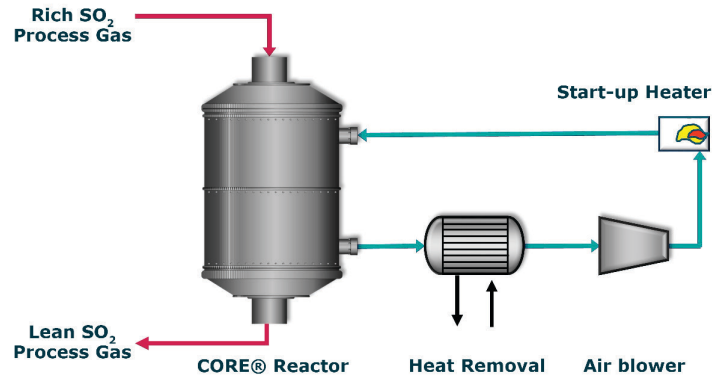
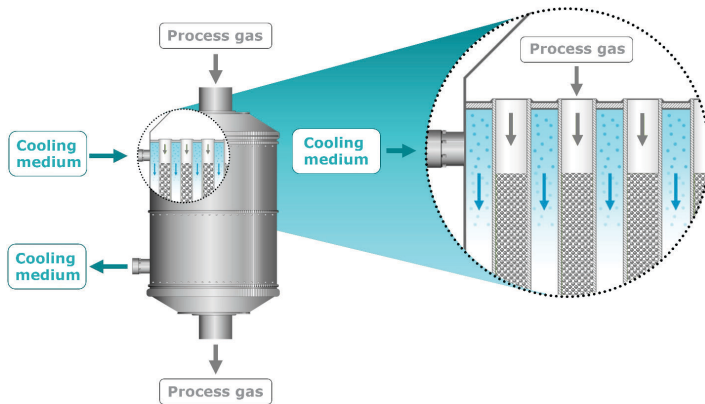


# CORE™ & CORE-S™

## SULPHURIC ACID TECHNOLOGY



Using active cooling of the catalyst, the **Cooled Oxidation Reactor (CORE™)** allows sulphuric acid plants to use SO<sub>2</sub> inlet concentrations of up to 60%, eliminating temperature/process limitations of historical plant configurations.

### KEY BENEFITS

- Simple to operate, well-proven equipment design
- Accepts SO<sub>2</sub> concentrations up to 60% by volume
- Achieves up to 95% conversion in a single converter converter pass
- Active cooling using air (CORE™) or molten salt (CORE-S™)
- Minimizes power consumption
- Longer catalyst life
- Eliminates the need for interpass cooling/gas-gas heat exchangers
- Easy to retrofit into existing sulphuric acid plants to increase plant capacity and/or lower SO<sub>2</sub> strength to the conventional acid plant
- With a regenerative scrubber, used to economically convert SO<sub>2</sub> stack emissions to merchant grade sulphuric acid and excess power/steam (CORE-FGD™)
- The CORE-SO<sub>2</sub>™ process using oxygen and a CORE-S™ converter allows sulphuric acid plants up to 13,000 MTPD in a single train with lower CAPEX and OPEX than conventional designs

### ABOUT US

Sustaining our world for generations to come through technological and environmental innovation, Worley delivers Chemetics® sulphuric acid solutions around the globe with a focus on site reliability, plant economics and workforce development.

Over the past 60 years, Worley Chemetics' full lifecycle solutions and equipment have enabled more than 800 plants to achieve higher capacities and availability, lower costs of operation, reduced emissions and greater safety. Leveraging our R&D lab and custom-built fabrication facility in Canada, global logistics management capabilities, specialized project teams and worldwide network of trusted suppliers, we deliver optimal solutions and equipment for your sulphuric acid facility, from greenfield projects to maintenance and turnarounds.



### GET IN TOUCH

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# CORE™ and CORE-S™

## FEATURES & BENEFITS

Most modern sulphuric acid plants utilize a conventional adiabatic converter design which is suitable for gases containing no more than 13vol% SO<sub>2</sub>. In order to process gases with higher SO<sub>2</sub> concentration, it is necessary to remove energy from the process gas as otherwise the catalyst temperatures would exceed safe operating limits leading to rapid catalyst degradation.

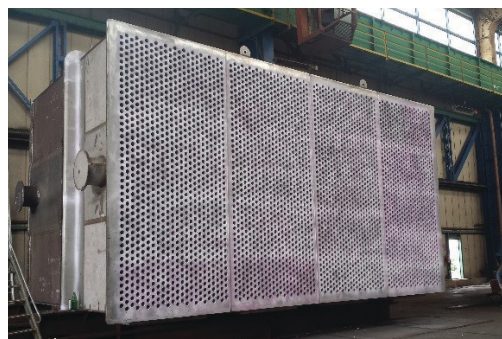
The CORE™ System consists of a reactor shell with multiple catalyst filled tubes. A circulating fluid outside of these tubes provides continuous cooling. The ability to remove reaction energy as the process gas passes through the catalyst also increases the conversion that can be achieved. The result is that a single CORE™ System replaces up to three adiabatic catalyst beds and their associated inter bed heat exchangers.

## Features of the CORE™ System

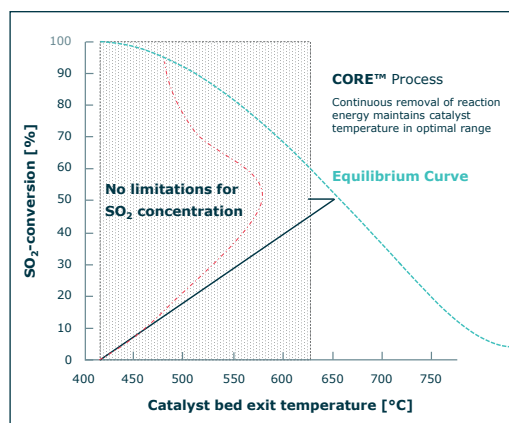
- The patented tubular reactor is fabricated from stainless steel for all parts in contact with the process gas and utilizes seal welded tubetube sheet connections to eliminate leaks
- The activity of the catalyst is carefully selected for the process gas conditions to prevent hot spots which could lead to catalyst deactivation
- Choice of cooling systems allows optimum integration into any existing facility
- High Pressure Steam generation can be easily incorporated into the cooling system with high degree of safety as direct contact of steam equipment (boilers and/or economizers) with process gas is not required
- Continuous operation at SO<sub>2</sub> concentration up to 60vol%
- Conversion rates over 95% are achieved in a single pass using the CORE-S™ System
- Compact layout and small footprint allows a CORE™ System to be retrofit into an existing acid plant where other conventional retrofit options are not possible
- Lower CAPEX due to less equipment, smaller equipment and reduced footprint
- Converter can be shipped in modular sections to lower installation costs and ensure high manufacturing quality



CORE™ Inlet Gas Vestibule



CORE™ Tube Bundle ready for shipment



Continuous active cooling of catalyst in CORE™ ensures optimal conversion



200 MTPD CORE™ Add-On System operating since 2009