



thyssenkrupp

Insights\_Uhde



Where experience really counts:  
Customized turnkey EPC solutions  
for every kind of urea plant  
technology

With a global output of some 200 million metric tons, urea is one of the most-manufactured chemicals and the most widely used nitrogen fertilizer. Six decades of expertise and experience in the engineering, procurement



and construction (EPC) of urea plants have made us one of the world leaders in this field. Our customized plant solutions ensure long-term sustainability and contribute to maximizing yields in crop production.

### **BAT for maximum uptime**

Our one-stop-shop urea plant solutions feature the best available technology (BAT) and ensure maximum uptime. Based on over 40 years of close partnership with Stamicarbon, we offer their market-leading CO<sub>2</sub> stripping, synthesis and prilling technologies in combination with our own cutting-edge and market-leading UFT® fluid bed granulation technology as a cost-efficient, environment-friendly, state-of-the-art and scalable solution suitable for any site worldwide. This granulation technology delivers all required product sizes (2-8 mm) from the same plant with only minimal adjustments. Moreover, the urea granules are well rounded, very hard, and ultra-resistant to crushing and abrasion. Our comprehensive portfolio, which also includes other granulation technologies, is complemented by extensive know-how, service and training facilities that enable us to meet all our customers' pre- and post-installation requirements.

### **Top references**

Our turnkey EPC solutions offer urea production capacities up to 6,000 metric tons per day (mtpd) along with state-of-the-art technologies to reduce ammonia and dust emissions. One of our top references is Europe's largest single-train urea plant with a nameplate capacity of 3,500 mtpd, a peak load of 4,200 mtpd, and an actual performance of around 4,000 mtpd. It was built at Sluiskil in The Netherlands for the world's biggest urea producer, the Norwegian company Yara. Other benchmarks in our long history include the QAFCO 4 plant in Qatar (which set world record for yearly urea production in 2011) and CFI plants in the USA (3,500+ mtpd capacities). For BFI in Brunei we are currently building on a turnkey EPC basis a 3,900-mtpd urea and granulation plant, which also includes a 2,200 mtpd ammonia facility and all the required offsites and utilities. On the basis of engineering studies completed for even larger plants, single-train capacities of up to 6,000 mtpd are now technically possible. With market-leading technologies and our EPC know-how we are well equipped to build the world's largest urea plants.

### **Exemplary emissions**

99.9% urea dust removal, >99% ammonia removal, zero liquid effluents: our plants ensure minimal emissions, high process efficiency, and excellent product quality. Besides, we can satisfy any specific requirements by offering tailored emissions management (e.g. acidic scrubbing, absorbing technology, etc.) as well as safety analyses and assistance in permit management, including HAZOP, SIL, LOPA, QRA, safety reports, and dispersion calculations.

### **Pioneering innovations**

Although urea formaldehyde is still the state-of-the-art urea granulation additive, it is categorized as a carcinogenic. That is why we developed a formaldehyde-free additive that significantly reduces the environmental impact by virtually eliminating VOC emissions and ensures compliance with health and

safety regulations on formaldehyde, while guaranteeing the same or even better granulation performance and product quality. Besides, the new formaldehyde-free additive extends the application range of urea granules with no or negligible impact on the plant.

New environmental requirements are forcing urea producers to more frequently offer slow-release urea fertilizers. That is why we developed a slow-release urea fertilizer, which uses a polylactic acid (PLA) instead of a PE coating. The major advantage of PLA over PE is that it is an environmental-friendly coating that also delivers higher fertilizer efficiency and crop yields. PLA dissolves completely without any residuals, while PE leads to an increased microplastic amount on farmland, which ultimately impacts groundwater quality negatively.

Intensive farmland utilization and even more so drastically reduced SO<sub>2</sub> emissions from power plants lead to a significant sulfur deficit in the soil. To encounter this we have developed Urea-ES granules where elemental sulfur is dispersed into the granules at up to 13 wt-% without changing the overall plant design of the existing urea granulation plant. Fertilizer manufacturers benefit from a high-value product with only very limited investment for a dispersion unit within the existing plant. Farmers benefit from the sulfur-enhanced urea granule structure, as sulfur is dispersed in the urea granules. This results in a fast conversion of elemental sulfur into sulfate, which enhances efficiency and crop yields.

For more information: <https://www.thyssenkrupp-industrial-solutions.com/en/products-and-services/fertilizer-plants/urea-plants>

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**The bottom line:** As these examples show, our leading-edge technologies enable urea plant operators to produce top-quality products by cost-efficient and environment-friendly means. Through close collaboration with market-leading technology licensors we provide our customers with turnkey EPC solutions for urea plants up to 6,000 mtpd capacity range. With top references from the Middle East, Europe and the USA we can rightly claim to have the right customized solution for any country and climate.

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