



thyssenkrupp

Insights_Uhde



Spray your way to higher yields - with UAN fertilizers produced with thyssenkrupp technology

Urea ammonium nitrate (UAN) solutions are fertilizers with excellent physical properties. Their low viscosity means they can be easily applied by spraying without the need for additional irrigation – a big advantage in the many crop-growing regions facing water shortages. At thyssenkrupp

we have a great deal of experience in designing UAN plants featuring either the uhde® urea ammonium nitrate or the uhde® urea off-gas neutralization process.

UAN is a mixture of ammonium nitrate, urea and water. Standard solutions contain 28%, 30% or 32% nitrogen, and may also be enriched with soluble plant nutrients, such as sulfur, boron and calcium compounds. A typical UAN composition with 32% nitrogen would have a 45:35:20 ratio of ammonium nitrate, urea and water. Depending on the specific composition, the salting-out temperature can be well below 0° C so transport and storage are unproblematic, even in cold climates. This property has helped UAN fertilizers to gain significant market shares, especially in North America. With two process alternatives in our portfolio we have designed single-train UAN plants with capacities up to to 4,300 metric tons per day (mtpd).

Ammonium nitrate neutralization

Ammonium nitrate (AN) is produced by the uhde® ammonium nitrate neutralization process. The AN solution is then mixed with urea solution and water in a specially designed UAN mixing unit to obtain the required nitrogen content and then adjusted to an alkaline pH. After cooling and addition of a corrosion inhibitor, the final UAN solution can be easily stored and handled. The contaminant level in the process condensate is normally below 15 ppmw of nitrogen.

Neutralization of urea off-gas

When implementing a once-through urea synthesis, the ammonia-rich off-gas can be used to drive the ammonium nitrate neutralization reaction. As a result of the high CO₂ content of the off-gas, the neutralization reaction is performed in a natural circulation loop. This is followed by the UAN preparation steps described above. With a sophisticated scrubbing system installed, ammonia losses in the vent gas can be reduced to 0.013 kg/tAN.

Benefits

Our portfolio covers everything from basic engineering to execution on an EPC lump-sum basis. Customers benefit from our uhde® Technologies through its great reliability and high on-stream time, cost effectiveness, energy efficiency, excellent safety standards, and low emissions, as the wet scrubbing system complies with environment regulations and best available technology levels.





The bottom line: At UAN solution plants such as the CF Industries facility in Louisiana, U.S., Iowa Fertilizer Company facility in Iowa, U.S. or MHTL facility in Point Lisas, Trinidad thyssenkrupp Technologies are playing a key role in the production of UAN fertilizer. Literally we provide whole process chain out of one hand. The uhde® Technologies offer convincing cost effectiveness and energy efficiency, while the plants stand out for their high reliability and availability, excellent safety standards, and compliant emission levels. With this said thyssenkrupp has been able to be market leader in this field of UAN Fertilizer Technologies.
