



DE DIETRICH® TRAINING PROGRAM 2018



De Dietrich
PROCESS SYSTEMS



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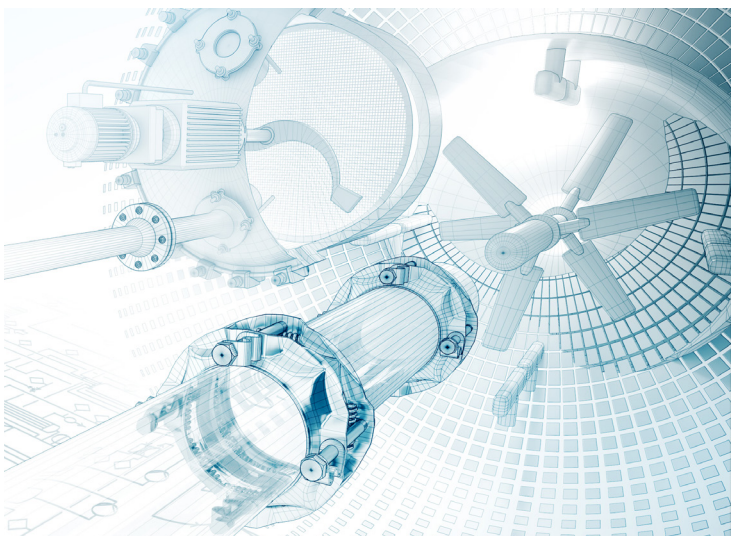
WELCOME TO THE WORLD OF DE DIETRICH !

De Dietrich Process Systems is the leading global provider of Process Equipment, Engineered Systems and Process Solutions for the chemical, fine chemical and pharmaceutical industries.

Our three Competence Centers focusing on Glass-lined Equipment, Glass Products and Filter/Dryers, enable us to provide solutions to every unit operation in Chemical Engineering.

Our expertise enables us to offer comprehensive Process Systems packages and our development hinges on a number of key activities such as reaction units, and integrated systems and services.

De Dietrich has designed various training modules for those of its clients who would like to learn the rudiments of the following fields:



- **Understanding glass lining and glass-lined equipment,**
whether for commissioning, controlling or maintaining equipment
- **Agitation and Heat Transfer**
with an approach focused on the use of the equipment and the optimization of the processes
- **Industrial glass**
with the development of the conditions of use of the material, Borosilicate 3.3, and the upkeep and maintenance of units with our standard in glass-making, QVF® SUPRA Line

Related services are also available, such as on-site tests, installation, start-up and assistance with the qualification of new systems, digital simulation, equipment maintenance and renovation services, and dedicated training seminars. Each one of these fields can be covered in a custom-designed service provision.

We trust that we will be able to count you among our future participants in one or more of our training modules.

For more information on De Dietrich Process Systems, please feel free to consult our Website to find out about our Solutions and Services: www.dedietrich.com

ENAMEL Module 1

PROCESS & GLASS-LINED EQUIPMENT

DURATION
LOCATION
DATES

1,5 day

Zinswiller/F

French:

12 - 13/02/2018
04 - 05/06/2018
08 - 09/10/2018

German:

05 - 06/03/2018

English:

14 - 15/05/2018
22 - 23/10/2018

1 480 € EX VAT
(accommodation & catering included)

PRICE
PUBLIC

MAXI 12 - All audience



PREREQUISITES: None

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OBJECTIVE

**Acquisition of the basics in enamel and glass-lined equipment
To know how to guide choices for technical solutions adapted to the implemented processes**

Presentation of the DE DIETRICH group

Enamel - Generalities:

- The enamel material
- The enamel manufacturing
- Practical workshop

Manufacture of the equipment:
boiler making, enamelling

Manufacturing process:
Factory tour and equipment manufacturing

Glass-lined equipment:

- The different types of reactors: AE - BE - CE - OptiMix®
- Receivers and tanks
- Columns
- Dryers
- Pipes
- Valves

Specification of enamel in the process:

- Properties and uses
- Processes using enamel
- Optimization of the equipment, agitation and heat transfer

Cleaning:

Cleaning In Place (CIP)

The Directives:

- PED, ATEX
- Specification for new equipment, reglassing and upgrading of equipment



ENAMEL Module 2

INSTALLATION AND MAINTENANCE OF GLASS-LINED EQUIPMENT

DURATION

2,5 days

LOCATION

Zinswiller/F

DATES

French:

14 - 16/02/2018
06 - 08/06/2018
10 - 12/10/2018

German:

07 - 09/03/2018

English:

16 - 18/05/2018
24 - 26/10/2018

PRICE

1 880 € EX VAT

(accommodation & catering included)

PUBLIC

MAXI 12 -

Maintenance and Inspection Services



PREREQUISITES: Mechanical knowledge

OBJECTIVE

Acquisition of maintenance techniques on glass-lined equipment
To know how to take the right decisions for repairs

DAY 1

ENAMEL INSPECTION AND REPAIR

Introduction to enamel and enamelled equipment

Preventive inspection

- Cleaning of the glass lining
- Visual and spark test inspection
- Measurement of the enamel and steel thicknesses

Rectification maintenance

- Tantalum repairs
- PTFE and Tantalum sleeves
- Enamelled discs
- Special repairs

Practical workshops

WORKSHOP 1:
Control

- Enamel cleaning and protection
- Visual and spark test inspection
- Measurement of the enamel and steel thicknesses

WORKSHOP 2:

- Instrumentation
 - GlasTest introduction and implementation
- Sampling baffles and temperature sensors introduction
- Dismantling and assembly temperature sensors on baffle

WORKSHOP 3:
Repair

- Principle of Tantalum screws and plates repair
- Principle of PTFE and Tantalum sleeves fitting

DAY 2

MECHANICS

Agitator drive unit:

- Mechanical seal model 06
- MDL drive
- MDL lateral dismantling tool

Presentation of the different gaskets: Aramid, Graphite

Presentation of the shimming procedure of a gasket

Cleanvalve introduction

Practical workshops

WORKSHOP 1:
Disassembly / assembly of glass-lined support flange on MDL mechanical seal cartridge model 06

WORKSHOP 2:
Disassembly / assembly of a mechanical seal housing model 06 on MDL drive

WORKSHOP 3:
Aramid / graphite gaskets shimming

DAY 3

MECHANICS

Agitators introduction

Pneumatic and davit arm openings

Practical workshops:

Introduction and assembly outlet bottom valve

Explanation and visualisation of the manufacturing process of glass-lined reactors - Factory tour



ENAMEL Module 3

PROCESS IMPROVEMENT / OPTIMISATION AGITATION AND HEAT EXCHANGE

DURATION

3 days

LOCATION

Zinswiller/F

DATES

French:

20 - 22/03/2018
16 - 18/10/2018

English:

24 - 26/04/2018
13 - 15/11/2018

PRICE

2 950 € EX VAT
(accommodation & catering included)

PUBLIC

MAXI 6 – Project Managers, Engineers
and specialists in material, Processes



PREREQUISITES: Process knowledge

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DAY 1 OBJECTIVE

Generalities

Introduction to agitation with a global approach to learn about the components to define an agitation system and the criteria used to select the agitation suited to one's process

Introduction

- Vessel geometry
- The different types of agitator
- Baffles effect
- Fluid properties: density, viscosity; Newtonian, non-Newtonian fluid
- Types of flow rate: turbulent, laminar system; Reynolds number

Overall characterisation

- Absorbed power: theory, measurements, curves, impact of different parameters, exercises
- Hydrodynamics: tip speed, pumping and circulation flow rates, mixing time, shear rates

Practical workshops

- Absorbed power measurement

Elementary operations

- Homogenization
- Solids suspension
- Crystallization
- Gas/liquid dispersion

Solutions in glass-lined steel:

- Agitators
- Baffle
- Dip pipe

Mechanical design

- Mechanical components of a mixing system
- Mechanical design:
 - Loads on agitator
 - Strength calculation: static, fatigue
 - Dynamic calculation: critical speed



DAY 2

OBJECTIVE

Blending and Heat Exchange

Further examination of the two most common operations in agitation:
Blending and Heat Exchange

Blending of miscible fluids

- General principles
- Blending in turbulent systems
- Blending in laminar systems
- Measurements

Continuous blending in reactor

- Introduction
- RTD basics
- Approximation

Practical works

- Measuring the macro-mixing time

Heat Exchange

- Introduction
- Calculation: Fourier's law, calculation of exchange coefficients and times
- Influence of different parameters
- General datas: Order of magnitude of different exchange coefficients
- Recommendation for glass-lined equipment

DAY 3

OBJECTIVE

Processes

Further examination of specific processes such as solid/liquid mixtures, gas/liquid dispersion...

Solid / liquid mixing

- Suspension: principle, characterisation, peel-off and suspension speed
- Crystallisation: Problematics, criteria
- Dissolution: significant criteria
- Implementation

Gas / liquid dispersion

- Principle
- Type of operating system
- Characterisations: gas hold-up, mass transfer coefficient
- Measurements

Practical works

- Solids suspension

Blending of immiscible fluids

- Emulsion type
- Break-up and coalescence
- Implementation

Extrapolation

- Introduction
- Dimensional analysis
- Choice of criteria
- Exercices

GLASS Module

TRAINING IN GLASS ASSEMBLY TECHNIQUES

DURATION

2,5 days

LOCATION

Mainz/D

DATES

French:
13 - 15/03/2018
04 - 06/12/2018

PRICE

1 290 € EX VAT
(accommodation and Monday & Tuesday
dinners are not included)

PUBLIC

MAXI 12 - All audiences



PREREQUISITES: Mechanical knowledge

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OBJECTIVE

To train users and «Maintenance» and «Methods» services technicians in the assembly, maintenance and use of industrial chemical engineering equipment in glass.
To discuss EC Directives on pressurised glass equipment, safety rules and good manufacturing practices.

Theoretical training:

- Introduction to glass
 - Presentation of Borosilicate 3.3. glass
 - Properties and limitations of use
 - Presentation of the SUPRA Line range
 - Presentation of the older ranges of QVF and SCHOTT products & compatibility for maintenance operations
- Presentation of parts and accessories - learning to recognise the products
- Visit to the manufacturing workshops

Practical training:

- Assembly of a representative unit that incorporate the particularities of glass equipment
- Practical work in frame assembly
- Practice in glasswork assembly
- Inspection of the unit: functionalities and analysis of assembly operations on the unit
- Preventive maintenance, what is necessary to analyze
- Dismantling the unit and tidying away
- Introduction to ATEX & static electricity
- Questions / Answers



Specific MODULE

TRAINING ON REQUEST

DURATION

On request

LOCATION

Zinswiler or customer site

DATES

To be agreed

PRICE

Following offer

PUBLIC

MAXI 12



PREREQUISITES: According to subject

OBJECTIVE

To acquire basics on enamel or glass, use and limits of materials - To know how to take the right decisions for repairs - To control the interventions and the «light» maintenance of the units - To implement preventive maintenance plans

De Dietrich offers dedicated and customized training courses, «on demand» for customers who want intra training for groups of employees.

In this case, the subjects to be approached and the targeted objectives are discussed with the customer.

After validation, De Dietrich proposes a schedule adapted to the needs of the customer. A commercial proposal is drawn up and a corresponding agreement drafted.

Personnel:

- Drawing office
- Engineering Services
- Inspection Services
- Maintenance

The number of participants may vary from 6 to 12 depending on the proposed activities.

Potential topics on enamel:

- The manufacturing of the enamel and the equipment
 - The use of the enamelled equipment
 - The tightenings
 - The mechanical seals
 - The assembly of piping
 - The controls and repairs
 - Stock analysis on customer site and expertise
- (Non-exhaustive list)

Potential topics on glass:

- The manufacturing and properties of glass
 - The assembly techniques
 - The tightenings
 - Stock analysis on customer site and expertise
- (Non-exhaustive list)



INFORMATION ON TRAINING CONDITIONS

TEACHING GOALS

- **PROCESS & GLASS-LINED EQUIPMENT** on Zinswiller site (F)
The objective of the training is to acquire the basics in enamel and glass-lined equipment
- **INSTALLATION AND MAINTENANCE OF GLASS-LINED EQUIPMENT** on Zinswiller site (F)
The objective of the training is to acquire the maintenance techniques on glass-lined equipment
- **PROCESS IMPROVEMENT / OPTIMISATION - AGITATION AND HEAT EXCHANGE** on Zinswiller site (F)
‘Advanced’ type training in 3 parts with the following objectives:
Part 1 – Generalities: Introduction to agitation with a global approach to learn about the components to define an agitation system and the criteria used to select the agitation suited to one’s process
Part 2 – Blending and Heat Exchange: Further examination of the two common operations in agitation: Blending and Heat Exchange
Part 3 – Specific Processes: Further examination of specific processes such as solid/liquid mixtures, gas/liquid dispersion ...
- **TRAINING IN GLASS ASSEMBLY TECHNIQUES** on Mainz site (D)
To train users and «Maintenance» and «Methods» services technicians in the assembly, maintenance and use of industrial chemical engineering equipment in glass. To discuss EC Directives on pressurised glass equipment, safety rules and good manufacturing practices.

COMPETENCES AND PERSONNEL

- This information is specified for each training module

SUPERVISORS

- The training courses are guaranteed by De Dietrich contributors who are specialists in their field and have a recognized experience in our company

TEACHING AND TECHNICAL MEANS

- The training courses include theory and practical
- Theoretical presentations are made on PowerPoint with a paper version to the trainees.
They are regularly updated according to the evolution of the technique or the technologies
- Practical works are carried out in the workshops on dedicated teaching materials.
Trainees are supervised by professionals
- For the training «Glass Assembly Techniques», a complete unit is dedicated to the practice of assembly and knowledge of materials

INTERNAL DE DIETRICH RULES

- In order to guarantee the safety of the trainees, a safety reception is carried out from the beginning of the training course. Safety boots, protective helmets and work clothes are mandatory (Trainees must come with their personal effects). De Dietrich provides the other necessary PPE: earplugs and safety glasses
- Trainees are prohibited to walk alone on the site
- It is forbidden to take pictures on the site

VALIDATION OF THE TRAINING

- A certificate of attendance at the training is given to the trainees insofar as they have followed the entire duration of the training

QUALITY FOLLOW UP AND IMPROVEMENT

- At the end of the training, an evaluation form is completed by the trainees in order to have their recommendation on the content and quality of the training course. We try to adapt the training according to the suggestions of our customers

GENERAL CONDITIONS FOR TRAINING COURSES

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- **Deadline for registration:** 4 weeks before the beginning of the training course according to place availability
- **Cancellation of a session:**
De Dietrich reserves the right to cancel a training session if the number of registrations is insufficient. We will notify the Training Services in due time to find alternative solutions
- **Are included in the price (unless otherwise indicated in the modules):** Theory and practical lessons, documents relating to the training session, meals and accommodation
- **Not included in the price:**
 - Travel expenses
 - Telephone charges, bar and minibar are to be paid by the trainees leaving the hotel
- **Welcome:**
A welcome dinner is organised at 7:00 pm the evening before the beginning of the session
- **Terms of payment:**
The registrations will only be taken into account upon receipt of the payment of the total amount of the training
- **Cancellation:**
Replacement by another trainee is accepted.
In case of cancellation by the contractor within 15 days before the beginning of the training course, De Dietrich will invoice 50% of the amount of the session. If the trainee is not present at the beginning of the session, 100% of the training amount will be invoiced to the contractor by De Dietrich.

Nota : Cancellation fees are the costs charged by hotels for late cancellations and administration fees.

The cancellation fees requested will be invoiced directly to the department responsible for the training of the company.

REGISTRATION FORM CONSTITUTING AN ORDER

Registration form to be filled out with an order form and/or order reference from the company.

Company:

Training Manager:

Email address:

Phone:

Name	First name	Function	Module N°	Dates

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Cost of the course to be paid to DE DIETRICH S.A.S

Module	Price EX VAT	Number of people	Total
Enamel Module 1	1 480 €		
Enamel Module 2	1 880 €		
Enamel Module 3	2 950 €		
Glass Module	990 €		
Specific Module	€		
Overall total			

Invoice address:

.....

Please provide below the references to be quoted on the invoice:

.....

Done at

On

Your contacts: Pia Beck or Josiane Jung

DE DIETRICH S.A.S

B.P. 8 - 67110 ZINSWILLER

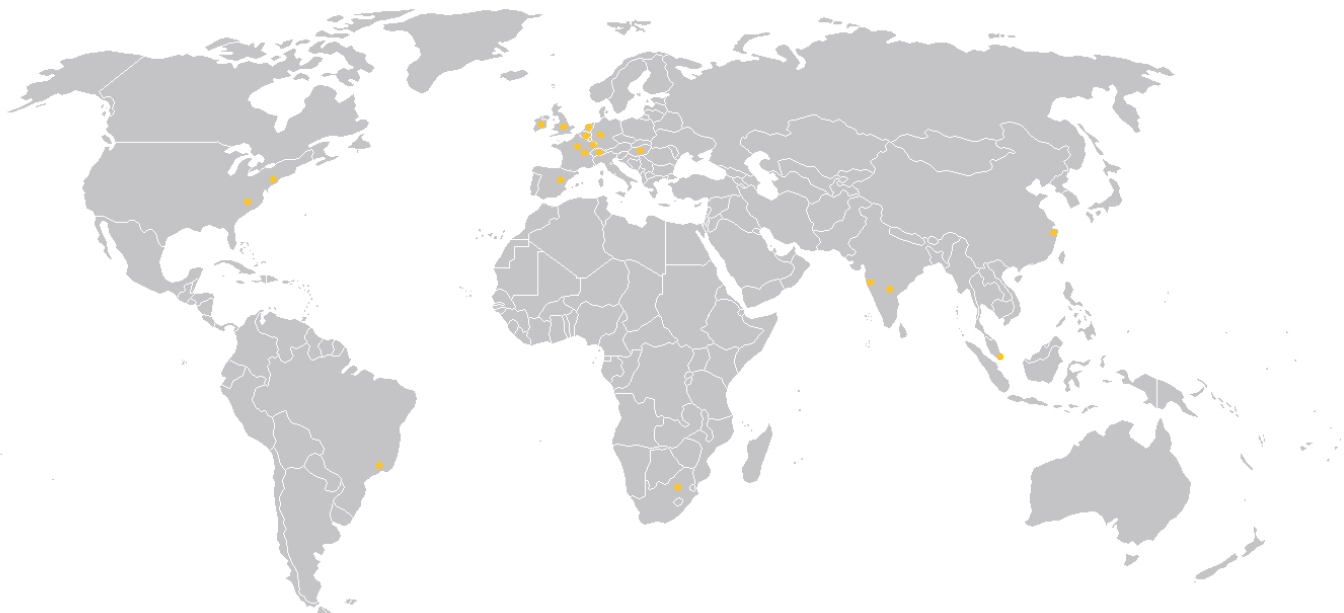
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Signature

Firm's stamp





De Dietrich PROCESS SYSTEMS



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De Dietrich Process Systems is the leading global provider of Process Equipment, Engineered Systems and Process Solutions for the fine chemical, chemical and pharmaceutical industry.

www.dedietrich.com