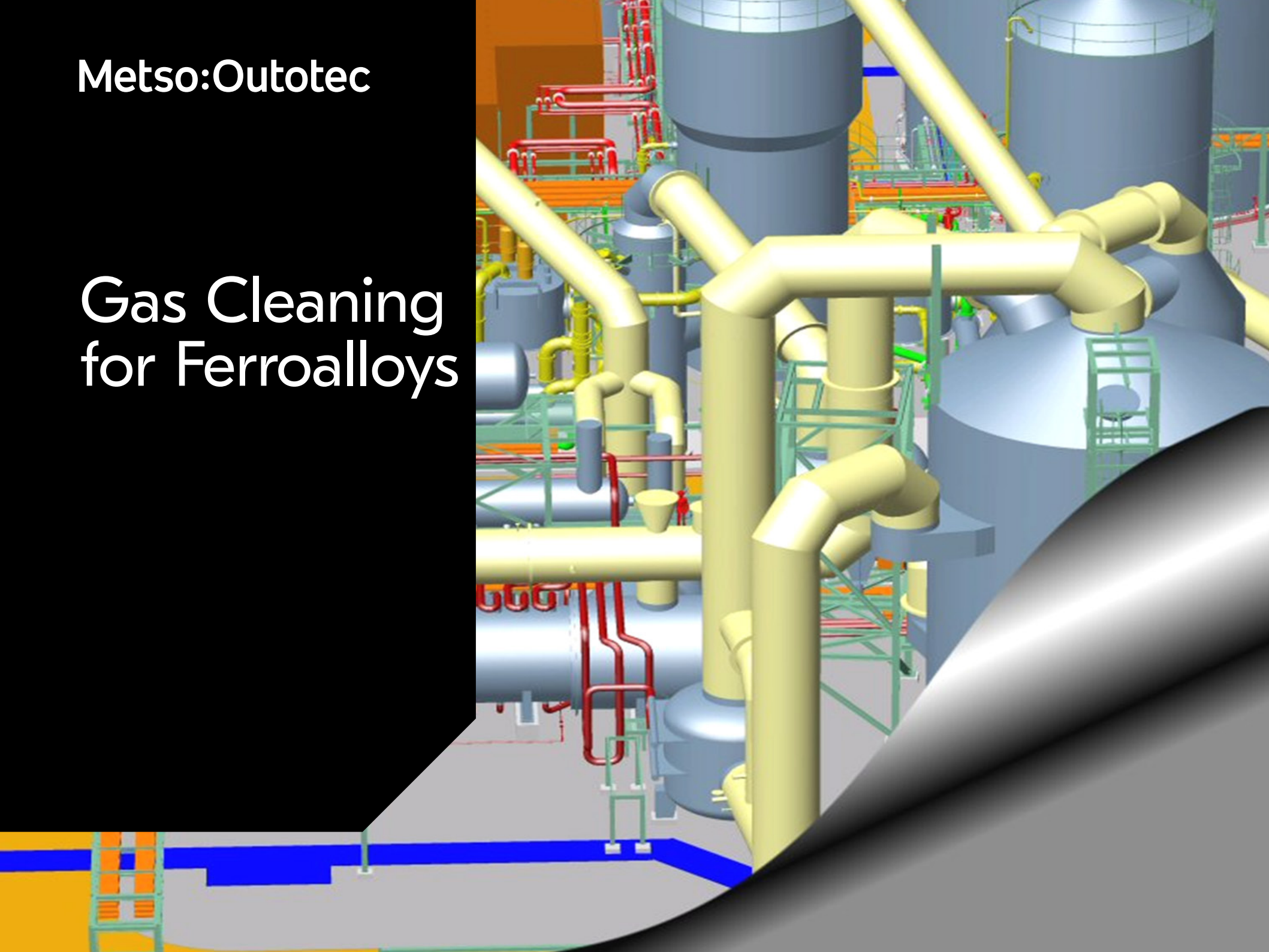
Metso:Outotec

Gas Cleaning for Ferroalloys



Metso Outotec is an industry pioneer in gas cleaning technologies for ferroalloy production. Our solutions are safe and easy to operate, provide extremely effective particle removal capability, fulfill all process requirements, and contribute to improved production capacity and cost-efficiency. We offer an extensive range of technologies that can be optimized for different processes, raw materials, and energy sources.

Benefits

- Minimized atmospheric emissions
- Lower maintenance costs
- Safe and reliable operation
- Effective slurry removal
- Compact equipment with a small physical footprint

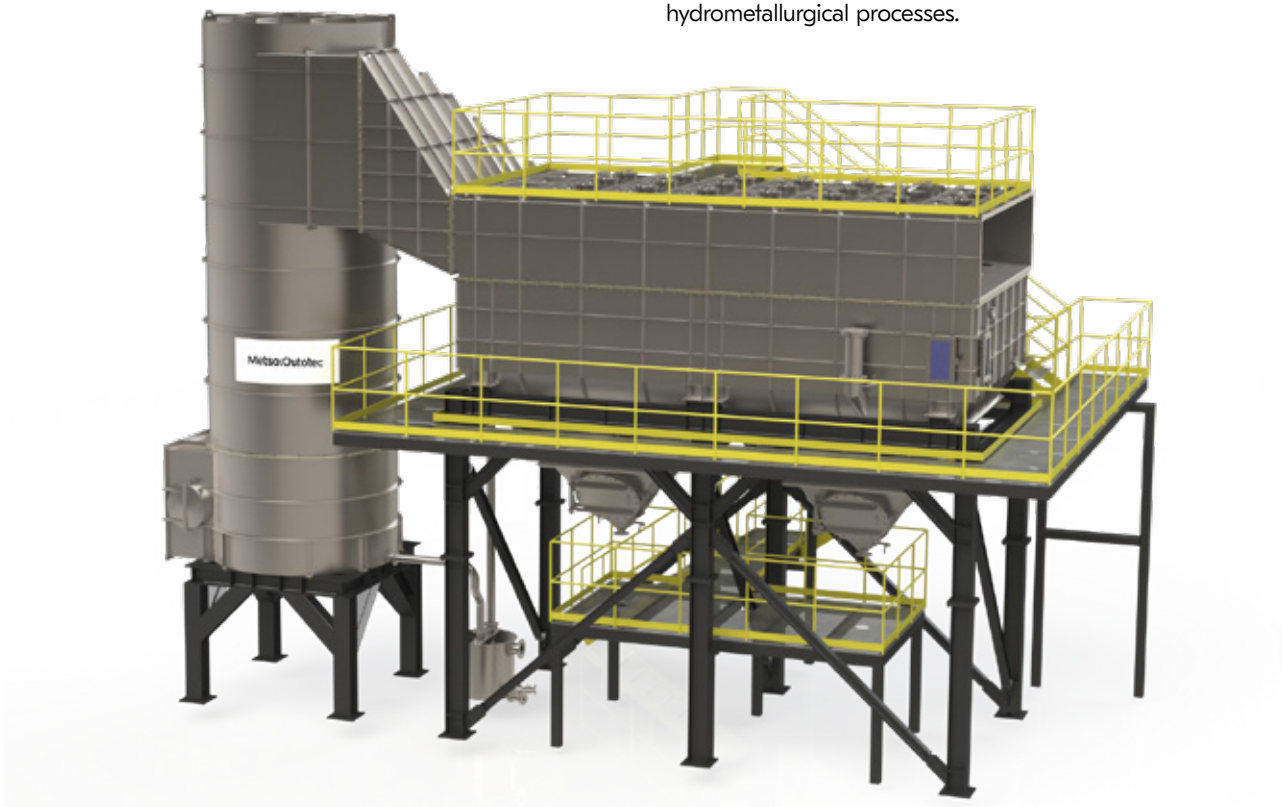
Metso Outotec Cascade Scrubber

Dust from raw materials is carried away from processes with the off-gases. Dust accumulation can have a significant impact on plant process efficiency and air quality.

The Metso Outotec Cascade Scrubber is a wet-type separator that provides efficient collection of solids from off-gases. Solid particles are separated from the gas stream by deposition on a collecting surface, from where they are removed for recovery or disposal.

Superior technology for improved efficiency
Efficient dust collection minimizes dust emissions to the surrounding atmosphere, ensuring a cleaner and safer working environment. Simultaneously, the ability to recover valuable materials from off-gases helps to reduce production losses.

Combining high productivity with outstanding separation efficiency, our Cascade scrubber solution is fully customizable to match the needs of your individual application. The technology is designed for cost-efficient operation, with low water and energy consumption. Typical applications for Cascade scrubbers are pelletizing plants and hydrometallurgical processes.



Technical specifications	
Capacity	1,500–150,000 Nm3/h
Gas temperature	up to 300 °C
Gas inlet pressure	(-) 3–5 kPa
Water supply	Clean plant water
Water flow	5–40 m3/h
Optimal particle size	> 5 microns

Benefits

- Reduces emissions to surrounding atmosphere
- Not sensitive to variations in gas flow
- Reliable operation and low maintenance costs and requirements
- Low water and energy consumption
- Reduces production losses by enabling recovery of valuable materials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Metso Outotec Venturi Scrubber

The Metso Outotec Venturi Scrubber is an easy-to-operate, high-pressure scrubber for the effective and safe cleaning of harmful and explosive process gases. The scrubber aspirates furnace off-gases and produces overpressure to the gas line. This overpressure prevents surrounding air from entering the line, enabling safer handling of CO gas. It both cools and cleans the gas, quenching sparks from the furnace to eliminate the risk of explosion. Because it contains no mechanical moving parts, it is also highly reliable and easy to maintain.

Outstanding gas-cleaning performance

Our Venturi scrubbers have a proven track record in the cleaning of off-gases from closed smelting furnaces. They are designed to operate in tandem in order to guarantee the maximum possible gas-cleaning efficiency, uniform ventilation of off-gas from the furnace, and to minimize the equipment footprint size. Combining the Metso Outotec Venturi Scrubber with the Metso Outotec CO Gas Filter ensures exceptional cleaning of electric furnace off-gases, with collection efficiencies close to 100%.

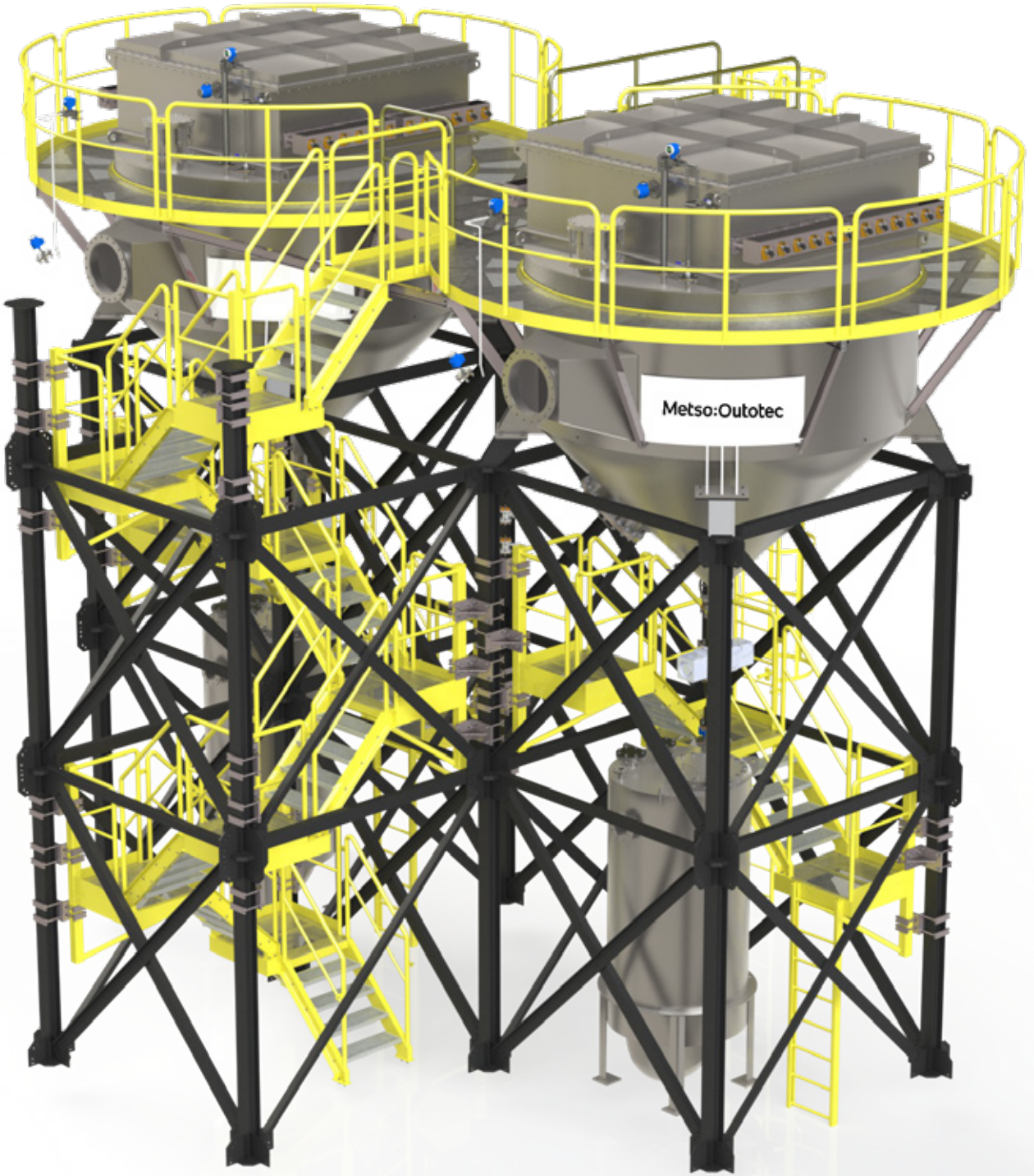
The Metso Outotec Venturi Scrubber combines the following functions into a single unit:

- Hot gas quenching
- Steam and vapor condensing
- Particulate removal
- Capture of harmful gases such as SO_x and HCl

Technical specifications	
Capacity	3,500–40,000 Nm^3/h
Gas temperature	Up to 1500 °C
Water pressure	Min. 30 bar
Water supply	Clean plant water
Water flow	100–250 m^3/h
Optimal particle size	> 5 microns

Benefits

- Reduces emissions to surrounding atmosphere
- Reliable operation and low maintenance costs and requirements
- Effective slurry removal
- Not sensitive to variations in gas flow
- Safe CO gas handling due to overpressure operation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Metso Outotec CO Gas Filter

Collecting the finest particles from electric furnace off-gases is challenging with wet scrubbing methods, so we have developed a cassette-type filter that enables the efficient removal of even the smallest particles that pass through the scrubbers. As an option, our patented coke-dust injection unit can be installed before the CO gas filter, with coke dust being used to absorb the tar from the CO gas. CO gas from the metallurgical process is blown into the filter and uniformly distributed between all the filter elements, and the dust is retained on the filter element surfaces.

The filter elements are cleaned with a nitrogen jet pulse cleaning system. The collected particles are flushed with water into the water lock tank from where the slurry is collected. Micro-filtered gas is very clean (solids content can be as low as < 1 mg/Nm3) and can be utilized in many different solutions such as cogeneration.

Improved environmental performance and energy efficiency
Filters are becoming an integral part of electric furnace off-gas cleaning. Cleaned CO gas can be used as a secondary energy source, which reduces primary electricity consumption and eliminates the need to use fossil fuels in the ferroalloy production process. For both ferroalloy and steel plants, the use of CO gas also significantly reduces overall dust and gaseous emissions, and improves energy optimization.

Technical specifications	
Capacity	3,000–15,000 Nm^3/h
Gas pressure	Max. 35 kPa
Gas temperature	Max. 70 °C
Water flow	1.5–3 m^3/h
Nitrogen consumption	15–50 Nm^3/h

Benefits

- Extremely low emissions
- Low maintenance costs
- Not sensitive to variations in gas flow
- Enables utilization of CO gas in other applications
- Modular design makes it easy to increase capacity
- Low pressure loss over the filter

Metso Outotec is a frontrunner in sustainable technologies, end-to-end solutions and services for the aggregates, minerals processing and metals refining industries globally. By improving our customers' energy and water efficiency, increasing their productivity, and reducing environmental risks with our product and process expertise, we are the **partner for positive change.**

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