



Vacuum physics and technology and the practice of helium leak detection

Ref. BL111 24 hours (including 7 hours of 40-30 workshop practice)

LEARNING OBJECTIVES

To understand the basic principles of vacuum physics.
To become familiar with pressure measurement and leak detection techniques (Helium methodology)
To acquire a better understanding of the operating principles and issues related to vacuum systems.

WHO WILL BENEFIT MOST?

Operators or technicians working with vacuum systems.
Users of installations having sealing or leak tightness constraints.

PREREQUISITES

Prior experience on vacuum installations is preferable.

PROGRAM

MODULE 1 – DISTANCE LEARNING

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. General introduction on vacuum physics

General information on vacuum production
Notion of pressure
degassing
The main laws on vacuum physics

Second virtual classroom – 3 hours

2. Vacuum production

Rotary vane pumps
Molecular pumps
Turbo pumps
Cryo pumps
Ion pumps

Third virtual classroom – 3 hours

3. Pressure measurements

Pirani
Penning

Triode gauges
Helium cell
Mass spectrometry
Gas analyser

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

Fourth virtual classroom – 3 hours

4. Leak detection: helium methodology

Hood and spray vacuum test
Helium sniffing
Pressurisation test
Sensitivity
Tolerances

MODULE 2 – HANDS-ON IN WORKSHOP

5. Questions/answers, demonstrations on vacuum systems

Vacuum production
Pressure measurement
Adjustments and recognition of symptoms of deterioration

5. Hands-on exercises

Looking for leaks using global, partial or spray helium
On request :
Sniffing test
Sniffing test by accumulation

Quiz on the whole course "physics and vacuum technology".

INNOVATIVE TEACHING RESOURCES

Module 1: distance learning

1- autonomous e-learning with the 40-30 collaborative platform

Course made up of several modules with powerpoint lessons, videos, quizzes, etc.

Working time from 2 to 4 hours depending on the participants.

The participant will receive his or her login and password in his or her email box;

40-30 will have access to the connection time to the platform and to the exercises carried out.



2. e-learning in a virtual classroom (VISIO) with the trainer

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

Module 2: Practical work (hands-on) in the workshop

On-site training equipment: demonstration bench, helium leak detectors, vacuum pumps, pressure gauges, demonstration tools.

Teaching methods :

Alternating between technical demonstrations and tutorials.

Session limited to 6 participants.

The duration and content is adaptable according to the participants' wish: give priority to the detection of leakage, pumping systems, vacuum generation, degassing.

Possibility to plan a half-day of practice in more on your site.

Multiple choice questions at the beginning and end of the training.

MAIN TRAINER

Michel THIAM: PhD in Physics (Strong Experience in Surface Physics and Surface Chemistry under UHV Conditions), from 40-30 Engineering Department, certified NDT Leak detection level 2.

DATES & LOCATION

Every morning, from 26 to 30 April 2021 - Distance Learning

The day of 20 May 2021 - on-site practical training 40-30 les Ulis (91)

Every morning, from 24 May to 28 May 2021 - Distance learning

The day of 29 June 2021 - practical on-site training 40-30 Bernin (38)

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

PRICE per person

lunch included for the day at 40-30

Complete training (24 hours): 1 656 € ex.VAT

Only the remote module (17 hours): 1 173 € ex.VAT

On quotation for a specific training course for your company