

■ **Course title:**

# Corrosion Aspects and Materials of Construction in Ammonium Nitrate and UAN Plants

■ **Introduction:**

This course will contribute to a better understanding of the mechanism of corrosion in acidic ammonium nitrate (AN). All relevant parameters which may influence the corrosion phenomena in equipment of AN manufacturing are described. Precautions are required for storage of UAN in carbon steel tanks.

*Duration 3 hours.*

■ **Course outline:**

## Module 1

1. Introduction.
2. UAN Process technologies.
3. Corrosion mechanism in acidic ammonium nitrate solutions.
4. Corrosion failure modes and materials of construction to be used in equipment and piping of UAN Plants:
  - a. Dissociation section.
  - b. Neutralization and mixing section.
  - c. Off gas purification section.
  - d. UAN storage and transport.
5. Experiences with pipe reactor for AN production.

## Module 2

1. Quality control of materials of construction.
2. Safety aspects related to handling of AN.
3. Inspection based on RBI philosophy.
4. Measures to mitigate detrimental corrosion in equipment of UAN plants.

Author(s) / Trainer(s):



## Giel Notten

Materials & Corrosion Engineer,  
---

Giel Notten is a materials and corrosion expert who, spent thirty-eight years working with DSM in The Netherlands. After gaining his Chemical Engineering degree he joined DSM's Materials and Corrosion Department and was heading this Department as Managing Senior Corrosion Engineer. In this job he was involved in a broad range of consultancy activities for numerous (petro-)chemical plants. For Stamicarbon, a previous subsidiary company of DSM, and licensing DSM's know-how, he set up programs for lifetime assessment studies, based on RBI philosophy, in numerous urea and ammonia plants and supervised these studies. Giel was also involved in the development of Safurex<sup>®</sup>, the super-duplex stainless steel grade (developed by Sandvik in cooperation with Stamicarbon) for application in Stamicarbon urea plants.

He was a board member of NACE Benelux and a member of the Contact Group Corrosion of the Dutch Chemical Process Industry.

Since his retirement from DSM, Giel started his own company NTT Consultancy in 2006 and has remained active as a materials and corrosion engineering consultant for many companies all over the world. He has devoted much of his time to passing on his knowledge and experience on the topic of corrosion engineering to a new generation of engineers in corrosion courses and trainings; numerous trainings have been presented. In cooperation with UreaKnowHow (in-house) training sessions have been organized and presented to more than 1000 urea engineers, managers, (shift-) supervisors and operators from all over the world. Several workshops have been presented in cooperation with UreaKnowHow for CRU in Nitrogen & Syngas Conferences.

Giel published many technical papers in reputable industry magazines and collected his knowledge and experience, illustrated with numerous cases of corrosion, in a book entitled Corrosion Engineering Guide.

5. Conclusions and recommendations.

**Learning outcomes:**

By the end of this training course you will understand:

- The mechanism of corrosion in acidic ammonium nitrate.
- The parameters which influence the corrosion aspects in equipment of UAN plants.
- Which materials to be used in equipment of UAN plants.
- Restrictions regarding storage of UAN in carbon steel tanks.
- How to prevent detrimental corrosion by taking measures in design phase, construction and operational phase.

**Who will benefit:**

Employees who are responsible or share responsibility with respect to the mechanical integrity and safe operation of UAN plants: process, mechanical, maintenance, corrosion and inspection engineers employed in UAN plants.

**Course materials:**

- Hand-out presentation slides in PDF format

**Price:**

**€350.00**

**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: MAT09**

On request the electronic (recently revised) version of the Corrosion Engineering Guide (> 800 pages) is available for additional costs of **€95.00**.

