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Fertilizer Grade Ammonium Nitrate Production by KBR Process

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Rajesh Verma
Associate Director

Process Economics Program

Contacts

Rajesh Verma
Associate Director, Process Economics Program
rajesh.verma@ihsmarkt.com

RJ Chang
Vice President, Process Economics Program
rj.chang@ihsmarkit.com

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Abstract

Fertilizers play an important role in providing nutrients to the soil and plants to grow and to increase the crop yield. Ammonium nitrate (AN) is the most popular form of nitrogen fertilizer in most European countries and some other temperate-zone countries. In 2019, the global production and apparent consumption of ammonium nitrates amounted to 21.2 million metric tons, which can be broken down as 17.0 million metric tons AN (80.2%) and 4.2 million metric tons calcium–ammonium nitrate (CAN) (19.8%). Because of the safety issues associated with AN, there has been an increase in the production of CAN.

The world ammonium nitrate (AN) capacity, production, and consumption are dominated by Eastern Europe, Western Europe, China, and the United States. Combined, these four regions accounted for 69.8% of capacity, 71.5% of production, and 64.1% of consumption in 2019. Increases in capacity in recent years have affected operating rates for the industry, as well as the prices. Some of the high-cost plants may be idled because of declining prices.

In 2016, KBR Inc. acquired Weatherly Inc. (Weatherly). Weatherly is a North American company with extensive experience in providing nitric acid and ammonium nitrate proprietary technologies and services to the fertilizer market. With the acquisition of Weatherly, KBR is uniquely positioned as a top global provider of fertilizer technologies and claims to offer low total installation cost, better plant operation, and superior emissions performance.

IHS Markit PEP has worked out the Stamicarbon ammonium nitrate production process economics in two previous PEP Reports, RP 127A (published in 1980) and RP 127B (published in 1999). This PEP Review evaluates the KBR/Weatherly Inc. process for ammonium nitrate production and provides its economics for a plant located at the US Gulf Coast. The review also shows the integrated plant economics for NH_3, HNO_3, and ammonium nitrate plants. This review also includes the market status assessment of supply and demand trends for ammonium nitrate, and an iPEP Navigator tool (an interactive cost module) is also attached to the electronic version of this review.

The process design and economics of the above-mentioned process is IHS Markit PEP's independent interpretation based on the companies' patent literature and other open source information and may not reflect in whole or in part the actual plant configuration. However, IHS Markit PEP believes that they are sufficiently representative of the above-mentioned processes, to estimate the plant economics within the range of accuracy for economic evaluations of the conceptual process designs.

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IHS Markit Customer Care:

CustomerCare@ihsmarkit.com
Asia and the Pacific Rim
Japan: +813 6262 1887
Asia Pacific: +604 291 3600
Europe, Middle East, and Africa: +44 1344 328 300
Americas: +1 800 447 2273

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