Thermo Scientific Training Courses

The key to your laboratory's success

2016 Training Programme Benelux

Thermo SCIENTIFIC

Invest in Yourself

People are the most valuable assets in any lab. We offer comprehensive, professional training and certification through a complete course portfolio that can help you achieve the most from your instrumentation and results.

Our ultimate goal is to provide you with a total solution for your analytical needs, and so we offer a wide range of training courses on:

- **Instrument operation - hardware and software**
- **Instrument maintenance**
- **Software and applications**

Optimal classroom settings and world-class instructors will enhance your learning experience and allow you to gain greater productivity. As experts in their disciplines, our experienced specialists can provide a variety of education solutions to ensure that students are able to get the most value from their investment and achieve relative practical and theoretical knowledge. A range of venues are available for your convenience: on-site or at one of our Centers of Excellence.

We look forward to discussing your training needs and working with you to ensure your success with our products.

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Life Sciences Mass Spectrometry

Invest in Yourself. Whether you would like to enhance your learning experience or gain greater productivity, the Life Sciences Mass Spectrometry courses are designed to ensure each student has time to address their specific topics of interest. The courses offer both practical and theoretical training and are taught by experienced and certified instructors.

Life Sciences Mass Spectrometry

Proteomics

Training: Ion Trap and LTQ Orbitrap Biotech Operations

Course Objective:

This course is designed for users that have previous LC-MS experience and are interested in protein and peptide analysis. It is specific to the Thermo Scientific™ LTQ Orbitrap™ and ion trap mass spectrometers and will include instruction for electrospray ionization (ESI) of proteins and peptides, instruction for setting up dynamic and static nanospray (NSI), calibration and basic maintenance, setup and optimization of various data-dependent acquisition methods. In addition, there will be an in depth discussion of qualitative analysis and processing of accurate mass methods with Thermo Scientific™ Xcalibur™, Proteome Discoverer™ and SIEVE™ software programs. When ETD training is requested, the following topics can be incorporated to the course timetable: maintenance of ETD source, optimization, tuning and calibration of the ETD components, experimental set-up, ETD data processing.

The course material includes:

- Ion Trap and Orbitrap Theory
- Tuning and Calibration
- Hands-on ESI and NSI MS
- Data Dependent Method Design
- Post-Translational Modification Methods
- Parallel Detection Methods
- Accurate Mass Methods
- Xcalibur Software for Qualitative Methods
- Proteome Discoverer Software
- Basic Thermo Scientific LTQ Maintenance

This course is offered at customer site only

Training: Q Exactive Biotech Operations

Course Objective:

This course is designed for users that have previous LC-MS experience and are interested in protein and peptide analysis. It is specific to the Thermo Scientific™ Q Exactive™ mass spectrometer and will include instruction for electrospray ionization (ESI) of proteins and peptides, instruction for setting up dynamic and static nanospray (NSI), calibration and basic maintenance, setup and optimization of the various data dependent acquisition methods. In addition, there will be an in depth discussion of qualitative analysis and processing of accurate mass methods with Thermo Scientific Xcalibur, Proteome Discoverer, FT and SIEVE software programs. Information on the Thermo Scientific™ Pinpoint software can be also be included in the training course.

The course material includes:

- Quadrupole and Orbitrap Theory
- Quadrupole and Orbitrap Hardware
- Instrument Tuning and Calibration
- Nano-flow LC Method Development
- Data Dependent and Multiplexing Method Design
- Xcalibur Set Up and Processing
- Proteome Discoverer Software
- Processing of Post Translation Modification Methods

Life Sciences Mass Spectrometry

Proteomics

Training: TSQ Biotech Operations

Course Objective:

The aim of this training course is to familiarize the new Thermo Scientific™ TSQ™ mass spectrometer user with instrument operation for the purposes of protein and peptide quantitation. It includes instruction for electrospray (ESI) and nanospray (NSI) ionization of proteins and peptides, instrument calibration and tuning, data collection, maintenance and functionality of Thermo Scientific Xcalibur and Pinpoint software packages. The training content can be customized according to the customer's specific needs.

The course material includes:

- TSQ Hardware and Theory
- Tuning and Calibration
- Hands-on ESI and NSI MS
- Maintenance
- Parameters necessary for Good Quantitation
- Xcalibur Software for Quantitative Methods
- Pinpoint Software
- Instrument Method Development
- Data Processing
- Introduction to Skyline

This course is offered at customer site only

Training: Fusion Biotech Operations

Course Objective:

This course is designed for users who have previous LC-MS experience and are interested in protein and peptide analysis. It is specific to the Thermo Scientific™ Orbitrap Fusion™ and Fusion Lumos Tribrid Mass Spectrometers and will include instruction for electrospray ionization (ESI) of proteins and peptides, instruction for setting up dynamic and static nanospray (NSI), calibration and basic maintenance, and setup and optimization of various data-dependent acquisition methods. In addition, there will be an in depth discussion of qualitative analysis and processing of accurate mass methods with Thermo Scientific Xcalibur, Proteome Discoverer, and SIEVE software programs. When ETD training is requested, the following topics can be incorporated to the course timetable: maintenance of ETD source, optimization, tuning and calibration of the ETD components, experimental set-up, ETD data processing.

The course material includes:

- Dual Pressure Linear Ion Trap, Quadrupole and Orbitrap Theory
- Basic Tune and Calibration
- Hands-on ESI and NSI MS
- Data Dependent Method Design
- Post-Translational Modification Methods
- Parallel Detection Methods
- Accurate Mass Methods
- Proteome Discoverer Software
- Basic Maintenance

This course is offered at customer site only

Life Sciences Mass Spectrometry

Proteomics

Training: Proteome Discoverer Software

Course Objective:

The aim of this training course is to provide new users with the ability to use the Thermo Scientific Proteome Discoverer software to its full potential. Proteome Discoverer is a flexible, expandable software platform for the analysis of qualitative and quantitative proteomics data. Detailed presentations will be given on all modules together with hands on exercises in order to ensure understanding of all the processes. The students will become familiar with database manipulation, database search parameters as well as the interpretation of results. By the end of the course they should be able to apply all software tools for their own purposes.

Training: SIEVE Software

Course Objective:

Thermo Scientific SIEVE software provides label-free quantitative differential expression analysis of proteins and peptides from the comparison of multiple LC/MS datasets. It is a statistically rigorous tool for analyzing data from biomarker discovery experiments. This course will allow the new user to use all modules of the software successfully. The students will become familiar with chromatographic alignment, statistical evaluation and database searching. By the end of the course they should be able to apply all software tools for their own purposes.

Training: PepFinder Software

Course Objective:

For biotherapeutic proteins to be effective, they must be produced in biologically active forms with proper folding and post-translation modifications (PTMs).

Thermo Scientific™ PepFinder software makes it easy to define the target protein sequence, select a proteolytic digest enzyme, and assign known and potential post-translational modifications to search. Protein sequences can be imported from FASTA and text files, or sequences can be pasted into a text box.

The aim of this training course is to provide new users with the ability to use PepFinder software to its full potential.The user will be able to create automated workflows necessary for an in-depth characterization of biotherapeutic proteins (glycopeptides identification, disulfide bond mapping, quantification of PTM's including oxidation, deamidation, phosphorylation). The users will also learn how to perform error tolerant and amino acid searches as well as processing Peptide Mapping raw data.

Life Sciences Mass Spectrometry

Proteomics

Training: Pinpoint software

Course Objective:

The aim of this training course is to provide new users with the ability to use the Pinpoint software to its full potential in combination with TSQ, LTQ Orbitrap or Q Exactive data. Pinpoint software assists in the fast development of quantitative protein/peptide assays and provides a great tool for processing data from quantitative analyses. The course will cover all aspects of the identification, characterisation and quantification of biological samples, providing a complete start-to-finish workflow for biomarker ID and verification. MSn and High-Resolution/Accurate customized for the customer's needs and this module can also be combined with the TSQ, LTQ orbitrap and Q Exactive Biotech Operations courses on offer.

Training: ProSightPC Software

Course Objective:

The aim of this training course is to provide new users with the ability to use Thermo Scientific™ ProSightPC software to its full potential. ProSightPC is an all round tool for identification and characterization of both intact proteins and peptides. It enables high-throughput processing of all accurate-mass MS/MS data, whether from top-down, middle-down or bottom-up experiments including the characterization of proteins with known PTMs. Detailed presentations will be given on all the options available with hands on exercises in order to ensure understanding of all the processes. The course will cover all the steps from software setup to data reporting, including the use of the multiple search modes available to determine the exact protein sequence including modifications and alternative splicing.

Training: Protein Deconvolution Software

Course Objective:

The aim of this training course is to provide new users with the ability to use Thermo Scientific™ Protein Deconvolution software to its full potential. Protein Deconvolution significantly improves the identification and characterization of intact proteins from mass spectrometric data. It is the only protein deconvolution software available today that takes full advantage of the ultra-high-resolution, accurate-mass data produced by Orbitrap-based mass spectrometers. Detailed presentations will be given on all the options available with hands on exercises in order to ensure understanding of all the processes. The course will cover all the steps necessary to the use of the two built-in algorithms (Xtract and ReSpect), deconvoluted data handling and reporting. Guidelines on intact protein analysis for Thermo Scientific mass spectrometers will also be provided.

Life Sciences Mass Spectrometry

Small Molecules

Training: Fusion Operations

Course Objective:

The Fusion Operations course is designed for users that have previous LC-MS experience and would like to familiarize themselves with the Orbitrap Fusion mass spectrometer. The course will cover API and ion trap theory, tuning, calibration, data collection, general functionality of the Xcalibur software and main workflows for additional processing softwares. The emphasis of the training is on small molecule analysis, accurate mass applications and data processing.

The course material includes:

- Dual Pressure Linear Ion Trap, Quadrupole and Orbitrap Theory
- Basic Tune and Calibration
- Compound Tuning for MS and MS/MS Purposes
- Data Dependent Method Design
- Introduction to Qual Browser/Freestyle
- Accurate Mass Methods
- Parallel Detection Methods
- Introduction to Elemental Composition and Structure Elucidation

Training: Ion Trap Operations

Course Objective:

The aim of this training course is to familiarize the new ion trap user with basic instrument operation, including API and ion trap theory (linear and 3D, single and dual traps), tuning, calibration, data collection, maintenance, and general functionality of the Xcalibur software package. The focus of this course is small molecule analysis for both qualitative and quantitative purposes. No attempt is made to teach protein mapping or peptide sequencing. Students desiring focused instruction on peptide/protein analysis should explore the possibility of taking one of the Biotech courses on offer, in lieu of this course.

The course material includes:

- Ion Trap Theory
- Tuning and Calibration
- Hands-on APCI and ESI MS
- Instrument Method Development for LC/MS
- Multi-Stage MS Method Building
- Quantitative Analysis
- Xcalibur Software
- Basic Maintenance

This course is offered at customer site only

Life Sciences Mass Spectrometry

Small Molecules

Training: LTQ Orbitrap Operations

Course Objective:

The LTQ Orbitrap Operations course is designed for users that have previous LC-MS experience and would like to familiarize themselves with the LTQ Orbitrap mass spectrometer. The course will cover API and ion trap theory, tuning, calibration, data collection and general functionality of the Xcalibur software. The emphasis of the training is on small molecule analysis, accurate mass applications and data processing.

The course material includes:

- LTQ 2D Ion Trap and Orbitrap Theory (Single and Dual Traps)
- Basic Tune and Calibration
- Compound Tuning for MS and MS/MS Purposes
- Instrument Method Development for LC/FTMS
- Introduction to Qual Browser/Freestyle
- Accurate Mass Methods
- Data Dependent Analysis
- Introduction to Elemental Composition and Structure Elucidation

This course is offered at customer site only

Training: Metabolite Identification

Course Objective:

The aim of this training course is to familiarize new Thermo Scientific mass spectrometer users with optimal instrument operation and software options for performing efficient identification of metabolites. The course will cover API and MS theory, tuning, calibration, data collection and general functionality of the Xcalibur software. In addition, data processing for the purposes of metabolite identification will be performed using Thermo Scientific software packages.

The course material includes:

- MS Theory
- Basic Tune and Calibration
- Compound Tuning for MS and MS/MS purposes
- Method Development
- Data Dependent Analysis and Accurate Mass Methods
- Introduction to Qual Browser/Freestyle
- Identification of Metabolites using Compound Discoverer
- Structure Elucidation using Compound Discoverer

This course is offered at customer site only

Life Sciences Mass Spectrometry

Small Molecules

Training: Structure Elucidation of Unknowns

Course Objective:

The aim of this training course is to familiarize new Thermo Scientific MS users with optimal instrument operation and software options for performing efficient structure elucidation of unknown small molecules such as: impurities in synthetic samples, toxic compounds, explosives, environmental components, etc. The course will cover API and MS theory, tuning, calibration, data collection and general functionality of the Xcalibur software.

The course material includes:

- Ion Trap and Orbitrap Theory
- Basic Tune and Calibration
- Compound Tuning for MS and MS/MS Purposes
- Method Development
- Data Dependent Analysis and Accurate Mass Methods
- Introduction to Qual Browser/Freestyle
- Component Detection using Compound Discoverer and m/z Cloud
- Creation and Interrogation of Libraries in Compound Discoverer and m/z Cloud
- Spectra Interpretation using Compound Discoverer and m/z Cloud

This course is offered at customer site only

Life Sciences Mass Spectrometry

Small Molecules

Training: SIEVE Software

Course Objective:

Thermo Scientific SIEVE software provides a label-free quantitative analysis of metabolic pools by comparison of multiple LC-MS datasets. It can be used to compare the metabolomes of control versus treated samples as well as from time-course experiments. This course will enable the new user to utilize all the modules of this software package in order to perform statistically valid metabolome experiments. The course topics include a familiarization with chromatographic alignments, statistical evaluation of metabolic pool sizes and exact mass database queries. By the end of the course the student will be able to apply all software tools to fulfill their experimental requirements.

Training: Compound Discoverer Software

Course Objective:

The aim of this training course is to provide new users with the ability to use the Thermo Scientific™ Compound Discoverer™ software to its full potential.

Compound Discoverer software ensures confident compound identification and structural elucidation in applications as diverse as pharmaceutical metabolism, impurity analysis, forensic toxicology, and environmental research. The software helps researchers plan how data will be collected, organized, stored and reported with the final result in mind. Its node-assembled processing workflows, advanced algorithms, and study-oriented data storage allow users to quickly process and assemble data collected from multiple samples into a unified report.

The training course will cover all the aspects of the software including:

- Isotope pattern trace
- Fragment ion search trace
- Multiple mass defect filtering
- Expected compound search including dealkylation and dearylation predictions and transformation products
- Untargeted compound detection with isotope and adduct grouping
- Fragment ion search (FISh) and structure annotations
- Compare with control experiments
- Reporting

Life Sciences Mass Spectrometry

Small Molecules

Training: TSQ Operations

Course Objective:

The aim of this training course is to familiarize the new TSQ user with instrument operation including atmospheric pressure ionization, quadrupole principles, compound tuning, instrument calibration, data collection, maintenance and general functionality of Xcalibur and Thermo Scientific™ TraceFinder™ software packages. The focus of this training course is small molecule quantitation and the different approaches enabled by hardware and software in this field will be explored. Customers interested in the quantitation of peptides and proteins should choose the TSQ Biotech Operations course instead.

The course material includes:

- TSQ Hardware Components
- TSQ Scan Modes
- TSQ Instrument Control
- Quantitation using TraceFinder
- Reporting
- User Maintenance

Training: Exactive Operations

Course Objective:

The aim of this training course is to familiarize the new Thermo Scientific™ Exactive™ mass spectrometer user with the Orbitrap technology. This will cover API and Orbitrap theory, tuning, calibration, data collection and general functionality of the Thermo Scientific Xcalibur and TraceFinder software packages. The emphasis of the training is on small molecule analysis, accurate mass applications and data processing.

The course material includes:

- Overview of Theory and Practical Operation of the Thermo Scientific Orbitrap Mass Analyzer
- System Tuning and Calibration Procedures
- Preventative Maintenance and Troubleshooting Procedures
- Method and Sequence Setup
- Data Processing and Reporting

Life Sciences Mass Spectrometry

Small Molecules

Training: Q Exactive Operations

Course Objective:

The aim of this training course is to familiarise the new Q Exactive user with Orbitrap technology. The training agenda covers API, Quadrupole and Orbitrap theory, tuning, calibration, data collection and general functionality of the Thermo Scientific Xcalibur and TraceFinder software packages. The emphasis of the training course is on small molecule analysis both from a qualitative and quantitative point of view, on accurate mass applications and data processing.

The course material includes:

- Overview of Theory and Practical Operation of the Thermo Scientific Orbitrap Mass Analyzer
- System Tuning and Calibration Procedures
- Preventative Maintenance and Troubleshooting Procedures
- Method and Sequence Setup
- Data Processing and Reporting

Training: Transcend II Operations

Course Objective:

The aim of this training course is to familiarize the new user with Thermo Scientific™ TurboFlow™ technology that can be used in conjunction with Thermo Scientific mass spectrometers and allows elimination of sample preparation techniques. The training will cover the theory of turbulent flow chromatography, hardware setup and maintenance, method development and data acquisition. The students will be guided through all principles of operation and hands on examples will be used for successful method development.

The course material includes:

- Theory of Turbulent Flow Chromatography
- Hardware Set Up: Autosampler, Injector Ports, Loading and Eluting Pumps, Multiple Column Module (MCM)
- Acquisition and processing Software: Method Creation, Batch Set Up, Pressure Trace Read Backs
- Quick Elute Methods
- Focus Mode Method Set Up
  - *Turbo Flow Column Selection*
  - *Elution Optimization from Analytical Columns*
  - *Method Variables*

This course is offered at customer site only

Life Sciences Mass Spectrometry

Small Molecules

Training: EQuan

Course Objective:

The aim of this course is to familiarize the new user with the Thermo Scientific™ EQuan large volume injection technique. The training will cover the principles of operation and the theory of the method, hardware setup and maintenance, method setup and data acquisition. All considerations with respect to large volume injections will be discussed. This training module can be combined with any of the instrument Operations courses on offer.

This course is offered at customer site only

Training: TraceFinder Software

Course Objective:

Thermo Scientific™ TraceFinder™ is a software package with built-in workflows that have been developed to assist in routine analysis of small molecules applications. The aim of this training course is to enable the users to implement fully automated acquisition and processing workflows. Detailed presentations will be given on all TraceFinder functionalities together with hands on exercises in order to ensure understanding of all the processes. The software setup, user selection and all the steps necessary for data collection and processing, data analysis and report generation will be covered. This training module can be combined with any of the instrument Operations courses on offer.

Training: LipidSearch

Course Objective:

Thermo Scientific LipidSearch software provides automatic identification and relative quantification of cellular lipid molecular species from large amounts of mass spectrometric data obtained in nano-infusion or LC-MS experiments. During the course you will learn how to use the software for different analysis conditions. The student will use practical examples to explore the lipid database, the ID module and how to perform relative quantitation. The various output options will be discussed. By the end of the student will be able to use LipidSearch to successfully analyse their lipidomics data.

Life Sciences Mass Spectrometry

Small Molecules

Training: MSQ *Plus* Operations

Course Objective:

The aim of this training course is to familiarize the new Thermo Scientific™ MSQ™ mass spectrometer Plus user with instrument operation including atmospheric pressure ionization, quadrupole principles, compound tuning, instrument calibration, data collection, maintenance and general functionality of the Thermo Scientific ™ Dionex™ Chromeleon™ software package. The focus of this course is small molecule analysis for both qualitative and quantitative purposes.

The course material includes:

- MSQ Hardware Components
- Maintenance
- Tuning and Mass Calibration
- Compound Optimization and Method Development
- Quantitative SIM Analysis by Electrospray
- Quantitation using Chromeleon
- Quantitation by APCI
- Cone Fragmentation
- Qualitative Processing

Training Schedule 2016

We currently don't offer any LSMS courses in our facility in Breda. However all the courses described in the brochure can be offered at customer sites. LSMS courses are offered at the following facilities:

- Hemel Hempstead, UK
- Villebon sur Yvette, France

For information on training dates and tuition language, please refer to the corresponding brochure.

Chromatography

Real-World Knowledge. For experienced and new users to our extensive line of Chromatography instruments, we offer both practical and theoretical training courses taught by experienced and certified instructors. Course sizes are kept to a minimum to ensure each student has access to instruments, as well as time to address their specific topics of interest.

Chromatography
GC

Training: GC Operations

Course Objective:

The aim of this course is to familiarize the new Thermo Scientific GC user with basic instrument operation including gas chromatography theory and optimization, routine maintenance, data acquisition and data processing.

The course material includes:

- GC Theory & Optimization
- GC Routine Maintenance
- GC Method and Sequence Set up
- Calibration strategies
- Evaluation of Quantitative Data
- Reporting

This course is offered at customer site only

Chromatography
GC-MS

Training: ISQ Operations

Course Objective:

The aim of this training course is to familiarize the new Thermo Scientific™ ISQ™ GC-MS system user with basic instrument operation including gas chromatography, optimization for mass spectrometry, maintenance, EI, CI and quadrupole theory, tuning, calibration, data acquisition, data processing and the general functionality of the Thermo Scientific Xcalibur software package.

The course material includes:

- GC Theory and Optimisation (EI and CI)
- Quadrupole Theory
- GC and ISQ Hardware and Maintenance
- Scan Functions
- Qualitative Set Up and Processing
- Quantitative Set Up and Processing
- Introduction to new software packages for GC-MS

Training: TSQ 8000 Evo Operations

Course Objective:

The aim of this training course is to familiarize new users of the Thermo Scientific™ TSQ™ 8000 Evo system with basic instrument operation including gas chromatography optimization for mass spectrometry, maintenance, EI, CI and quadrupole theory, tuning, calibration, data acquisition, automated SRM development, data processing and the general functionality of the Thermo Scientific TraceFinder software package.

The course material includes:

- GC Theory and Optimization (EI and CI)
- Quadrupole Theory
- GC and TSQ 8000 Hardware and Maintenance
- Scan Functions
- Qualitative Set Up and Processing with Xcalibur and Tracefinder
- Quantitative Set Up and Processing with Xcalibur and Tracefinder

Chromatography
GC-MS

Training: Q Exactive GC-MS/MS Operations

Course Objective:

The aim of this training course is to familiarize new users of the Thermo Scientific™ Q Exactive™ GC Orbitrap™ GC-MS/MS system with basic instrument operation including gas chromatography optimization for mass spectrometry, maintenance, EI, CI, MS/MS and Orbitrap theory, tuning, calibration, data acquisition, data processing and the general functionality of the TraceFinder software package.

The course material includes:

- GC Theory and MS Source Optimization (EI and CI)
- High resolution and accurate mass: definitions
- Orbitrap Theory
- GC and Q Exactive Hardware and Maintenance
- Scan Functions
- Qualitative Set Up and Processing TraceFinder
  – Target screening with a database
  – Deconvolution and High Resolution screening
- Quantitative Set Up and Processing TraceFinder

Chromatography
GC-MS

DFS Instrument Operator Training for Quantitative Applications

Course Objective:

The general objective of the Thermo Scientific™ DFS™ instrument operator training for quantitative applications is to introduce the new user to quantitative GC/HRMS techniques using dioxin/furan analysis as an example. The course will familiarize users with the operational techniques and data evaluation procedures needed for high resolution GC/MS MID methods for isotope dilution techniques, following EPA method 1613 for the analysis of Dioxins/Furans. Please note that for this course, knowledge of the EPA method 1613 or equivalent methods is required, as well as proficient understanding of mass spectrometry (MS). The participants should have experience in the field of chromatographic analysis, especially in gas chromatography.

The course material includes:

- Introduction into the Hardware and Basics of the Dual Data Acquisition
- Instrument setup for Dual Data Analysis
- Troubleshooting and Maintenance of the Dual Data Configuration.

DFS Dual Data Operator Training

Course Objective:

The general objective of the DFS Dual Data Operator training course is to introduce Dual Data acquisition for high throughput applications. For this course, a proficient understanding of mass spectrometry and DFS operation is expected. The participants should have the Dual Data option on the DFS system.

The course material includes:

- Introduction into the Hardware and Basics of the Dual Data Acquisition
- Instrument setup for Dual Data Analysis
- Troubleshooting and Maintenance of the Dual Data Configuration

Chromatography
GC-MS

Training: Xcalibur Software

Course Objective:

This course is designed to familiarize the student with the operation of Xcalibur software for use in qualitative and quantitative analysis. Detailed presentations will be given on all Xcalibur modules together with hands on exercises in order to ensure understanding of all the processes. The students will become familiar with the subjects of method and sequence set-up, data manipulation, automated processing and report generation. By the end of the course they should be able to apply all software tools for their own purposes.

Training: TraceFinder Software

Course Objective:

TraceFinder is a software package with built-in workflows that have been developed to assist in routine analysis of environmental and food residue applications. The aim of this training course is to provide new users with the ability to use the software to its full potential. Detailed presentations will be given on all TraceFinder functionalities together with hands on exercises in order to ensure understanding of all the processes. The software setup, user selection and all the steps necessary for data collection and processing, data analysis and report generation will be covered. This training module can be combined with any of the instrument Operations courses on offer.

Chromeleon Software

Training: Introduction to Chromeleon 7 – Level 1

Course Outline

- Getting started
- General navigation
- Basic sequencing and programming
- Basic calibration
- Manual and automatic instrument operation
- Collecting data
- Data processing
- Specially requested topics (time permitting)

Who Should Attend?

This course has been designed for chromatographers who are new to the Chromeleon workstation or for existing users who require refresher training.

Training: Next Steps in Chromeleon 7 – Level 2

Course Outline

- Advanced sequencing and programming
- Building and managing eWorkflows
- Report writing and editing
- Queries
- System suitability testing
- Specially requested topics (time permitting

Who Should Attend?

This course has been designed for experienced users of Chromeleon or delegates who have attended the Introductory course.

Ion Chromatography (IC)

Training: Ion Chromatography Theory & Troubleshooting Course

Course Objective:

- Basic Ion Chromatography theory
- System functions
- Frontline hardware maintenance
- Column care
- Developing troubleshooting skills

Courses are grouped to maximise the best utilization for the operator on their particular product line.

Who Should Attend?

The courses are designed to help users who are new to the technique and instrumentation of Ion Chromatography or for those who want to enhance their theoretical understanding of Ion Chromatography and wish to carry out frontline maintenance.

Which Systems are Covered?

Thermo Scientific™ Dionex ICS-900, Dionex ICS-1000, Dionex ICS-1100, Dionex ICS-1500, Dionex ICS-1600, Dionex ICS-2000, Dionex ICS-2100, Dionex ICS-3000, Dionex ICS-5000 and Dionex ICS-5000⁺ systems.

Training: HPAEC-PAD Theory & Troubleshooting Course

Course Objective:

- Fundamentals of Electrochemical Detection
- System functions
- Frontline hardware maintenance
- CarboPac column care
- Developing troubleshooting skills

Who Should Attend?

The courses are designed to help users who are new to the technique and instrumentation of Ion Chromatography or for those who want to enhance their theoretical understanding of Ion Chromatography with electrochemical detector and wish to carry out frontline maintenance.

Ion Chromatography (IC)

Training: IC Method Development

Course Objective:

- Increase of actual skills for method development
- Discussions about separation and detection techniques
- Making a roadmap of method development
- Use of "Virtual Column"
- Discussions of Examples which can be used in own environment

Who Should Attend?

You should have a basic knowledge of Ion Chromatography.

Training: Carbohydrates Method Development

Course Objective:

- Understand and explain the workflow for Carbohydrates analysis
- Identify the key parameters that affect Carbohydrates detection
- Understand best practices for Carbohydrates sample preparation
- Increase overall skills in method development
- Discussions about separation and detection techniques
- Making a roadmap of method development
- Use of "Virtual Column"
- Discussions of Examples which can be used in own environment

Who Should Attend?

You should have a basic knowledge of Ion Chromatography.

HPLC Systems

Training: Theory and Troubleshooting Course for UltiMate 3000

Course Outline

- A basic introduction to HPLC.
- Understanding of the practical aspects of the instrument.
- Practical tips to improve system performance.
- Information regarding useful operation parameters.
- An overall familiarization of the Thermo Scientific™ Dionex™ UltiMate™ 3000 systems.
- Effectively detecting, troubleshooting and rectifying common issues.
- Performing instrument maintenance.
- Carrying out relevant diagnostic tests.
- Experience from hands-on laboratory exercises.
- Replacing common HPLC parts.

Who Should Attend?

This course has been designed for new users or potential users of the UltiMate 3000 HPLC and UltiMate 3000 RSLC (Rapid Separation) systems and for those who wish to carry out frontline maintenance.

HPLC Systems

Training: Theory and Troubleshooting Course for Vanquish

Course Outline

- A basic introduction to HPLC.
- Understanding of the practical aspects of the instrument.
- Practical tips to improve system performance.
- Information regarding useful operation parameters.
- An overall familiarization of the Thermo Scientific™ Vanquish™ and Vanquish Flex systems.
- Effectively detecting, troubleshooting and rectifying common issues.
- Performing instrument maintenance.
- Carrying out relevant diagnostic tests.
- Experience from hands-on laboratory exercises.
- Replacing common HPLC parts.

Who Should Attend?

This course has been designed for new users or potential users of the Vanquish and Vanquish Flex systems and for those who wish to carry out frontline maintenance.

Accelerated Solvent Extraction (ASE)

Introduction to Accelerated Solvent Extraction (ASE)

Course Outline

- Theory of Accelerated Solvent Extraction.
- Sample operation.
- Method development using ASE technology.
- Optimizing extraction conditions.
- Overview of instruments operation.

Who Should Attend?

This course is suitable for users of any Thermo Scientific Dionex ASE Accelerated Solvent Extractor product to develop their skills and understanding of the Dionex ASE™ systems.

This course is offered at customer site only

Maintenance and Troubleshooting for Accelerated Solvent Extraction

Course Outline

- Troubleshooting Dionex ASE Systems.
- Performing instrument maintenance.
- Hands-on laboratory exercises.
- Replacing essential parts when required.

Who Should Attend?

This course has been designed for users of any Dionex ASE product who want to develop their practical skills using ASE technology. This course is ideal as a follow up from the Accelerated Solvent Extraction Course.

This course is offered at customer site only

On-Site Training Course

Course Description

On-site training provides your company with the opportunity to create a custom made course which meets your specific requirements. Customized training courses of various lengths and content can be designed and held in your training facility, laboratory or at one of our locations.

Courses can include any of the topics covered in the previous pages plus:

- Software Features for Photodiode Array Detection
- Software Features for Report Publishing
- Using Chromeleon to Comply with 21 CFR 11
- Chromeleon Software Features for Administrators
- Advanced Software Features for Fraction Collection
- Thermo Scientific™ Dionex™ ASE™ instruments
- AutoTrace Solid Phase Extraction
- Electrochemical and CAD Detectors
- Dionex Ultimate Nano and Capillary LC Systems operations

Training Schedule 2016

COURSE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Introduction to Chromeleon 7.2 – Level 1		2			17				20			
Next Steps in Chromeleon 7.2 – Level 2				19-20						11-12		
Ion Chromatography – Theory and Troubleshooting			8-9								15-16	
Ion Chromatography – Method Development				12							22	
Theory and Troubleshooting Course for U3000			22-23							18-19		
HPAEC-PAD Theory Method Development		23-24								25-26		
Carbohydrates Method Development				13							23	

Breda, tuition in Dutch.

Trace Elemental Analysis

Optimize Your Processes. From AAS to ICP, our experience and intrinsic knowledge of the market will help you expedite applications and streamline your process for maximum efficiency and productivity. Whether it's environmental, petrochemical or clinical, our experienced instructors will prepare you to operate your instrument and software with ease.

Trace Elemental Analysis

Atomic Absorption Spectroscopy (AAS)

Training: Flame AAS Operations

Course Objective:

This course is designed for the Thermo Scientific AAS Operator and covers all the essential topics related to flame optimization, method development and efficient operation of the instrument.

The course material includes:

- Absorption and Emission Theory
- Hardware: Set up, Use and Optimization
- Correction System for Non-Specific Absorptions
- Influence of Experimental Parameters
- Absorption and Emission Analysis
- Non-Specific Absorption and Chemical Interferences
- Maintenance
- Sample Solubilization
- Quality Control Tests

Training: Furnace AAS Operations

Course Objective:

This course is designed for the Thermo Scientific AAS Operator and covers all the essential topics related to optimization of a furnace AAS system, method development and efficient operation of the instrument.

The course material includes:

- Theory of Absorption
- Development of an Analytical Method
- Hardware: Set Up, Use and Optimization
- Non-Specific Absorption and Matrix Modifiers
- Correction System for Non-Specific Absorptions
- Maintenance
- Sample Solubilization
- Influence of Experimental Parameters
- Quality Control Tests

Trace Elemental Analysis

ICP-OES

Training: ICP-OES Operations

Course Objective:

The aim of this is to improve the theoretical knowledge and practical skills of the Thermo Scientific ICP-OES user. The course will cover atomic spectroscopy theory, plasma related topics, instrument hardware, tuning and method set-up, functionalities of the software package, basic maintenance and troubleshooting.

The course material includes:

- Atomic Spectroscopy Theory
- Instrument Optimisation
- Identifying and Overcoming Interferences in ICP
- Overview of Software Packages available
- Quantitative Analysis
- Instrument Hardware, Maintenance and Troubleshooting

Training Schedule 2016

COURSE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Flame AAS Operations					19							
Furnace AAS Operations					20							
ICP-OES Operations			24			23			8			

Breda, tuition in Dutch.

All the courses described in the brochure can be offered at customer sites.

Additional dates are available at:

- Hemel Hempstead, UK
- Villebon sur Yvette, France
- Dreieich, Germany
- Rodano, Italy

For information on training dates and tuition language, please refer to the corresponding brochure.

Inorganic Mass Spectrometry

Increase Your Efficiency. Designed to offer both practical and theoretical training, the Inorganic Mass Spectrometry courses are taught by experienced and certified instructors. Covering a wide range of techniques our courses ensure that the customer interests and needs are covered regardless of the uniqueness of their application.

Inorganic Mass Spectrometry
ICP-MS

Training: iCAP Q Operations

Course Objective:

This course covers the fundamentals of the Thermo Scientific™ iCAP™ Q ICP-MS system operation and maintenance with a mixture of lectures and practical sessions. Topics include atomic spectroscopy theory, plasma description, hardware, tuning and method setup, functionalities of the Thermo Scientific™ Qtegra™ software package, basic maintenance and troubleshooting.

The course material includes:

- Quadrupole ICP-MS Fundamentals
- ICP-MS Analysis and Method Development
- Analytical Issues: Sample Preparation, Matrix Effects
- Calibration
- Data Management and Processing
- Qualification and Performances Report
- Maintenance
- Interferences and Solutions
- Flatapole Technology (Q Cell)
- Multi-Elements and Multi-Modes Analysis

Training Schedule 2016

COURSE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
iCAP Q Operations			14-15			13-14			5-6			

Breda, tuition in Dutch.

All the courses described in the brochure can be offered at customer sites.

Additional dates are available at:

- Hemel Hempstead, UK
- Villebon sur Yvette, France
- Dreieich, Germany
- Rodano, Italy

For information on training dates and tuition language, please refer to the corresponding brochure.

Molecular Spectroscopy

Increase Your Efficiency. Our Molecular Spectroscopy training courses offer students the opportunity to move from fundamental to advanced knowledge levels. Attendees are encouraged to bring samples to instrument operations courses.

Molecular Spectroscopy

FT-IR

Training: Fundamentals of FT-IR Analysis

Course Objective:

The Thermo Scientific Fundamentals of FT-IR Analysis course is designed to provide all the tools necessary for the user that would like to expand their knowledge of analysis with FT-IR spectrometers. The course material is presented as a combination of software training, instrument demonstrations, and hands-on activities through the use of desktop computers and instruments in a laboratory setting.

The course material includes:

- Basic FT-IR Theory
- Creating Experiment Files
- Creating User Configurations
- Transmission Analysis with FT-IR
- Attenuated Total Reflectance (ATR) Theory and Data Collection
- Reflection Analysis using Sampling Accessories
- Post-Collection Data Manipulation
- Creating Custom User Reports
- Creating User Libraries and Optimizing Library Search Results
- An Introduction to Spectral Interpretation

Training: FT-IR Spectral Interpretation

Course Objective:

The Thermo Scientific FT-IR Spectral Interpretation Training Course is designed for those who desire an extensive review of the interpretation of mid-infrared spectra. It is designed to show students how to interpret FT-IR spectra for structural information.

The course material includes:

- FT-IR Theory and Principles of Organic Chemistry
- Alkanes, Alkenes and Alkynes
- Aromatics
- Carbon containing Alkyl Groups
- Ethers and Alcohols
- Amines, Amides, and Nitro Compounds
- Halides
- Polymers
- Inorganics
- The use of Interpretive Aids

Molecular Spectroscopy

FT-IR

OMNIC Software Operations

Course Objective:

This FT-IR software course is designed for advanced users and those who wish to utilize the capabilities of the system beyond basic data collection with their Thermo Scientific™ OMNIC™ system software. This course utilizes desktop computers and examples to provide hands-on use of the tools discussed during the course.

The course material includes:

- How to create Experiment files
- How to create individual user configurations
- Troubleshooting spectral results
- Performing basic post collection data manipulation
- Creating user reference libraries and optimizing library search results
- Creating custom reports and storing them within OMNIC
- Advanced data processing

This course is offered at customer site only

Basic Macro Development

Course Objective:

This workshop is held following our Thermo Scientific OMNIC Software Operations course and covers automation of sample collection and processing through the use of the optional MACROS Basic software package. This is an interactive class that details how to automate basic functions and then use those basic functions together to create more detailed automation that can be used in conjunction with OMNIC software to save time and improve consistency in the laboratory.

This course is offered at customer site only

Molecular Spectroscopy
FT-IR

Quantitative TQ Analyst Software Operations

Course Objective:

This course is designed to enhance users' understanding of Thermo Scientific™ TQ Analyst™ software as a tool for quantitative analysis method development. An overview of chemometric analysis methods and experimental design principles is included. This course utilizes an array of data sets to demonstrate the different types of models available to the user. Students utilize desktop computers for this course to work along with the instructor on example methods and then perform a series of increasingly complex exercises to gain hands-on experience with the software and method creation.

The course material includes:

- Development of models based on
- Simple Beer's law
- Classical least squares (CLS)
- Partial least squares (PLS)
- Classification analysis
- Quantitative method diagnostics
- Software wizards to measure the feasibility and performance of the methods

This course is offered at customer site only

Spectral Interpretation Applications

Course Objective:

This course is designed for students who desire an extensive review of the interpretation of mid-infrared spectra. It is designed to show students how to interpret FT-IR spectra for structural information. The course is presented in a lecture/workshop format where the students will have an opportunity to interpret data and to present their findings to the class.

The course material includes:

- Alkanes and branched alkanes
- Alkenes and alkynes
- Aromatics
- Carbon containing alkyl groups
- Ethers and alcohols
- Amines, amides, and nitro compounds
- The use of interpretive aids

This course is offered at customer site only

Molecular Spectroscopy

FT-IR

Nicolet iN10 (MX)/Continuμm Microscope Operations

Course Objective:

This course is designed to provide users with detailed knowledge for the analysis of a wide range of samples using various microscopy techniques. Sample preparation and optimization of hardware settings on the MX microscope will be emphasized. The course utilizes a combined approach of lecture, demonstration, and hands-on training to show the user how to exploit the powerful advantages of the Thermo Scientific™ Nicolet™ iN™ 10 (MX)/Continuμm microscope and Thermo Scientific™ OMNIC™ Picta™ and Atlμs software systems.

The course material includes:

- Introduction to Microscopy
- Microscope alignment and performance testing
- Sample preparation techniques for transmission and reflection analysis
- Attenuated Total Reflectance (ATR) theory and analysis
- Creation of user libraries and optimizing library search results
- Sample mapping and analysis using Picta or Atlμs software

This course is offered at customer site only

DXR Micro Raman Operations

Course Objective:

This course is designed to help users get the most from their Thermo Scientific™ DXR™ Raman instrument and will educate users on system configuration and software through lecture and hands-on training. In addition to providing students a sound understanding of Raman theory, the course also features instruction on proper experiment setup, alignment, and use of tools and software. Training will also cover post-collection data manipulation, sample preparation, and the use of system tools.

The course material includes:

- Raman theory
- Experiment setup and configuration
- System alignment
- Creation and use of libraries
- Mapping using Atlμs software (microscope with automation only)

This course is offered at customer site only

Training Schedule 2016

We currently don't offer any Molecular Spectroscopy courses in our facility in Breda. However all of the courses described in the brochure can be offered at customer sites.

Molecular Spectroscopy courses are offered at the following facilities:

- Villebon sur Yvette, France
- Dreieich, Germany

For information on training dates and tuition language, please refer to the corresponding brochure.

Discrete Industrial Analyzers (DIA)

Improve your productivity. From the Thermo Scientific™ Gallery™ Automated Photometric Bench top Analyzer to the floor standing Thermo Scientific™ Aquakem™ 600 Prime, our discrete nutrient analysers will offer a complete solution to rapid, random access sample analysis with efficient dip and sip sample and reagent consumption. Our experts in environmental, industrial, brewing, food and beverage analysis will provide you with 'hands on' instrument training using the intuitive software.

Discrete Industrial Analyzers

Training: Thermo Scientific Aquakem Photometric Analyzer Systems

Course Objective:

The aim of this training course is to familiarise the new user with the principles of discrete analysis and instrument components using the high throughput floor standing analysers. Then the emphasis shifts to the software features, routine operation, explanation of Test Flows and their effect on range and limits of detection, through to results reporting, database management and basic troubleshooting.

The course material includes:

- Hardware Components
- Software Features
- Routine operation
- Method Test Flow Explanation
- Result Reporting and Database Management
- Preventative Maintenance and Basic Troubleshooting

Training: Gallery/Gallery Plus/Gallery Plus Beermaster

Course Objective:

The aim of this training course is to familiarise the new user with the principles of discrete analysis and instrument components using the bench top analysers. Then the emphasis shifts to the software features, routine operation, explanation of Test Flows and their effect on range and limits of detection, through to results reporting, database management and basic troubleshooting.

The course material includes:

- Hardware Components
- Software Features
- Routine operation
- Method Test Flow Explanation
- Result Reporting and Database Management
  Preventative Maintenance and Basic Troubleshooting

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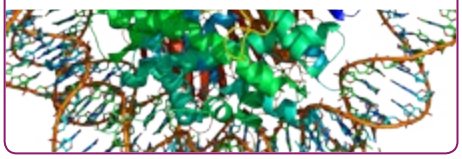
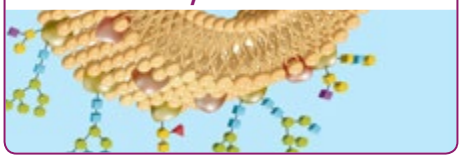


Material Sciences

Chemical

Environmental

Glycomics

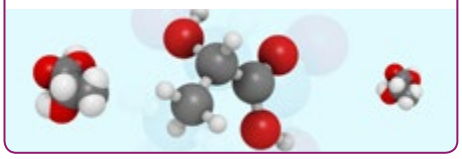


Pharmaceutical

Food & Beverage Solutions

GeoSciences

Metabolomics



Clinical Research & Forensics

How to Register

For further information or to register on any of the courses listed, please use the following:

Email: training.cmd.eu@thermofisher.com
Phone: + 31(0) 765 795 555
Fax: + 31(0) 765 810 961
Web: **www.thermoscientific.com/eutraining**

Thermo Fisher Scientific
Takkebijsters 1
4817BL Breda
The Netherlands

Cancellation Policy

- We reserve the right to cancel any course, 30 calendar days prior to the scheduled start date, due to insufficient enrollment.
- We reserve the right to change the venue of the course, 30 calendar days prior to the scheduled start date.
- In the event of a venue change, you will be notified by a Thermo Scientific representative.
- Thermo Fisher Scientific will not be responsible for expenses incurred (for example, non-refundable airline reservations) if the course is cancelled or moved 30 calendar days prior to the scheduled start date.
- Attendee substitutions may be made at any time upon notification of the Training Institute Co-ordinator.
- Enrollment in your desired training course(s) is not guaranteed until receipt of the registration documents and confirmed method of payment.

Refund Policy

- 100% refund for cancellations received 15+ business days prior to course date.
- 50% refund for cancellations received 10-15 business days prior to course date.
- No refund for cancellations received fewer than 10 business days prior to course date.
- No refund for no-shows.

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