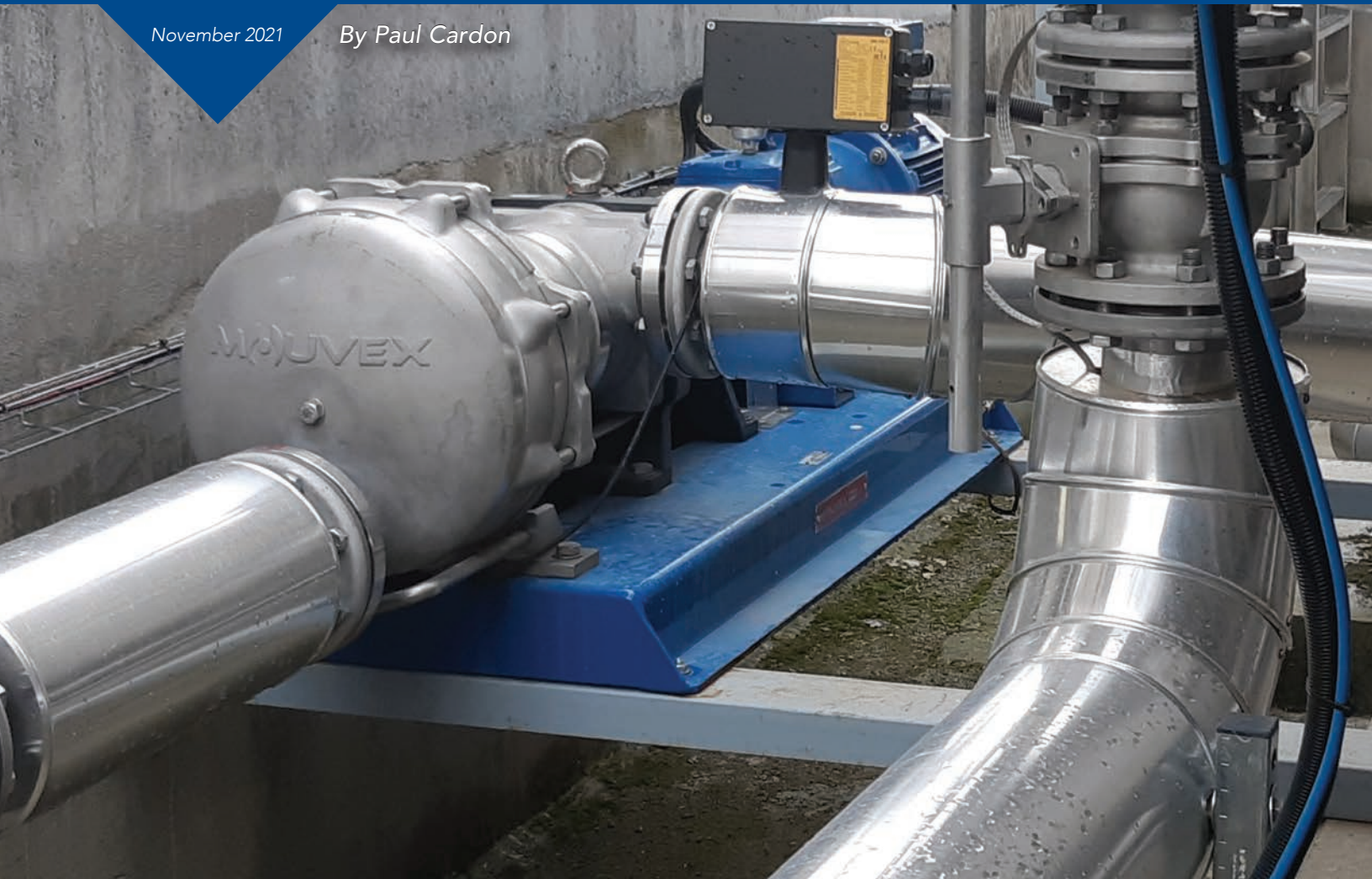


# Moving Fluids with Mouvex®

Meeting the challenge of transferring dangerous liquids without common pitfalls, expenses

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By Paul Cardon



*A worldwide leading producer of paints and coatings has been running eccentric disc pumps for the handling and transfer of resins, solvents, binders and finished paints without interruption or maintenance since the installation of the first pumps in 2005.*

## Introduction

Moving industrial fluids from one point to another is essential to the health of the worldwide economy. There are a variety of methods to transfer these fluids, with the most common being by truck and rail. The process of loading and unloading tank trucks and railcars occurs daily thousands of times at industrial sites across the world.

While this is a routine procedure, it also comes with safety and cost challenges. On the safety side, the primary risks associated with fluid transfer include leakage and spillage, both of which can create catastrophic consequences. Hazards from leaks and spills range from widespread pollution to fires.

Regarding expenses, spills and leaks lead to a loss of product. When you consider the frequency of fluid transfers across the world, a small spill or leak during each of those interactions creates substantial product loss, all of which impacts the bottom line to the tune of millions of dollars. Additionally, if leaks or spills occur, then maintenance also becomes an immediate necessity on the pumping equipment, which adds to those costs. Another costly problem comes from shearing when using a non-adapted pumping technology.

Complicating fluid transfer is the fluid itself. Each liquid brings its share of unique challenges when it comes to loading and

	Flammable	Toxic	Hard to Seal	Shear Sensitive
<b>Isocyanates</b>	Yes	Yes	No	Yes
<b>Polyols</b>	Yes	Yes	No	No
<b>Styrene</b>	Yes	Yes	No	No
<b>Polymer emulsions</b>	No	Yes	Yes	Yes
<b>Phytosanitary products</b>	Yes	Yes	No	No
<b>Polyethylene glycol</b>	No	Yes	No	No
<b>Cationic binder</b>	Yes	Yes	Yes	No
<b>Fertilizers</b>	Yes	Yes	No	No
<b>Glucose</b>	No	No	Yes	No
<b>Molasse</b>	No	No	Yes	No
<b>Dairy products</b>	No	No	No	Yes
<b>Wine</b>	Yes	No	No	Yes
<b>Fruit concentrates</b>	No	No	Yes	Yes

unloading. In the chart above, are a few examples of liquids that are transported by road or rail. If there is at least one “yes” in the product line, an adapted pumping technology must be used for loading and unloading applications.

## Hazards

Leaks from pumping equipment typically come from the mechanical seal. A truck uses an unloading pump intermittently, meaning that its intervals are not continuous or steady. Those circumstances can prove problematic for products that dry or polymerize when static, especially when a mechanical seal has a leak. Those products will leak rapidly from the compromised seal.

Spillage is nearly impossible to avoid. During those thousands of routine transfers, the hose between the truck tank and the pump must be disconnected. Regardless of the liquid, there will always be some left inside the disconnected segments. This requires recovery protocols and protective measures for staff.



*Eccentric disc pumps are successfully handling flocculent at a polymers plant.*

## Costs issues

Outside of the high expenses that come from safety issues, the main costs associated with loading and unloading pumps are maintenance, downtime and product loss.

Regarding maintenance, it’s almost inevitable that a mechanical seal will eventually leak. Complications arise even further when considering some applications feature pumps that run continuously, such as with isocyanates. These low-molecular-weight chemicals cannot be left in a static state. When they are not moving during loading and unloading functions, they are kept active through continuously running pumps.

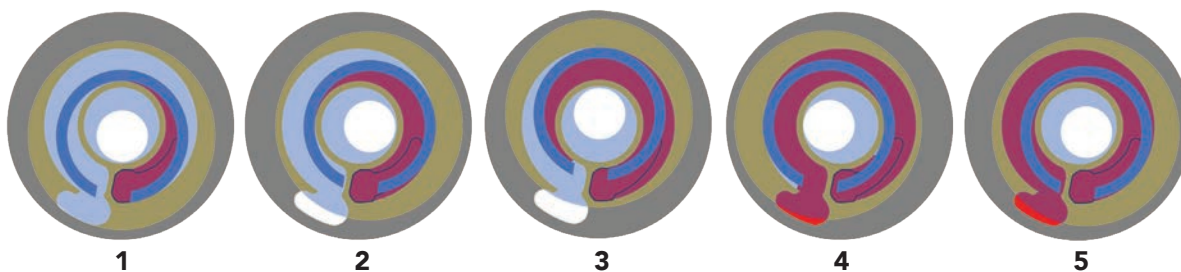
Under this scenario, a failed mechanical seal will cause a serious leak, resulting in severe costs, including lost product, maintenance on the seal, product cleanup and halted production. All of these costs accumulate to create an unnecessary and harmful financial burden.

Downtime results from these complications. If liquids cannot be transferred, it amounts to lost time on both ends and also affects the downstream process. The longer the downtime, the more detrimental the costs.

Product loss affects costs because of the expensive nature of the transferred liquids. Whether it be through a major spill or a slow mechanical seal leak, any loss of product will impact expenses. Over time, those expenses become more pronounced and harmful. Additionally, the loss of the product isn’t the only issue. That lost product, especially during spills, needs to be cleaned up, which raises costs.



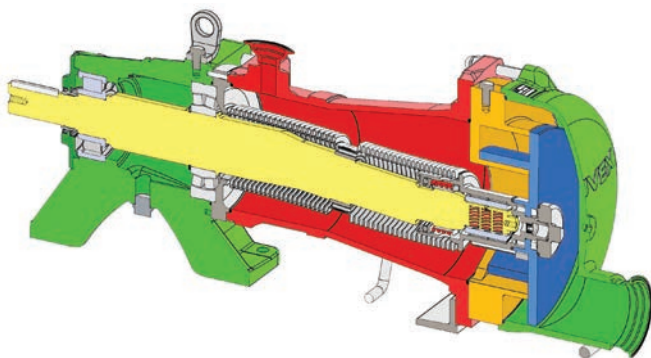
## Mouvex Principle



*Eccentric disc pumps consist of a cylinder and pumping element mounted on an eccentric shaft. As the eccentric shaft is rotated, the pumping element forms chambers within the cylinder, which increase in size at the intake port, drawing fluid into the pumping chamber. The fluid is transported to the discharge port where the pumping chamber size is decreased. This action squeezes the fluid out into the discharge piping.*

## Addressing the challenge

Mouvex® eccentric disc pumps can mitigate all of the challenges that come from liquid transfers. This technology consists of a cylinder and pumping element mounted on an eccentric shaft. As the shaft rotates, the pumping element forms chambers within the cylinder. This increases the size of the cylinder at the intake port and draws fluid into the pumping chamber. The fluid moves to the discharge port, where the pumping chamber size decreases, squeezing out the fluid.



*Eccentric disc pumps can be used in the unloading of toxic vapors from tank trucks due to their seal-less design.*

During loading and unloading, this unique design provides the following:

- Line stripping that leaves a minimum amount of product inside the hoses on the suction and discharge sides after transfer, which ensures cleaner and safer operation and reduces the opportunity for product spillage. This is crucial, especially when transferring a dangerous chemical.
- Self-priming from underground tanks. This is necessary to start the pump and creates a strong vacuum to lift the liquid.
- No mechanical seal, which ensures no maintenance and no leaks, and thus no downtime.
- Limited regular maintenance. The only maintenance needed is a transmission oil change every 24,000 hours,

which equates to every 2.7 years. This is for a pump that runs continuously year-round.

- Constant flow rate vs. variable viscosity – Loading and unloading applications are generally located outside with significant ambient temperature variations between winter and summer.
- Constant flow rate vs. variable pressure – When filling a tank from the bottom, the discharge pressure will increase while the level rises.
- Low shear on fragile products.
- Can run dry for up to five minutes even in ATEX zones.
- Up to 300 gpm (70 m<sup>3</sup>/h).



*This Mouvex® G-Flo 50 pump does both resin tank truck unloading and process supply, combining all advantages listed on this page.*

## Proven performance

Mouvex seal-less eccentric pumps have proven their performances and reliability on many loading and unloading applications. A few of those examples include:



Truck loading of polymers emulsions. G-Flo 50 pump.

**Problem solved:** Seal leakage

**Bonus:** Product recovery inside the hose



Truck unloading of cream.

SLS36 pump.

**Problem solved:** Liquid shear

**Bonus:** Product recovery inside the hose



Truck unloading of fruit concentrate.

SLS36 pump.

**Problem solved:** Product losses



Truck unloading of Polyethylene glycol.

SLC36 pump

**Problem solved:** liquid spillage after transfer

## About the Author:

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