

## Training Basics & design principles for ultra-clean vacuum

This training starts on: 02-11-2020

**Location:** Eindhoven  
**Price:** 1.995,00 euro excl. VAT  
**Duration:** 4 consecutive days  
**Contact:** training@hightechinstitute.nl, +31 85 401 3600

### Overview

Since vacuum is unknown in daily life, no reference framework exists for those who are not involved in this technique. To acquire the necessary level of understanding the trainees will be introduced to the basic principles of vacuum technique as well as in the required design principles to achieve ultra-clean vacuum conditions.

Key issue is to become aware of the fact that the whole chain of design, machining, cleaning and the assembly of the components is an integrated process which is as strong as the weakest link in the production chain.

Read the interview with lecturer Mark Meuwese: 'Lower bar by raising the bar'.

### Intended for

The course is meant for employees of BSc and higher levels who are responsible for the design of components to be implemented in ultra-clean vacuum systems.

### Objective

During the course the trainees will acquire an understanding of the basic principles of ultra-clean vacuum and its implications for the production of ultra-clean vacuum systems.

### Programme

#### Day 1

- Introduction
- Basic principles
- Interaction of gases with Surfaces (adsorption, desorption)
- Flow of gases (viscous, molecular & intermediate regime)
- Selected exercises
- Dry backing vacuum pumps and molecular pumps
- Total pressure measurement
- Partial pressure measurement (residual gas analysis)

#### Day 2

##### Part 1: Vacuum as an engineering aspect

- Vacuum fundamentals
- Pumping speed
- Gas loads
- Materials
- Joining techniques
- Vacuum seals

##### Part 2: Mechatronic systems in a vacuum environment

### Partner

### Certified by

Euspen

### Certification

This course is certified by the European society for precision engineering & nanotechnology (euspen) and the Dutch Society for Precision Engineering (DSPE) and leads to the ECP2-certificate.

### Course leader

Dr. Adrian Rankers

### Teachers

Dr. Dick van Langeveld

Theo Mulder BSc  
Mark Meuwese  
David Schijve  
Sven Pekelder MSc

### Timetable

02-11-2020 | 09:00 - 17:00  
03-11-2020 | 09:00 - 17:00  
04-11-2020 | 09:00 - 17:00  
05-11-2020 | 09:00 - 17:00

- Heat transfer
- Tribology
- Feedtroughs
- Activators
- Dynamics
- Electronics/Sensors
- Adhesives
- Vacuum budgetting
- Tips & tricks

#### Day 3

- Cases of construction in vacuum
- Cases in design for UCV

#### Day 4

- Cleaning, work discipline
- Leak testing
- Exercises & seminar on questions students

#### Methods

Lectures, selected exercises & calculations, workshop.