Training to support manufacturing & research

Remote training

Vacuum physics and technology advanced level

Ref. EL111-2 20 hours, including 15 hours of virtual classes

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 systems in terms of production and maintenance.
Improve pressure measurement and leak detection techniques (Helium methodology).
Know how to calculate a leak value.

WHO WILL BENEFIT MOST?

Maintenance technicians and engineers working on vacuum installations.
Management personnel.

PREREQUISITES

An experience of vacuum installations.

INNOVATIVE TEACHING RESOURCES

2 steps :
1- autonomous e-learning with the 40-30 collaborative platform
Course made up of several modules with Powerpoint courses, videos, quizzes…
2. e-learning in a virtual classroom with the trainer
Alternating between lectures, technical demonstrations, exercises and interaction with participants.

MAIN TRAINER

Michel THIAM: PhD in Physics (Strong Experience in Surface Physics and Surface Chemistry under UHV Conditions), from 40-30 Engineering Department.

DATES

The virtual classes are every afternoon from April 12 to 16, 2021 and include 5 hours of activities and independent tutorials.

The virtual classes are every afternoon from 17 to 21 May 2021 and include 5 hours of activities and independent tutorials.

Sessions open from 4 registered participants and limited to 6 participants.

PRICE per person

1380 € ex.VAT

PROGRAM

Individual e-learning start-up activities 2- 3 hours
Science and Technology Positioning Test
Courses and videos to start exploring the subject
Vacuum physics - pumps - pressure gauges - helium methodology - operation of a helium leak detector

First live virtual class with the trainer – 3 hours
1. Vacuum physics
- The atom, the molecule
- Ionization
- Atmospheric pressure
- Vaporization
- Mariotte's law
- Ideal gas law
- Molecular state law
- Mean free path

Second virtual classroom – 3 hours
2. Flows
- Pressure, flow rate, volume, flows
- Conductance
- Pumping time calculation
- Response time calculation

Third virtual classroom – 3 hours
3. Vacuum production
- Rotary vane pumps
- Molecular pumps
- Turbo pumps
- Cryogenic pumps
- Ionic pumps...

Individual training activities - 2-3 hours
Knowledge tests with application exercises

Fourth virtual classroom – 3 hours
4. Pressure measurements
- Pirani
- Penning
- Triode gauges
- Helium cell
- Mass spectrometry
- Gas analyser

Third virtual classroom – 3 hours
5. Leak detection: Helium methodology
- Global, partial and spay vacuum test
- Helium sniffing
- Helium bombing
- Sensitivity
- Tolerances
- Values

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