

Vacuum physics and technology / Level 1

REF. 1-111.

OBJECTIVES

- //. Understanding the basic notions of vacuum physics.
- //. Become familiar with pressure measurement and leak detection techniques (Helium methodology)
- //. Acquire a better understanding of the operating principles and stakes related to vacuum installations.

AUDIENCE

- //. Operators or technicians working on vacuum installations.
- //. Users of installations having sealing constraints.

PREREQUISITES

Initial experience on vacuum installations is preferable.

TEACHING RESOURCES

- //. Lectures, controlled practical exercises, demonstrations.
- //. Custom training manual, a true practical guide on the workstation.
- //. Prior interview of the trainees possible in order to qualify their needs.
- //. Multiple choice questions at the start and end of the training.

DURATION 3 days (21 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 1380 € ex. VAT / person. (Lunch included)

PROGRAMME

- 1. Generalities of vacuum physics**
 - The main laws of vacuum physics
- 2. Vacuum production**
 - Rotary vane pumps
 - Molecular pumps
 - Turbo pumps
 - ...
- 3. Pressure measurements**
 - Pirani
 - Penning
 - Triode gauges
 - Helium cell
 - Mass spectrometry
 - Gas analyser
- 4. Leak detection: Helium methodology**
 - Global, partial and spray vacuum test
 - Helium sniffing
 - Helium bombing
 - Sensitivity
 - Tolerances
- 5. Practical exercises**
 - Looking for leaks using global, partial or spray helium
 - Direct sniffer test
 - Sniffer test by accumulation

TRAINING PLUSSES

Possibility of planning an extra practical half day on your site.
Professional 40-30 instructor used to solving maintenance and productivity issues on vacuum installations.

Vacuum physics and technology / Level 2

REF. 1-112.

OBJECTIVES

- // Allow the trainees to acquire deeper understanding of vacuum physics and its technical applications in order to better understand the stakes related to vacuum installations in terms of production and maintenance.
- // Master pressure measurement and leak detection techniques (Helium methodology).
- // Know how to calculate a leak value.

AUDIENCE

- // Maintenance technicians working on vacuum installations and management personnel.
- // Users of installations having sealing constraints.
- // Mass spectrometry users.

PREREQUISITES

An experience of vacuum installations and basic notions in physics are recommended.

DURATION 3 days (21 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 1380 € ex. VAT / person. (Lunch included)

TRAINING PLUSSES

Training centre within the 40-30 workshops.
Practical training on equipment equivalent to the enterprise equipment.
Custom training manual, a true practical guide on the workstation.

PROGRAMME

Notions of mathematics

1. Vacuum physics
 - The atom, the molecule
 - Ionisation
 - Atmospheric pressure
 - Vaporisation
 - Mariotte's law
 - Ideal gas law
 - Molecular state law
 - Mean free path

2. Flows

- Pressure, flow rate, volume, flows
- Conductance
- Pumping time calculation
- Response time calculation
- Parasite volume

3. Vacuum production

- Rotary vane pumps
- Molecular pumps
- Turbo pumps
- ...

4. Pressure measurements

- Pirani
- Penning
- Triode gauges
- Helium cell
- Mass spectrometry
- Gas analyser

5. Leak detection: Helium methodology

- Global, partial and spay vacuum test
- Helium sniffing
- Helium bombing
- Sensitivity
- Tolerances
- Recordings

6. Practical exercises: Helium leak detection

- Global, partial and spay vacuum test
- Helium sniffing

Use and maintenance of leak detectors

REF. 1-113.

OBJECTIVES

Production objectives :

- //. Using leak detectors safely.
- //. Avoiding handling errors that can deteriorate the equipment.

Teaching objectives :

- //. Acquire understanding of leak detector operating principles.
- //. Understand leak detector technology and its possibilities.
- //. Know the main principles of leak detection.
- //. Provide the operators with the required knowledge and practises for the optimal maintenance of their detectors with the objective of increasing the lifespan of the equipment.

AUDIENCE

- //. Leak detector operators
- //. Production operators
- //. Technicians and Engineers

TEACHING RESOURCES

- //. Lectures, controlled practical exercises, demonstrations.
- //. Custom training manual, a true practical guide on the workstation.
- //. Prior interview of the trainees possible in order to qualify their needs.
- //. Multiple choice questions at the start and end of the training.

DURATION 2 days (14 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 1100 € ex. VAT / person. (Lunch included)

PROGRAMME

1. Theoretical elements

- The principle of seal control using tracer gas
- Assessment of the width of a crack
- Preparation of the parts to be checked

2. Working methods

- Spray method
- Sniffer method
- Bombing method

3. Detailed study of an ASM 142 detector

- General (presentation of the appliance, technical specifications)
- Description (vacuum synoptic, control panel, remote control unit, use)
- Description of the services as part of level 1 maintenance

4. Detailed study of an ASM 192 detector

- General (presentation of the appliance, technical specifications)
- Description (vacuum synoptic, control panel, remote control unit, use)
- Description of the services as part of level 1 maintenance

5. Precautions and limitations of use

- Recovery time
- Use limit temperatures Accidental air intake
- Remark: stability of a calibration leak
- Role of the filter

Detailed studies can be made on other models of detector. Please contact us for further details.

6. Exercises in a live situation

TRAINING PLUSSES

Professional 40-30 instructor used to solving maintenance and productivity issues on vacuum leak detectors.
Practical training on equipment equivalent to the enterprise equipment.

Mass flow controller

REF. 1-114.

OBJECTIVES

- //. Practical and theoretical training on the basic principles of mass flow control.
- //. Allow MFC users to know the technical possibilities and limits of their equipment for an efficient and safe use.
- //. Make the users capable of a precise diagnosis of defective equipment and identify the causes of the defect.

AUDIENCE

MFC users having followed technical training.

PREREQUISITES

Basic knowledge of physics, mechanics and gas are required.

DURATION 1 day (7 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 550 € ex. VAT / person. (Lunch included)

PROGRAMME

1. General description of an MFC
 - overview
 - pressure dropping elements
 - sensor
 - electronics
 - regulation valve
2. Definition of an MFC
 - flow rate
 - gas
 - analogue / digital
 - digital
 - types of joint
 - connections
 - assembly direction
 - conversion factor
3. Technical approach
 - symptoms and causes of faults
 - diagnoses
 - summary table of MFC faults
 - purging and dismantling technique
4. Practical approach
5. Open discussion

TRAINING PLUSSES

Professional 40-30 instructor used to solving maintenance and productivity issues on MFC.
Training centre within the 40-30 workshops
Practical training on equipment equivalent to the enterprise equipment.
Custom training manual, a true practical guide on the workstation.

Using leak detectors

REF. 1-115.

OBJECTIVES

- // Acquire understanding of leak detector operating principles.
- // Understand leak detector technology and its possibilities.
- // Using leak detectors safely.

AUDIENCE

- // Technicians and engineers.
- // Management personnel
- // Leak detector users.

PREREQUISITES

Initial experience on leak detectors or vacuum installations is preferable.

TEACHING RESOURCES

- // Lectures, controlled practical exercises, demonstrations.
- // Custom training manual, a true practical guide on the workstation.
- // Prior interview of the trainees possible in order to qualify their needs.
- // Multiple choice questions at the start and end of the training.

DURATION 1 day (7 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 550 € ex. VAT / person. (Lunch included)

PROGRAMME

1. Theoretical elements

- The principle of seal control using tracer gas
- Assessment of the width of a crack
- Preparation of parts to be checked
- Leak detection methods

2. Mass spectrometry helium type detectors

- Constitution of a helium detector
- Analysis cell

3. Working methods

- Spray method
- Sniffer method
- Bombing method

4. Detailed study of an ASM 122 D and/or ASM 180 TD+ detector

- General (presentation of the appliance, technical specifications)
- Description (vacuum synoptic, control panel, remote control unit, use)

5. Detailed study of an UL 1000 FAB detector

- General (presentation of the appliance, technical specifications)
- Description (vacuum synoptic, control panel)
- Detailed studies can be made on other models of detector. Please contact us for further details.

6. Precautions and limitations of use

- Recovery time
- Use limit temperatures Accidental air intake
- Remark: stability of a calibration leak
- Role of the filter
- Large volumes (choice of the pumping set, assembly, concrete example)

TRAINING PLUSSES

Possibility of planning an extra practical half day on your site.
Professional 40-30 instructor used to solving maintenance and productivity issues on vacuum leak detectors.

Gas pumping systems

REF. 1-116.

OBJECTIVES

- // Introduction to the different vacuum production technologies (vacuum pumps) and to their use in industry and research.
- // Make the users aware of the conditions of use of the different pumps: starting pressure, limit vacuum, and flow rate.

AUDIENCE

- // GCSE level maintenance technicians and engineers. Management personnel
- // Users of vacuum pumps.

PREREQUISITES

An initial experience of vacuum installations and basic notions on vacuums are recommended.

TEACHING RESOURCES

- // Lectures, controlled practical exercises, demonstrations.
- // Custom training manual, a true practical guide on the workstation.
- // Prior interview of the trainees possible in order to qualify their needs.
- // Multiple choice questions at the start and end of the training.

DURATION 1 day (7 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 550 € ex. VAT / person. (Lunch included)

TRAINING PLUSSES

Practical training on equipment equivalent to the enterprise equipment.
Professional 40-30 instructor used to solving maintenance and productivity issues on vacuum leak detectors.

PROGRAMME

Notions of pressure

1. Different pump technology

- blowers
- ejectors
- liquid ring pumps
- rotary vane pumps
- piston pumps
- membrane pumps
- sling pumps
- screw pumps
- claw pumps
- root pumps
- turbomolecular pumps
- cryogenic pumps

2. Vacuum applications in industry and research

- food industry
- wood, paper, cardboard
- printing, binding
- transport, logistics
- plastics, heat moulding
- chemical, pharmaceutical
- petrol and gas
- cements, bricks, tiles, ceramics and glass
- metal industry, mechanics
- textile
- water treatment
- electronics and semiconductors
- medical, hospitals, dentists
- research
- electro mechanics, lighting
- civil engineering
- agriculture
- composite materials
- environment, recycling
- power stations
- supermarkets
- analysis fields

3. Questions and answers related to working situations

Analysing gases using mass spectrometry

REF. 1-118.

OBJECTIVES

Allow the users to become familiar with the technology of mass spectrometry and its use in interpreting results taking into account the processing environment.

AUDIENCE

Mass spectrometry users of the RGA quadrupole type.

PREREQUISITES

Basic knowledge of the behaviour of gases and an understanding of vacuums are recommended.

TEACHING RESOURCES

- // Lectures, controlled practical exercises, demonstrations.
- // Custom training manual, a true practical guide on the workstation.
- // Prior interview of the trainees possible in order to qualify their needs.
- // Multiple choice questions at the start and end of the training.

DURATION 1 day (7 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 550 € ex. VAT / person. (Lunch included)

PROGRAMME

1. Theoretical aspects

- Analysis of the operating theory of a quadrupolar spectrometer of the RGA type.
- Analysis of the theory of deciphering a spectrum.
- Theoretical study of the software on a simulator.
- Theoretical study of calibration.
- The mass centre, the position of the peaks, resolution, sensitivity.

2. In Practise

- Installation, connection, configuration and commissioning of an RGA quadrupolar spectrometer
- Calibration, adjustment, mass centre, peak position, resolution, sensitivity
- Preparation of recipes in monitor or analogue mode, in bar mode, in selected peaks mode, in leak check mode
- Leak simulation and searching for leaks
- Qualitative and quantitative analysis

3. Questions and Answers

TRAINING PLUSSES

Practical training on equipment equivalent to the enterprise equipment.
Custom training manual, a true practical guide on the workstation.
Professional 40-30 instructor used to solving maintenance and productivity issues on **des spectromètres de masse quadripolaire**.

First level maintenance of vacuum systems

REF. 1-121.

OBJECTIVES

- //. Understanding the different technology for the production of vacuums (vacuum pumps) and their use in industry and research.
- //. Diagnosing the symptoms of deterioration, planning and completion of preventive maintenance.
- //. Provide the technicians with the required knowledge and practises for the optimal maintenance of their vacuum equipment with the objective of increasing the lifespan of the equipment.

AUDIENCE

- //. Technicians and engineers.
- //. Management personnel
- //. Users of vacuum pumps.

PREREQUISITES

Initial experience on vacuum installations is recommended.

TEACHING RESOURCES

- //. Lectures, controlled practical exercises, demonstrations.
- //. Custom training manual, a true practical guide on the workstation.
- //. Prior interview of the trainees possible in order to qualify their needs.
- //. Multiple choice questions at the start and end of the training.

DURATION 3 days (21 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 1380 € ex. VAT / person. (Lunch included)

TRAINING PLUSSES

Possibility of planning an extra practical half day on your site.
Professional 40-30 instructor used to solving maintenance and productivity issues on vacuum installations.

PROGRAMME

REMINDERS ON MATHEMATICS

1. The physics of vacuums

Generalities on the production of vacuums - notions on pressure

2. Operation and use of vacuum pumps

- operating principles
- maintenance frequency
- recognition of the symptoms caused by deterioration
- first level maintenance

Selection of equipment depending on your work situation: Rotary valve pumps, piston pumps, root pumps, dry pumps: membrane pumps, sling pumps, screw pumps, molecular pumps, turbomolecular pumps, diffusion pumps, fixation pumps, cryogenic pumps, Chillers

3. Operation and use of connecting elements

- types of existing elements
 - choice of parts and assembly for optimal vacuum
 - notions of stoving and ultra-high vacuum
- Joists
Collars

4. Operation and use of measuring instruments

- operating principles and adjustments
 - calibration frequency
 - recognition of the symptoms caused by deterioration
 - first level maintenance
- Manometers (Bourbon, Pirani, heat coupling, capacitance, Penning, Bayert-Alpert)
Leak detectors
Gas analysers

5. Practical exercises

Level 1 maintenance practise (purge, greasing, checking compliance with manufacturer specifications) and diagnosis of symptoms announcing a malfunction on a piece of equipment.

Best practises in metrology in industry

REF. 1-122.

OBJECTIVES

- // Optimising measurements in an industrial environment
- // Efficiently managing a fleet of measurement instruments, both suitable to the needs of the processes and in compliance with the requirements of the ISO 9001 type management standards.
- // Reducing the global cost of metrology.
- // Mastering the risks of incorrect measurements.

AUDIENCE

- // Technicians and operators who need to work with measurement instruments.
- // All persons involved in the enterprise metrology functions: choice of a measurement instrument, calibration or checking, analysis of measurement functions, choice of a sub-contractor for a metrology monitoring operation, definition of the surveillance programme for measurement instruments.

PREREQUISITES

Practical experience in taking measurements in industrial processes and/or the management of measurement instruments is recommended.

TEACHING RESOURCES

- // Lectures, controlled practical exercises, demonstrations.
- // Custom training manual, a true practical guide on the workstation.
- // Prior interview of the trainees possible in order to qualify their needs.
- // 2 Multiple choice sessions during the training

DURATION 2 days (14 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 1100 € ex. VAT / person. (Lunch included)

TRAINING PLUSSES

Practical training on equipment equivalent to the enterprise equipment.
Custom training manual, a true practical guide on the workstation.

PROGRAMME

A- Metrology: A quality tool

- Legal and industrial metrology
- Definitions, vocabulary
- Unit systems
- Organisation, organisations, standards

B- Monitoring a measurement instrument

- Measuring and measurement results
- Measurement instruments and specifications
- Calibres and calibration: calibration period Including measurement errors and uncertainties.
- Measurement traceability

C- Optimising metrology

- The metrology function in the enterprise
- The metrology monitoring process
- Compliance with management standards
- Reaching performance in metrology

Ultrasonic cleaning

OBJECTIVES

- //. Using the ultrasonic cleaning technology and fully understanding its consequences to guarantee the optimum cleansing of products.
- //. Acquire knowledge of ultrasonic cleaning technology
- //. Learn how to set up an ultrasonic cleaning plan and how to find the correct compromise between cleaning efficiency and damage to parts.
- //. Acquire knowledge of the selection and comparison criteria for cleaning equipment.

AUDIENCE

Technicians and users of ultrasonic cleaning technology.

PREREQUISITES

R&D Manager for 40-30, PhD in surfaces and interfaces. Fields of competence: ultra clean cleaning using ultrasonic baths, sanding and CO2 blasting, measurement of contaminations on surfaces (particles, metallic, ionic and organic)

TEACHING RESOURCES

- //. Lectures, controlled practical exercises, demonstrations.
- //. Custom training manual, a true practical guide on the workstation.
- //. Prior interview of the trainees possible in order to qualify their needs.
- //. Multiple choice questions at the start and end of the training.

DURATION 2 days (14 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 1100 € ex. VAT / person. (Lunch included)

PROGRAMME

1. What is an ultrasonic wave?
2. Ultrasound generation
 - Generators
 - Transducers
 - Baths
3. Ultrasounds in aqueous environments
 - Transmission of ultrasounds in water
4. The parameters that influence ultrasonic cleaning
 - Frequency
 - Power
 - Temperature
 - Bath geometry
 - Gas
5. Measuring ultrasound generation
 - Tools making it possible to specify the correct operation of ultrasounds
6. Ultrasonic cleaning procedures
 - How to draft a procedure
 - Creating a recipe taking into account cubic parameters
7. Equipment and ultrasonic suppliers
 - Equipment selection criteria

TRAINING PLUSSES

Possibility of planning an extra practical half day on your site.

Use of wet and dry micro blasters

OBJECTIVES

- // Understand the technique and operation of wet and dry micro blasters.
- // Optimise the use of micro blasters.
- // Know which medium to use.
- // Improve the medium use time.
- // Use the right parameters and the correct medium for cleaning adapted to the parts being processed.
- // Improve the lifespan of the parts.

AUDIENCE

Operators, maintenance technicians working on micro blasters.

TEACHING RESOURCES

- // Lectures, controlled practical exercises, demonstrations. Exercises on your technical issues.
- // Analysis during the course of situations experienced by the participants.
- // Custom training manual, a true practical guide on the workstation.
- // Prior interview of the trainees possible in order to qualify their needs.
- // 2 Multiple choice sessions during the training.
- // 15 years of development of the cleaning and ultra clean reconditioning activity.

DURATION 2 days (14 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 1100 € ex. VAT / person. (Lunch included)

PROGRAMME

Theory

1. Why sand a surface?
 - Cosmetics
 - Cleaning and decontamination
 - Modification of the state of a surface
 - Advantages and disadvantages of wet & dry blasting

2. Operating principles

- Constitution of a helium detector
- Analysis cell

Use

1. Types of substrates that can be treated and the risks of deterioration

2. Mediums

- Existing mediums
- Their action on different materials
- The combinations between different mediums

3. The impact of parameters on the state of the surface and the wear of the medium

4. Preparation of parts before micro blasting (protection)

- Presence of critical zones on the parts (Joint housing, threading, etc.)
- Types of protections (Rubber templates, Tapes, caps and screws, joints, adhesives, PVC and vinyl)

5. Ergonomics of the workstation

Micro blaster maintenance :

1. Daily maintenance of the equipment
2. Frequency of replacements of wear parts
3. Frequency of changes in medium depending on the materials to be processed & contamination
4. Waste management

Installing a blaster :

1. Required infrastructure
2. Environmental and safety aspects.
2. Choosing the right equipment (sizing, lifespan and maintenance)
3. Estimation of the installation costs

TRAINING PLUSSES

Possibility of planning an extra practical half day on your site.

ULTRACLEAN REFINISHMENT

REF. 1-213.

OBJECTIVES

- //. Understanding the cleaning technique using dry ice.
- //. Understanding the operation of dry ice blasting equipment.
- //. Using the right parameters for cleaning adapted to the treated parts using dry ice blasting equipment.
- //. Optimising the use of the equipment.

AUDIENCE

Operators and maintenance technicians using dry ice blasting equipment.

TEACHING RESOURCES

- //. Lectures, controlled practical exercises, demonstrations. Exercises on your technical issues
- //. Analysis during the course of situations experienced by the participants.
- //. Custom training manual, a true practical guide on the workstation.
- //. Prior interview of the trainees possible in order to qualify their needs.
- //. 2 Multiple choice sessions during the training

DURATION 1 day (7 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 550 € ex. VAT / person. (Lunch included)

PROGRAMME

Theory

1. What is the interest of CO2 blasting?
 - The specifics of this technology
 - The advantages & disadvantages

2. Operating principles

Use:

1. Types of substrate that can be treated using CO2 blasting equipment
 - Materials
 - Risks of deterioration (impact on roughness, consumption of materials, wear, mechanical deformation, inclusion of deposits on the substrate...)
2. Media
3. Effects of parameters on surface roughness
 - Compressed air pressure
 - Blasting angle, gun-substrate distance, scanning
4. Preparation of parts before blasting
 - Presence of critical zones on the parts
 - Types of protection
5. Ergonomics of the workstation

Micro blaster maintenance

1. Frequency of replacements of wear parts
2. Waste management
3. Cost of using CO2 blasting

Installing CO2 blasting equipment

1. Périodicité de changement des pièces d'usure
2. Choosing the right equipment (sizing, lifespan and maintenance)
3. Estimation of the installation costs

TRAINING PLUSSES

Professional 40-30 instructor used to solving maintenance and productivity issues on ultra-clean reconditioning equipment.

Over the last 15 years, 40-30 has developed the ultra-clean cleaning and reconditioning activity and has made reports on the contamination of surfaces (particles, metallic, ionic and organic)

ULTRACLEAN REFURBISHMENT

REF. 1-221.

OBJECTIVES

- // Become familiar with ultra-clean concepts.
- // Know the different cleaning techniques.
- // Optimise ultra-clean cleaning of parts for the micro-electronics industry.

AUDIENCE

Operators, technicians and engineers working in cleanrooms or designing and carrying out cleaning operations (materials, equipment or surfaces) or maintenance operations in cleanrooms.

TEACHING RESOURCES

- // Lectures, controlled practical exercises, demonstrations.
- // Custom training manual, a true practical guide on the workstation.
- // Prior interview of the trainees possible in order to qualify their needs.
- // Multiple choice questions at the start and end of the training.

DURATION 2 days (14 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 1100 € ex. VAT / person. (Lunch included)

PROGRAMME

Introduction to the Clean-Concept

1. Micro-electronics workshops and their contamination
2. Reactor parts
3. Specification modes
4. Types of cleaning
5. Cleaning qualification
6. New types of cleaning
7. Silicon plate transport boxes

This training can be customised depending on your equipment and work situations as well as on the initial skills of the participants.

TRAINING PLUSSES

Practical training on equipment equivalent to the enterprise equipment.
Custom training manual, a true practical guide on the workstation.
Professional 40-30 instructor used to solving maintenance and productivity issues on vacuum installations.

Industrial radiofrequency

REF. 1-311.

OBJECTIVES

- // Understand the principles and techniques in RF in order to achieve quick and efficient diagnoses on production and plasma chamber machines using RF sources and tuning systems.
- // Understand the principle of RF to optimise the use of your equipment.
- // A theoretical and practical approach to the steps in the RF chain adapted to existing equipment makes it possible for the participants to see parallels with their own issues.

AUDIENCE

GCSE level maintenance technicians and engineers.

TEACHING RESOURCES

- // Lectures, controlled practical exercises, demonstrations.
- // Custom training manual, a true practical guide on the workstation.
- // Prior interview of the trainees possible in order to qualify their needs.
- // Multiple choice questions at the start and end of the training.

DURATION 2 days (14 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 1100 € ex. VAT / person. (Lunch included)

PROGRAMME

1. Prerequisites

Reminder of the different dimensions in electronics that are essential for the remainder of the course.

2. Impedance adaptation

Theoretical module which covers the issues of energy transfer in RadioFrequency, the concept of reflected power, and the use of the Smith chart.

3. RF Match

The key to energy transfer, detailed view of the different models and design choices.

Implementation of energy transfer issues for high RF currents, etc.

4. Skin effect

Highlighting of the effects and limitations due to high frequency currents and materials.

5. RF Cables

Theory, Issues, cable choice, power resistance and cut-off frequency.

6. RF generator

Detailed analysis of the components of an RF generator. Fault analysis.

Specification analysis.

7. RF microwave generator

Cavity magnetron preventive maintenance

8. Metrology and diagnosis

This module describes the implementation of RF measuring equipment in the context of engraving and deposit machines. Fault diagrams are analysed.

TRAINING PLUSSES

Instructor from the 40-30 engineering service who has developed the RF activity since 2001.
Practical training on equipment equivalent to the customer's equipment.

Prevention of chemical and gas related risks

REF. 1-511.

OBJECTIVES

- //. Make the participants aware of the risks relative to their working, production and maintenance situations.
- //. Make the participants responsible for, and participate in, the analysis of risks related to chemical products.
- //. Inform without understatement or overstatement.
- //. Create an awareness, new habits in professional situations, but also in private situations.
- //. Analyse working situations: know and recognise risks related to hazardous products.
- //. Be an actor in safety: respect procedures, wear protective equipment.
- //. Encourage the detection and notification of anomalies
- //. Adopt the right behaviour towards dangers
- //. Know how to react in the event of an incident or accident in the enterprise
- //. Put into practise general prevention rules

AUDIENCE

Operators, production and maintenance technicians, management personnel.

TEACHING RESOURCES

- //. Lectures, controlled practical exercises, demonstrations.
- //. Custom training manual, a true practical guide on the workstation.
- //. Prior interview of the trainees possible in order to qualify their needs.
- //. Multiple choice questions at the start and end of the training.

DURATION 1 days (7 hours)

DATES Contact us

LOCATION Grenoble (FR) possible on customer site

PRICE 550 € ex. VAT / person. (Lunch included)

TRAINING PLUSSES

Practical training on equipment equivalent to the enterprise equipment.

PROGRAMME

Assessment of knowledge by Multiple Choice Questions

ELEMENTS FOR ANALYSIS

I. Dangerous chemical substances: properties, dangers, types of exposure and types of risk

1. Liquid and gas chemical substances: properties and dangers
2. Means of exposure (penetration channels, severe / chronic exposure) and effects on health (limit values)
3. Types of risk and associated pictogram (including new SGH regulations)

II. Prevention and protective measures implemented on site

1. Notions of cause trees and responsibilities of actors
2. General preventive measures (suppression, reduction, R&D)
3. Work organisation and protection of the operator (Operating mode, Collective and individual protective equipment)
4. Training and information available (workstation notices, Safety notices, labels, procedures...)
5. General safety instructions and first aid equipment

APPLICATION

III. Risks and safety instructions at the work station

1. Feedback on accidents, whether real or fictional (either originating from the enterprise accidents or from «standard» accidents)
2. Case study of selected working situations

The studied work situations will be selected during the assessment of the needs of the enterprise.

They will be specific to the enterprise or to the micro electronics industry depending on the information given to the instructor and the desired level of customisation

The participants are the actors in the analysis of their familiar work situations.

- they identify the dangers and assess the risks
- describe the procedures, working and protection instructions implemented

- validate the behaviour in the event of an accident

- Questions; «spot the error» quiz

(domestic risks related to chemical products)

Assessment of acquired knowledge and training in the form of multiple choice questions