

DRUSCHKE

 **SERVICE TRAINING CENTRE**



**TRAINING COURSE
PROGRAM**

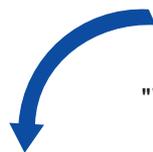
DRUSCHKE GROUP...

... is comprised of three companies: Druschke GmbH Vacuum Service, Karl Druschke Seal Manufacturing e.K. and the SSD GmbH Training Center. For over 15 years we have been Leybold GmbH's reliable contract services partner. Our company group supports them worldwide whenever the need arises. Furthermore, as an independent group in sales, services and training, we cover the complete vacuum market range.

Through the convenient location of our company at the center of the European Union and to the vicinity of Frankfurt airport, our service technicians are quick at customer site.

Whether in Germany, Europe or worldwide, we are there for our customers.

Flexibility, quality and fast response times are estimated from our customers.



"We have recognized that it is of little worth to be constantly repairing components. The cause of the fault needs to be rectified. This means communicating with our customers, discussing the causes of damage and suggesting the best way of rectifying them."



WE ARE ...

... currently the only training providers who cover complete plant maintenance training in the area of vacuum technology, with instruction tailored to your team's requirements and involving knowledge of all major manufacturers.

We provide a full range of information and skills, from the basics of vacuum technology, valve maintenance, the use of measuring equipment, sealing systems, troubleshooting and leak detection.



- ... Member of the German Vacuum Society e.V.
- ... Member of the Committee on Education and Training
- ... DVG certified training courses



OVERVIEW OF VACUUM SEMINARS

1. Fundamentals of Vacuum Technology
2. Leak Detection in Theory and Practice
3. Custom Workshop
4. Custom Workshop on Vacuum Pumps
5. Seminar PVD / CVD Processes
6. Vacuum Workshop for Operator
7. Workshop Mass Spectrometry
8. Workshop Total-/Partial Pressure Measurement
9. Workshop Troubleshooting on Vacuum Systems
10. Vacuum Technology for Apprentice
11. Vacuum Technology for Non-Technicians

1. FUNDAMENTALS OF VACUUM TECHNOLOGY

- PHYSICAL BASICS OF VACUUM TECHNOLOGY
pressure, volume, temperature, quantity of gas, leakage rate, environmental factors, ...
- PRESSURE MEASUREMENT IN THE VACUUM RANGE
liquid vacuum meters, force vacuum meters, capacitance vacuum meters, thermal conductivity vacuum meters, ionization vacuum meters, ...
- FUNDAMENTALS OF VACUUM GENERATION – VACUUM PUMPS
technical parameters (pumping speed, pumping power, ...), mechanical vacuum pumps, kinetic vacuum pumps, ...
- COMPONENTS OF VACUUM TECHNOLOGY
connections, valves, feedthroughs, ...
- SAFE HANDLING OF VACUUM SYSTEMS
potential hazards, avoiding of fatal mistakes, ...

TARGET

Basic understanding of processes in vacuum technology

TARGET GROUP

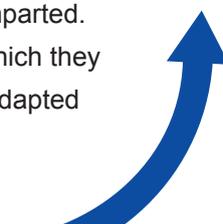
Participants with little or no previous knowledge of vacuum technology

RECOMMENDED DURATION

2 days

– DATES ON REQUEST –

The focus of the seminar is on the practical demonstration of the knowledge imparted. The participants experience typical effects by means of practical experiments which they partly can perform themselves. The exact content of the seminar is specially adapted to the needs of the participants.



2. LEAK DETECTION IN THEORY AND PRACTICE

- Basics of leakage detection
- Real and virtual leaks
- Leak detection methods
- Setup and function of a Helium leakage detector
- Basic methods of Helium leakage detection
- Efficient implementation of a leak detection with a detector
- Procedure for leak detection on components and vacuum systems
- Additional disrupting factors in vacuum technology

TARGET

Correct and effective implementation of leak detection on components and vacuum systems

TARGET GROUP

Employees with low basic skills in vacuum technology, leak detection agents, mechanics, commissioning engineers, maintenance personnel, etc.

RECOMMENDED DURATION

2 days

– DATES ON REQUEST –

The focus of the seminar is on the practice of a leak detection.
Participants are finally able to independently carry out leak searching
and evaluating, regardless of model of the Helium leakage detector used.



3. CUSTOM WORKSHOP

YOUR SPECIAL REQUIREMENTS ON THE TRAINING FORM THE CONTENT, SO AS

- Basics of vacuum / vacuum technology
- External influence on the function / performance of a vacuum system
- Design of vacuum systems
- Sealing concepts for different pressure ranges and environmental conditions
- Component selection for vacuum systems
- Setup / design of pump type, pump size, pump station ...
- Selection of measurement systems
- Hedges of a vacuum system for production operation
- Leak detection on components / vacuum systems
- Troubleshooting, failure recognition and elimination on a vacuum system

TARGET

Profound understanding of the used or planned vacuum systems and thereby installed components

TARGET GROUP

According to customer specifications, for example, commissioning engineers, vacuum system operators, designers, sales representatives, retailers, secretaries, ...

RECOMMENDED DURATION

on the scope of training

– DATES ON REQUEST –

4. CUSTOM WORKSHOP ON VACUUM PUMPS

- General knowledge on vacuum pumps
- Safety
- Setup and function of various vacuum pumps
- Content and benefits of the instruction manuals
- Commissioning and installation
- Maintenance / maintenance schedule
- Practical exercises on the vacuum pumps
- Troubleshooting as specified by the instruction manual (fault, cause, remedy)
- Special Tools
- Custom modifications to pumps and pumping stations
- Application possibilities

TARGET

General overview of the vacuum pumps in vacuum technology. Detection of typical operating states and basic failures. Preventive maintenance and simple repairs to be carried out independently.

TARGET GROUP

Mechanics, commissioning engineers, maintenance and service technicians, maintenance personnel of the vacuum systems

RECOMMENDED DURATION

2 days

– DATES ON REQUEST –

The focus of the seminar is customized on certain types of pumps: Rotary piston pump, rotary vane pump, screw pumps, roots pumps, oil diffusion pumps, turbo molecular pumps, cryo pumps, cryo generator systems etc. Setup and function is explained in detail by means of section models or functioning pumps. Participants will thereby get hands to the various pumps.

5. SEMINAR PVD / CVD PROCESSES

- Fundamentals, basic function of PVD / CVD processes
- Physical requirements
- PVD processes (thermal evaporation, sputtering, reactive sputtering, electron beam evaporation, ...)
- CVD processes (metal-CVD, non-metal-CVD, plasma enhanced CVD, ...)
- Discussion of specific process problems

TARGET

Basic understanding of PVD / CVD processes and the reactions during these processes.
Better understanding of the own application.

TARGET GROUP

Participants with basic knowledge of vacuum technology. Mechanics, commissioning engineers, service personnel, shift supervisors, foremen, maintenance personnel, etc.

RECOMMENDED DURATION

1 day per process (PVD, CVD)

– DATES ON REQUEST –

6. VACUUM WORKSHOP FOR OPERATOR

- Fundamentals of vacuum technology
- Setup and function of your vacuum system
- Typical failures
- Correct handling of vacuum systems
- Preventive maintenance
- Recognition and elimination of simple failures

TARGET

Better understanding of the entrusted vacuum system. Prevention of operating errors, detection and correction of simple failures, increased availability through preventive maintenance.

TARGET GROUP

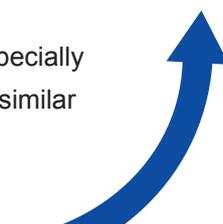
Operator, shift foreman, foreman, etc.

RECOMMENDED DURATION

min. 2 days

– DATES ON REQUEST –

The workshop is based on the modules of the special vacuum system and is specially adapted to the individual customer requirements. On open dates operators of similar vacuum systems are selected for the certain workshop.



7. WORKSHOP MASS SPECTROMETRY

- Physical / chemical basics of mass spectrometry
- SETUP AND FUNCTION OF A MASS SPECTRUM ANALYZER
vacuum system, ion source, mass filter, detector, ...
- Connection and commissioning of a mass spectrum analyzer
- EVALUATION / INTERPRETATION OF MEASURED MASS SPECTRA
spectral partners, peak families, spectral library, ...

TARGET

Basic knowledge of a mass spectrometer and its function. Recognizing the importance of the interpretation of mass spectra and learning aids for better understanding.

TARGET GROUP

User of mass spectrometers and analyzers of mass spectra, ...

RECOMMENDED DURATION

1 day

– DATES ON REQUEST –

The workshop is based on the special requirements / processes of the individual customer which is why a significantly higher preparation effort is required. On open dates operator of similar vacuum systems are selected for the certain workshop.



8. WORKSHOP TOTAL / PARTIAL PRESSURE MEASUREMENT

- Setup and function of the total / partial pressure measurement
- Composition of air
- Adsorption / desorption
- Desorption rates of various surfaces
- Composition of condensable and not condensable gases in a vacuum system
- Pressure / time behavior of a tight vacuum system
- Pressure / time behavior of a leaking vacuum system
- Evaluation of a partial pressure measurement

TARGET

Recognizing the advantages of the total / partial pressure measurement. Essential are the simple analysis, the significant results and time savings of up to 10 hours compared to the conventional total pressure measurement.

TARGET GROUP

Mechanics, commissioning engineers, service personnel, shift supervisors, foreman, maintenance personnel, etc.

RECOMMENDED DURATION

1 day

– DATES ON REQUEST –

9.

WORKSHOP TROUBLESHOOTING ON VACUUM SYSTEMS

- Typical failures in vacuum technology
- Basic knowledge on error recognition
- Procedure for troubleshooting
- Detailed explanation and practical demonstration of the test methods
- Practical exercises on the mobile training vacuum system
- Implementation at customers vacuum system



TARGET

Detect and eliminate vacuum errors deliberately

TARGET GROUP

Mechanics, commissioning engineers, service personnel, shift supervisors, foremen, maintenance personnel, etc. with prior knowledge:

Basic course on vacuum technology, leak detection in theory and practice, advanced course on vacuum pumps or experience with vacuum systems.

RECOMMENDED DURATION

2 days

– DATES ON REQUEST –

10. VACUUM TECHNOLOGY FOR APPRENTICE

- Why do I need a vacuum?
- How to create a vacuum?
- What options exist for connecting vacuum components and what differences are there?
- How do I measure the pressure in a vacuum system?
- How do I recognize a leak in my vacuum system and how do I find this leak?
- What are the hazards in the field of vacuum equipment and what safety measures are necessary at least?

TARGET

The vacuum technology in general and vacuum technology specifically applied by the respective participant will be explained in simple terms. Risks and possible sources of error to be detected and avoided.

TARGET GROUP

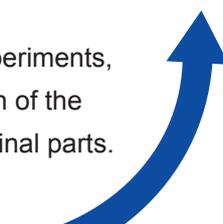
Apprentices from all sectors with little or no knowledge in the field of vacuum technology.

RECOMMENDED DURATION

2 days

– DATES ON REQUEST –

The mediated theoretical facts are clarified on the basis of practical tests and experiments, which can be carried out by the participants themselves. Structure and function of the individual vacuum components are explained by means of section models or original parts.



11. VACUUM TECHNOLOGY FOR NON-TECHNICIANS

- Historical development of vacuum technology
- What is a vacuum and how can it be explained?
- How to generate a vacuum?
- Why do we need a vacuum?
- Some vacuum technology basics
- What do we need to build a vacuum system?
- How do vacuum pumps and vacuum gauges work?

TARGET

Oriented overview on the vacuum technology with the aim to show the complex relationship in simple terms.

TARGET GROUP

Participants with little or no knowledge in the field of vacuum technology / engineering, for example, newcomers, commercial office staff, administrative staff, secretaries, etc.

RECOMMENDED DURATION

1 day

– DATES ON REQUEST –

For a better understanding different tests are carried out: Implosion, pressure, gas volume, sound transmission in a vacuum, weight test in a vacuum, various leak rates, ...

Most of the tests are performed by the participants themselves. Concluding the seminar, the demonstration of „chocolate marshmallow in a vacuum“ takes place.



DRUSCHKE GROUP

HOUSE OF VACUUM



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