

ENGINEERING  
TOMORROW



Wastewater | High Pressure Pumps

## Save water, time and money with the **new Danfoss APP W HC pump**

Reduce the discharge of industrial wastewater by applying the highly efficient Danfoss APP W HC pump with an outlet pressure of up to 120 bar.

**90%**  
efficiency at all  
operation points



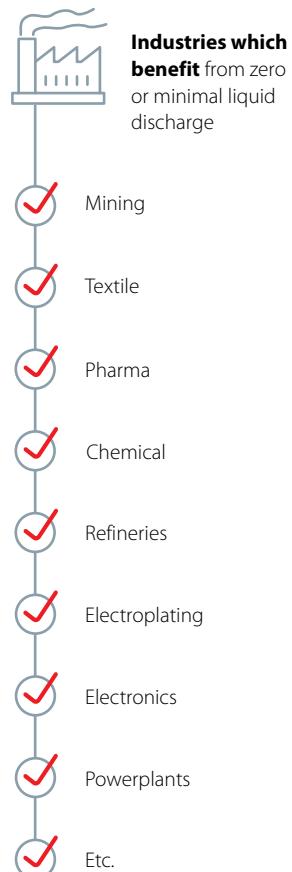
# We can't reuse our planet. But we can **reuse our wastewater.**

We consume substantial amounts of freshwater while producing massive quantities of industrial wastewater. All too often, poorly treated industrial wastewater is discharged into the environment. This not only poses a major threat to the health of our ecosystem and the public, but also to the health of businesses all over the world.

To improve the reuse of water and reduce the discharge of industrial wastewater, a zero liquid discharge (ZLD) or a minimal liquid discharge (MLD) treatment system is often used. ZLD/ MLD is an ambitious wastewater management strategy that eliminates any liquid waste, enabling the plant or facility to recover most of its wastewater for reuse.

The elimination of effluent and discharge makes the process extremely beneficial to both industrial and municipal organizations. However, the process is constrained by high costs and intensive energy consumption.

**Or, it used to be ...**

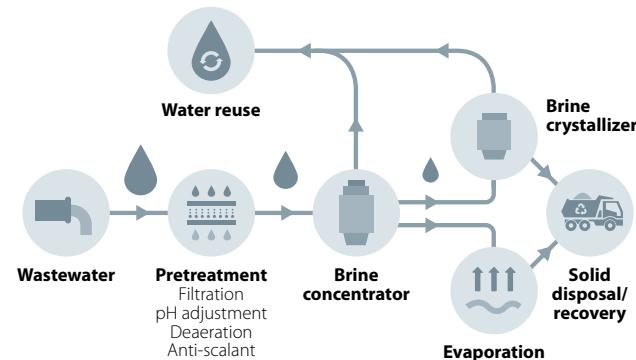




# Save energy with a membrane-based process

Most ZLD/MLD systems are operated with a thermal-based process as standard. This process puts great demand on energy consumption, making it a very expensive investment.

## Standard thermal process with high energy consumption



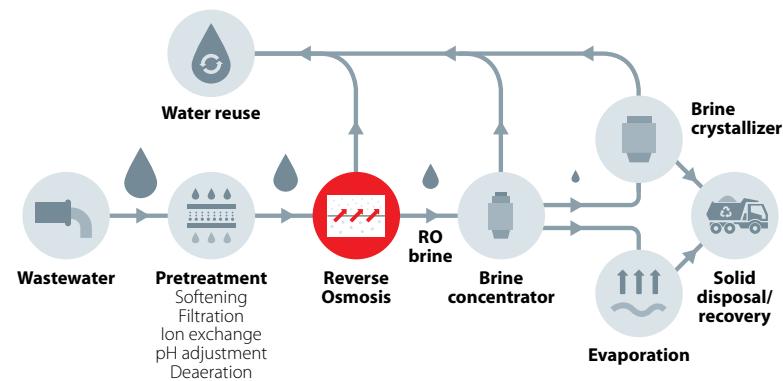
## How businesses benefit from applying a ZLD or MLD treatment system

Zero or minimal liquid discharge technologies help to meet discharge and water reuse requirements, enabling businesses to:

- Meet strict cooling tower blowdown and flue gas desulfurization (FGD) discharge regulations
- Comply with stringent effluent requirements
- Treat and recover valuable products from waste streams
- Improve management of the water produced
- Protect the environment

One way of reducing energy consumption is to reduce the amount of water that needs to be evaporated by changing from a thermal to a membrane-based process. This is supported by studies that show an efficiency gain of up to 75% when going from the thermal-based to the membrane-based process.

## Reverse osmosis process with significantly reduced energy consumption



To apply the membrane-based process, also known as the reverse osmosis process, you need membranes and a pump that can operate with pressure up to 120 bar. Membranes have now been developed for pressures up to 120 bar. With the new Danfoss APP W HC pump, professionals also have access to a reliable and highly efficient pump that will help meet the requirements of the membrane-based process. This makes it easier than ever to improve the energy efficiency of industrial wastewater treatment systems, reduce costs, and protect the environment.

# Run more efficiently with **high pressure** **up to 120 bar**

Save up to  
**54%**  
compared to  
alternative pump  
technologies

The new Danfoss APP W HC pump is a reliable and highly efficient solution with a maximum outlet pressure of as much as 120 bar. This makes it the obvious choice for a ZLD or MLD treatment system operated with a membrane-based process – and enables professionals to keep energy consumption to a minimum.



**Low leakage risk**  
due to low housing pressure.



**Strong corrosion resistance**  
since the pump is made of duplex;  
unlike pumps made of 316.



**Low pulsation**  
as the greater number of piston,  
rather than triplex, pumps has a  
positive impact on the pulsation  
level in the system.



**Effortless scalability**  
since the pump easily  
runs in parallel.



**World-class efficiency**  
with an efficiency rate of up to  
90% at all operation points.



#### **Easy installation & maintenance**

due to few components and no oil.



#### **Simple operation**

as the flow is directly proportional to the shaft speed.



#### **No risk of contamination**

as the pump does not use oil.



#### **Fast delivery time**

compared to competitors, making the pump easily accessible.



#### **Low complexity**

with fewer components than other pumps.



#### **Unrivaled reliability**

as the pump, currently operating in +20,000 systems worldwide, is based on known and widely acknowledged Danfoss technology.



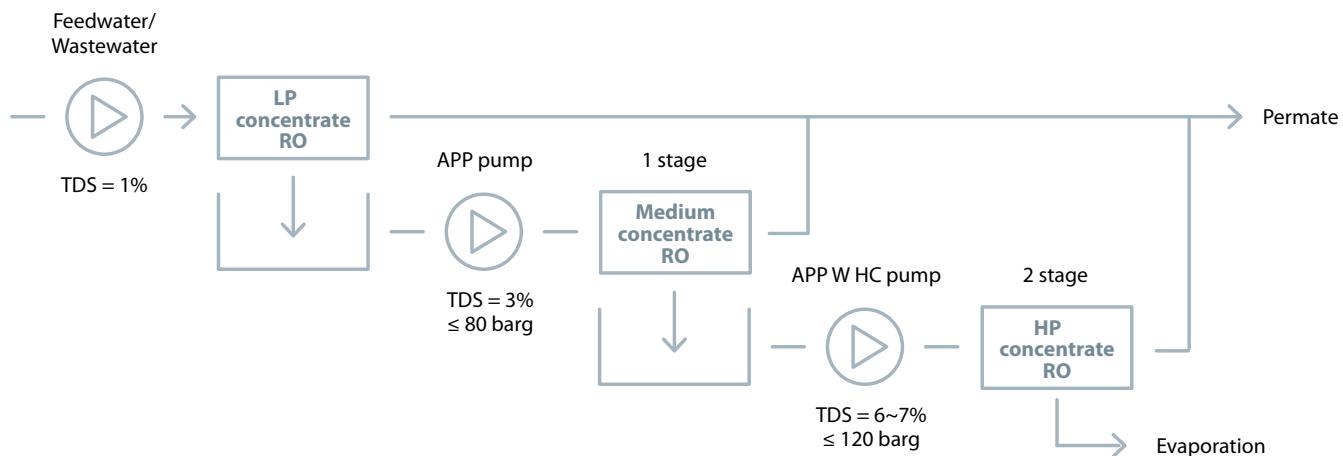
## A future-proof pump built on well-known technology

The new APP W HC pump increases the efficiency of a ZLD or MLD treatment system, making it possible to treat industrial wastewater at a favorable price. The pump can easily be parallel-coupled to fulfill the required capacity at any time and has an outlet pressure of up to 120 bar, which makes it applicable for the newest membrane technology.

The APP W HC pump is built on proven technology used in the well-known APP pumps. The APP pumps are applicable in the first stages of the membrane-based process where pressure is limited to 80 bar.

### APP W HC pump range

Pump	rpm	Flow		Max. outlet pressure	
		m³/h	gpm	barg	psig
APP W HC 15	500-750	11-15	48-66	120	1740
APP W HC 21	500-1000	11-21	48-92	120	1740
APP W HC 24	500-1200	11-24	48-106	120	1740



## CASE

### Bohui Paper Group, Shandong Province

#### Wastewater plant in Shandong Province

The plant is treating 30,000 m<sup>3</sup> industrial wastewater per day using 49 high-pressure pumps from Danfoss.



Operating costs are in great focus for such a large build-and-operate zero liquid discharge project. The extremely high efficiency of Danfoss APP pumps fully meets our requirements; at the same time, their maintenance-free features greatly reduce our on-site workload.

R. Chao,  
Factory Manager,  
Bohui Paper Group



#### Wastewater plant in Suzhou

The plant is treating 1,200 m<sup>3</sup> industrial wastewater per day using 8 Danfoss high-pressure pumps.



A large city like Suzhou must dispose of very large amounts of garbage every day, so the stability and reliability of the waste disposal equipment is crucial. We have used Danfoss APP W HC pumps to treat landfill leachate for nearly 7 years and have increased the number of pumps to 8 from the original 5.

Lin,  
Engineer,  
Suzhou Qizishan



## CASE

### Qizishan, Suzhou



# Fight freshwater scarcity with Danfoss

Freshwater scarcity is one of the most critical global challenges – threatening the health of both ecosystems and businesses.

Danfoss High Pressure Pumps is a fast-growing division of the Danfoss Group that is committed to engineer sustainable solutions that will help shape the world of tomorrow. To support professionals fight freshwater scarcity, Danfoss offers a wide range of high-pressure pumps for the wastewater industry as well as frequency converters and pressure transmitters.

As one of the largest and leading companies in the business, our products are engineered to offer you world-class reliability and efficiency – all to assist you in achieving your business goals and making a positive impact in the world.

## Do you want to know more?

Visit [hpp.danfoss.com](http://hpp.danfoss.com) to learn more about the new Danfoss APP W HC pump.

## Danfoss A/S

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