

# MECS® SULFOX™ FOR GAS DESULFURIZATION AND SULFUROUS WASTE REGENERATION



## PRODUCE SULFURIC ACID INSTEAD OF SULFUR OR GYPSUM EFFLUENT

The SULFOX™ process is a highly energy efficient technology used for cleaning waste gases containing sulfur compounds that produces a saleable product — sulfuric acid.

**SULFURIC  
PROCESS TECHNOLOGIES**

Learn more at [www.mecsglobal.com](http://www.mecsglobal.com)



## A UNIQUE, RELIABLE SOLUTION

MECS® SULFOX™ is a unique wet gas sulfuric process where merchant grade sulfuric acid is produced instead of unwanted process by-products, sulfur or gypsum effluent. Each SULFOX™ plant is custom designed according to the feed gas concentrations and the customer's specific requirements while keeping the investment and operating costs as low as possible. The SULFOX™ process, which was developed to treat sulfur-containing waste gases, has over 20 years of successful field experience.

MECS, Inc. (MECS) is one of few companies that design and manufacture their own sulfuric acid process equipment and technologies such as catalyst, heat recovery and mist elimination. By combining process technology, materials science, the backing of DuPont and nearly a century of sulfuric acid plant expertise, MECS can provide a single point overall guarantee of quality workmanship AND performance.

## SULFOX™ HK NATURAL GAS SWEETENING



# SULFOX™ TECHNOLOGY

## FEATURES:

- Wet catalytic oxidation of sulfur compounds with recovery of concentrated sulfuric acid
- Solution for a wide range of off gas compositions
- Efficient waste heat recovery
- High steam production for concentrated H<sub>2</sub>S feeds economical alternative with low operating costs compared to Claus (H<sub>2</sub>S) or scrubbing (SO<sub>2</sub>)
- No or minimal liquid effluent
- Very low cooling water consumption
- Flexible operation with high turndown ratio

## BENEFITS:

- Guaranteed ultra low acid mist emissions exceed the most stringent regulated values
- Low SO<sub>2</sub> emission thanks to activated carbon filter
- Very reliable and proven gas cleaning using DynaWave™ Technology
- Simple automated operation (minimal operators required)
- Robust and low maintenance acid concentration column with short horizontal tubes
- Special catalyst usage for specific applications
- Long catalyst operation without screening
- Very compact modular design

## SULFOX™ NK



## SULFOX™ APPLICATIONS:

- Refinery
- Coal Gasification SRU
- Natural gas processing
- Spent acid and liquid sulfates regeneration
- Coke manufacturing
- Viscose fibers
- Mining & roasting
- Pigments production

# PROCESS DESCRIPTION

**THE SULFOX™ PROCESS** is based on the thermal and catalytic conversion of sulfur-bearing compounds into sulfuric acid.

The off gas passes over a prefilter before it is preheated to the required catalyst intake temperature by the glass tube heat exchanger of the concentration column and an additional gas preheater. This gas preheater is part of the heat recovery system which typically uses molten salt as the heat transfer medium.

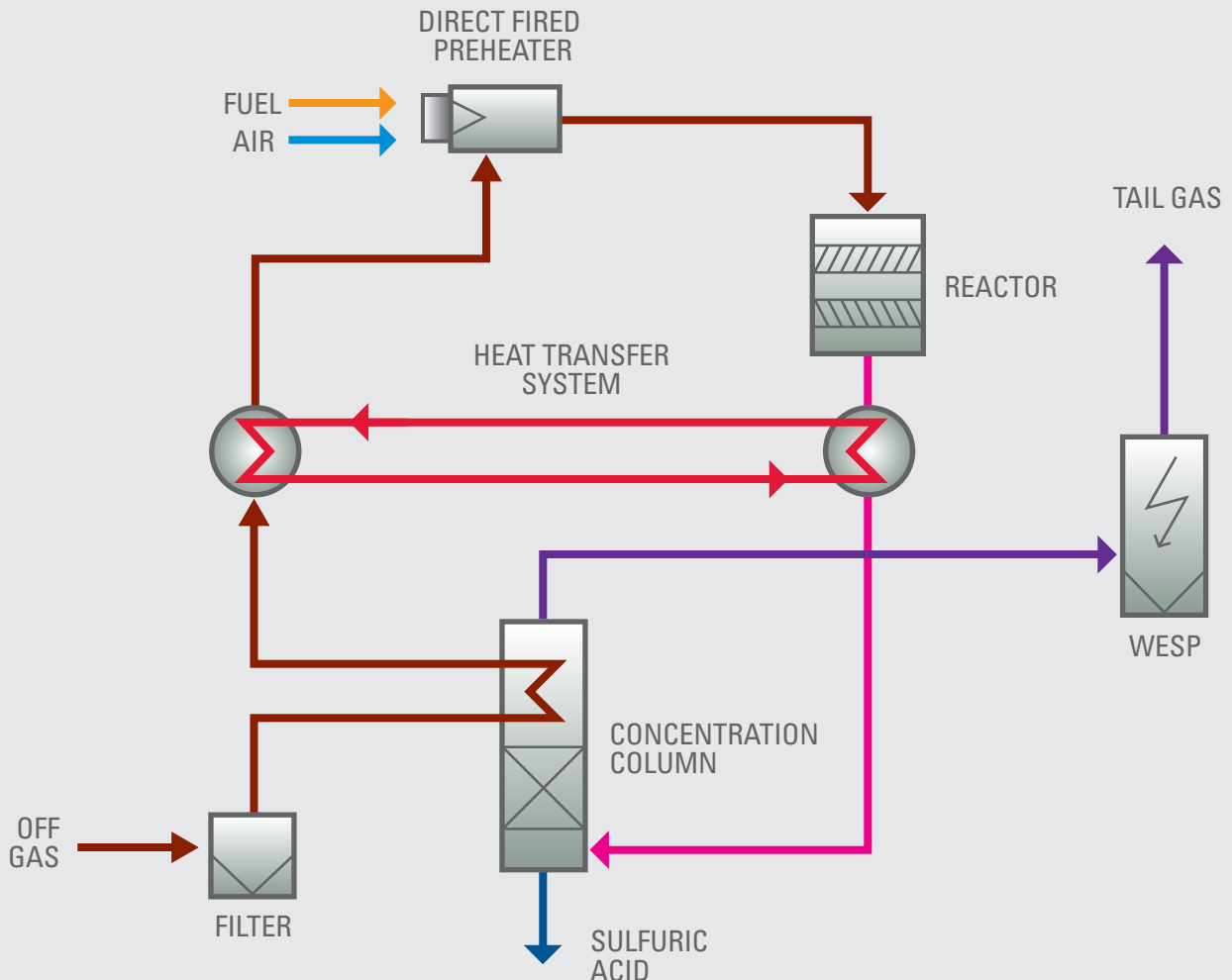
An additional direct fired preheater is used for plant start up operation and plant operation at low off gas concentrations.

The reactor contains catalyst beds where the sulfur compounds are oxidized to  $\text{SO}_2$  and  $\text{SO}_3$ . The  $\text{SO}_3$  reacts with the water vapor to form gaseous sulfuric acid.

The acid condenses in the concentration column and evaporation of water produces concentrated acid that is collected in the sump of the column.

The wet electrostatic mist precipitator (WESP) removes the remaining acid mist. A further reduction of  $\text{SO}_2$  emissions can be achieved with an additional activated carbon filter.

## SULFOX™ FLOW DIAGRAM



# PLANT TYPES

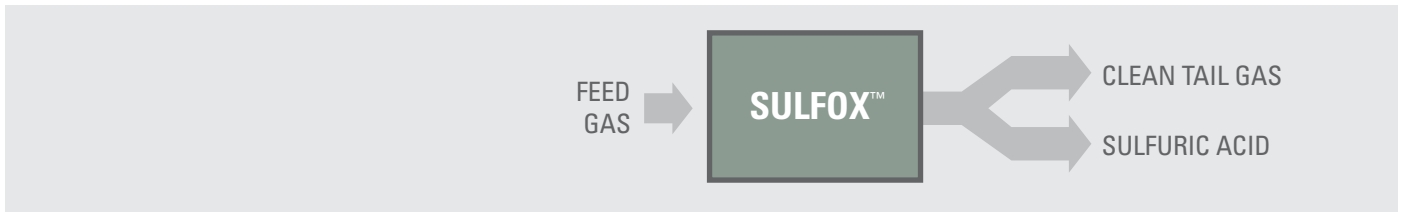
Depending on the feed gas conditions, customized plant types are offered. For large H<sub>2</sub>S gas feeds, SULFOX™ technology is combined with a combustion chamber and steam equipment. For dirty and wet SO<sub>2</sub> gases, a customized gas cleaning system is included. We can regenerate spent acid or liquid sulfate feeds by combining

SULFOX™ technology with a decomposition furnace followed by steam equipment and gas cleaning.

The following block diagrams present the different plant configurations for a range of feed types processed:

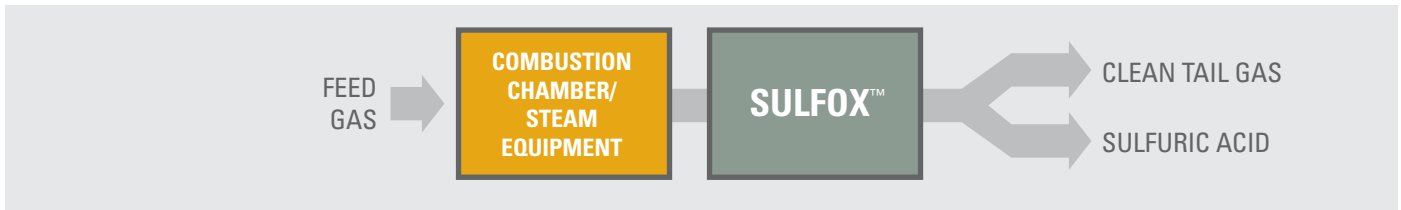
## SULFOX™ NK

USED FOR LEAN FEED GAS CONCENTRATION



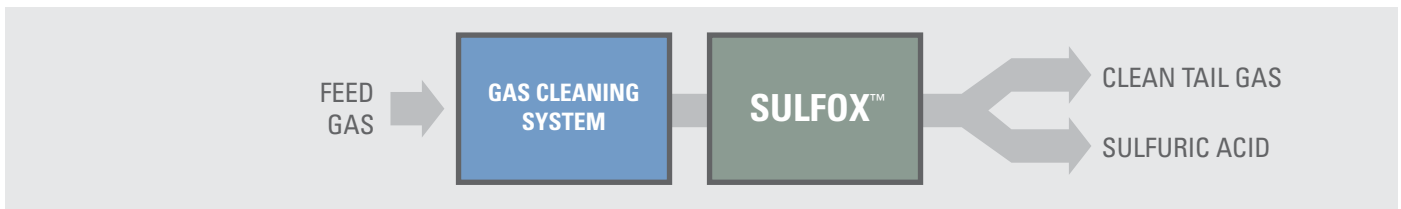
## SULFOX™ HK

USED FOR LARGE H<sub>2</sub>S GAS FEED



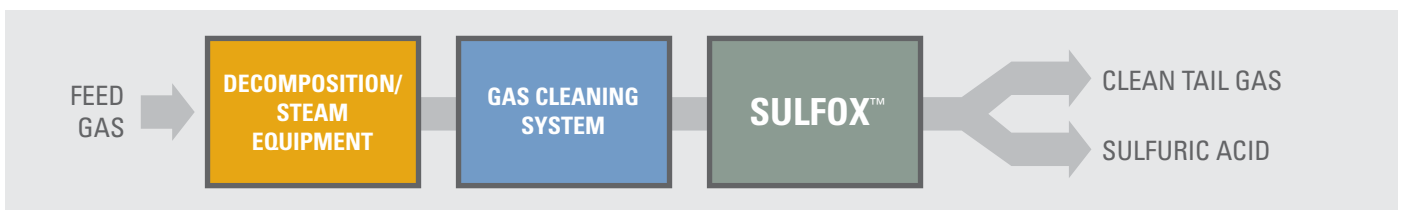
## SULFOX™ MET

USED FOR DIRTY OFF GAS FEEDS IN THE METALLURGICAL INDUSTRY



## SULFOX™ SAR

USED FOR SPENT ACID AND LIQUID SULFATE REGENERATION







The miracles of science™

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SULFOX™ HK



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