

■ **Course title:**

# Fertilizer Markets, Products and Technologies

■ **Abstract:**

You will learn about the various types of fertilizers, the various fertilizer production technologies and fertilizer finishing technologies with its pros and cons, the role of fertilizers, the market trends and players in the fertilizer business and the hazards of the various fertilizers and fertilizer production technologies.

■ **Course outline:**

## Module 1: Fertilizer Market (duration 2hrs)

1. What is Fertilizer
2. The role of Fertilizers worldwide
3. The role of each nutrient
4. What are the market drivers
5. The role of Nitrogen
6. The environmental consequences
7. Agriculture and Green House Gas emissions
8. Ammonia as Fuel
9. Fertilizer market situation per continent

## Module 2: Fertilizer Products and Production Technologies (duration 1.5hrs)

1. Overview of the various fertilizers
2. Nitrogen (N)
3. Phosphates (P<sub>2</sub>O<sub>5</sub>)
4. Potassium (K<sub>2</sub>O)
5. NPK
6. Sulphur (S)
7. Nitrogen & Sulphur
8. Micronutrients (B, Fe, Ca, etc), organic / recycle materials
9. Enhanced Efficiency Fertilizers

Author / Trainer:

**Mark Brouwer**

Process & Safety Engineer,  
Urea Expert

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Mark has over 25 years of licensing, revamping, engineering and consultancy experience in urea projects. He has been visiting more than 100 urea plants located in almost all continents.

Mark has experience in all project phases starting from Concept and Front End Engineering (FEED) through Commissioning and Operation. He is a Master of Chemical Engineering, Post Bachelor in Safety for Engineers, Marketing and Business Strategy Courses at the Rotterdam School of Management and a Member of American Institute of Chemical Engineers (AIChE).

Mark has extensive experience in revamp studies, engineering and process safety consultancy services to EPCM companies and urea plants including the preparation of Revamp and Plant Assessment and Safety Reports, hazard identification and analysis, troubleshooting, risk registers, corrosion inspections, procurement services, training services, etc.

Mark's expertise are Process technology, Corrosion, Licensing, Engineering, Revamping, Marketing, Sales, Contract negotiations, Troubleshooting, Project Management, International business, Safety, high pressure urea valves, high pressure urea equipment.

Mark has provided extensive training programs to more than 1000 urea engineers, managers, (shift)supervisors and operators from all over world.

Mark has published numerous technical papers in reputable industry magazines and presented at numerous CRU Nitrogen & Syngas and AIChE Ammonia Safety Conferences.



### **Module 3: Fertilizer Finishing Technologies (duration 2hrs)**

1. Various solid fertilizer products
2. Prilling tower
3. Oil prilling
4. Rotoformer
5. Fluid bed granulation
6. Drum granulation
7. Pugmill granulation
8. Pan granulation
9. Prill fattening
10. Compacting
11. Extrusion
12. Coating / Seedcore
13. Bulk blending

### **Module 4: Safety, Health & Environmental aspects (duration 1hr)**

1. Compatibility of solid fertilizers
2. Nitrates (fire, detonation)
3. Anhydrous ammonia
4. Phosphates (HF, phosphogypsum)
5. Sulphur (fire, SO<sub>2</sub>, explosion)
6. Nutrient use efficiencies

Optionally we can add to above modules a Market Strategy Discussion for your products and services.

#### **Learning Outcomes:**

By the end of this course you will understand:

- Role of Fertilizers in our world
- The main trends and players in the Fertilizer industry
- The various types of Fertilizers
- The various technologies to produce Fertilizers with its pros and cons
- The various finishing technologies to produce solid Fertilizer products with its pros and cons
- The safety, health and environmental impact of Fertilizers and Fertilizer Technologies

■ **Who will benefit:**

Anyone who is involved in the marketing, sales, business development of fertilizers or fertilizer production technologies or fertilizer production equipment and design and operation of any kind of nitrogen fertilizer plant, including:

- Engineers and Managers
- Marketing and Business Development Managers
- Safety, Health and Environmental Managers
- Operations

■ **Course materials:**

- Hand Out Presentations in pdf format
- Technical Paper: The Future of Urea in pdf format

■ **Price:**

**€ 950**

■ **Discounts:**

- 2 places – 10% discount
- 3 places – 15% discount
- 4 or more places – 20% discount.

■ **In-company training:**

This course is also available as an in-company course (face-to-face or online) where content can be customised to meet your organisation's specific needs and delivered on a date/location that suits your requirements.

[Contact us](#) for more information.

■ **Training code:** FERT01