

# Halia® pH neutralization system

## Carbon dioxide (CO<sub>2</sub>) for pH control in wastewater treatment



“Your operation can be safer and more economical by switching from mineral acids to carbon dioxide to neutralize alkaline water and wastewater. In addition, it’s virtually impossible to overdose and obtain pH levels below 6.0 when using carbon dioxide due to the self-buffering nature of the solution. As a result, its use is becoming more widespread.”

Jeff Huber — CO<sub>2</sub> Applications Specialist

### Industries served, include:

- Chemical
- Food/Beverage
- Mining
- Municipalities
- Pharmaceutical
- Power Generation/Utilities
- Pulp and Paper
- Refining
- Steel

You’re up against a lot of pressure to operate cost effectively and to meet state and local authorities’ pH level requirements in your wastewater stream. Let Air Products help alleviate some of that pressure. Our wastewater treatment solutions use carbon dioxide (CO<sub>2</sub>) instead of acids to help you more efficiently and safely neutralize your wastewater prior to discharging it into municipal sewer systems or natural water streams.

### Benefits

The aggressive nature of commonly used mineral acids, such as hydrochloric, sulfuric or nitric acid, means that neutralizing wastewater with dissolved carbon dioxide has many operational and environmental advantages:

**Safer working conditions** – Decrease risk of burns, poisonous fumes and other hazards resulting from the handling of mineral acids.

**Accurate pH control** – The risks of excessive acidification using strong acids are prevented. It is virtually impossible to overdose when using carbon dioxide.

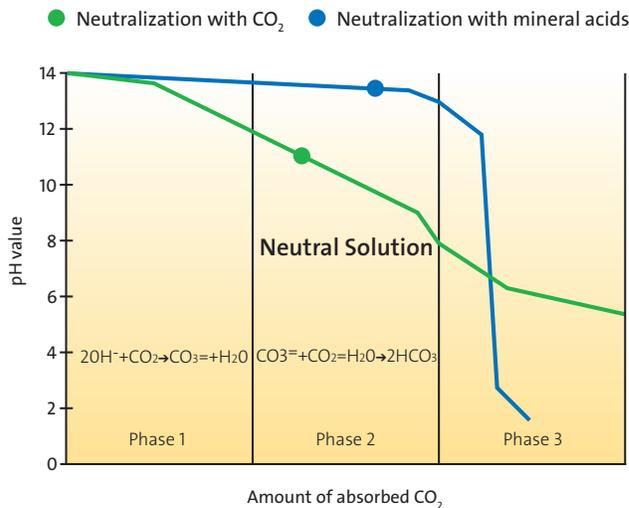
**Low initial investment** – There are various application systems, but all involve simple, safe and compact equipment.

**Automated process** – Automation eliminates handling and transporting corrosive acids within your plant, requiring fewer resources.

**Continuous operation** – pH is controlled automatically, without the need for significant maintenance.

**Economy** – The use of carbon dioxide is very economical and cuts down on indirect operating costs, such as maintenance and handling.

## Controlling pH with carbon dioxide vs. mineral acids



## Customer service and reliability commitment

Air Products employees pride themselves on making a difference to customers by exceeding their expectations for service.

- Local plant operators, drivers, mechanics, and managers work closely with Air Products' central customer service and logistics center 24/7/365 to uphold our reliability record of over 99.9%—supplying product on time and at the flow, purity and pressure our customers specify.
- Customer station technicians can service Air Products' tanks at customer sites, as well as customer owned tanks, 24/7.
- Regional technical specialists can provide process and applications support to help optimize our customers' performance.

For more information, please contact us at:

### Corporate Headquarters

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## Optimization

At Air Products, we understand the difficulties of neutralizing alkaline wastewater. We offer different injection options, including sidestream, diffusion and direct injection systems. Air Products applications engineers can assess your operation to determine which system offers you the optimal efficiency.

## Experience

You may know Air Products as a gas supplier to your upstream production operations. Turn to us to provide a safer, more cost effective solution for your wastewater stream. Contact us today to discuss an evaluation of your process to determine the potential benefits of using CO<sub>2</sub> in your operation.

## Excellence in safety

For Air Products, nothing is more important than safety—not sales, not production and not profits. It is a commitment we all share and one that we share with our customers. We design and operate our gas facilities worldwide to the highest safety standards. Among our peers in the gas industry, Air Products consistently demonstrates world-class performance in preventing injuries. We continue to deliver record low recordable rates and are on a mission to be an industry leader in safety by continually reducing our injury rates.

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