



## Matériaux et corrosion dans les industries chimiques : matériaux et modes de dégradation [PC-2]

### Objectives:

Acquire knowledge of :

- the main modes of corrosion and metallurgical degradation encountered in major chemical environments.
- the main families of corrosion-resistant metallic materials in the chemical industries.

### Target group:

- This course is aimed at technicians or engineers from new works, process, maintenance and inspection departments with at least 6 months' professional experience.
- Maximum 8 to 10 people per session.

### Course content

#### Day 1

Degradation modes in major chemical environments

09:00 - 10:30

- Initial quiz on materials and corrosion
- Introduction to mechanical, thermal and chemical degradation phenomena: process conditions/environments/materials/stresses

10:30 - 10:45

Break

10:45 - 12:15

Corrosion mechanisms in metallic materials

- Low-temperature corrosion phenomena :
  - o Generalized corrosion
  - o Localized corrosion
  - o Stress corrosion
  - o Galvanic corrosion
  - o Erosion and abrasion corrosion

- High-temperature corrosion phenomena :

- o Oxidation,
- o Sulfuration, nitridation, carburization

12:15 - 13:15

Lunch

13:15 - 14:45 Material characteristics :

- Mechanical properties of metallic materials: yield strength, elongation, hardness, resilience, toughness.
- Stresses: service and residual
- Specifying and checking mechanical properties.
- Failure modes: ductile and brittle
- Prevention of brittle fracture

14:45 - 15:00

Break

15:00 - 16:30

Mechanical and thermal degradation :

- Fatigue and corrosion fatigue
- Creep and creep fatigue
- Microstructural changes: softening and embrittlement

## **Day 2**

Metallic materials in chemistry

09:00 - 10:30

The main families of materials, their properties and standardization :

- Carbon and low-alloy steels
- Stainless steels: ferritic, austenitic, super-austenitic, duplex

10:30 - 10:45

Break

10:45 - 12:15

- Nickel alloys and bases
- Titanium alloys
- Product forms: cast, forged, rolled, plated.

12:15 - 13:15

Lunch

Corrosion prevention in major chemical environments

13:15 - 14:45

Corrosion in major chemical environments:

- Mineral acids
- Organic acids
- Caustic media
- Chloride media

14:45 - 15:00

Break

15:00 - 16:30

- Corrosion in major chemical environments (continued) :
  - o Materials used

- o Critical factors
- o Types of corrosion
- o Prevention
- o Documentary sources

-Exit quiz

**Implementation / working method:**

Interactive 2-day face-to-face course, with material shared at the start of the course in paper and digital formats.

A questionnaire will be sent to trainees before the course in order to adapt the course content to participants' expectations as far as possible.

A course evaluation questionnaire will be distributed to participants at the end of the course.

**Course language and materials**

French

**Event Properties**

<b>Event Date</b>	Wednesday, 14 May 2025 - Thursday, 15 May 2025
<b>Registration Start Date</b>	Monday, 30 November -0001
<b>Cut off date</b>	Monday, 30 November -0001
<b>Individual Price</b>	Membre CHF 1'130.00, non-membre CHF 1'350.00, étudiants/doctorants/AVS CHF 600.00 (incl. Lunch)
<b>Lecturer</b>	<a href="#">François Dupoiron</a> , PRIMCO
<b>Course language</b>	French
<b>Location</b>	<a href="#">PRIMCO Thônex, Thônex</a>