

September 21st, 2020

SARA®, a new “all-in-one” acid regeneration plant dedicated to small-scale acid waste streams

While acid regeneration systems for bigger pickling installations are state of the art in the steel industry, small capacity waste acid streams are generally not regenerated due to economic reasons, thus generating a negative environmental impact. John Cockerill has developed SARA® to address precisely this environmentally unacceptable situation. As such, the new innovative SARA® (Small Acid Regeneration Assembly) concept helps smaller steel plants, surface treatment and long products pickling plants with no or limited access to conventional acid regeneration technology, to efficiently and economically regenerate their small-scale acid waste streams.

The hydrochloric acid regeneration process is the total recovery of chloride solutions based on the pyro-hydrolysis principle, itself being the chemical conversion of metal salts into hydrochloric acid (HCl) and iron oxide. Producers not only recover the HCl, but also obtain high quality iron oxide as a valuable by-product. Renowned for decades as the pioneers in chemical processes, its **two brands Keramchemie and UVK**, made John Cockerill the worldwide leading supplier of acid regeneration plants for both of the two available pyro-hydrolysis processes, namely the fluidized bed and the spray roaster technology.

Lately, due to its proven reliability and environmental advantages, **the fluidized bed type acid regeneration plant (FB-ARP)** producing a high-density iron oxide, became the worldwide-preferred acid recycling technology, and constitute the obvious reasons why the highly innovative SARA® concept is based on this technology. Just like the conventional fluidized bed acid regeneration plants, John Cockerill's new SARA® offers a modular design that guarantees its clients the optimal solution for all their individual process requirements and applications.

With an acid recovery rate of up to 99%, SARA® is closing the loop on acid regeneration also for installations only producing small amounts of waste acid, with volumes in-between 10 and 30 m³ per day. Therefore, this new technology efficiently ensures an optimal and continuous operation of push pull pickling lines (PPL), wire coil pickling lines (WCPL), or other long product pickling lines, while for such small throughputs, conventional ARPs are to be operated in time-consuming intervals, resulting in a high wear of the refractory shell with every stop.

SARA® is designed to reach hydrochloric acid and dust emission values under 10mg/Nm³. An outstanding performance, as this value is well below even the most stringent worldwide emission limits. The highly efficient absorber system recovering the hydrochloric acid from the off

gas, and the following off-gas cleaning system, eliminating both the hydrochloric acid and the dust aerosols, are main contributors to this great achievement.

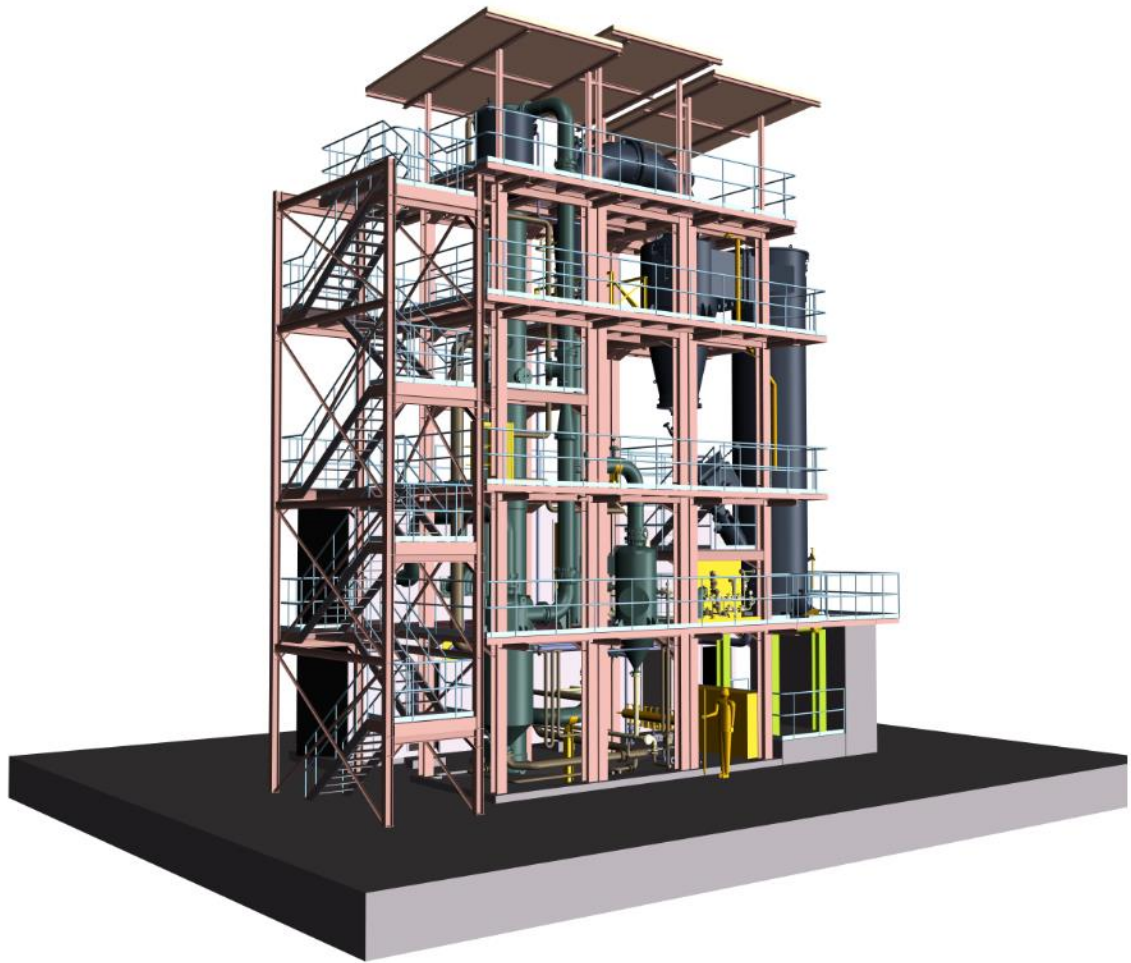
But SARA® also stands for state-of the-art plant automation. While allowing the ARP to run in a fully automated mode, its monitoring and operation is entirely integrated in the control system of the pickling line. Aiming at the optimal operation of the installation, the automation system is constantly monitoring all of the ARP's key parameters, providing the operators with both advice and suggestions for problem solving if and when necessary.

Additionally, SARA® comes as an “all in one”, standardized acid regeneration plant and is available in two different sizes economically regenerating spent acid throughputs of either 500 - 800l/h, or 800 - 1300l/h. Both of the two sizes of this new ultra-compact acid regeneration plant are supplied in pre-assembled equipment packages and come with their pre-manufactured building of less than 130m², allowing for a quick and easy installation and commissioning, equally provided by John Cockerill.

Besides, the resulting decreased investment costs, SARA® also reduces the amount of fresh acid to be purchased, as well as the waste streams of the plant, as the system is processing the rinse water generated in the pickling line and allows for the transfer of the waste heat generated by the reactor to the pickling line. All of the above is resulting in a considerably lower return on investment that translates into an average payback time of 2 years when taking the example of Western Europe.

While this highly innovative, cost effective and environmental friendly concept is appealing a number of potential clients, **a leading Turkish steel wire and rope producer already placed an order with John Cockerill Industry's German entity UVK for the design, manufacturing, and the complete supply of a SARA® ARP to be commissioned early 2021.** A great success bolstering John Cockerill's leading position in the design and supply of relevant and environmental-friendly acid regeneration installations.





John Cockerill, enabler of opportunities

Driven since 1817 by the entrepreneurial spirit and passion for innovation of its founder, the John Cockerill Group develops large-scale technological solutions to meet the needs of its time: preserving natural resources, contributing to greener mobility, manufacturing sustainably, combating insecurity and facilitating access to renewable energy.

Its offer to businesses, governments and communities consists of services and associated equipment for the sectors of energy, defense, industry, the environment, transport and infrastructures.

With its 6000 employees, John Cockerill achieved a turnover of 1.26 billion euro in 23 countries on five continents in 2019.

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