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The Next Generation of Sulfuric Acid Technology

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Abstract

For the sulfuric acid industry, compliance with emissions and effluent reduction targets – while balancing productivity and profitability - is becoming essential to survive these turbulent times. Previous approaches to simultaneously minimize capital expenditures (CAPEX), operating expenditures (OPEX), and emissions proved unsuccessful because of technology limitations.

Producers were forced to make choices, selecting one benefit while accepting a negative consequence, either financial or environmentally. But today, CAPEX, OPEX, and emissions cannot be dissociated because of an increasing global drive to minimize production costs and emissions together. These pervasive trends have heavily influenced research and development work at MECS over the past 6-8 years. MECS knew that a new approach was needed to solve these complicated problems, and started by reviewing all areas in a sulfuric acid plant that consume time, water and money, as well as all drivers of emissions, both liquid and gaseous. The MECS R&D team has developed a novel approach that eliminates or at least reduces high consumers of time, water and money while also recovering more energy – all at best in class emissions.

The result is MAX3™ - a proprietary sulfuric acid plant technology that simplifies the conventional sulfuric acid plant flow scheme by combining a single absorption HRS™ plant with MECS' SolvR® regenerative SO₂ scrubbing technology. It eliminates equipment, cuts cost and increases efficiency. In a MAX3™ plant, the use of SolvR® makes it possible to achieve close to zero SO₂ emissions. SolvR® also improves operating flexibility, capital and operating costs. It economically removes SO₂ from gases with concentrations as low as 300 ppmv and as high as 50 vol%, reducing SO₂ emissions below 30 ppmv. If even lower limits are required, additional regenerative steam can be used to reduce SO₂ emissions below 10 ppmv.

This paper describes MECS's research and development journey to develop MAX3™, from lab concept, to proven technology.