excellence in safety

Services
relating to machine safety and occupational safety

tec.nicum
Schmersal Group

Heinz and Philip Schmersal,
Managing Directors of the Schmersal Group

Introduction

In 2016, the Schmersal Group founded an independent service division, tec.nicum. Our experts design and implement projects and safety solutions in all life cycle phases, such as the development, manufacture, operation or modernisation of machines and plants all over the world.

Demand for these services has grown steadily in recent years. As a result, we have continuously expanded our global consulting network of TÜV Rheinland®-certified specialists and engineers, including through the acquisition of omnicon engineering GmbH in 2019.

In 2024, tec.nicum significantly expanded its range of safety services – particularly with regard to digitalisation and complete solutions for machine safety. In addition, global activities and competences are to be more closely integrated. For this reason, the Schmersal Group founded a new subsidiary in 2024, tec.nicum – Solutions & Services GmbH, into which omnicon engineering GmbH was also merged. The new company is based in Kirkel.

On the one hand, our customers benefit from the greater pooling of the extensive industry knowledge and application experience of our global network of safety engineers. For example, we use the expertise of our Brazilian engineering team to support our customers in the Americas and Europe, and the expertise of our Indian team in Asia.

Secondly, tec.nicum has significantly expanded its portfolio of safety services. The four modules on which the tec.nicum offering has been built to date – academy, consulting, engineering and integration – have been supplemented by two more: digitalisation and outsourcing. This involves additional services such as cloud solutions, IIoT applications and energy management – but also the option of completely outsourcing all tasks relating to machine safety to tec.nicum.

The services can be accessed around the globe. A manufacturer-neutral and objective consulting approach is part of the tec.nicum core philosophy. Our guiding principle is: We offer customers competent, product- and manufacturer-neutral advice and support them in analysing and designing their machines and workplaces in terms of safety – true to the slogan: excellence in safety!

Heinz Schmersal

Philip Schmersal

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Six modules
for machine safety and occupational health and safety

In the Schmersal Group, tec.nicum is the department for services relating to machine and industrial safety. The experts of tec.nicum give advice to both the machine manufacturers and the machine operators.

Functional safety is a complex matter that has to be taken into account when developing, upgrading and converting existing machinery as well as when integrating machinery into overall plants.

Consulting for machine manufacturers

The experts at tec.nicum advise and accompany machine manufacturers throughout the entire conformity certification process, in accordance not only with the European Machinery Directive, but also with other national regulations in markets worldwide.

Consulting for machine operators

Regarding machine operators, tec.nicum offers machine- and plant-specific risk assessment services in Europe, which, according to the Framework Directive 89/391/EEC, serves to “improve the safety and health of employees at work.”

Thanks to a worldwide consulting network, the services can be accessed easily and conveniently at your location. The Functional Safety Engineers and Machinery CE Experts certified by TÜV Rheinland® have both in-depth knowledge of the regionally or nationally applicable directives, laws and regulations as well as technical know-how and many years of experience in the implementation of projects.

Support in all life cycle phases

The range of services at tec.nicum is based on six modules: knowledge transfer in the academy section, consultancy services in the consulting section, designing safety solutions in the engineering section, practical implementation in the integration section, the development of software solutions and new digital technologies in the digitalisation section and the provision of complete solutions in the outsourcing section.

academy

Education center

- Training courses
- Customer-specific trainings
- In-house seminars
- Certified courses (mce.expert and FSE)

consulting

Analysis and documentation

- Technical support
- Risk assessment
- CE conformity assessment
- Evaluation of machines and production lines
- Reports

engineering

Planning and design

- Technical project planning
- Conceptual project development
- Electrical and mechanical design
- Executive project management

integration

Practical application

- Turnkey approach
- Installation
- Retrofit

digitalisation

Software integration

- tec.**ps** (Product Service System)
- tec.**ssm** (Schmersal Smart Machine)
- tec.**cvs** (AI and Computational Vision Solutions)
- tec.**dloto** (Digital Lockout Tagout)
- tec.**ems** (Energy Monitoring System)

outsourcing

Serial solutions

- Plug & Play products
- Engineer to Order projects
- Systems and cabinets

tec.nicum

Learning
tec.nicum academy

Face-to-face training – In-house seminars – Online training – Workshops

Seminars and training

The tec.nicum academy offers a comprehensive range of seminars and training on machine and plant safety worldwide.

From basic introductory courses to customer-specific topics, training content is carefully matched to the requirements of tec.nicum customers.

An international team of trainers comprising certified safety experts help to ensure that knowledge is conveyed with consistently high quality.

Whether as face-to-face training at one of our training centres worldwide, as an in-house seminar on site or conveniently at a location of your choice as an online course, the tec.nicum academy supports manufacturers and operating companies with the expertise needed in the implementation of regional regulatory requirements for the safety of machinery and workplaces.

Training subjects include:

- Conformity assessment procedure
- Machinery Directive 2006/42/EC
- Machinery Regulation 2023/1230
- Machine and plant safety standards
- Risk assessment following ISO 12100
- Application of EN ISO 13849-1 – SISTEMA basic knowledge
- Practical workshop – working with SISTEMA
- Normative requirements for validation
- Technical documentation of machines and plants
- Fundamentals of the local legislation training
- Hazard assessment for machines and plants
- New construction, conversion and retrofitting of machines
- Human-robot collaboration
- Automated guided vehicles
- Compact seminar – explosion protection
- Inspection function with standard optoelectronic safety devices
- Safety-orientated design of battery production systems

You can find the courses currently on offer from the national tec.nicum academy organisations at:
www.tecnicum.com

academy

Seminar highlights of the tec.nicum academy

Machinery CE Expert with TÜV Rheinland® Certified Qualification

Become an internationally recognised expert in machinery safety with the “Machinery CE Expert with TÜV Rheinland® Certified Qualification”. This five-day course provides you with all the knowledge you need to meet the legal and normative requirements of the EU single market in a compact format. You will gain the necessary expertise to apply CE marking to machinery and equipment.

After attending the training course, you will have the opportunity to take an examination under the supervision of TÜV Rheinland®. Upon successful completion of the exam, participants will be entitled to use the title “Machinery CE Expert with TÜV Rheinland® Certified Qualification”.

Seminar duration: 5 days plus online exam

mce.expert
Machinery CE Expert

Training course and exam for the

Functional Safety Engineer (TÜV Rheinland®) certificate

The programme is open to engineers with proven experience in machine safety and functional safety. You will be introduced to the requirements of international standards and, after passing the final examination, you will receive an official certificate as a Functional Safety Engineer (TÜV Rheinland®). The course explains and discusses international regulations, basic concepts of risk assessment, examples of protective devices on machines, safety functions, circuit concepts and Performance Level (PL) and Safety Integrity Level (SIL) calculations.

The standards ISO 13849 Part 1 and Part 2 as well as IEC 62061 are necessary working material for this course and must be purchased and brought along by the participants.

Seminar duration: 5 days plus online exam

functional.safety
tec.nicum

Find more info on pages 22-23.

Consultancy services
tec.nicum consulting

Analysis, conception and documentation

Risk assessments of existing machines according to ISO 12100

tec.nicum carries out safety inspections of existing machines, systems and production lines.

If adjustments are required to ensure that the machines comply with the Health, Safety and Environmental Equipment Directive and specific national legislation, tec.nicum makes recommendations for action.

In the case of old or modified machines and systems, tec.nicum engineers assess whether the current condition or the modifications made meet the applicable safety requirements.

When evaluating machinery from the operator's point of view, tec.nicum proceeds as follows:

- Analysis of existing documentation
- Recording of machines and processes
- Checklist of mandatory criteria according to local regulations
- Assessment of machine safety when providing work equipment

Manufacturer obligations for machine operators

Operators who combine several existing machines to form a new unit or system, or who rebuild and significantly modify machines, must fully comply with their obligations as manufacturers and at the same time as suppliers of new work equipment.

Advice at an early stage in the planning phase can reduce or avoid the work involved in re-certification.

Technical support

tec.nicum offers its customers the expertise and experience of its specialists in the various phases of the life cycle of machines and systems. They provide information on applicable legal regulations and standards for machine and occupational safety, draw up concepts for the safety-related revision of old and existing machines and make recommendations on suitable protection concepts.

The tec.nicum experts can support you on site, by telephone or online.

consulting

Risk assessments for new machines according to ISO 12100

The tec.nicum specialists carry out risk assessments on machines and systems based on this internationally recognised standard.

- Definition of the machine's limits
- Identification of all hazards present
- Estimation of the risks
- Evaluation of the risks
- Risk reduction measures

If there are increased risks with further potential for risk reduction, tec.nicum will provide recommendations for action and standard-compliant corrective measures.

The focus is on a discreet protection concept that maintains productivity and functionality.

- Application of specific hazard lists according to specific standards
- Derivation of functional safety requirements
- Reference to applicable legal regulations
- Development of recommendations for action to minimise risks

Verification of functional safety according to ISO 13849, IEC 62061 and IEC 61511

tec.nicum moderates and describes the safety functions in consultation with the customer and verifies them against the required Performance Level (PL_r) or Safety Integrity Level (SIL).

The following services are provided:

- Creation of the safety functions in principle/block diagrams
- Specification of the safety functions (SRS)
- Proof of safety integrity using SISTEMA or other tools
- Management of functional safety
- Creation of the validation planning
- Creation of test specifications

Machinery conformity assessment

During the development, manufacturing and installation phase of machines, it is necessary to ensure that they meet the regulatory and legal requirements.

- Design Risk Assessment (DRA)
- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)

Consultancy services
tec.nicum consulting

Technical documentation (from modular structure to conformity recommendation)

The creation and maintenance of technical documentation is an essential principle of machine and occupational safety. In order to prevent accidents and clarify liability issues in the event of damage, complete technical documentation is the benchmark for product and process safety against which a manufacturer is measured.

To make this process as efficient as possible, tec.nicum checks and completes the necessary technical documentation based on the information available to the customer, which may include the following content:

- Checklists based on product standards
- Risk assessments
- Evaluation of the protection concept
- Specification of technical protective measures
- Electrical circuit diagrams, including pneumatic and hydraulic processes
- Measurement and test reports
- Certificates
- Validation documents
- Preparation of operating instructions
- Technical data, tables, manuals and maintenance schedules
- Creation of a conformity recommendation, following the local regulation

CE Conformity

Manufacturers wishing to place machinery on the market in certain regions of the world are subject to local legal requirements, which increasingly include safety requirements.

In Europe, this is expressed in the Machinery Directive 2006/42/EC. Proof of compliance must be provided in the form of CE conformity and the associated CE marking, which is regarded as a “passport for machines and systems.”

This module combines several services with the aim of covering the entire process of proving conformity with regional machinery directives.

International regulation conformity

Being a global company, tec.nicum also supports manufacturers in complying with machine-related regulations around the world. Such as:

- Brazil – NR12
- USA – OSHA
- Canada – CCOHS
- India – Omnibus Technical Regulations

consulting

Procurement of machines from outside the EU

For companies procuring machinery for use or transfer from outside the EU, the conformity of the machinery supplied plays a key role. This is because both new and used machinery imported into Europe is considered to have been made available on the European Union market for the first time at the time of importation. These machines must therefore comply with all applicable requirements and the state of the art at that time.

Depending on the arrangements for sourcing the machinery, you may take on the role of an economic operator or even the obligations of a manufacturer. tec.nicum is able to carry out acceptance tests anywhere in the world in order to counteract possible problems with machine safety or formal requirements before a machine makes its way to Europe. With tec.nicum experts in North and South America, Saudi Arabia, India, China and Europe, we have an international presence and a strong network.

Evaluation of areas with potentially explosive atmospheres

The requirements of explosion protection apply to many areas of industry – not only the chemical industry, but also in the cosmetics and food production, for example, where powdered or gaseous raw materials or end products are processed, manufactured or stored.

tec.nicum offers the following services in the field of explosion protection:

- Classification according to EX zones
- Documentation of explosion protection measures
- Technical project planning in potentially explosive environments
- Validation of devices in accordance with applicable requirements

Technical planning
tec.nicum engineering

Design and programming

Technical project planning

Engineering is one of the most important stages in building or modifying a machine or system. It lays the foundation for the quality of the subsequent design. The aim is to develop efficient and comprehensible safety solutions for machines and systems in order to avoid unnecessary consequential costs, poor machine availability or, in the worst case, machine failure. Detailed technical safety concepts are used to eliminate identified hazards or at least reduce them to an acceptable level.

The module includes:

- Creating safety-related concepts and layouts for machines and systems
- Mechanical, electrical, pneumatic and hydraulic preliminary and implementation planning
- Selecting the right components in consultation with the customer
- Specification and creation of the required software
- Creation and implementation of visualisation concepts

tec.nicum analyses and defines the necessary safety elements and examines the required PL, SIL or PFHD values. In addition, tec.nicum shows the best way to implement the new construction or modification in order to achieve optimum system productivity.

Operating/assembly instructions according to IEC/IEEE 82079-1 and ISO 20607

In accordance with the requirements of the Machinery Directive, manufacturers of machines and systems must produce operating or assembly instructions before commissioning or placing on the market. The must be made available to the operator in the official language of the country of use for proper operation.

We prepare operating or assembly instructions in accordance with the applicable standards and requirements, including IEC/IEEE 82079-1. We review existing operator manuals and revise them as necessary. After modifications have been made by the operator, we work with them to decide whether to amend the original operating instructions or to produce an additional modification description.

engineering

Calculation and validation of safety functions according to ISO 13849 and IEC 61508

Based on the applicable standards, tec.nicum prepares all the documents for verification and validation (e.g. validation plan, error lists, calculations) and carries out the validation of the safety functions by analysing and testing them on site.

tec.nicum checks the circuit diagrams of the mechanical, electrical, pneumatic and hydraulic systems and calculates the achieved performance level PL or SIL for each safety function. The results of the validation are documented by tec.nicum in a report.

Modifications and upgrades of machines (retrofitting)

tec.nicum carries out modification and upgrading projects from A to Z, from design to commissioning or turnkey delivery of a standard compliant machine.

We proceed as follows:

- Analysis of directives and standards and the state of the art
- On-site inspection of the existing machine or system
- Identification of deviations
- Coordination of fields of action with the customer
- Creation and coordination of action lists, concepts, generic diagrams and sketches (CAD/CAE)
- Design, specification and construction of the modification
- Procurement of all necessary components and materials (e.g. guards, cabinets, safety components)
- Installation of equipment and peripherals, followed by commissioning and acceptance
- Training of personnel
- Safety tests and acceptance of the entire installation
- Creation and delivery of complete project documentation

In all projects, tec.nicum takes into account the specific risks and individual requirements, such as accessibility and availability of the systems, in order to develop the most efficient and sustainable solution from an economic and environmental perspective.

engineering

Technical planning
tec.nicum engineering

Measurements

tec.nicum carries out all the measurements required to prove that the machine complies with the applicable standards and directives. For example, stopping time measurements are carried out on the reaction times of dangerous machine movements in order to calculate the safety distances to be maintained from hazardous points in accordance with ISO 13855. The following measurements are also carried out: electromagnetic compatibility (EMC), noise, vibration.

Electrical tests

tec.nicum carries out the electrical safety tests required by IEC 60204-1 and checks whether the requirements for placing electrical and electronic devices on the market – in Europe in accordance with the Machinery Directive 2006/42/EC – are met:

- Testing for continuous protection potential
- Testing of the insulation resistance
- Stress tests and measurement of residual voltage
- Testing the dielectric strength

integration

Implementation
tec.nicum integration

Execution and assembly

Installation of safety guards and safety fences

tec.nicum has extensive experience in the planning and implementation of complex protective equipment for various industries. These include, for example, the food and packaging industry, the automotive industry, paper manufacturing, metal processing and chemicals and pharmaceuticals.

tec.nicum's technical safety solutions are tailored to the individual requirements of the respective industry and the relevant company. Examples include hygienic safety doors for food processing, process adaptations for potentially explosive areas or protective equipment with special access options.

This involves the planning and installation of fixed or moving protective equipment and complete machine housing using a wide range of materials.

Installation and integration of safety components

The tec.nicum engineers support the mechanical engineers and operators in implementing standard-compliant safety solutions for their machines and systems.

Support during configuration, programming and commissioning:

- Programming and integration of safety PLC
- Configuration and assembly of opto-electronic safety products (AOPDs)
- Installation of
  - safety terminal strips, safety mats, etc.
  - safety switches and interlocks
  - safety sensors to meet ATEX requirements
  - safety sensors to meet the requirements of the food industry
- Conversion of control cabinets based on the PL required
- Planning and manufacturing of control cabinets

Software integration
tec.nicum digitalisation

digitalisation: more than a safety solution – a complete technology platform

tec.nicum is increasingly offering newly developed software solutions, such as a new tool for carrying out risk assessments, as well as new digital technologies such as cloud solutions, IIoT applications, digitalised lockout-tagout procedures and energy management tools.

blue.print is a software developed by Schmersal that can already be used worldwide to carry out risk assessments. The advantage for the customer – especially for large companies with many international branches: the software enables standardised procedures and a standardised presentation of results on a global level, thus avoiding isolated solutions. At the same time, however, the SAP-based software can also be customised to individual user requirements. Schmersal is continuously expanding **blue.**print so that in future the entire project management process – from the initial quotation to invoicing – can be handled using the software.

tec.nicum also develops IIoT solutions for its customers so that data and information from production can be better used to increase the efficiency of machines and systems. The new cloud solution collects data from networked devices, sensors and actuators and analyses it in real time. The results and the recommendations for action based on them are used to optimise the machines and processes. Key approaches in these concepts are condition monitoring, predictive maintenance, the calculation of key performance indicators (KPIs) and energy management. In addition, tec.nicum offers various solutions for the digitalisation of lockout-tagout procedures that protect employees from dangerous energy release. Cloud-based technologies allow users to monitor workflows and data at any time from their desktop, tablet or smartphone.

tec.ps – Product Service System

The Product Service System platform is designed to store and visualise factory floor data collected from PLCs, safety controllers and IoT devices. This data is used to provide insight into production and productivity, and to monitor the measurements and calculations required by safety system regulations such as HRN (Hazard Rating Number) and Time Mission. The Product Service System uses consolidated communication methods such as MQTT and OPC UA, as well as the ability to integrate with databases and APIs. All collected data is made available and centralised in a dedicated operating station for each client, making the platform a multi-tenant concept.

digitalisation

The Product Service System complies with international privacy standards. Each user has their own navigation environment, with dashboards designed for quick analysis of the information available. It is also possible to manage customised and standardised alerts, making the tool more versatile.

tec.ssm – Schmersal Smart Machine

Empower Control: Discover the revolution in monitoring with our tec.ssm

We combine all our technologies into a streamlined solution for our customers. Get data, image analysis through AI, energy consumption control, and sophisticated security analysis on a single platform.

tec**.ssm** focuses on the end user, from new purchases to retrofits. We bring new machines and processes up to the technological standards demanded by leading industrial companies. We make Industry 4.0 a reality for our customers, using at least five pillars to modernise solutions. Our engineering team is ready to understand our customers' technological requirements and translate them into simple and effective solutions.

tec.cvs – Computational Vision Solutions: If you can see, we can measure

A modular ecosystem of video analytics solutions that integrates information from multiple challenges faced by industries into a single environment. We can measure images, performance indicators, availability, quality and above all the safety of people and equipment.

An IP camera image capture system is used for implementation, and it is even possible to use already installed devices. Processing and decision-making can be done on site or in the cloud, and reports are made available via a customised dashboard platform. Our product is divided into three different categories:

tec.stepsafe – Artificial Intelligence for Accident Reduction

Video analytics system for Safety, Health and Environment (SHE). The system recognises potential risks in real time, through detection and recognition of dangerous interactions between humans, objects and the work environment.

Continued on next page

Software integration
tec.nicum digitalisation

The system detects:
- PPE (Personal Protective Equipment) usage during activities
- Suspended loads proximity and inclination
- Controlled areas access
- Proximity with dangerous objects
- Falls and accidents

tec.stepmotion – Behavioural and Interaction Analysis System

Video analysis system that recognises human actions on the factory floor, capable of:
- Performing real-time chronoanalysis
- Detecting all human actions in the area, segregated by occupational profile
- Evaluating compliance with routines, checklists and set-up standards
- Identifying usage patterns and defects in equipment
- Analysing and standardising execution and performance
- Identifying bottlenecks and points of inefficiency

tec.stepscan – Unified Characteristics Classifier

tec**.stepscan** is a system capable of recognising various quality standards, extracting information from:
- Format and dimensions
- Counting and losses
- Recognition of visual defects
- Conformity analysis (e.g. holes)
- Pointing out the cause and effect of problems for immediate resolution
- Trend analysis

digitalisation

tec.dloto – Digital Lockout Tagout

Equipment blocking – audited and confirmed by software

The Digital Lockout Tagout (tec**.dloto**) software helps to implement procedures and manage resources in an effective way, eliminating human errors by increasing the availability of information for each piece of equipment and isolation point. The system uses an individual QR code for each piece of equipment to document, through photographs, that all energy sources on the equipment have been locked out using standardised devices. Once the photos have been validated, the maintenance worker or operator is free to carry out the action in a safe and documented manner. The equipment release process follows the same protocol.

tec.ems – Energy Monitoring System

Understand the consumption of your equipment or departments in detail

tec**.ems** is a modular energy monitoring system designed to provide you with complete visibility and control of your facility's energy consumption:

- The plug-and-play module allows easy deployment and mapping of energy meters via front-end configuration
- Granular reporting of energy consumption to guide energy efficiency initiatives
- Self-powered individual components are designed to maintain communication with the web server in the event of a power failure
- Preconfigurations to send alerts when parameters are out of range
- Insights to provide oversight across assets

Our team is involved from assessment to implementation of the solution.

outsourcing

Serial solutions
tec.nicum outsourcing

tec.nicum offers companies the opportunity to completely outsource all tasks related to machine safety, from the planning and installation of control cabinets to the design of integrated safety solutions.

The specialists at tec.nicum analyse the entire supply chain and are therefore able to offer integrated solutions. They provide support in product development and the optimisation of products through co-design. The customer benefits from simplified processes and reduced costs. On request, orders can be processed according to the Engineer to Order principle, whereby products or components are designed and produced according to customer specifications. In this way, tec.nicum provides customers with customised solutions that are tailored to their individual order requirements. This is made possible by efficient software and error-free digital processes. If required, tec.nicum provides the user with products as ready-to-connect plug & play systems.

Upon request, tec.nicum can also develop complete safety solutions for companies – from the design of safety systems and practical implementation to 24/7 process monitoring, monitoring of safety functions and trouble shooting.

The outsourcing service offers the resource that allows Schmersal to be engaged to develop improvements in a production process or in an industrial line or installation, leveraging our expertise as a company specialised in solutions for safety and automation systems.

Supply models

The outsourcing delivery model offers complete solutions that integrate several aspects:

- Simplification of customer processes; cost reduction in administration; development support
- Product improvement through co-creation and engineering integration; cost and inventory reduction
- Panel: Provides control panels designed for a wide range of applications (e.g. safety panels, distribution, air conditioning, pumps, agricultural panels, etc.)
- Material Kits: Provides plug and play solutions, ideal for existing installations (e.g. preassembled kits, panel plus field items such as buttons, sensors, safety switches. We also have mechanical solutions such as customised plating and protection)

Services for operators
Turnkey solutions

For machine operators, conversions or modernisations are usually more advantageous than a new investment.

The turnkey solutions from tec.nicum offer high added value for operators of machines and systems that are to be modernised in terms of safety technology. All relevant work, from the initial analysis to the complete technical implementation, is undertaken and carried out by tec.nicum.

The advantage of complete turnkey solutions for the customer is that the machines and systems can be used immediately after the turnkey handover without any further adjustments.

If it turns out during a project that special activities cannot or may not be carried out by the tec.nicum experts themselves, the tec.nicum team will also take care of the corresponding implementation. A broad network of specialised partners enables us to react quickly to any task.

In the case of open projects, it is up to the client to decide which trades they would like to carry out themselves and which they would like to outsource to tec.nicum. In the end, the tec.nicum team hands over the turnkey project to the customer at the agreed time.

Even after a machine has been modified, the safety technology must be maintained. The scope of these maintenance services depends on the customer's requirements and any external requirements.

For example, periodic inspections of optoelectronic protective devices (e.g. light barriers or light curtains) are required at regular intervals, or individual components need to be replaced because they have reached the end of their service life.

tec.nicum also provides these services as part of a turnkey project.

Certification as a “Machinery CE Expert”

Expert for machine safety in only five days

The tec.nicum academy has added a new qualification offer to its programme: In a five-day seminar, participants can qualify as “Machinery CE Expert®” (mce.expert).

Based on decades of experience, Schmersal has developed this seminar and its contents and had them certified by TÜV Rheinland®. The course conveys in a compact form all the knowledge required to implement a CE conformity assessment procedure for machines and plants with all the relevant sub-steps. In this compactness and with this extensive knowledge transfer, the seminar in this form is almost unique on the market.

Upon successful completion, participants can prove their acquired qualification as an expert in machine safety by means of a certificate issued by TÜV Rheinland®.

You are entitled to use the title “Machinery CE Expert® with TÜV Rheinland® certified qualification”. This qualification is internationally recognised.

In the online certificate database “Certipedia”, TÜV Rheinland® provides information on all tested product features, services, companies, systems and personnel certifications (www.certipedia.com). The description of the seminar “Machinery CE Expert®” as well as the individual identification number of each graduate can be viewed and verified in the “Certipedia”.

Further information at:
www.tecnicum.com/en/mce-expert

mce . expert
Machinery CE Expert

Training course and exam for the Functional Safety Engineer (TÜV Rheinland®) certificate

During the five-day classroom course, participants can expect theory, practical examples and discussions on machine safety according to ISO 12100 and functional safety according to ISO 13849 and IEC 62061.

The participants will be introduced to the requirements of international standards and, after passing the final examination, you will receive an official certificate as a Functional Safety Engineer (TÜV Rheinland®). The course explains and discusses international regulations, basic concepts of risk assessment, examples of protective devices on machines, safety functions, circuit concepts and Performance Level (PL) and Safety Integrity Level (SIL) calculations.

The course provides high-level expertise in the following areas:

- Risk assessment and risk reduction
- Specification of machine guarding
- Development of safety functions
- Calculation and validation of the performance level
- Calculation and validation of the safety integrity level

Who should attend?

Professionals with proven experience in the field of machine safety and functional safety (application engineers, system integrators, designers, safety specialists) who wish to have their knowledge tested and certified by an official international certification.

Further information at:
www.tecnicum.com/en/fse-expert

functional.safety
tec.nicum

tec.nicum:
global service and engineering hubs

tec.nicum – Solutions & Services GmbH is a subsidiary of Schmersal Group. It offers a wide range of services relating to machine and occupational safety.

tec.nicum comprises a global consultancy network of TÜV Rheinland-certified Functional Safety Engineers and Machinery CE Experts. Services can be called upon around the world.

The range of services at tec.nicum is based on six modules: academy in the training and workshop section, consultancy services in the consulting section, engineering in the designing of safety solutions section, integration section in the field of practical implementation, the development of software solutions and new digital technologies in the digitalisation section and the provision of complete solutions in the outsourcing section.

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