Clean and efficient pastillation of urea and multi-nutrient fertilizer mixtures
With the world’s population expected to reach 9 billion by 2050, the challenge of achieving global food security will place a huge responsibility on the fertilizer industry.

Not only will farmers have to increase crop production to feed these extra mouths, but they will have to do so against a backdrop of nutrient deficiencies in the soil, environmental concerns over the over-use of fertilizers and finite supplies of phosphorus, nitrogen and potassium.

The industry is therefore going to have to develop new, enhanced fertilizers, products that deliver multi-nutrients in the most efficient way possible, maximizing crop prosecution while at the same time meeting environmental concerns.

At Sandvik, we have the systems to help.
A wealth of experience in developing innovative engineering processes for fertilizers

Sandvik Process Systems is a market leader in the design, engineering and installation of specialist fertilizer solidification and handling systems. Part of the Sandvik group, a business active in more than 130 countries, we combine the responsiveness and customer focus of a medium-sized company with the strength and stability of a global engineering group.

Solidification systems for fertilizer plants

Our partnership with the chemical industry extends back more than 50 years and our solidification systems are now firmly established as the default solution for a wide range of products, including fertilizers.

These systems include the Sandvik Rotoform®, a fast, efficient and clean method of converting fertilizer melts into uniform pastilles in a single step, and one that provides an ideal solution for fertilizer producers looking to de-bottleneck or revamp existing process facilities.
**Up- and downstream plant for turnkey solutions**

The wealth of experience and engineering know-how that exists across Sandvik means we can deliver complete turnkey installations including control systems, information technologies and electrical services.

This integrated design capability also covers:

- Mixing/grinding line
- Dosing/measuring equipment
- Heated tanks and pipework
- Pumps, chillers and cooling towers
- Elevators/conveyors
- Storage silos
- Bag filling systems

We can therefore provide complete end-to-end systems for the mixing, solidification and downstream handling of a wide range of products including fertilizer urea, technical grade urea and speciality urea products such as UAS.
Environmentally-friendly production of uniform pastilles

The Sandvik Rotoform pastillation process is simple with low investment and operating costs and minimal environmental impact, making it ideal for upgrade projects, removing bottlenecks or the production of special fertilizer products.

There is no need for dedicated scrubbing, recycling, crushing or bulk cooling. Pastilles are free-flowing and uniform in shape, and an almost complete lack of dust ensures safe and easy transportation and stockpiling or bagging.

Proven Rotoform performance
The first Sandvik Rotoform was installed in the early 1980s and more than 1700 systems have been installed since. The technology has undergone significant enhancements over the years but the core principle remains unchanged.

Molten product is fed onto a continuously running steel belt in the form of measured droplets. As they travel along the system, heat is transferred from the product to cooling water sprayed against the underside of the steel belt, and the droplets are solidified into consistently sized pastilles.

In this environmentally-friendly process, the cooling water and product do not come into contact with one another so there is no possibility of cross contamination.
THE OUTSTANDING QUALITIES OF THE ROTOFORM PROCESS MAKE IT THE CHOSEN SOLUTION FOR DOZENS OF FERTILIZER PRODUCTS

Other process benefits include:

- High quality pastilles, adjustable from 1-5 mm
- High crushing strength (vs prills)
- Very low dust emissions
- Very low vapour/gas emissions
- Very low power consumption

**Clean production of high-value technical grade urea**

Another key benefit of the Rotoform process – the ability to produce pastilles with a high crushing strength without the addition of formaldehyde – enables the efficient and economical production of technical grade urea for applications including animal feed, pharmaceutical products and Diesel Exhaust Fluid (DEF) used in Selective Catalytic Reduction (SCR) to lower NO\(_x\) concentration, commonly referred to as AdBlue.
Grow market share with enhanced, multi-nutrient fertilizer products

The benefits of multi-nutrient fertilizers are now widely accepted, opening up new market opportunities for producers with the versatility to develop and introduce these products.

Our ability to supply complete in-line mixing, solidification and handling systems provides a low cost, low risk route into this potentially lucrative market.

**Upstream mixing solutions**
Complementing our Rotoform solidification technology, we supply a range of upstream solutions including blending and grinding units. These can be used to combine liquid and solid products into suspensions, enabling the production of speciality urea products such as:

- Urea + sulphur
- Urea ammonium sulphate (UAS)
- Urea + potassium
- Urea blended with micronutrients

Other special fertilizers that can be produced on these systems include ammonium nitrate and additives, magnesium nitrate and sulphur bentonite.
EFFICIENT DOSING, WEIGHING, MIXING AND GRINDING
WITH ACCURATE CONTROL AND EASY MAINTENANCE

Production flexibility to meet specific crop needs

Precise control of dosing allows product ratios to be varied to meet different needs, while the inherent versatility of the Rotoform system allows quick and easy changeover from one product to another with only minimal modification.

As a result, producers can develop and launch innovative new fertilizers and achieve higher profit margins by adding value to low value products. At the same time farmers can achieve the higher crop yields they’re looking for, and the more efficient use of fertilizers means reduced environmental impact all round.
Versatile, expandable modular system for easy integration alongside existing facilities

The flexibility of the Sandvik Rotoform system allows easy integration into existing facilities. It can be used for product development, for debottlenecking, to enable production of multiple product types or to reduce overall plant emissions by transferring a proportion of existing production to pastillation.

A single Rotoform system will offer a throughput capacity of between 120-170 TPD depending on the product being processed. The modular design of the system means that a number of Rotoform lines can be run in parallel to deliver capacities of more than 2500 TPD. This multiple approach provides the flexibility to switch lines on and off to meet changing throughput requirements.
Modular design allows a number of Rotoform lines to be run in parallel

See the technology in action at our Productivity Center
Rotoform systems are now in operation in fertilizer and urea plants in North and South America, Europe, Asia and Australia.

If you'd like to find out more about the opportunities this system could open up for your company, or to discuss how we can integrate upstream mixing and feed and downstream handling and bagging to deliver a turnkey solution, we'd be delighted to talk to you.

And if you'd like to really put the Rotoform system to the test, we invite you to visit our Productivity Center in Germany where you can assess its performance or even undertake pilot production of a specific product using your own products.

INCREASED FLEXIBILITY FOR PRODUCT DEVELOPMENT, DEBOTTLENECKING, MULTIPLE PRODUCTS OR REDUCING EMISSIONS