

DIGITAL SOLUTIONS FOR FERTILIZER PLANTS

OPTIMIZING THE FUTURE OF PLANT OPERATIONS



WHAT ARE THE CHALLENGES

TODAY'S FERTILIZER PLANTS FACE?

The fertilizer industry faces many challenges. Changes in market demand, in personnel and regulations, fluctuations in energy prices and new technologies. Production is more and more complex and there's a growing need to raise operational efficiency, reduce energy consumption and emissions, increase flexibility, improve product quality and lower cost of operation. How do you achieve all this without comprising safety and process efficiency? How do you develop the skills your need in your team to operate in new challenging conditions?

Bottomline: How do you improve performance to make your fertilizer plant futureproof? With our digital process solutions and 70 years of knowledge and experience, we believe we are part of the answer. Our suite of digital services has been developed to help fertilizer plants achieve operational excellence by harnessing the power of real-time data. We share valuable insights with you to show how digitalization drives continuous process improvement and generates new opportunities for your plant and your people. Are you up to the challenge? We are!

Our software and quality assurance services allow you to control and optimize your processes and systems.



OUR DIGITAL SOLUTIONS

TAKE YOUR PLANT TO NEW HEIGHTS

As a leading licensor of fertilizer plant technology, we understand that digitalization helps increase production efficiency, while reducing energy consumption, emissions and downtime. All you need is the right kind of data – and

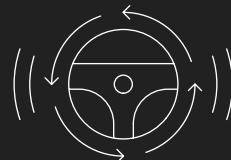
the knowhow and technology to interpret and benefit from it. Our digital solutions turn real-time process data into meaningful information, providing your staff with insights that help them take your plant to new heights.

**The right kind
of data to
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benefit from it.**



Process Monitor

We take a deep dive into your process operations, generating rich data in dashboard form. You get the insights you need to optimize your plant performance. The online Process Monitor incorporates our state-of-the-art H&M balance, and thermodynamic and kinetic fertilizer models.



TTS (Technology Training Simulator) for urea

Stamicarbon develops high-fidelity operator training simulator systems for urea. We have a wide range of customers in the chemical industry, with an extended range of nitrogen, syngas and adjacent technologies..

Customers of Stami Digital Solutions are licensors, engineering contractors, plant owners and training centers.





PROCESS MONITOR

KEEP A CONSTANT EYE
ON YOUR PLANT





Key benefits

- Review all data in clear dashboards
- Access real-time key process data
- Compare expected and actual plant behavior
- Monitor equipment and instrument performance
- Monitor ammonia emissions

More insights at

www.stamicarbon.com

MONITOR YOUR PROCESS IN REAL TIME

For your plant to operate at optimal capacity, you need all equipment and instrumentation functioning properly and all plant indicators where they need to be. But many of them cannot be monitored continuously. Well, until now...

Our Process Monitor solution generates continuous real-time equipment and instrument performance data. We deliver soft-sensor output based on live distributed control system (DCS) data and a first principles-based process model tailored to your historical plant operation. This supports your staff in their day-to-day process optimization activities.

Assess: the first step to success

The first step in the monitoring process is an in-depth assessment of your plant,

your process control and your process dynamics. We build a process plant model, tailored to your fertilizer plant.

The model results are validated during the assessment, factoring in a wide range of operating conditions.

What's in it for you?

Our Process Monitor solution allows you to calculate all key process parameters, equipment and instrument performance parameters, and ammonia emissions in real time. Operators can use this data to improve plant performance (throughput, energy consumption, emissions) or initiate troubleshooting and maintenance activities.



TECHNOLOGY TRAINING SIMULATOR

GET VALUABLE INSIGHTS INTO PLANT
OPERATIONS

Optimize your plant



FROM SIMULATION TO OPERATION

Production system simulations provide input for the development of valuable solutions. That's because they are the source of clear insights into complex systems. In the fertilizer industry, we provide high fidelity Technology Training Simulator (TTS) specifically developed to that end. Our process simulator software creates a dynamic environment to analyse computer models while they are running, harnessing world-class thermodynamics knowhow. It has already proved its worth at various (urea, ammonia and nitric acid) fertilizer plants and in other chemical processes, such as hydrogen peroxide to propylene oxide (HPPO).

Features:

The Process Simulator runs various urea melt and granulation operating modes, including:

- Normal operation
- Cold start-up
- Recovery mode
- Blocking-in and restarting
- Blocking-in and draining
- Switching pumps
- Recovering from pre-defined scenarios

The simulator is fully equipped, including:

- Control valves
- Interlocking system
- Clearly marked manual (field) valves
- Sample points
- Alarm, trend & event view

The process simulator can be configured to precisely mirror your plant process equipment, and emulate the control and interlocking systems of the plant's DCS.

UNLIMITED OPPORTUNITIES FOR EXPERIMENTING AND LEARNING

Why use a process simulator?

Our operator training simulators are real-time dynamic process simulators for fertilizer plants. They create a process simulation that behaves like a real plant. Each OTS has the look and feel of a real DCS, with unlimited opportunities for experimenting and learning. This helps make your plant safer, more cost-effective and improve its technical performance.

More dynamics insights

The simulation software delivers more insights in the technical ins and outs of operational processes. It's a valuable training tool that enhances the knowhow of plant operators, giving them a better understanding of plant dynamics.

Maximum risk reduction

Safety first! By simulating the operation processes in a risk-free environment, plant operators learn how to keep their fertilizer plant running even when unforeseen issues occur. Analysts and engineers gain trust in a model by seeing it in action and can clearly demonstrate findings to management.

Lower operating costs

Training in standard operating procedures and unforeseen issues brings more efficient plant operations within reach and saves you valuable time and money down the line. Downtime, equipment damage, disruptions, training time and human error are reduced. You also benefit

from trouble-free start-ups and faster recovery after disruptions. Your staff are trained to run your plant at maximum capacity while dealing with boundary conditions, including minimizing steam consumption and ammonia losses, testing new modified operation procedures before implementation, and checking control and interlocking functions.

Operators learn how to optimize plant performance.

OTS by Stamicarbon

For over 25 years, Stamicarbon offers advanced high-fidelity operator training simulators with state-of-the-art techniques that can be used in all levels of education, from technical students in training centers to highly experienced operators in chemical facilities. Our solutions can be used - and have proved their value - in different markets/segments.

More insights at www.stamicarbon.com





ADVANCE™ CONSULT™

NEXT-LEVEL PLANT ASSESSMENT

Improving your process through assessment

Our ADVANCE™ CONSULT service takes your operational performance to an even higher level. This plant assessment helps you evaluate opportunities to increase capacity, lower operating costs and reduce emissions.

Absolutely essential

A plant assessment is absolutely essential to be able to identify opportunities to enhance plant performance. Our engineers need to conduct an in-depth analysis to determine the current status and give advice about any improvements.

Our expert advice drives you forward

We provide expert advice and optimal equipment conditions to help you operate your plant at a consistently high level and achieve high-quality outputs long-term. We evaluate the feasibility of enhancing plant performance, raising production and lowering energy consumption by troubleshooting and optimizing process conditions.

An ADVANCE CONSULT™ plant assessment provides valuable insights when you want to:

- Find a sustainable solution to an operational bottleneck
- Analyze your plant status to identify ways to enhance performance



Added value for your plant.

The ADVANCE CONSULT™ service includes:

- Calculating current material balances
- Identifying sections operating at maximum load
- Identifying equipment that constantly operates close to design limits, needs replacing or will require essential upgrades in the future
- Providing recommendations to address areas of concern (such as LP steam venting)
- Advising how to improve your plant's performance, including using proven debottlenecking solutions to take full advantage of all design margins to produce more urea while also reducing emissions

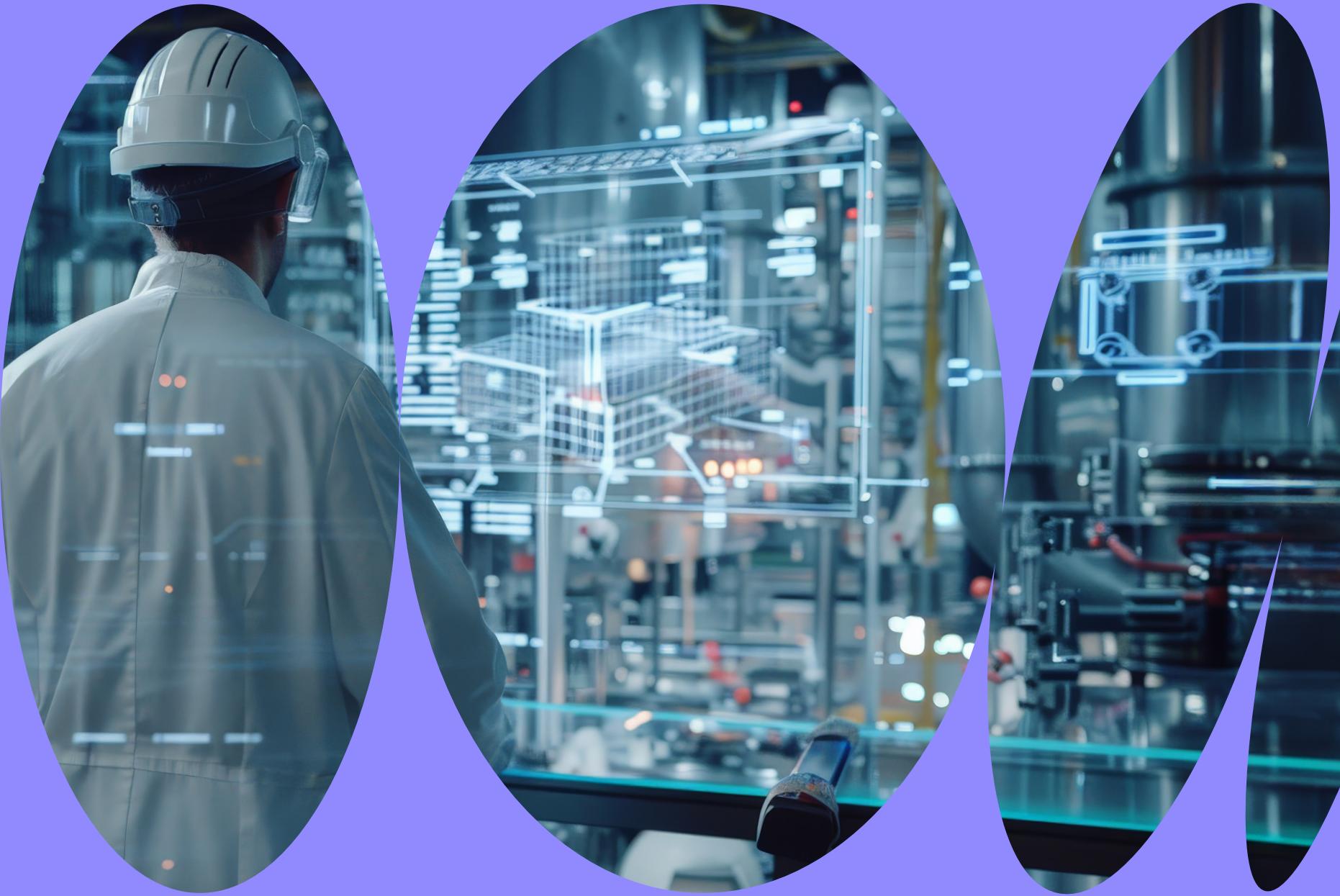
ADVANCE CONSULT™ combining with our digital Process Monitor solutions to improve results, gain a better understanding of the digital tools and train your operators.

We take your operational performance to an even higher level.

ADVANCE™ CONSULT™

Interested?

Like to know what ADVANCE™ CONSULT can do for you? How it can increase your plant's capacity and cut your operating costs and carbon emissions? Contact our experts at www.stamicarbon.com.



WE ARE STAMICARBON

WHAT CAN WE DO FOR YOU?

Stamicarbon, the nitrogen technology licensor of NEXTCHEM (MAIRE Group), designs and licenses fertilizer plant technologies, specializing in urea, green ammonia, and nitric acid. As part of NEXTCHEM, Stamicarbon leverages the capabilities and expertise of a world-leading engineering group. In total, Stamicarbon has licensed more than 260 urea plants and realized more than 100 revamping and optimization projects. Applying more almost 80 years of

knowledge and experience, Stamicarbon offers you tailored solutions and services to maintain, improve and optimize plants in every stage of their life cycle, with a focus on sustainable fertilizer production. As pioneers with a higher purpose, Stamicarbon's vision is to help enable the world to feed itself and improve the quality of life. Stamicarbon is headquartered in Sittard, The Netherlands, and operates worldwide.

Questions?

Would you like to know more? Talk to us - we're here for you! Contact our experts at www.stamicarbon.com.



Stamicarbon

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