

# Metering Pumps in Acid Applications

Diaphragm metering pumps prove the perfect acid-handling solution in water/wastewater applications

By Ken Underwood, Neptune Chemical Pump Company

No life form, whether it be human, animal, or plant, can survive without water. The same can be said for many industries, whether they be mining, food and beverage processing, or steel manufacturing. In most instances, water is used to help facilitate and optimize the production process, from cooling equipment to cleaning totes, barrels, and storage tanks.

When used in these types of applications, clean water is quickly transformed into wastewater full of impurities. Aiding in wastewater disposal or recycling are acids that help make it safe to either be reused or introduced to the environment. This white paper will highlight the pumping technology—diaphragm-type metering pumps—that most successfully meets the challenges in most wastewater-handling applications that require the use of acids.

## THE CHALLENGE

Acids are an industrial jack-of-all-trades used in a dizzying variety of unique applications and processes, including the manufacture of agricultural fertilizers, cosmetics productions, fluoridation of drinking water, pH adjustment in cooling towers and boiler water pretreatment.

A few of the more commonly used acids in these applications include hydrofluorosilicic acid, hydrochloric acid, phosphoric acid, sulfuric acid, and citric acid. These acids are used in a wide and unique set of applications, from water fluoridation and regeneration to metal pickling and food flavoring.

What all of these acids have in common is that safety in containing, controlling and handling them is a critical concern, not only to protect the health and productivity of workers, but to ensure zero impact on the environment. For example, hydrofluorosilicic acid is highly corrosive to most metals, while sulfuric acid is highly exothermic.



Neptune's 500 Series Hydraulic Metering Pumps, offered by Neptune Chemical Pump Company, North Wales, Pennsylvania, a product brand of PSG®, a Dover company.



Example of a rusting acid skid



Neptune 500 acid skid

**THE SOLUTION**

The best choice for acid injection in wastewater-handling applications is hydraulic, mechanical, or electronic diaphragm metering pump technology. Neptune's 500 Series Hydraulic Metering Pumps are ideal for acid-handling because they can

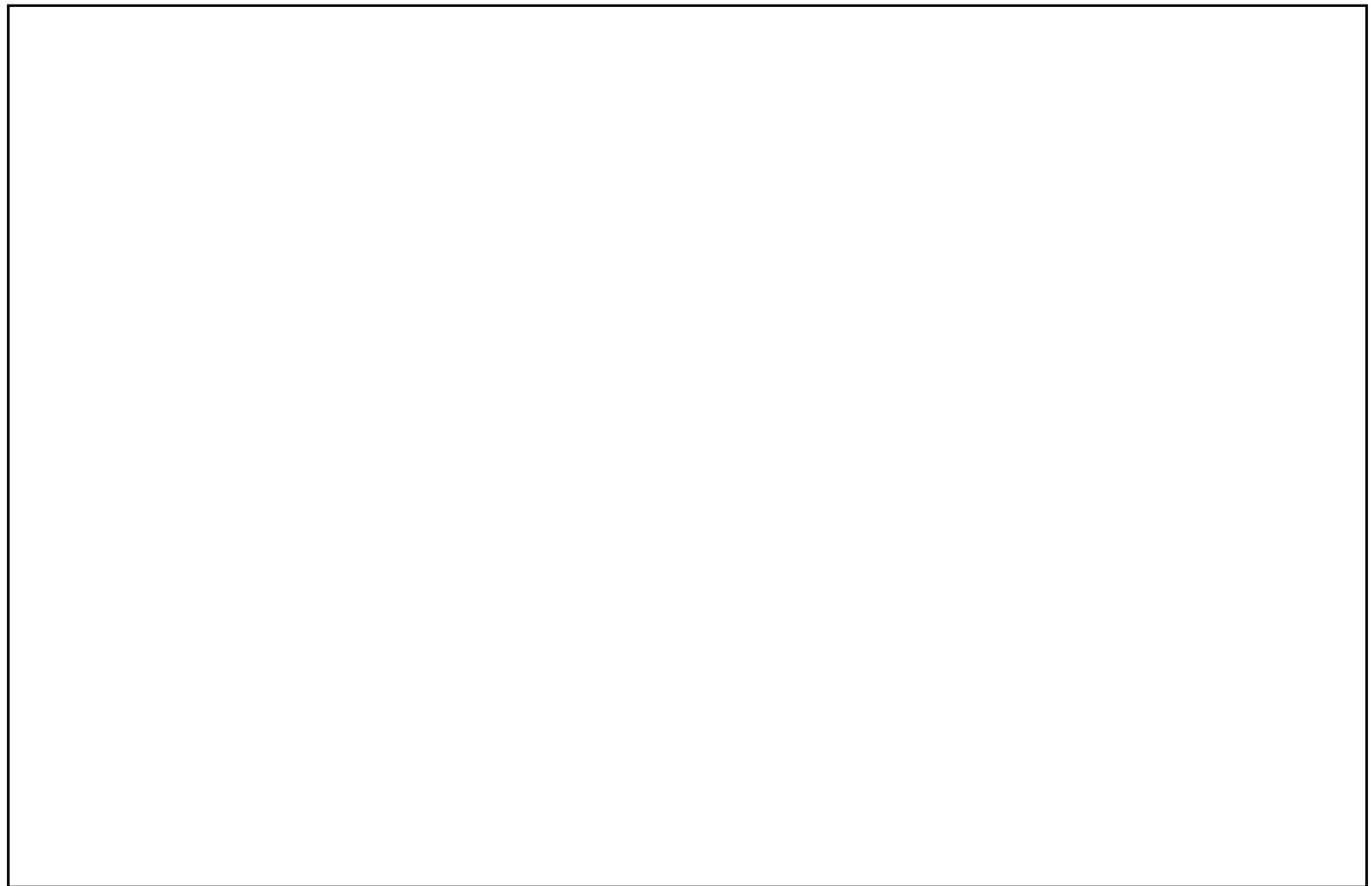
inject precise and controlled amounts of chemicals; feature an internal relief valve; have leak-free operation; can handle high pumping pressures; require minimal maintenance; can feature an automatic stroke control actuator or variable-speed motor; have low energy usage; and offer an adjustable micrometer dial that can

be adjusted whether the pump is running or stopped.

Neptune's 7000 Series Diaphragm Metering Pumps are mechanically actuated and have been designed to handle clear liquids with viscosities ranging from water-like to 5,000 cPs, making them ideal for use in water and wastewater-treatment applications. The 7000's mechanical design eliminates the use of contour plates on the

liquid side of the diaphragm, and combined with a straight-through valve and head configuration improved flow characteristics are created.

Neptune PZ Series Electronic Metering Pumps are a viable option in acid-handling operations because



they are able to offer stroke length and speed adjustments that make them particularly suited for low-flow

acid-feed applications, which can require the pump to possess a wide turndown capability.

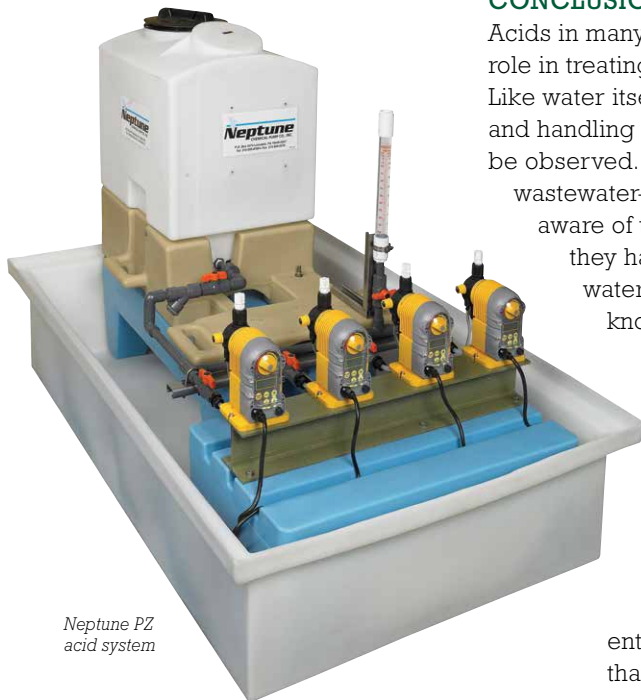
## CONCLUSION

Acids in many forms play a critical role in treating water and wastewater. Like water itself, proper care and handling of acids must also be observed. While operators of wastewater-treatment facilities are aware of the responsibilities they have in ensuring safe water sources, they also

know that they must take every measure to optimize the cost-effectiveness of their operations.

That's where identifying and utilizing the most efficient and reliable pumping technology enters the picture. For more than fifty years, Neptune

has been setting the industry standard in diaphragm metering pump technology. So whether a wastewater-management operation requires a hydraulic, mechanical or electronic diaphragm metering pump to meet its needs, Neptune offers the best array of choices via its 500 Series, 7000 Series, and PZ Series diaphragm metering pump product lines. ♦



Neptune PZ acid system

**Ken Underwood** is project manager, municipal products for Neptune™ and PSG®. He can be reached at 215.699.8900 or [ken.underwood@psgdover.com](mailto:ken.underwood@psgdover.com). Neptune is a leading brand of metering pumps, chemical feed systems, and chemical injection accessories. For more information on Neptune's full line of products, please go to [www.neptune1.com](http://www.neptune1.com).