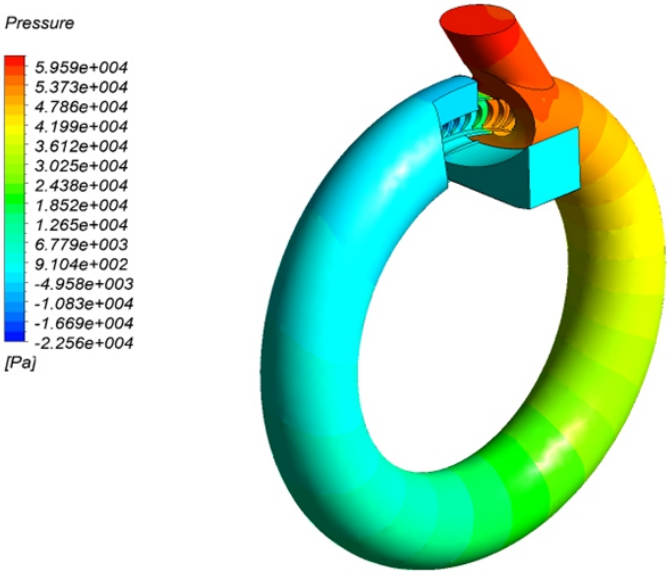
RFCs are advantageous for incorporation in small closed cycle helium refrigerators.

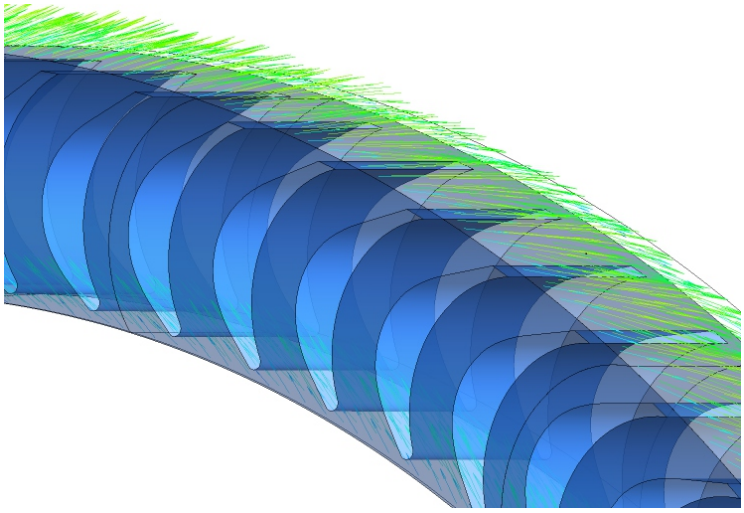
Because of the reliability, compact size and low maintenance, recently there is an increasing use of regenerative compressors in low pressure (1.38-103.5 kPa gauge) natural gas compression required by microturbine systems. Regenerative blowers have found many industrial applications in solids conveying systems.They also find use in sewage treatment, which require considerable volume to be blown against a head of water. Regenerative blowers are also used for powder coating recovery applications, plating, cleaning and rinse tank agitation.



RFPs have found applications in automotive and aerospace fuel pumping, booster systems, water supply, agriculture industry, shipping and mining,



chemical and foodstuff industries and regulation of lubrication and filtering. One of the advantages of regenerative pump is that operation under cavitation does not generally lead to mechanical failure.



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