



Dimensioning of vacuum systems

Ref. EL111-4 20 hours, including 14 hours of virtual classes

TRAINING OBJECTIVES

Allow the trainees to acquire deeper understanding of vacuum physics and its technical applications in order to better understand the issues related to vacuum installations, in terms of production and maintenance. Calculate the parameters of a pumping group (pumping speeds, conductances, diameters and lengths of pumping pipes, pumping time...).

PUBLIC

Process engineers, members of the design office, project managers, supervisory staff.

REQUIREMENTS

People who have already completed the 40-30 MS111 *Physics and Vacuum Technology* training or equivalent.

PEDAGOGICAL INNOVATION

2 steps :

1- e-learning in autonomy with the 40-30 collaborative platform

Course made up of several modules with Powerpoint, videos, quizzes, etc.
40-30 will have access to the connection time to the platform and to the exercises performed.

2. e-learning in virtual classroom with the trainer

Alternating between presentations, technical demonstrations, exercises and interaction with participants.

LEAD TRAINER

Michel THIAM : PhD in surface physics, Engineer-researcher of the engineering activity 40-30, 20 years of experience in the design of equipment related to ultra-vacuum, certified COFREND LT level 2

DATES

The virtual classes are every afternoon from April 19 to 23, 2021 and include 6 hours of independent exercise.

The virtual classes are every afternoon from May 25 to 28, 2021 and include 5 hours of independent exercise.

Sessions open from 4 registrants and limited to 6 participants.

PRICE PER PERSON

1860 € ex.VAT

On quotation for a specific training for your company

PROGRAM

Prerequisites and individual start-up activities in e-learning

2- 3 hours

e-learning positioning test in mathematics, physics, chemistry, technology and methodology
Course on vacuum physics and technology.

First VISIO, live with the trainer - 3h30

1. Reminder on the physics of vacuum

The atom, the molecule
Ionization
The atmospheric pressure
Vaporization
Mariotte's Law
The laws of perfect gas
The laws of molecular state
The average free run

2. The flows

Pressure, flow, volume
Conductance
Calculation of pumping time
Calculation of response time
Parasitic volume
Case Studies

Second virtual classroom - 3h 30

3. Vacuum generation

Rotary vane pumps
Molecular pumps
Turbo pump, ...

4. Pressure measurement

Pressure gauges
The mass spectrometer
The gas analyzer

Individual training activities -2 hours

Exercises, case studies

Third virtual class- 3h30

5. degassing

Thermal degassing (heat induced)

6. Operation and use of the connecting elements

Typology of existing elements.
Choice of parts and assembly for vacuum optimization.
Opening concepts: gaskets, flanges.

Individual training activities -2 hours

Fourth virtual class - 3h30

5. Case Studies and Questions/Answers