



Tanker Offloading

Transfer of hazardous substances between sites by road or rail is an essential part of the UK economy. The cargo is often extremely hazardous and very valuable.

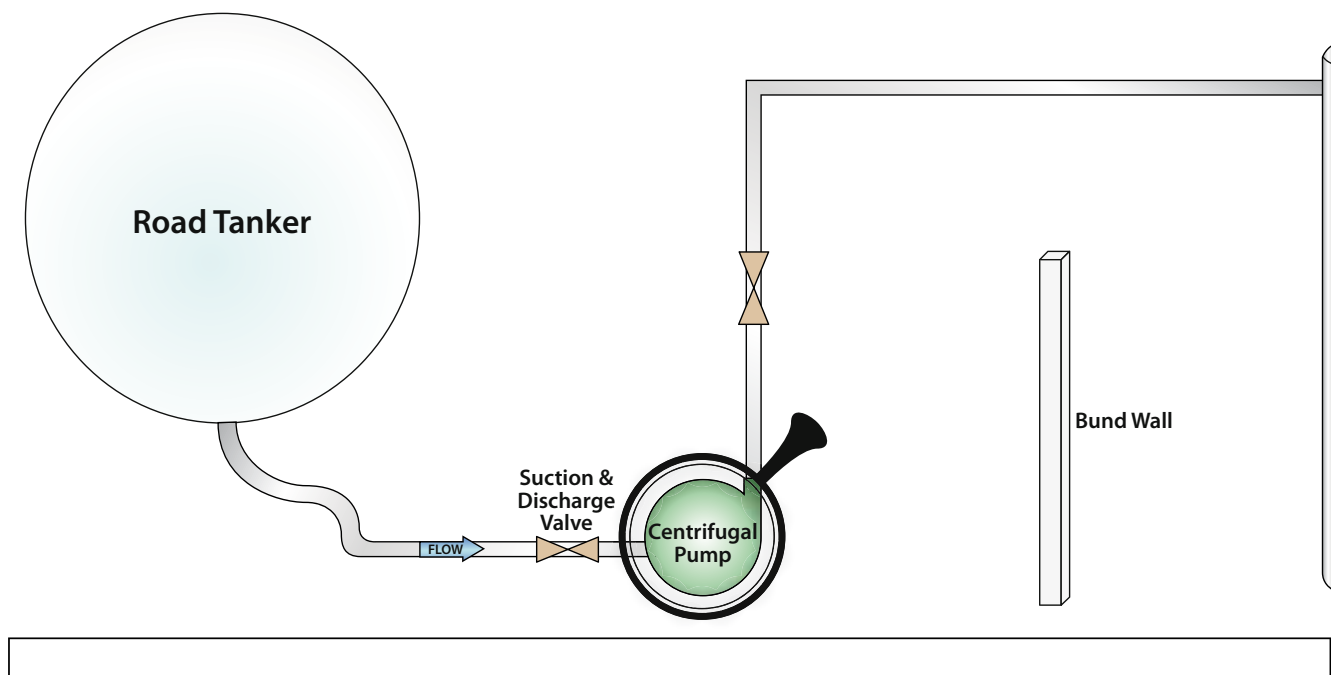
The transfer of the liquid from tanker to holding tank/IBC is a critical point for safety of personnel and the load. A leakage of highly aggressive chemicals is costly in time, clean-up and may cause damage to the site staff, equipment and the surroundings.



Cargo examples

There are many different products transferred between sites in bulk powder, liquid or gaseous form

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|-----------------------|---------------------|---------------------------------|
| ■ Ferric Chloride | ■ Caustic Soda | ■ Toluene |
| ■ Ferrous Chloride | ■ Petroleum | ■ Acetone |
| ■ Aluminum Sulfate | ■ Oil | ■ Ethanol |
| ■ Sodium Bisulfite | ■ Food and beverage | ■ Other acid & alkali solutions |
| ■ Sodium Hypochlorite | | |



Left: An example of a tanker offloading system

Process points

Tanker loads may need different pump materials to withstand their corrosive and aggressive properties.

There is potential for a pump to run-dry from the tanker off-loading its contents. Pumps are often run until the operator hears cavitation prior to switching off.

When off-loading in cold weather the viscosity of a pump media can increase rapidly. When handling more viscous media the unloading pump discharge pressure may not be high enough to overcome the elevation head required to pump into the storage tank.

The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) require UK employers to control the risks to safety from fire and explosions. The off-loading process is subject to stringent site safety regulations.

Onsite and offsite personnel may have different clearance levels to authorise and initiate the transfer. A quick turnaround time is needed, particularly for busy sites with a schedule of multiple off-loading.

A pump must be compatible with standard regulation couplings to maintain the site safety directives.

The solution

Verder has consulted extensively with customers requiring an off-loading facility for a tanker.

Customer options

Customers suggested that previously installed side-channel pumps could handle a range of chemical and other aggressive media, however it did not have the NSPHR for when the discharge pressure fell from the tanker. A canned motor pump operated very well with all aspects of operation, however customers suggested that the spare parts cost was prohibitive for the estimated working-life of the pump.

Example of offloading requirements

Flow Rates	20 – 135 m ³ /hr.
Differential Head	8.5m – 45m.
Density	790 kg/m ³ –1000 kg/m ³ .
Viscosity	0.32cP – 46.5cP.
Solids	2% Sodium Ascorbate (less than 50µm).
Operating Temperature	-10°C – 25°C

The use of mechanical seals had caused significant problems due to leakage and costly clean-up procedures.

The Verdermag range of pumps have been specified at key sites with great success. Verder provide a full consultation for the pump media and the site requirements with a trial pump at the site.

Verdermag advantages

Verdermag pumps do not use mechanical seals. Every Verdermag pump is hermetically closed, which means it is 100% leak-free. Every pump is designed to have as few parts as is possible for a robust operation with emphasis put on maximum interchangeability and quality. This makes any Verdermag pump easy to service and involves very little maintenance.

The Verdermag range has an optimised open impeller design with low NPSHr. The pump range also features high quality Alpha sintered SIC bearings and ETFE wetted parts.

The range is compatible with accessory products such as digital load monitors to measure when the pump is in danger of running dry with auto-shutdown facility and dip switches for security coded operation.

The Verdermag range is suitable for a very wide range of aggressive chemicals due to the leak-free nature and list of internal materials and coatings it is available with.

The simple operation and design assist with a quick off-loading time to keep a site on schedule.

The Verdermag centrifugal pump was a lower cost option than a side-channel or canned motor pump.

Specialist applications

For high pressure and for heavy duty applications, the Verdermag Global range of pumps can accommodate aggressive materials at high pressures and extreme temperatures.

