

Steam Jet Vacuum Pumps (Single-Stage)

In steam jet vacuum pumps live steam expands through the inlet nozzle, issuing at high velocity. The powerful suction thus produced entrains air or vapors via the suction connection.



Advantages

- A single pump can manage very large flow volumes of up to 1,000,000 m³/h without problems.
- High standard of operational reliability and vacuum performance
- Low investment costs in comparison to other possible alternatives
- Absolutely no difficulties in the case of process media with a strong tendency towards fouling and small amounts of solids or liquids
- No moving parts
- Practically maintenance free
- Corrosion/erosion resistance by choosing suitable material
- Easy installation
- Simple compact construction

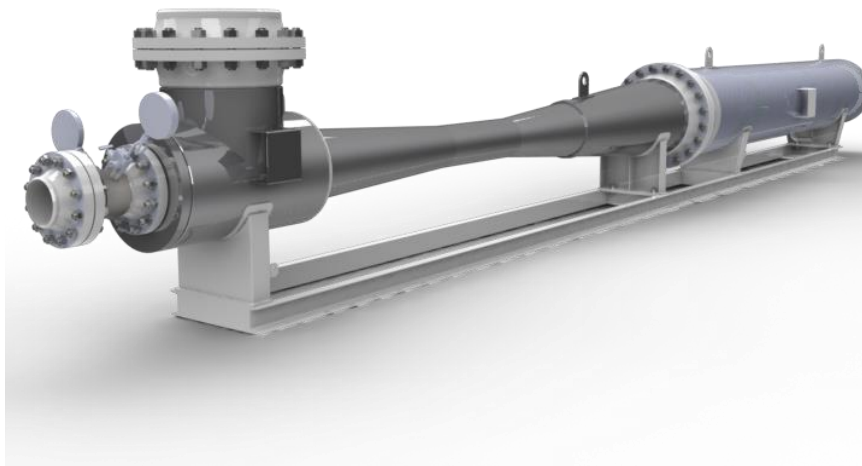
Applications

If a plant is to be evacuated within a given time, for example, during starting up, and the vacuum pump which maintains the operational vacuum takes longer than the given time, a jet pump is added as a *start-up pump* or *pre-evacuator* to speed up the evacuation. It is brought into operation together with the vacuum maintaining pump, but works only until the required vacuum, or a determined intermediate vacuum is reached.

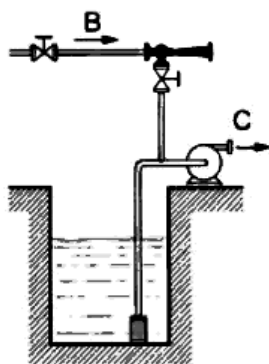
Steam jet vacuum pumps are commonly used for handling condensable and noncondensables in processes such as

- Priming centrifugal pumps

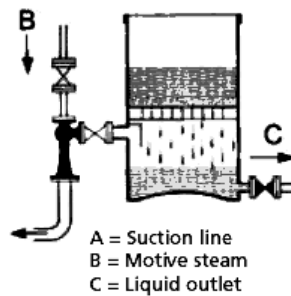
- Exhausting air from vacuum pans and evaporators
- Exhausting tire molds
- Cooling
- Handling corrosive gases
- Distillation
- Absorption
- Mixing
- Vacuum packaging
- Freeze drying
- Production of vacuum in stirred vessels in discontinuous processes



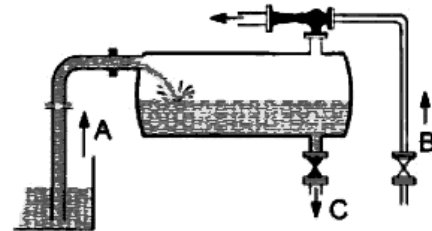
Typical applications for single stage steam jet vacuum pumps are shown below:



Evacuation of the pump lines of non self-priming pumps



Production of vacuum in suction filter or similar types of filters

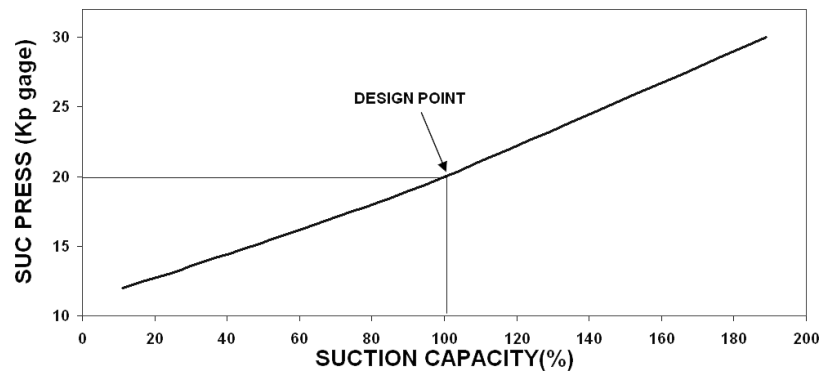


Lifting liquids

Range of Operation

- When compressing against atmospheric pressure, used for the production of vacuum down to a suction pressure approx. 100 mbar.
- Single stage start-up jet pumps can, according to the motive steam pressure, achieve a suction pressure of 50 - 200 mbar.

The graph below shows the changes of suction pressure in terms of suction flow rate for a single stage steam ejector.



Also, the curve of the diagram below specifies the suction capacity per unit volume of the tank in terms of the required vacuum and the time to reach it.

