KISTLER ACADEMY
SEMINARS AND TRAININGS

Know-how for your success

Issue 01/2025

www.kistler.com

KISTLER

measure. analyze. innovate.

Content

Bundled measurement technology expertise for your success

Welcome to Kistler!

If you work in the field of measurement technology and want to secure competitive advantages, you need to be constantly informed about the latest developments – because there is always something happening in this area.

The 2015 edition of the globally used and recognized ISO 9001 quality management standard explicitly requires "appropriate training" and "appropriate documented information as proof of competence" in chapter 7.2 "Competence".
In our seminars, we aim to provide you with exactly the information and knowledge you need to handle your processes even more competently.

We are constantly developing our training program. We are pleased to be able to offer you many of our training courses as

- classroom trainings at a Kistler plant,
- in-house trainings at your premises or
- online trainings

Benefit from the expertise of our qualified instructors and the exchange with others taking part in the training. We are flexible and cater to your wishes: If required, please contact us about our customized training courses, which we can also tailor precisely to your specific requirements.

Choose the most suitable training program for you from our wide range of seminars.

We look forward to your participation!

Yours

The Kistler Academy

The Kistler Academy

Welcome to the Kistler Academy!

Our aim is to provide you with exactly the information and knowledge you need to work safely, efficiently and successfully in your profession in our high-quality training courses. Benefit from the expertise of our qualified instructors and the exchange of experience with other training participants. We are also happy to organize seminars at your premises on request.

TÜVNORD

Certificate

TÜVNORD
TÜV NORD CERT GmbH
DIN ISO 21001
tuev-nord.de

Management system as per
DIN ISO 21001 : 2021

The Certification Body TÜV NORD CERT GmbH hereby confirms as a result of the audit, assessment and certification decision according to ISO/IEC 17021-1:2015, that the organization

Kistler Remscheid GmbH
Kölner Straße 71
42897 Remscheid
Germany

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operates a management system in accordance with the requirements of DIN ISO 21001 : 2021 and will be assessed for conformity within the 3 year term of validity of the certificate.

Scope

Adult education on core competency subjects of the organization and product instruction

Certificate Registration No. 44 128 230840 Valid from 2024-08-23
Audit Report No. 3536 6934 Valid until 2027-08-22

Essen, 2024-07-22
Certification Body at TÜV NORD CERT GmbH

TÜV NORD CERT GmbH
Am TÜV 1, 45307 Essen
www.tuev-nord-cert.com

TÜV®

DAkkS Deutsche Akkreditierungsstelle D-ZM-12007-01-00

The Kistler Academy is an ISO 21001 certified educational organization.

Most of our seminars are available in both, German and English. They are held at a Kistler branch or, on request, at your premises. Seminars without a practical component can also be held online via video conference.

All seminars can be booked exclusively; the time and place will depend on your wishes.

KISTLER ACADEMY
ISO 21001 certified

TÜV NORD
TÜV NORD CERT GmbH
DIN ISO 21001
Freiwillige Zertifizierung

Customized trainings

You haven't found the "just right" training program? Please contact us – at no extra cost, we will be happy to customize the training courses on offer to suit your needs and add theoretical or practical components according to your wishes: your needs are our focus!

We would be happy to advise you on the details of our training programs.

Registration information

Training request
Select the suitable course on the Kistler Academy homepage and add it to your shopping basket. This enquiry is free of charge and non-binding. Alternatively, you can also send your enquiry by e-mail to service@kistler.com with the keyword "Training".
The relevant trainer will contact you promptly and clarify your questions; an offer will then be prepared,

Travel and overnight stay
The venues are conveniently located and easily accessible by car. It will only be necessary to stay overnight on site if you are travelling a long way. If you need accommodation recommendations, we will be happy to help you at any time. Accommodation and travelling expenses are not included in the seminar fees.

In-house-trainings
Would you like to save time and money? We are also happy to come to you. Simply book an on-site training course!

Online-trainings
Knowledge transfer for certain training topics can also take place digitally, we also offer this format upon request. Your advantage: You take part in a live online training course, can ask your questions at any time and all without travelling. If required, please contact us at service@kistler.com or call +49 2191 698 113.

Seminar documents and training certificates
For most seminars we provide detailed working documents, which are also suitable for following up the seminars or for reading later.
You will also receive a training certificate/proof of training at the end of each seminar, which shows the seminar content and confirms your participation in the training course.

Catering
All drinks, snacks and meals provided during the seminars in Kistler branches are included in the seminar fees.

Contact us
For all questions regarding seminar organization, registration, travel and accommodation, please do not hesitate to contact us:

Kistler Academy
Peter Jaeger
Koelner Str. 71
42897 Remscheid
Tel. +49 2191 698 113

Registration: service@kistler.com
Information: academy@kistler.com

PLASTICS

PLASTICS

Cavity pressure basics
P1 Cavity pressure training (theory and practice)

The training is part of the product training courses and transmits the basics of cavity pressure technology. It is supplemented by half a day where the learned content is experienced at the machine.

Seminar content
- Why cavity pressure measurement
- Motivation Process monitoring
- Process data vs. setup data
- Cavity pressure in the injection molding process phases
- Different materials
- Correlation to setup data
- Correlation to product quality data
- Failure examples and corrective actions

Goal
- Understanding the benefits of cavity pressure measurement
- Teaching an application-oriented understanding of the processes in the injection mold
- What happens in the mold during the different injection molding phases?
- Detection of deviations and definition of counter measures
- Setting up the process efficiently
- Preparation for the practical implementation of what has been learned on the machine

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

PLASTICS

Installing cavity pressure sensors P2 Sensor installation (theory and practice)

The training is part of the product training courses and transmits the basics of cavity pressure technology. It is supplemented by half a day where the learned content is experienced at the machine.

Seminar content
Presentation of specialties for different sensors:
- Direct cavity pressure sensors
- Indirect cavity pressure sensors
- Contactless cavity pressure sensors
- Membrane sensors
- Temperature sensors
- Tolerances and installation guidelines
- Checklists
- Practical exercise on demo molds
- Practical check of sensor function
- Documentation

Goal
- Understanding the sensor setup for different in-mold sensors (cavity pressure sensor direct, indirect; membrane sensor, temperature sensor)
- Requirements for the installation
- Check of installation requirements
- Check for correct installation and functional check
- Exercises on a demo mold

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

PLASTICS

Working with the ComoNeo process monitoring system
P3 ComoNeo Training (theory and practice)

The training is part of the section product trainings and provides the ability and options to use the process monitoring device ComoNeo. The lecture part of the training is supplemented by many practical exercises.

Seminar content
- Instrument set-up
- Creation of different mold types
- Setup of different monitoring strategies and methods
- Setup of different control strategies and methods
- Export of different data types (CSV/UPC-UA)
- Connection to ComoDataCenter and AkvisIO
- Practical exercises on the devices

Goal
- Setup and operation ComoNeo
- Device configuration, configuration of a moldas well as a monitoring and control strategy
- Data export and communication to machine and external software
- Practical exercise of what has been learned

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

PLASTICS

Management and use of the ComoDataCenter and AkvisIO IME process data storage solution P4 Data storage options

The training is part of the section product trainings and provides the ability and options to use the data management software ComoDataCenter/AkvisIO. The lecture part of the training is supplemented by practical exercises.

Seminar content
- Installing the software
- Integrating the devices (ComoNeo/ComoScout)
- Different data types
- Approaches to data analysis (trends/curve data)
- Filtering and searching data sets
- Export & report options

Goal
- Connecting ComoNeo/ComoScout devices to ComoDataCenter/AkVisio
- Structure of the data model
- Retrieval of historical measurement data
- Statistical Evaluation of production lots and retrieval of abnormalities

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

PLASTICS

Quality Molding I

The training is part of the Kistler Knowledge Training module. This concept is based on conveying fundamental correlations and in-depth process knowledge.

The training is the first part of a modular learning cycle. It is completed with a recognized certificate, which is based on a final exam after each module.

Seminar content
Module 1 (day 1):
- Process data vs. setup data
- Cavity pressure in the process phases
- Different materials
- Correlation to setup data
- Correlation to product quality data
- Failure modes and corrective actions

Module 2 (day 2):
- Mold start-up with the support of cavity pressure
- Setup of a new process (injection, transfer, holding pressure)
- Demonstrate/Use ComoNeo Recover
- Monitoring of the injection molding process
- Control options based on cavity pressure
- Exam

Goal
- Comprehensive understanding of the cavity pressure curve
- Understanding of how process-related relationships in the mold are reflected in the cavity pressure curve
- Interpretation of the cause of a change
- Application of the learned correlations on the injection molding machine

Duration (days)
2

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

PLASTICS

Quality Molding II

The training is part of the Kistler Knowledge Training module. This concept is based on conveying fundamental correlations and in-depth process knowledge.

This training is a supplement and intensification to the seminar Quality Molding I. It is completed with a recognized certificate, which is based on a final exam after each module.

Seminar content
Theory:
- Material behavior during injection molding
- Physical processes in the process phases
- Switching strategies
- Aids for process setup
- Mold-specific features (hot runner)
- Hot Runner Balancing with Multiflow
- Development of checklists

Practical workshop:
- Systematic setup of the injection molding process based on self-determined checklist
- Clear separation of process phases
- Processing of different materials
- Practice on different molds (hot runner vs. conventional gate)
- Interpretation of processing errors intentionally created
- Correction of errors
- Demonstrate/Use ComoNeo Multiflow
- Exam

Goal
- In depth understanding of the physics influencing the injection molding process
- Understanding of the individual process phases
- Systematic setup of the injection molding process based on physical principles (scientific molding)
- Understanding of material behavior and the molding process
- Recognition of process errors and corrective measures
- Possibilities of visualizing processes in the mold

Duration (days)
3

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

PLASTICS

Quality Molding III

The training is part of the Kistler Knowledge Training module. This concept is based on conveying fundamental correlations and in-depth process knowledge.

This training is a supplement and intensification to the seminar Quality Molding I and Quality Molding II. It is completed with a recognized certificate, which is based on a final exam after each module.

Seminar content

The following injection molding variants shall be covered:

- Multi-component injection molding
- Sequential injection molding
- Compression molding
- Rubber/Thermoset Injection molding

For these processes the following aspects shall be covered:

- Molding process
- Set-up strategy
- Typical failures and corrective actions
- Possibilities of process monitoring

Goal

- Transfer of the procedures and findings learned in Quality Molding II to special injection molding variants
- Understanding of special materials
- Getting to know different special injection molding processes and their requirement

Duration (days)
2

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

PLASTICS

Data Management I

The training is dedicated to the topic of data from the injection molding process. It is aimed at data experts who want to find out about the specific conditions in the injection molding process, as well as injection molding experts who want to investigate the potential of process data.

Seminar content

- Interfaces of injection molding machines and peripherals (OPCUA, Euromap, ...)
- Process data vs. setting data vs. quality data vs. material data vs. ...
- Export possibilities of data (CSV/UPC-UA)
- Preparation, merging and evaluation of data
- Market overview of platforms and various software solutions in the area of process data management

Goal

- Knowledge of common interfaces and data protocols
- Typical injection molding data and classification
- Answer to the questions: How can process date be gained? How can I use this data?
- Get to know analysis options
- Market overview of common software solutions

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

PLASTICS

Data Management II

The training has a strong workshop character and builds on the training "Data Management I". In the injection molding facility, interfaces are configured, and data is recorded. Real process data are used and evaluated in a practice- oriented learning style.

Seminar content
- Configuration of an exemplary data interface in the injection molding facility
- Recording of data and export of data with suitable software
- Data manipulation with common software tools
- Correlation of process data with machines and Q-data

Goal
- Configuration of a typical injection molding machine interface
- Acquisition of data in the process
- Processing and evaluation of data
- Interpretation with regard to physical relationships

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

SOFTWARE


Process Capability Study
Name
Organisation
Shift
from 01.02.2013 to 13.02.2013
Operator
Inspector
Department
N
Xq
S
Min
Max
X(S)
UG
OG
Xbar +3s
Xbar -3s
CP
CPK
Samples

SOFTWARE

CEUS Basic course

With CEUS software, all quality-relevant fastening processes can be monitored and controlled. In order to implement and macke optimal use of the complete system and its many features within the user´s own company structure, knowledge of the configuration settings and organization in the CEUS system is required. This basic course will demonstrate the basic configuration options and the organization that builds upon these options, as well as how to create master data based on the rules and structures of the participation companies. In practical test, participants will learn how to properly use the individual software features in their business.

Seminar content

- Introduction and fundamentals of the CEUS system
- Configuration and organizational structure of the CEUS system, incl. practical exercises
- Tool and screw point management
- Master data creation for tools and screw points
- Tool organization, searching and finding of tool datasets, incl. tool creation exercises
- Use of data through various measuring systems
- Introduction to the evaluation options of the CEUS system
- Evaluation of measurement data in CEUS and INSPECTpro
- Practical applications and examples

Goal

Attendees will be able to adapt the CEUS system for optimal results. Exercises on data creation and the resulting optimization potential will ensure that users become competent users of CEUS.

Duration (days)
2.5

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

SOFTWARE

CEUS Installation and maintenance

To ensure high availability of IT systems, system maintenance and short respond times to system failures are indispensable. CEUS was designed as a client-server application. IT employees must have the right training to install, maintain, back up and restore the GUI at the front end and the DB at the back end. In this seminar, participants will learn the correct way to install and operate the CEUS software.

Seminar content

- Introduction to the CEUS quality management system
- CEUS modules
- Installation and setup options
- Directory and database structure
- Storage of LOG files
- Unrestricted instance name in Oracle
- Debug mode for CEUS modules
- Service export
- Backup/restore of database, backup/restore of PC Client with and without connected measuring instrument
- Options for updating with cloaderadmin

Goal

The aim of the seminar is to provide important framework conditions for installing and operating the CEUS software in order to ensure high quality management availability. Additional skills will enable integration into a software distribution system, for example, which will lead to short response times in the event of a system failure.

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

SOFTWARE

CEUS Test planning

High quality standards for the fastening process require comprehensive test planning. To achieve this, the influencing factors of people, method, material and machine must be taken into account. In this seminar, participants will learn the fundamental principles of test planning with CEUS and will apply them in practical exercises.

Seminar content

- Fundamental principles of test planning: definitions schedules, attributes, test cycles, operating calendar
- Getting started with CEUS: tool or screw point-related work, fixing
- Ways to facilitate the work: test cycle classes, route creation, reference screw points
- Evaluations
- Person or time-oriented smoothing
- Uncertainly configuration
- Test plan dump

Goal

The goal of this seminar is to learn the theoretical principles, background and options of test planning in CEUS and to implement and advance this knowledge directly in practical examples.

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

SOFTWARE

CEUS Evaluation

The database of the CEUS software system includes a number of quality-relevant data. This software provides many options for the analysis, evaluation and display of these data. Participants will learn about these in this seminar. Using practical examples, the trainer will show how the stored measurement data can be used to obtain insights.

Seminar content

- Motivation for evaluations: traceability of measurements, SPC, inventory by creating list overviews
- Filtering and evaluating master data: screwdriving points, tools, measuring equipment
- Filtering and evaluating measurement data: overview lists, SPC evaluation, certificates, NOK comments
- Use of the Report Builder: creation of new layouts, adaptation of existing layouts

Goal

Attendees will be able to correctly display and evaluate their master and measurement data in the CEUS software.

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

SOFTWARE

testXpert Basic seminar

The application of this analysis system requires comprehensive knowledge of the numerous features and options of the testXpert software. With this measuring and evaluation program, parameters can be predefined and individual measured value and profiles can be conveniently evaluated. In this basic seminar, the trainer will demonstrate how the system is set up and used in practical applications. Initial measurements and tests will be conducted, results will be defined and logs will be evaluated.

Seminar content

- Introduction: definition of terms, basic terminology, general information about the system, traceability of measured values, program structure
- Basic: program operation, window layout, system configuration, preparatory input
- Application: system description, creation of simple tests performance of measurements
- Advanced: definition of results, continuation of plots and tables, speed dialog, user-defined data, output (logs)

Goal

Participants are familiar with the functions and options of the testXpert software can apply the knowledge they have gained in their daily work.

Duration (days)
2

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

CALIBRATION AND TESTING

Test- and measurement equipment management and calibration

**Monitoring and calibration of measuring and test instruments is mandatory and specified in various standards. There are also requirements for calibration laboratories. The seminar gives an introduction to the proper and targeted metrological and organizational handling of measuring instruments.
The participants learn how to request the matching calibration and how to define calibration intervals. In addition, the most important requirements of the ISO 9000 series and ISO 17025 are taken into account as a basis. Basics for a process-oriented and certification-compliant management of measuring equipment and hints for the safe passing of an audit round off the contents of the seminar.**

Seminar content
Part I, basics
- Measurement technology in general
- The International System of Units SI
- Standards: ISO 9001 ISO 17025, IATF 16949
- Calibration
- Traceability
- Uncertainty of measurement or tolerance?
- Calibration certificate contents
- Calibration mark
- Conformity statement and decision rule in calibration certificate
- DKD/DAkkS
- Accreditation/calibration laboratory with accreditation

Part II, Testand measurement equipment management
- Measuring equipment management and ISO 9000
- Classification of measuring and test equipment
- Determination of calibration intervals
- Rules for handling measuring and test equipment
- Establishment of a measuring equipment management system
- Planning of calibrations
- Testing for electrical safety DGUV A3
- Machine capability test MFU
- Measuring equipment capability

Goal
Application of basic metrological knowledge in daily work, e.g. as a measuring equipment administrator or quality management representative.

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

Calibration: basics and standards

The monitoring and calibration of measuring and test equipment is specified in various standards. There are requirements for calibration laboratories, too. The seminar provides an introduction to the proper and targeted metrological and organizational handling of measuring instruments. The participants will learn important metrological basic terms and and learn about the most important requirements of ISO 9000 series as well as ISO 17025. They learn the specifications for the contents of calibration certificates and are able to make decisions in the operational handling of measuring and test equipment. The content of the seminar corresponds to the basic part of our full-day seminar "Test and measurement equipment management and calibration", the measuring equipment management part is not included.

Seminar content
The seminar is designed as an online seminar. The course documentation will be sent as a bound book.

- Measurement technology in general
- The International System of Units SI
- Standards: ISO 9001, ISO 17025, IATF 16949
- Calibration
- Traceability
- Uncertainty of measurement or tolerance?
- Calibration certificate contents
- Calibration mark
- Conformity statement and decision rule in calibration certificate
- DKD/DAkkS
- Accreditation/calibration laboratory with accreditation

Goal
Application of basic metrological knowledge in daily work daily work, e.g. as a measuring equipment manager or quality management representative.

Duration (days)
0.5

Location
In-house, on-site, online

Available language
German, English

Registration
service@kistler.com

Basic training “Head of accredited calibration- / test laboratory”

The head of an ISO 17025 accredited calibration- / or testing must have extensive knowledge that goes far beyond the actual (technical) performance of calibrations. Extensive training material will be provided as books.

Seminar content
This training provides a “common thread” in laboratory management and includes:

Part I, basics
- Basic knowledge of calibration
- Standards and normative references
- Measuring equipment management
- Basics of measurement uncertainty calculation
- Measurement technology in general
- The International System of Units SI
- Standards: ISO 9001 ISO 17025, IATF 16949
- Testing/Verification/calibration
- Traceability
- Calibration certificate contents
- Calibration mark
- Statement of conformity and decision rule
- DKD/DAkkS/ILAC
- Accreditation/calibration laboratory with accreditation

Part II, test and measurement equipment management
- Measuring equipment management and ISO 9001 requirements
- Classification of measuring and testing equipment
- Definition of calibration intervals
- Rules for handling measuring and testing equipment
- Setting up a measuring equipment management system
- Planning calibrations
- Machine capability test
- Measuring equipment capability

Part III, Laboratory management
- General requirements
- Structural requirements
- Requirements for resources
- Requirements for processes
- Requirements for the management system

Includes/contains
- Authority matrix
- Internal rules
- Proof of further training
- Competence matrix
- and more.

Goal
Get to know the management characteristics of an ISO 17025 accredited calibration/test laboratory.

Duration (days)
1.5

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

MFU, MSA, Calibration: basics and standards

The seminar teaches the fundamentals of MFU/MSA including calculation examples and the distinction to calibration.

Seminar content
- References and sources
- Influences on quality = process management
- Influences on processes
- Process capability testing and machine capability testing
- Intro: Process capability analysis
- Intro: Machine capability study
- Mathematics: the standard deviation
- Standard deviation and variance with Excel
- Sample set
- Machine capability study
- Guideline „Capability verification of measuring systems"
- VDI/VDE 2645 sheet 2
- VDI/VDE 2647
- MSA procedure
- Accreditation as a test laboratory
- Facts and take-away
- Glossary

Goal
The course participant knows the basics of an MFU/MSA, can perform simple calculations (standard deviation, variance, etc.) with Excel and knows the difference calibration vs testing.

Duration (days)
0.5

Location
In-house, on-site, online

Available language
German, English

Registration
service@kistler.com

FASTENING TECHNOLOGY

FASTENING TECHNOLOGY

VDI/VDE 2637-MT Part 1 Focus “Fastening Technology“

Kistler offers in the field of fastening technology training courses on:

Qualification modules in accordance with VDI/VDE 2637-MT, Part 1 “Qualification in fastening technology”.

We will be happy to put together a selection of qualification modules tailored to your needs for the main topics of “fastening technology” – please contact us!

Seminar content
- Selected VDI/VDE 2637-MT Q-modules

Goal
The course participant fulfills the knowledge requirements of the selected Q-module of VDI/VDE 2637-MT Part 1.

Duration (days)
depending on No. of selected Q-modules, min. 0.5 days

Location
In-house, on-site, online

Available language
German, English upon request

Registration
service@kistler.com

VDI/VDE 2637-MT Part 1 Focus “Metrology Modules”

Kistler offers in the field of fastening technology training courses on:

Qualification modules in accordance with VDI/VDE 2637-MT, Part 1 “Qualification in fastening technology”.

We will be happy to put together a selection of qualification modules tailored to your needs for the main topics of “metrology” – please contact us!

Seminar content
- Selected VDI/VDE 2637-MT Q-modules

Goal
The course participant fulfills the knowledge requirements of the selected Q-module of VDI/VDE 2637-MT Part 1.

Duration (days)
depending on No. of selected Q-modules, min. 0.5 days

Location
In-house, on-site, online

Available language
German, English upon request

Registration
service@kistler.com

FASTENING TECHNOLOGY

User knowledge torque wrenches – basics and calibration

This one-day seminar is intended for torque wrench users. Precise screw connections with the correct torque have become an integral part of modern fastening technology. Whether in the medical sector, the automotive industry or wind turbines – torque wrenches are used everywhere.

Learn to understand the torque wrench as a measuring tool. You will receive tips on correct use and an overview of what is behind the tightening specifications. Gain an insight and understanding of a calibration process and learn about the numerous error influences that can occur on/with a torque wrench.

Seminar content

- Normative references (ISO 9001, IATF16949, DIN EN 6789:2017 and others, if applicable)
- Theoretical basics of torque
- Theoretical basics of fastening technology
- Torque wrench types
- Application examples, handling instructions
- Information about calibration/calibration certificate, traceability of the wrench

Goal

Application of basic metrological knowledge concerning torque wrenches in daily work.

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

FASTENING TECHNOLOGY

Fastening technology for practitioners

Quality and cost-oriented bolt assembly requires an understanding on the part of employees in planning, assembly and maintenance of the interaction between the bolt and the properties of the bolted material. This seminar will present the fundamental principles of fastening technology in theory and practice.

Seminar content

- Fundamentals of fastening technology: definition of a bolted joint, parameters and limits, definition of screw/bolt types, standards, materials, danger classes
- Coating and lubrication, influence on the coefficient of friction
- Selection, test methods and analyses
- Tightening methods: definition, torque, angle of rotation and limit of elasticity controlled tightening, superelastic assembly
- Definition, use and testing of various tool types
- Reference measurement on the shop floor
- Manual/machine fastening
- Prevention of setting behaviors
- Observation of fastening processes, testing of tools in working practice, approaches to problem solving
- Relevant standards ISO/VDA, tool standards

Goal

After attending the seminar, participants will be able to choose and employ the right tool and bolt types, as well as the right tightening methods, in their daily work.

Duration (days)
1

Location
In-house, on-site,

Available language
German, English

Registration
service@kistler.com

SYSTEM/TECHNOLOGY TRAININGS

Working with NC joining systems

The integration of process monitoring is gaining importance in industrial production. In automated joining and embossing tasks in particular, the advantages of electromechanical NC joining systems is apparent. They help reduce energy costs, increase plant utilization and aximize the economic efficiency of the production operation. This introductory course provides insight into the design and principle of operation of electric joining modules. In a workshop setting, the trainers will teach the participants how to work with the modules in a step-by-step anner and will provide exercises that simulate various processes based on real-world examples. In addition to Kistler NCF modules, IndraDrive and S7-CPU will also be used.

Seminar content

- Fundamentals of joining technology
- System design and principle of operation of individual components
- Initial start-up of the NC joining system with a typical parameter assignment
- Integration into the machine PLC using the example of the S7 CPU
- Servicing of NC joining systems
- Troubleshooting and correction
- Documentation for quality assurance

Goal

The participants will have an understanding of the system design and principle of operation of NC joining systems. After attending the seminar, they will be able to start-up and service the system.

Duration (days)
1 – 3

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

SYSTEM/TECHNOLOGY TRAININGS

CEUS measurement technology training cerTEST

cerTEST is the system for dynamic testing of torque tools in assembly use. The system can be configured for individual use cases by controlling the measuring brakes. To operate cerTEST properly using the CEUS software, the user must be familiar with the necessary technology parameters for testing a broad range of tool technologies. In this seminar, participants will learn how to efficiently use the cerTEST test system.

Seminar content

- Introduction to the CEUS quality management system
- cerTEST development stages
- Device operation, handling, control elements
- Safety aspects, behavior in case of malfunction
- Test strategies
- Tool technologies
- Parameter page, technology parameters
- Measuring modes, measurement operation, measurement operation results
- Simulator selection
- Route operation
- System configuration and system test program cerTEST
- Practical examples

Goal

The goal of this seminar is to apply the knowledge gained in day-to-day work and become more proficient in the use of cerTEST.

Duration (days)
1.5

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

CEUS measurement technology training caliTEST

The caliTEST test bench is an automatic calibration device that is internationally recognized as a calibration standard for manually operated torque screwdrivers. The device has the necessary metrologyl features and drive methods to conduct tests according to ISO 6789-2 or other test methods. It also allows for the programming of user-defined test methods and automatic performance of tests or calibrations.

To operate caliTEST using the CEUS software, knowledge of the necessary technology parameters is required. In this seminar, participants will learn how to efficiently use this calibration device.

Seminar content

- Introduction to the CEUS quality management system
- caliTEST development stages
- Device operation, handling, control elements
- Safety aspects, behavior in case of malfunction
- Test strategies: BIC, KIC, MCA, initial testing and rule check
- Tool technologies: type I (indicating keys), type II (actuating keys)
- Parameter page, technology parameters
- Measurement operation, measurement operation results, measurement operation mask, measuring modes
- Drive selection
- Route operation
- System configuration and test program caliTEST
- Practical examples

Goal

The goal of this workshop is to become more proficient in the use of caliTEST and optimize day-to-day work through the skills gained.

Duration (days)
1.5

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

CEUS measurement technology training INSPECTpro

The portable torque and angle of rotation measuring instrument INSPECTpro is designed for in-process sampling; inspection of screws, torque wrenches and joining elements; as well as for determining process capability as part of the SPC of already installed bolted joints with anual torque/rotation angle sensors.
To operate the mobile test system using the CEUS software, high-level knowledge of the necessary technology parameters is required. In this seminar, participants will learn how to efficiently use INSPECTpro under CEUS.

Seminar content

- Introduction to the CEUS quality management system: technology pages, test strategies, technology parameters, routes
- Introduction to INSPECTpro: modules, user interface, menu navigation, connections, sensor connection
- INSPECTpro operation: basic device settings, management of measuring instruments, overview, description and setting of measurement parameters, measuring modes, sensor selection
- Monitoring and evaluation of torques for use in assembly: application of measurement parameters for the bolted material, in-process measurements of the bolted material using pneumatic screw-drivers, actuating keys, manual torque/rotation angle sensors
- Practical applications and examples
- Evaluation of measurement data in CEUS and INSPECTpro

Goal

The goal of this workshop is to optimize day-to-day work through the skills gained become more proficient and efficient in the use of INSPECTpro.

Duration (days)
1.5

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

PROCESS MONITORING

User training process monitoring system maXYmos BL and TL

In industrial production, where processes must run error-free, quality is increasingly becoming a decisive cost factor. This product and user training teaches the participants how they can use targeted monitoring of part-specific curve characteristics (XY monitoring) improve the quality of their products and thus optimize their image and competitiveness. The participants work directly with the monitors and learn how to practical examples of how Kistler's XY monitors work, how they can operate the process monitoring system correctly and how to use the functions profitably for different monitoring tasks. For Kistler NC joining systems we recommend the individually course "Handling of NC Joining Systems". We will be happy to advise you on the most suitable training contents.

Seminar content

- Handling and basics of piezoelectric sensors
- Operating concept and parameterization of the evaluation unit
- Application-related part: Device adjustment and process evaluation from the application point of view; What are the evaluation elements?
- Data export of the recorded measurement data
- Maintenance, component replacement and troubleshooting
- Data backup and restore
- Software maXYmos PC basic/plus
- Kistler NC joining systems are not part of this seminar contents.

Goal

The participant will be able to install a Kistler XY monitoring system (maXYmos BL and TL), e.g. a force-displacement monitoring system, and to integrate it into the existing control and data structure.

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

PROCESS MONITORING

Force measurement in production processes

This course will present the fundamental principles of piezoelectric force measurement technique in industrial plants. This includes information about production monitoring, statistics, zero-defect production and Industry 4.0. During the training, participants will learn how to properly select and size force and strain sensors, how they operate, and how to properly install and calibrate them.

In workshops, they will then practice working with piezoelectric measuring chains. Live presentations of XY monitoring systems (Kistler maXYmos), which are used for production monitoring and quality assurance in production stations, will complete the seminar content.

Seminar content

- Fundamental principles of piezoelectric force measurement technique in industrial plants
- Proper planning and commissioning of metrology solutions
- Sizing, installation, measurement accuracy and calibration of force and strain sensors
- Working with piezoelectric measuring chains
- Practical exercises
- Live demonstration of XY monitoring systems

Goal

After the seminar, participants will be able to plan and commission a metrology solution (such as force-displacement measurement/monitoring) in their test setup or plant.

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

ACCELERATION

Working with accelerometers

This seminar provides an overview of the features of accelerometers and how they work. Special emphasis will be placed on miniature sensors. In a practical training session, participants will learn at various workstations manned by specialists how to identify and avoid potential sources of error and the causes of failure in vibration and impact/impulse measurements. A number of measuring devices and sensors will be available. Participants will also gain valuable insight into installation/ removal procedures and will practice verifying that the equipment is in good working order.

Practical part with exercises
- Attachment and detachment techniques
- Methodical testing of the frequency response for selected attachment methods
- Use of suitable fixing adhesives as well as detachment and cleaning of sensors
- Noise and humming, avoidance of ground loops
- Resolution limits when taking measurements
- Lateral acceleration effects
- Base strain and thermal effects
- Mass loading effects on structures
- Testing and calibration of sensors
- Working with cables and replacement on miniature sensors

Seminar content
- Introduction to principles and features of accelerometers
- Guidelines for working properly with accelerometers
- Detection of sources of error and causes of failure during measurements

Goal
At the end of the seminar, participants will be able to work properly with accelerometers and avoid measurement errors.

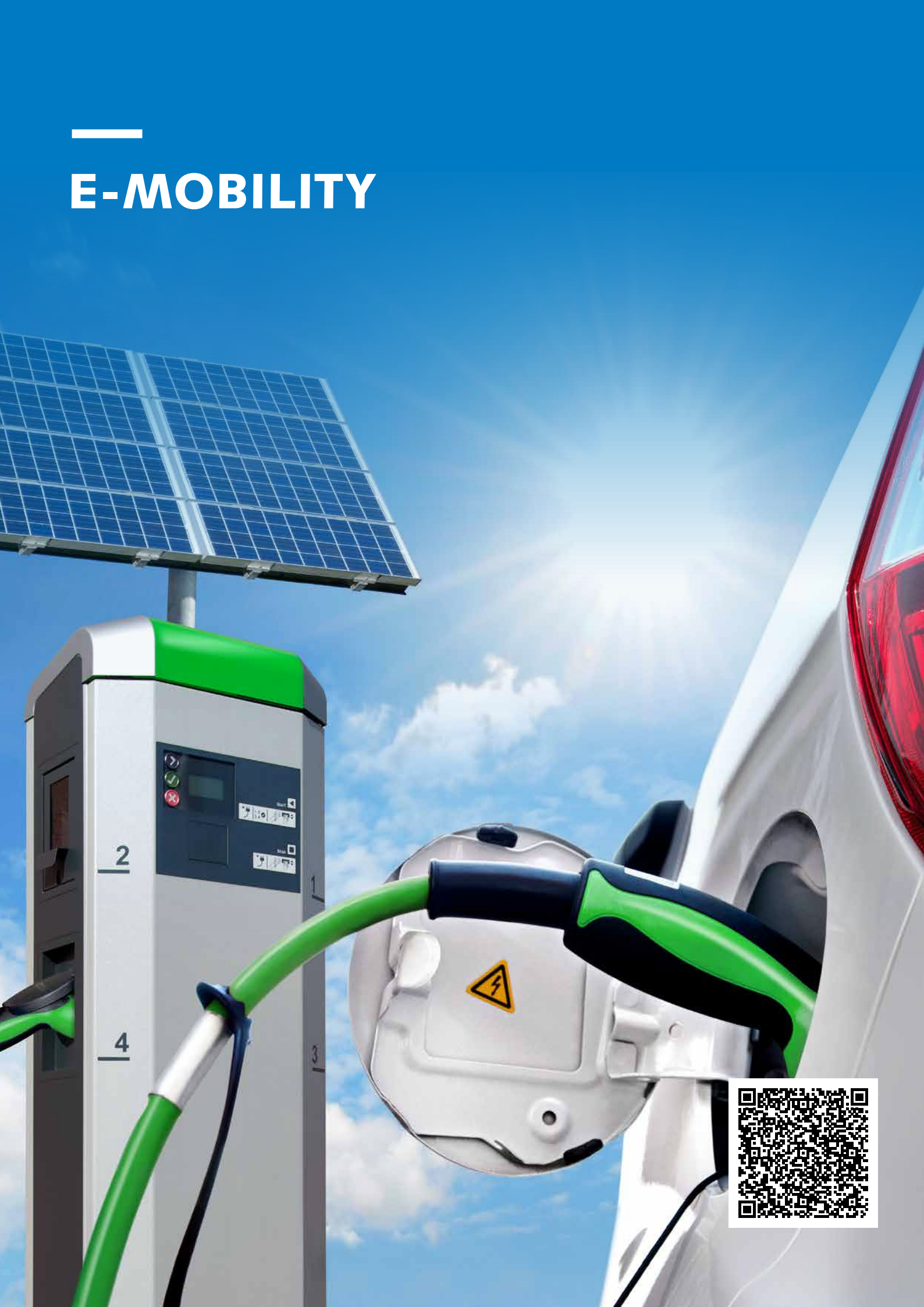
Duration (days)
2

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

E-MOBILITY



E-MOBILITY

Contact resistance measurement in EV bolted joints

E-vehicles have extremely powerful drive batteries and have a high-voltage section and a separate 12-volt battery. One vehicle, two batteries and two voltages – that requires special attention when bolting the vehicles. It's no longer just about the mechanical fastening of vehicle components, many screw connections are deliberately designed to be live, have potential, others must be potential-free.

Seminar content
This training provides an introduction to the bolting technology of modern e-vehicles:

- Why do e-vehicles use different batteries
- Electrical resistance in motor vehicles
- Dimensions of electrical wiring
- Contact resistances
- Connectors
- Oxidation, pollution and their impact
- Electrochemical series
- Fastening challenge
- Outlook: Screw connection with accompanying contact resistance measurement

Goal
At the end of the seminar, the participant will know the basics of e-vehicle bolting.

Duration (days)
0.5

Location
In-house

Available language
German, English

Registration
service@kistler.com

E-MOBILITY

High-voltage system training for electric vehicle applications

Qualification as a qualified high-voltage instructed person (FuP) is also required for conventional work on vehicles with high-voltage systems. Employees are facing electrical hazards during such work.

The Kistler Academy provides practical training in the professional and safe performance of the required activities.

Seminar content

- Electrical hazards and protective measures as well as first aid
- Operating vehicles and associated equipment
- General activities, without the need for - Disconnection from the power supply
- Position and marking of HV components and cables
- Carrying out mechanical activities with safety instructions
- Decommissioning the HV system
- Impermissible work
- Stopping work in case of uncertainty and informing the responsible UAS
- Organizational procedure for work on HV components

Goal

The training qualifies you to work on vehicles with high-voltage systems without risk.

Duration (days)
0.5

Location
In-house

Available language
German, English

Registration
service@kistler.com

FORCE

FORCE

Force measurement with piezoelectric sensors

This basic course provides an introduction to piezoelectric measurement technology and provides essential information on dimensioning, installation and maintenance of force sensors. In workshops participants the proper way to install and check sensors and how measuring chains are put into service (laboratory and industrial amplifiers). Using practical application examples, they will also become familiar with the various mounting variants. Measuring chains and mounting material will be provided for this purpose.

Seminar content

- Design, principle of operation and installation of piezoelectric force sensors
- Determination of pretension and permissible load limits
- Concept of series connection and shunt
- Measuring chain design
- Calibration guidelines

Goal

At the end of the course, participants will be able to plan, put into service and maintain their test setup or plant.

Duration (days)
1

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

MACHINING

MACHINING

Cutting force measurement on machine tools

Maintaining successful long-term prospects in the machining industry requires detailed knowledge of cause-effect relationships in machining and the ability to use these efficiently and profitably. This user course presents fundamental principles of cutting force measurement. Participants will gain initial practical experiences by conducting measurements directly on machine tools under the guidance of the trainer. The measurement data collected will then be discussed in the group and will also be available to course attendees after the seminar.

Seminar content

- Introduction to piezoelectric multi-component measurement technology
- Fixed and rotating cutting force dynamometers
- Working with measuring instruments and measurement data acquisition
- Conduction of test measurement
- Interpretation of measured values

Goal

The goal of this seminar is to present the fundamental principles of cutting force measurement to participants so that they can apply these correctly in real-world scenarios. After attending the training, they will be able to employ sensors and amplifiers as designed for optimal results.

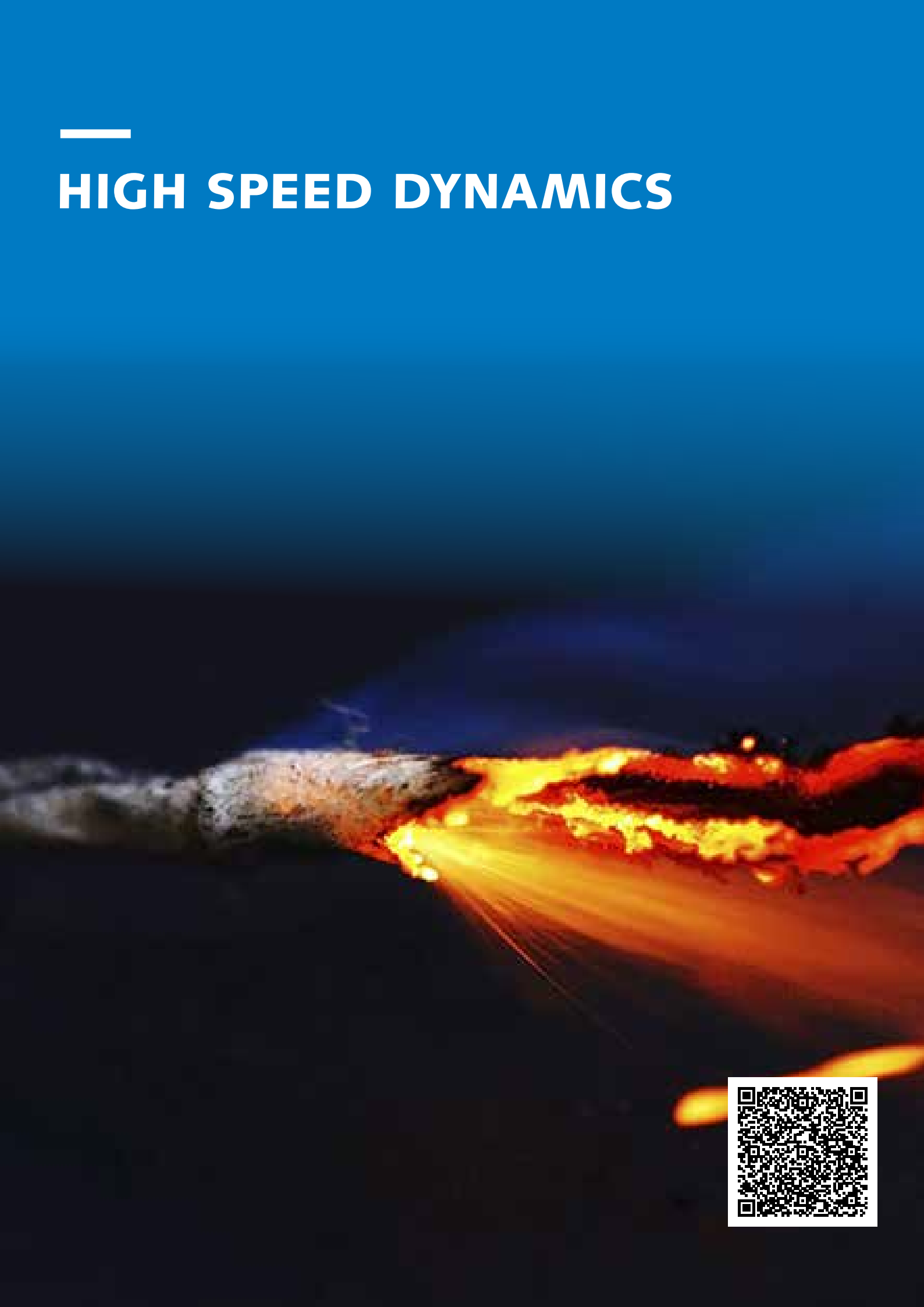
Duration (days)
1 – 2
(by arrangement)

Location
In-house, on-site

Available language
German, English

Registration
service@kistler.com

HIGH SPEED DYNAMICS



High Speed Dynamics

Anyone who works with highly dynamic pressure and acceleration measurements must have comprehensive knowledge of sensor systems. In this product and application training from Kistler, participants will learn how to properly select and install sensor systems. In numerous practical examples and exercises, they will learn the proper way to work with sensors and how to correctly install, clean, and protect them.

Seminar content

- Selecting sensor systems for highly dynamic pressure and acceleration measurement
- Measuring chain planning
- Working with highly dynamic pressure sensors and accelerometers
- Installing highly-dynamic pressure sensors and accelerometers
- Installing a speed measuring system
- Selecting and assigning data acquisition parameters
- Processing recorded data, e.g., through filters
- Troubleshooting
- Calibration

Goal

The goal of the seminar is to give participants the confidence they need to set up and operate highly dynamic measuring chains without assistance.

Duration (days)
3

Location
In-house

Available language
German

Registration
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