

■ **Course title:**

How to improve the conversion in the urea reactor

■ **Introduction:**

This training course will discuss the operating and control philosophy of the high pressure urea reactor in any urea plant. How to determine the reactor conversion, what can be the causes for a low reactor conversion and what measures one can take to improve the reactor conversion.

■ **Course outline:**

Module 1: Reactor conversion (duration 1.5hrs)

1. High pressure urea reactor
 - Thermodynamics and phase diagram
 - Various designs in different urea processes
 - Temperature profile
 - Corrosion
 - Materials
2. How to determine the reactor conversion
3. The various causes for a low reactor conversion
 - Loads
 - N/C and H/C ratios
 - Liquid and gas distributor systems
 - Pressures
 - Inerts
4. Measures to improve the reactor conversion again
 - High efficiency trays
 - Optimum N/C and H/C ratio
 - Optimum pressure and inerts content

■ **Learning Outcomes:**

By the end of this course you will understand:

- The fundamentals and differences of high pressure urea reactor
- How to determine a low reactor conversion

Author / Trainer:

Mark Brouwer

Process & Safety Engineer,
Urea Expert

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.



- The various causes for a low reactor conversion
- Measures to improve the reactor conversion again

■ **Who will benefit:**

Anyone who is involved in the design, engineering, operation and maintenance of any urea plant including marketing, sales, business development of urea production technologies or production equipment and instrumentation including:

- Engineers and Managers
- Operations
- Maintenance
- Marketing and Business Development Managers

■ **Course materials:**

- Hand Out Presentations in pdf format
- Technical Paper: Comparison Stamicarbon - Saipem – Process Technologies

■ **Price:**

€ 250

■ **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:** UREA05