

Cold Sump Effect

Vertical Sealless Pump



All cryogenic pumps face two operational challenges. First is running two phase flow, that is supplying the pump with liquid close to its boiling point, and second is insufficient initial pump cool-down. Either case will lead to cavitation, resulting in pump damage and reduced life.

The solution to both these challenges is to build the cold end of the pump “into a liquid sump”.

ACD’s AC-32 pump has tackled both of these issues resulting in a cold end that

is integral to the motor. The liquid cryogen is circulated through the motor casing, effectively providing a “cold sump” in which the pump cold end is located. The pump is designed to operate with Nitrogen, Oxygen, Argon, LNG or low pressure refrigerated liquefied petroleum fuels.

This design provides two significant benefits over traditional centrifugal pumps. It eliminates the need for a seal on the shaft between the motor and the cold end. Additionally, cooling the pump to a sufficiently cold temperature dramatically increases efficiency. The pump also features virtually wear-free ceramic bearings, eliminating the normal mechanical play found in the shaft. The combination of sealless design coupled with ceramic bearings greatly extends the life of the pump.

The AC-32 is perfectly matched to filling and offloading road tankers at very high flow rates while affixed to the vehicle, or located on-site.

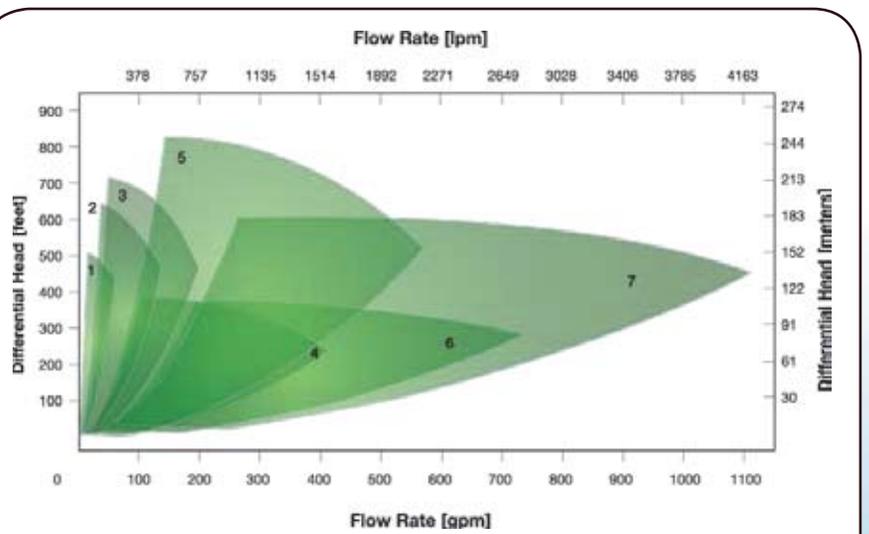
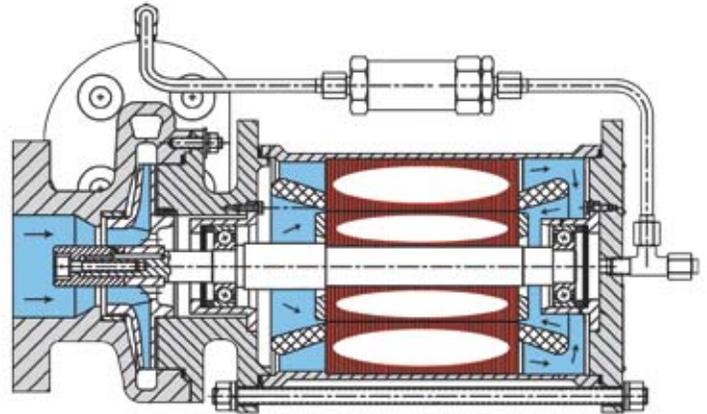
In order to increase pay load on large haul runs, many road tankers do not fit pumps onboard. They connect to a ground mounted pump for unloading. Often the liquid is “warm” and the pump can have

difficulties priming and pumping efficiently.

The sump on the AC-32 enables the vapor to be removed from the liquid resulting in higher efficiency. Some fueling locations fill tankers regularly several times a day and need to start pumps quickly. In this case, the sump can be maintained full of cryogenic liquid, and ready for immediate start up.

Cryogenic Industries affiliates ACD and Cryoquip, have worked together on this project. ACD engineered the pump and Cryoquip designed and built the sumps.

It is this synergistic collaboration and team work that sets Cryogenic Industries apart and allows them to provide innovative solutions to the gas industry’s challenges. www.acdcom.com.



Speed	1: 1 x 2 x 4.5.....1,500 to 7,000 rpm	5: 2 x 4 x 8.5 1,500 to 7,000 rpm
Range:	2: 1 x 2 x 6.....1,500 to 7,000 rpm	6: 3 x 5 x 8.5 1,500 to 5,000 rpm
	3: 1.5 x 3 x 6.....1,500 to 7,000 rpm	7: 4 x 5 x 10.5 1,500 to 5,000 rpm
	4: 2 x 4 x 6.....1,500 to 7,000 rpm	