

Ammonia

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Abstract

Although fundamental ammonia-manufacturing technologies have not radically changed in the last ten to fifteen years, numerous technological changes and improvements have taken place in processing technologies, aiming for increased energy efficiencies and, of late, for higher capital productivity and improved competitive profit margins from lower operating costs. Most of the above advantages are being achieved through development and implementation of better process conditions and more efficient equipment design.

In the last decade, several improved and more efficient ammonia technologies have already been commercialized worldwide by major licensors, including Haldor Topsoe, KBR, Uhde, and Ammonia Casale. This PEP report provides an overview of the catalysts and technology advancement occurred in the last decade in ammonia process. The report then develops the process economics for production from the most common type of ammonia feedstock, natural gas. The report will also highlight the major hallmarks of the technologies, along with the current commercial picture for the ammonia industry.

This report covers the detailed technology descriptions and the cost analysis of the Casale's Ammonia process, KBR's PURIFIER™ process, and Uhde Dual pressure process. The production economics assessment in this report is based on a US Gulf Coast location. However, an iPEP Navigator module (an excel-based computer costing model developed by IHS Markit) is attached with this report to allow a quick calculation of the process economics for three other major regions also—Germany, Japan, and China. For every process, the module also allows the production economics to be reported in English or metric units in each region.

The technological and economic assessment of the processes is PEP's independent interpretation of the companies' commercial processes based on information presented in open literature, such as patents or technical articles, and may not reflect in whole or in part the actual plant configuration. We do believe that they are sufficiently representative of the processes and process economics within the range of accuracy necessary for economic evaluations of the conceptual process designs.

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