

HYBRID SULPHURIC ACID PLANTS

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ABSTRACT

Resulting from increasingly stringent environmental regulations, there is increased interest worldwide in improving plant designs to lower gaseous emissions to the environment, specifically the emission of sulphur-containing species from sulphur-burning, metallurgical and acid regeneration sulphuric acid plants. NORAM and CPPE formed an alliance to provide a comprehensive solution to the abatement of SO₂ gases in industrial applications with the development of innovative Hybrid sulphuric acid plants. Hybrid acid plant technologies by NORAM-CPPE allow for increased production of sulphuric acid and steam with very low emissions of SO₂, SO₃ and H₂SO₄. Such Hybrid acid plants utilize contact sulphuric acid technology of single absorption configuration with modern NORAM equipment designs, coupled with the CPPE Sulfacid[®] gas scrubber technology. The acidic effluent from the Sulfacid[®] equipment is fed back into NORAM's contact section resulting in a closed loop that does not require added chemicals, and does not produce waste by-products. The Hybrid sulphuric acid technology significantly reduces the OPEX of the complete system and may be applied to new facilities or be retro-fitted to existing plants. The plant can achieve lower SO₂ emission values than those of typical double absorption systems and even further reduce emissions with the addition of extra Sulfacid[®] catalyst to meet future environmental requirements. Due to the characteristic absorption "sink" provided by the activated carbon of the Sulfacid[®] process, the Hybrid process is less sensitive to fluctuations in SO₂ load which may occur due to process upsets. In addition the Hybrid sulphuric acid plant can achieve reduced start-up emissions, allow for faster start-up times and is able to accept a wide range of SO₂ concentration without impacting the plant emissions.

This paper presents some of the technical features of the NORAM-CPPE Hybrid acid plant technology and discusses a number of performance parameters for industrial applications.

Keywords: Reduced plant emissions, Sulphuric acid plants, Tail gas scrubbing, Sulfacid[®] process, Contact process, Hybrid sulphuric acid plants.

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