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**FERTILIZERS - CAPABILITY STATEMENT**



# FERTILIZERS

## Capability Statement

## Engineering Solutions for the Fertilizer Industry

Our fertilizer experience covers the full spectrum of services, for the production of intermediate products to granulated fertilizers and derivative products.

De Smet Agro has completed hundreds of mandates, ranging from studies to full implementation, in fertilizer industry facilities around the world with focus on Phosphoric Acid, AN / CAN granulation plants and Clean air solutions.

We combine the world's best technologies and global know-how to deliver complete customized sustainable solutions and to improve the capacity and efficiency of our clients' existing operations.





# Customized solutions

For fertilizer base chemicals to downstream fertilizers production plants

## Phosphoric acid

With highly qualified expert teams, we have supported customers worldwide in the design and construction of fertilizer and merchant grade phosphoric acid plants, in upgrading facilities, and in developing optimal solutions for their operations.

- > Phosphate rock (solid/slurry) storage & handling
- > Single and double crystallization processes
- > Fluosilicic acid recovery
- > Gypsum transport, storage & valorization
- > Fluorine gas scrubbing
- > Acidic cooling tower design
- > Phosphoric acid concentration and purification technologies
- > Environmental design with zero liquid effluent

## Granulation, prilling and crystallization

Decades of experience designing and building synthesis, evaporation and granulation units, crystallization plants, and prilling towers have contributed to our high-level in-house expertise appreciated by clients worldwide.

- > Ammonium nitrate and derivatives (AN)
- > Calcium ammonium nitrate (CAN)
- > Technical ammonium nitrate (TAN)
- > Calcium nitrate (CN)
- > MAP / DAP / NPK
- > Ammonium sulfate (AS)
- > Ammonium sulfo-nitrate (ASN)

## Fertilizer industry

We have a long-standing history in the design and management of urea and nitrogen based fertilizers production facilities. We also work extensively in the gaseous effluents treatment where we have been involved in numerous projects.

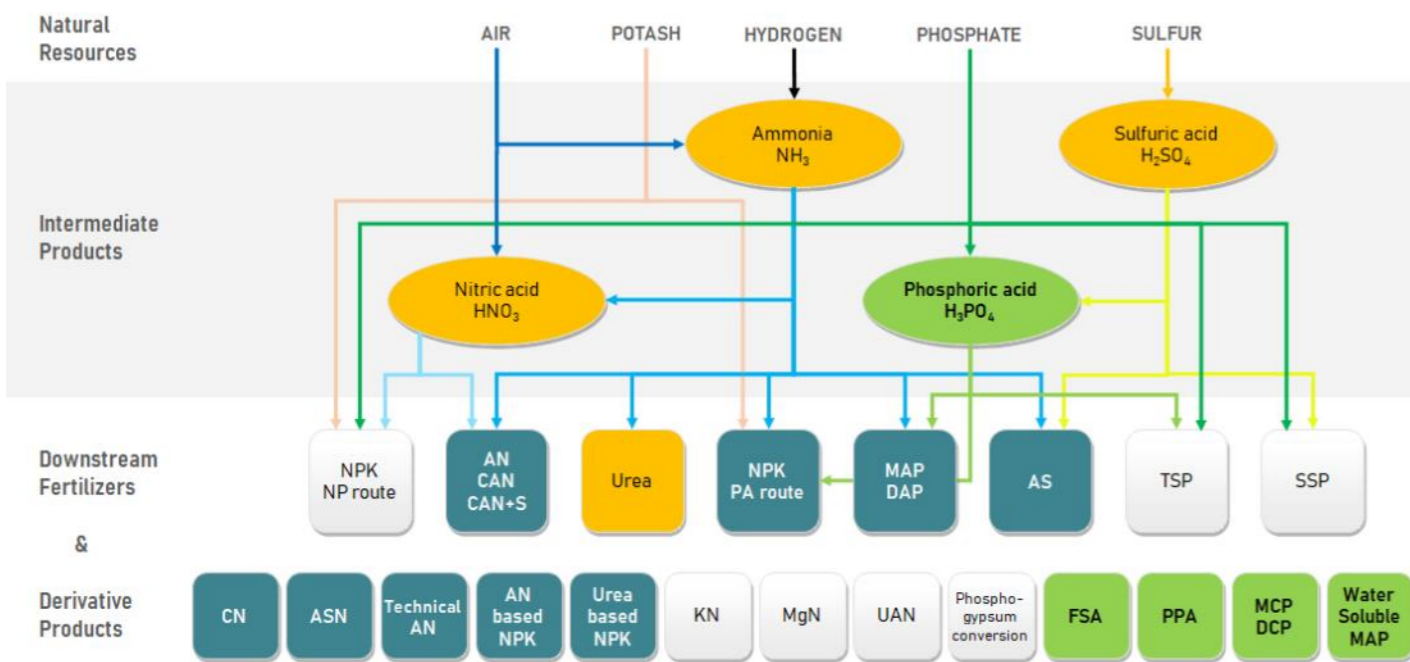
- > Prilling towers gaseous effluents cleaning
- > Flue gas scrubbing applied to fertilizer industry
- > Ammonia
- > Urea
- > Nitric acid
- > Sulfuric acid



ACTIVE FOR OVER



YEARS IN THE FERTILIZER INDUSTRY



IN-HOUSE TECHNOLOGIES FOR: AN | CAN | CN | AS | ASN | NPK | MAP | DAP

MOST EXPERIENCED LICENSEE OF LEADING TECHNOLOGY PROVIDER FOR PHOSPHORIC ACID: PRAYON TECHNOLOGIES

FULL ACCESS TO ALL LEADING TECHNOLOGY PROVIDERS FOR: AMMONIA, UREA, NITRIC ACID, SULFURIC ACID

<b>AN</b> Ammonium Nitrate	<b>CN</b> Calcium Nitrate	<b>MAP</b> Monoammonium Phosphate	<b>PPA</b> Purified phosphoric acid
<b>AS</b> Ammonium Sulfate	<b>DAP</b> Diammonium Phosphate	<b>MCP</b> Monocalcium Phosphate	<b>SSP</b> Single super Phosphate
<b>ASN</b> Ammonium Sulfo-Nitrate	<b>DCP</b> Dicalcium Phosphate	<b>MgN</b> Magnesium Nitrate	<b>TSP</b> Triple super Phosphate
<b>CAN</b> Calcium Ammonium Nitrate	<b>FSA</b> Fluosilicic acid	<b>NP</b> Nitrophosphate	<b>UAN</b> Urea Ammonium Nitrate
<b>CAN+S</b> CAN with sulfur	<b>KN</b> Potassium Nitrate	<b>PA</b> Phosphoric acid	





# Services to Clients

With a **Process-oriented** multi-disciplinary engineering team, De Smet Agro cover various activities:

- > Technical audits
- > Pre-feasibility / feasibility studies
- > CAPEX estimate + financial study
- > Basic engineering / FEED
- > Detail engineering
- > Procurement services
- > Construction management
- > Operator training
- > Commissioning and start-up activities

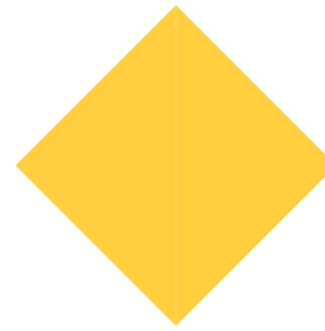
For all types of projects:

## New plant

- > Greenfield plant
- > Brownfield plant
- > On-site and off-site facilities

## Existing plant

- > Modernization
- > Revamping
- > Capacity increase



# Selected References

## Phosphoric Acid production plant revamping

**Client:** OCP group

**Location:** Jorf Lasfar, Morocco

**Services:** EPCM

### Highlights

- > Adaptation of existing phosphoric acid lines to process phosphate slurry instead of dry phosphate rock
- > 4 phosphoric acid lines based on Nissan technology were revamped into 4 phosphoric acid units on DH Prayon's technology with capacity increase up to 1350 MTPD  $P_2O_5$

## Sulfuric and Phosphoric Acid production plants

**Client:** JIFCO

**Location:** Eshidiya, Jordan

**Services:** EPCM

### Highlights

- > Greenfield 1-train double absorption sulphur burning sulfuric acid plant producing 4500 MTPD (100%  $H_2SO_4$  basis) and phosphoric acid plant with 4 concentration lines producing 1500 MTPD  $P_2O_5$
- > Storage tanks, utilities, and on-site / off-site infrastructure
- > Efficient workshare brought the best of our sulphuric and phosphoric expertise to the client and a one-stop-shop solution for the complex, from raw material handling to truck loading of final product

## Calcium Ammonium Nitrate granulation plant

**Client:** Sasol Nitro

**Location:** Secunda, South Africa

**Services:** Technology + EPCM

### Highlights

- > Greenfield evaporation and granulation plant to produce 1333 MTPD of Calcium Ammonium Nitrate (CAN)
- > Supply of De Smet Agro's in-house Fluidized Drum Granulation (FDG) technology which affords high granulation efficiency and enables easy adjustment of granule size
- > Supply of proprietary and critical equipment.

## Phosphoric Acid production plant and balance of plant

**Client:** ETI Bakir (Cengiz holding)

**Location:** Mazidagi, Turkey

**Services:** Basic & Detail Engineering

### Highlights

- > Greenfield 700 MTPD  $P_2O_5$  plant based on DH Prayon technology including 2 concentration lines
- > Design of master plot plan, utilities production, storage units and all interconnections between SAP, PAP,  $NH_3$  and DAP plants

## Purified Phosphoric Acid production plant

**Client:** Emaphos

**Location:** Jorf Lasfar, Morocco

**Services:** EPCM

### Highlights

- > Greenfield 450 MTPD  $P_2O_5$  plant based on Prayon technology, including desulfation, desarseniation, decantation, solvent extraction & concentration
- > Design of raw materials storage, additives storage and all utilities

## Calcium Nitrate granulation plant

**Client:** Acron

**Location:** Veliki Novgorod, Russia

**Services:** Technology + Basic engineering

### Highlights

- > Greenfield concentration and granulation plant to produce 300 MTPD of Calcium Nitrate (CN)
- > Supply of De Smet Agro's in-house Fluidized Drum Granulation (FDG) technology
- > Supply of proprietary equipment.



### CONTACT DETAILS

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