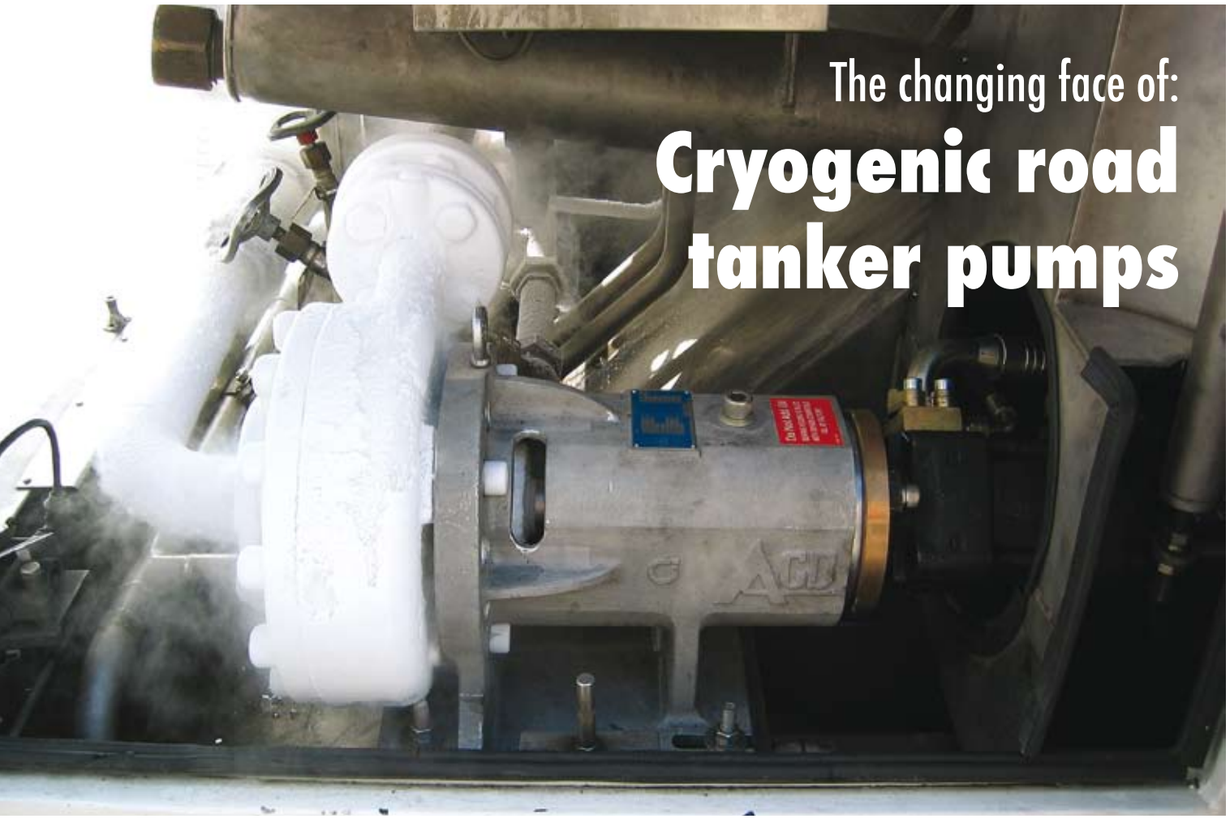


The changing face of: Cryogenic road tanker pumps

The changing needs of today's cryogenic road tanker fleet operators require the development of new road tanker pumps to meet the challenge. Rising to this challenge prompts the evolution of such pumps as we know. The development of cryogenic road tanker pump solutions is not new to ACD CRYO.

About ACD CRYO
Whilst the European operation may appear small, it is often forgotten that ACD CRYO is part of one of the largest cryogenic equipment manufacturers in the world. ACD CRYO is a member of the Cryogenic Industries Group and benefits from the technical support of its parent company ACD. This support is particularly important when ACD CRYO is looking at improving or designing new pumps.

•www.acdcryo.com

Photo Above:
Top 260 pump.

ACD CRYO is not the largest Cryogenic Pump manufacturer in Europe, but when it comes to innovative solutions it is no slouch either. The company has worked on the development of two types of road tanker pumps in recent years and as part of one of the largest cryogenic equipment manufacturers in the world, is well placed to discuss the evolution currently underway.

Ensuring reliability and avoiding costly failures, integrating ease of use, and a longer shelf life are all factors for the evolution of cryogenic pumps – as we discover this month.

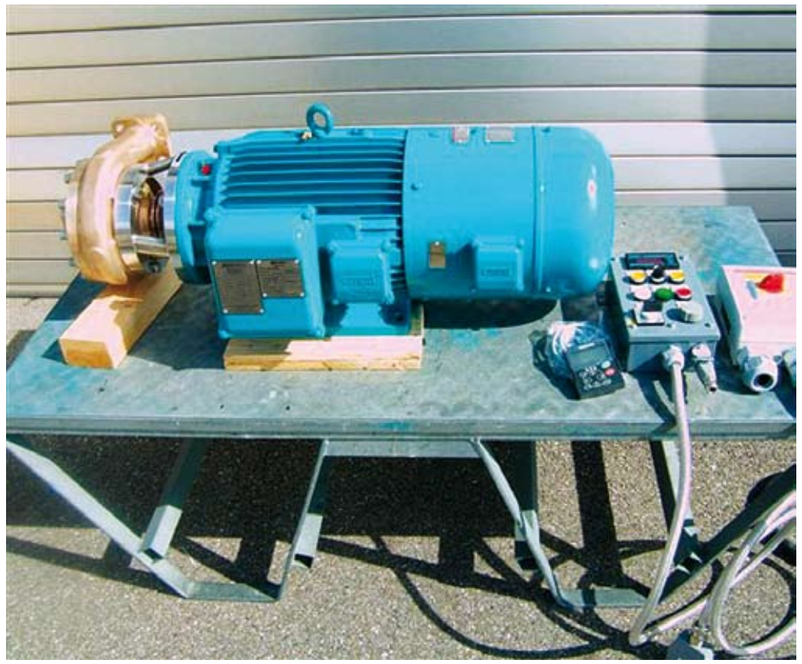
Here, ACD CRYO's Business Development Manager, Steve Hinchliffe discusses the development of road tanker pumps undertaken by the company and the requirements from industry that shaped the way these were made.

Meeting the challenge
ACD CRYO's original variable frequency drive DCP 180 had been available for some years, but we were asked to look at a pump that would force the operator / driver to make some positive choices before he operated the pump to ensure safe operation due to both available line current limitations and also receiver tank pressure.

Our clients particularly like the ACD CRYO DCP 180 pump because the pump is fitted directly onto the specially extended motor shaft thus eliminating any chance of coupling imbalance caused by using two separate shafts that are joined. Some other manufacturers use a joint between their shafts and this could cause premature mechanical seal or motor bearing failure.

They also like the idea that they can change the impeller to a narrow tip type enabling them to achieve at least 33 bar discharge pressure in LIN. This means that there is no need to install a different model of pump if they have a client that requires higher than normal road tanker pump pressures. All they have to do is install the narrow tip impeller and the rest of the pump remains the same. This is seen as a real cost saving option due to the fact that they don't need to stock spares for two different pump models.

Of course, as with all Variable Frequency Drive pumps, it is also possible to control the pump speed within pre-set limits via the frequency control device that allows the driver / operator to adjust the speed to suit a particular installation. An additional feature is that the pump also comes with the CFS mechanical seal that is designed to give longer life than the old carbon faced seals. Such a pump design has been so



successful that a number of customers now specify this pump for their mobile pumping operations.

The second road tanker pump development arose when we were asked if we could deliver a high flow/ pressure pump to meet the 35-36 bar pressure for LIN tanks that are used to supply gas for laser applications.

With a standard type of pump as generally used by all cryogenic road tanker operators, the driver / operators has to drop the pressure of the laser supply tank from around 33/34 bar to less than 29 bar to enable them to get the product from the road tanker into the receiver tank. Unfortunately this method necessitated the loss of a considerable amount of product. There were already existing hydraulically driven pumps on the market that could meet this higher pressure, but they were all known to suffer from frequent bearing or seal failures and were not considered reliable enough.

Reliability
ACD CRYO had not ventured into this aspect of the market before, but we were aware that our parent company had the TOP 260 pump available that was large enough to deliver the pressure/flow requirement provided we could re-design the impeller to provide a higher discharge pressure.

If we could make the changes there would be some distinct benefits of using this pump over other pumps. The pump is directly coupled to a hydraulic motor eliminating the need for a gearbox and the pump shaft bearings are lubricated through a splash oil system that ensures that the bearings do not have to be replaced as frequently as do pumps with grease lubricated bearing.

Another benefit is that the foot mounting points are cast as an integral part of the casting eliminating the need for a special mounting bracket to hold the pump. The design team at ACD rose to the challenge of the request made by ACD CRYO and in a matter of weeks had a pump available for our customer to install for extended tests. After six months of operation the customer's feedback proved very positive.

> **"We cannot afford to sit back and relax for one minute..."**

There is another unique design aspect to this pump. The Mechanical seal is of a cartridge design where the pre-load is already set in the factory meaning the technician changing the seal doesn't have to worry about setting the correct pre-load reducing both down time and the chance of error during seal change.

Conclusion – A view from inside ACD CRYO
We are very pleased with the developments we have made so far with our road tanker pumps, but we cannot afford to sit back and relax for one minute and we already have other thoughts on improvements that can be made to make life easier for our customers.

One final word…..we wouldn't want anyone to think that we only concentrate on road tanker pumps! We have already introduced a new concept in high pressure cylinder filling piston pumps which work just as well on non-thermosyphon as they do on thermosyphon design tanks.

The customers that have purchased them so far are delighted with the performance, reliability and the extended time between service intervals; and better still, the service cost of this pump is below that of other similar duty pumps. ❑

Industry testimonial
Testimonial for the TOP 260 centrifugal pump from Mr R-J Cornelissen, Fleet Manager, Linde Gas Benelux.

"On the 7th November we achieved 1.000 running hours without other problems. For us this is a milestone as we have never achieved to operate a direct driven road tanker pump for such a period of time without failure. It's even more special because it runs in a 24/7 double shift with different drivers and a wide range of discharge pressures. In total approximately 12 drivers have been operating this Semi Trailer and your pump."

Photos:
Above left: DCP180 – FC pump with controls.
Above: Frequency Converter.
All pictures © ACD CRYO