Leading the field in nitric acid plant technology

Market-leading know-how breeds success. With over a century of expertise in nitric acid plant design and construction, around 90 years of experience in the fertilizer sector, and over 130 nitric acid plants engineered and delivered since 1958, we are best placed to deliver proven, economic and environment-friendly nitric acid plants for the fertilizer, mining and petrochemical industry.

Given the current market conditions, plant operators are looking for favorably priced solutions that deliver interruption-free availability with minimal downtime and low emissions, high product quality combined with low energy and raw material consumption, and minimized maintenance costs. This is what we have to offer – plus seamless handling of an entire project from a single source. Our extensive portfolio includes all the nitric acid technologies the market demands, i.e. dual pressure and mono pressure acid processes, and all based on the pioneering work undertaken by Friedrich Uhde, who built the world's very first nitric acid plant featuring ammonia oxidation. Our state-of-the-art nitric acid processes are named after him.

uhde® dual pressure nitric acid process

The benefits of the uhde® dual pressure nitric acid process include a highly efficient ammonia burner, optimized heat recovery, a corrosion-avoiding acid condensation system, a patented seal gas system for the nitrous gas compressor, and a range of nitric acid concentrations from typically 60 wt.% to more than 68 wt.% (azeotropic acid). Also two concentrations at the same time are possible, e.g. 60 wt.% and 68 wt.%. These features help to make such plants more reliable, efficient and flexible. The plant capacities we offer range from around 500 metric tons per day (mtpd) to over 2,000 mtpd. Thanks to the high efficiency of the dual pressure process, these nitric acid plants have the lowest operating costs.

uhde® mono pressure nitric acid processes

Low investment costs due to smaller equipment and pipe sizes for the mono high pressure process, as well as a lower equipment count than dual pressure plants make the mono pressure processes (mono medium - and mono high pressure) particularly suitable for small-capacity plants, i.e. below 500 mtpd but is also referenced for plants with more than 900 mtpd. Other advantageous features of this technology include a highly efficient ammonia burner, optimized heat recovery, a corrosion-avoiding acid condensation system, and a choice of nitric acid concentrations of up to 67 wt.% or two concentrations at the same time, e.g. 60 wt.% and 67 wt.%.

Although around 80% of nitric acid production is required for manufacturing fertilizer, the non-fertilizer industry also requires this feedstock, e.g. for the organic syntheses that ultimately lead to materials such as soft and hard polyurethanes. With concentrations of more than 68 wt.% (azeotropic acid), required for non-fertilizer production processes, our uhde® azeotropic nitric acid process is the ideal technology and offers similar benefits to those outlined above. Whichever technology a plant operator chooses, a nitric acid plant from thyssenkrupp will stand out for reliability, efficiency and flexibility.

The bottom line: With around 90 years of expertise and experience in nitric acid plants, thyssenkrupp is the global market leader in this technology with all the capabilities required to deliver highly efficient, compact and environment-friendly plants. Our reference list includes several capacities and processes, the biggest capacities at about 1,500 mtpd for CF Industries, Iowa Fertilizer Company (USA), INEOS (Germany), MHTL (Trinidad) up to maximum capacity of about 1,850 mtpd operated by AFC (Egypt). The next generation is to increase capacities above 2,000 mtpd.

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