



Services

PILZ
THE SPIRIT OF SAFETY

Your projects belong in safe hands
Consulting, engineering and training





Safety for man and machine:
Pilz Services

► Pilz Services

Pilz offer a wide range of machinery lifecycle services, specialising in the protection of man, machine and the environment. Through our international subsidiaries, we offer real customer focus and impress with individual consulting and the highest flexibility and reliability.

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Secure not only your personal success but also that of your company – with continuing professional education as part of our training courses.

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Pilz is your solution supplier for all automation tasks. Including standard control functions. Pilz developments protect man, machine and the environment.

Pilz has a tradition as a family-run company stretching back over 60 years. Real proximity to customers is visible in all areas, instilling confidence through individual consultation, total flexibility and reliable service. Worldwide, round the clock, in 42 subsidiaries and branches, as well as 27 sales partners on every continent.

More than 2400 staff, each one of them an ambassador for safety, make sure that your staff – your company's most valuable asset – can work safely and free from injury.

SERVICES

Consulting
Engineering
Training

Economical

PILZ

THE SPIRIT OF SAFETY



Automation solutions from Pilz – at home in every industry.

► Safety for man and machine

We support your business with our services in the field of machinery safety and automation. Benefit from our extensive portfolio across the whole machine lifecycle which includes consulting, engineering and training. Implement your safety and operational goals with our help. We assess your safety challenges and provide you with practical, tailored and economical solutions. With this approach, our service specialists provide increased safety in every industry sector around the world.





Benefit from these services:

- ▶ Increased awareness of safety in new production plants through identification of possible risks
- ▶ Retrofitting plant and machinery with automation and safety technology to increase productivity as well as safety
- ▶ The integration of safety technology in plant and machinery to satisfy legal compliance requirements
- ▶ Support you during the introduction of technically advanced machinery and the installation of corresponding protective measures
- ▶ Training of personnel with regard to national and international machinery safety to enable maximum plant availability and safety

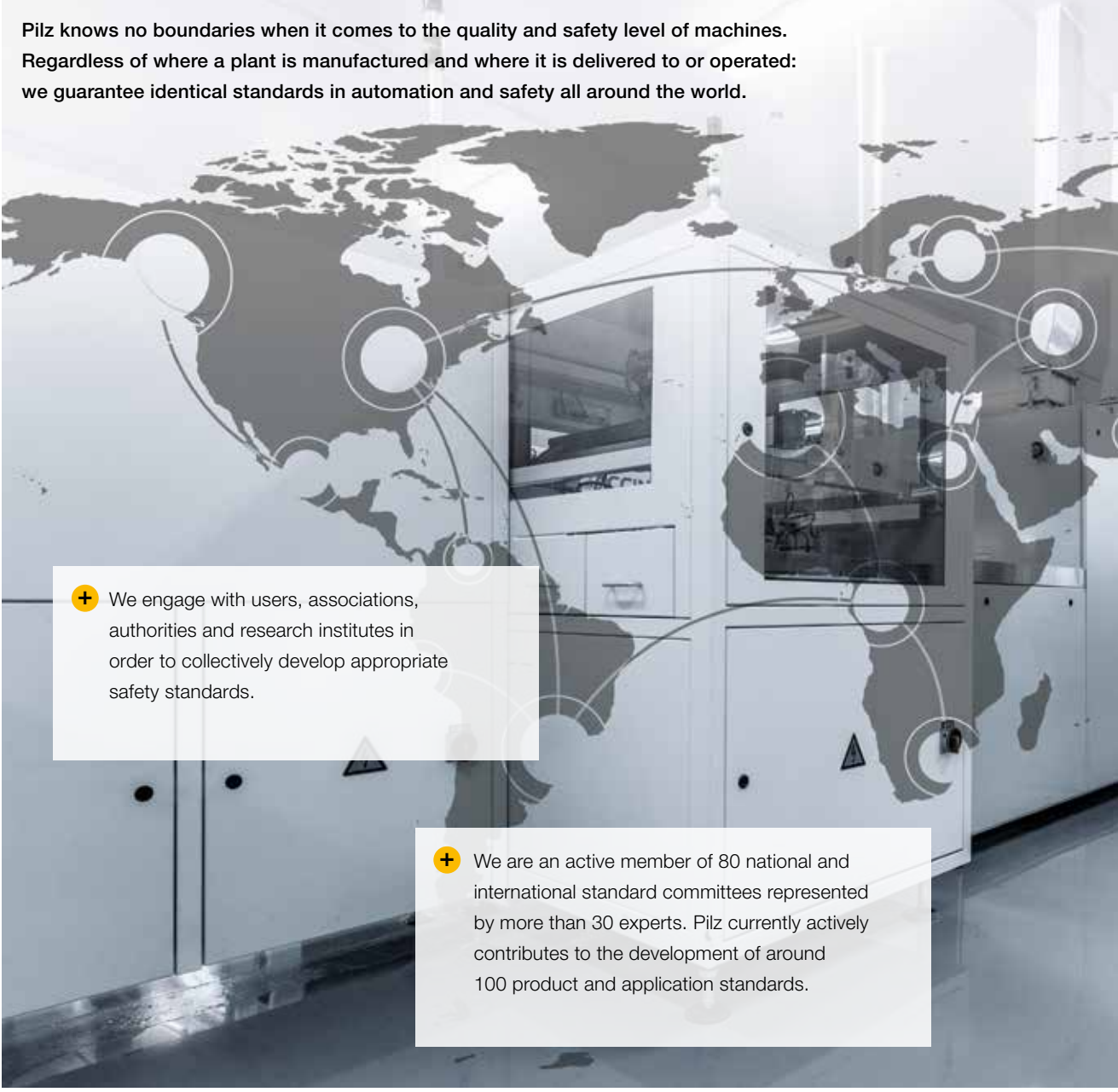
“ We develop solutions for applications that have specific technical requirements to ensure compliance, such as achieving the safe interaction between humans and robots.”



► We overcome boundaries for your global projects

We provide our services throughout the world – thanks to our local organisations, we can guarantee the highest quality uniformly and globally. We have carried out challenging and unique projects all over the world. Our global network of experts always goes the extra mile by consulting and implementing locally while maintaining a global outlook.

Pilz knows no boundaries when it comes to the quality and safety level of machines. Regardless of where a plant is manufactured and where it is delivered to or operated: we guarantee identical standards in automation and safety all around the world.



+ We engage with users, associations, authorities and research institutes in order to collectively develop appropriate safety standards.

+ We are an active member of 80 national and international standard committees represented by more than 30 experts. Pilz currently actively contributes to the development of around 100 product and application standards.



There for you, worldwide

We develop practical solutions to complex questions of safety in all industries for national and international industrial companies. With our international team of committed employees, we help companies to apply the best possible manufacturing processes with a view to optimising the availability and productivity of their facilities all over the world.

+ By adapting to country-specific requirements, we take all steps to ensure that machines can be operated reliably and safely without a loss of time – no matter the country.


“ Pilz is able to provide and apply local knowledge on a transnational basis and to operate across borders with a consistent level of professionalism and quality.”

Renate Pilz, Chair of the Board
Pilz GmbH & Co. KG

► Range of plant and machinery lifecycle services

As a solution supplier, Pilz can help you in the global application of optimum safety strategies that comply with specifications. Our services ensure the highest safety for man and machine worldwide.

Pilz Services for Safety and Automation




Machinery safety

Safety through the whole machine lifecycle

- Risk Assessment
- Safety Concept
- Safety Design
- System Implementation
- Validation

Safe machinery at any stage




International compliance

Conformity with international standards and regulations

- CE Marking
- NR-12

Compliant machines worldwide




Workplace safety

Absolute safety when operating machines

- Plant Assessment
- Lockout Tagout System
- Inspection of Safeguarding Devices

The maximum possible safety for man and machine



Training

International qualification programme and certified courses

Enhancement of professional development



Training

Pilz supports you with a comprehensive range of training courses on all topics of machinery safety and automation.



And to progress to the expert level in machinery safety we offer the qualification of CMSE® – Certified Machinery Safety Expert.



Machinery safety

Risk Assessment

We review your machinery in accordance with the applicable standards and directives and assess the existing hazards.

Safety Concept

We develop detailed technical solutions for the safety of your plant and machinery through mechanical, electronic and organisational measures.

Safety Design

The aim of the safety design is to reduce or eliminate danger points through detailed planning of the necessary protective measures.

System Implementation

The results of the risk analysis and safety design are implemented to suit the particular requirements through selected safety measures.

Validation

In the validation, the risk assessment and safety concept are mirrored and inspected by competent, specialist staff.

And we perform collision measurement for human-robot applications in accordance with the limit values from ISO/TS 15066.



International compliance

CE Marking

We control all activities and processes for the necessary conformity assessment procedure, including the technical documentation that is required.

NR-12

As a complete supplier we can provide support from risk assessment to validation, technical documentation at the manufacturer's and final acceptance at the operator's in Brazil.



Workplace safety

Plant Assessment

We will prepare an overview of your entire plant in the shortest possible time. With an on-site inspection we will expose risks and calculate the cost of optimising your safeguards.

Lockout Tagout System

Our customised lockout tagout (LoTo) measures guarantee that staff can safely control potentially hazardous energies during maintenance and repair.

Inspection of Safeguarding Devices

With our independent, ISO 17020-compliant inspection body, which is accredited by the German Accreditation Body (DAKKS), we can guarantee objectivity and high availability of your machines.



Pilz GmbH & Co. KG, Ostfildern, operates an inspection body for plant and machinery, accredited by DAKKS.

► As unique as your requirements: Pilz industry expertise

Pilz offers unique industry know-how, built up over decades of experience and continuously improved, that virtually no other company in the world is able to match.

At home in
every industry

Comprehensive know-how of many different applications

We know the technical challenges you face when it comes to choosing machine and automation processes for your manufacturing operation and production goals. Our experts have a comprehensive understanding of all the standards and regulations applicable for your plant. And they will support you with services and tailored solutions for your industry and its own particular needs.



Safe interaction between human and robot

Robotics

We help you to implement and automate safe human-robot applications with a service portfolio that is specifically developed for all the phases of a robot system. In the process we demonstrate new ways in which human and robot can work together safely in even greater proximity in future.



High level of safety for heavy material

Steel and aluminium

Your machinery is exposed to demanding production conditions. The processing of raw and processed materials demands a particularly high level of safety. Our experts have already demonstrated their ability in adapting a large number of the most diverse applications safely to the respective production requirements.



Special safety measures for special machines

Pulp and paper

When potentially hazardous interventions are needed on a machine, such as after a paper tear, particular protective measures are essential. But which solutions are best suited to your needs? Enabling switches, fixed guards, creep speed control or a start-up alarm? We develop the ideal solution for you based on our risk assessment and safety concept.



Safely packaged with Pilz

Consumer goods packaging

High speeds and frequent change of material are factors that stretch machines and automation technology to the limit. We develop customised safety concepts for you on the basis of a detailed technical risk assessment that provides risk minimisation while maximising productivity.

Whatever industry you are in, we support you with our structured project management, safety expertise and know-how.



Safe machines for handling food ingredients

Food

You need flexible manufacturing systems in order to produce a wide range of products. That means you need a strong safety partner by your side. We can support you in the integration of additional equipment or the upgrading of existing machinery, taking all aspects of safety into account.



Safe dosing of poisonous ingredients

Health technology

- ▶ Pharmaceuticals: we know the challenges you face when dealing with explosive atmospheres or toxic waste products. Through our process safety services we can provide you with effective assessment and recommendations on your machinery.
- ▶ Medical devices: precise production technology such as collaborative robots requires specialist knowledge and experience. We ensure the protection of your employees and of your high-value production assets.



Higher plant availability in automotive production

Automotive

We can assist you in achieving the high availability and efficiency of your plants through integrated machinery safety. Our experts will advise you every step of the way in the production process – whether pressing, body shell manufacturing, paint systems or the assembly line.





Pilz services throughout the machine lifecycle



- ▶ Risk assessment
- ▶ Safety concept
- ▶ Safety design
- ▶ System implementation
- ▶ Validation

▶ Machinery safety at each stage

Whether in the design phase, during operation or with a machine retrofit: manufacturers and operators are naturally keen, and often legally obliged, to detect and eliminate potential safety risks for man and machinery at an early stage.

Pilz offers you comprehensive safety services customised to your company's needs throughout the entire machine lifecycle.

► Systematically evaluate hazards: with the Pilz Risk Assessment

With a risk assessment tailored to your individual requirements and systematically performed, Pilz provides you with the most important foundation for determining safety measures and ensuring machinery safety compliance.

Your requirements

Combination of compliance and customised solutions

For the risk assessment of plant and machinery, operators and manufacturers require a concept that complies with the requirements of various national laws and international directives and standards. To achieve this a practical, logical, structured and targeted assessment of your plant and machinery is needed.

At your side right from the start

When all parameters have been agreed upon, our experienced specialists will develop a concept that enables a professional risk assessment, which is tailored to the special requirements of your machinery and in accordance with your corporate policies, procedures and operational needs.

Our services

Responsible and systematic risk assessment

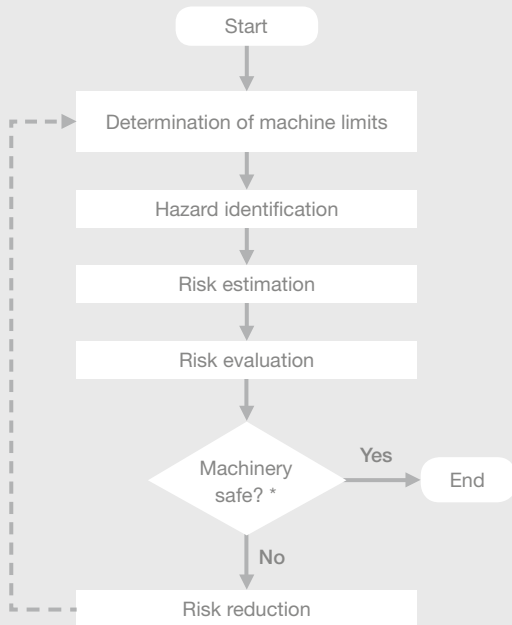
We will work with you to undertake a technical inspection of your machinery in accordance with the applicable national and/or international standards and directives. Based on the information determined here, safety measures for the machine can then be defined, prioritised and implemented. The aim: to guarantee compliance with standards and regulations during the entire working life of the machine.

The risk assessment from Pilz includes:

- Determining the applicable standards, regulations and procedures
- Description of machine's limits
- Checking your machine in accordance with the relevant national and international standards
- Determination and assessment of existing hazards
- Examination of the hazards in all relevant phases of the machine lifecycle
- Estimation and assessment of the risk
- Recommendation for procedure to reduce the risk



Risk assessment in the machine safety lifecycle



* Is the risk sufficiently reduced?

The result of the risk assessment is used to develop the safety concept and create the safety design. You can also benefit from the technical competence and professional objectivity of our company and make our competence and experience in risk assessment work for you to good effect!

Benefits to you

Effective and economical risk assessment

With a risk assessment created individually for you and systematically performed you can detect and address not only the existing hazards to which your staff is exposed during operation or maintenance, but also for the wider safety concerns of your manufacturing plant:

- ▶ You extend the service life of your machinery using early hazard detection
- ▶ You ensure compliance with the Machinery Directive in accordance with applicable standards and directives
- ▶ You save time and money during the integration of suitable safety measures



Risk assessment

Safety concept

Safety design

System implementation

Validation



Keep up-to-date on Pilz risk assessment

Webcode: web7765

Online information at www.pilz.com

► Combining safety and productivity: with Safety Concepts from Pilz

Pilz safety concepts are based on the individual requirements of the customer. Using our tried and tested methodologies our safety concepts enable the safe interaction between operators or maintenance personnel and machinery – without affecting productivity.

Your requirements

Intelligent and cost-effective safety concept

A competitive manufacturing company, you require an effective and practical safety concept for the use of new machinery or upgraded existing machinery, without restricting productivity.

Perfectly tailored to you

We at Pilz are always aware of your production needs and targets. Our safety concepts prioritise the optimal solutions for combining functional safety and productivity. For this purpose, we only develop safety concepts that are based on the individual requirements of our customers and which can be implemented without creating too many obstacles for manufacturers and their staff.

Our services

Creating engineering solutions

At Pilz, an interdisciplinary team works to create the best possible safety concept for your individual requirements.

With profound technical knowledge mechanical or electrical solutions and the most effective state-of-the-art safety technologies are created based on the risk assessment conducted previously. These describe the technical measures to ensure the safety of your machinery in accordance with national and international standards as well as your own corporate standards.

The Pilz safety concept

takes the following into account:

- Use of fixed and movable guards
- Implementation of safety-related plant and machinery controllers
- Facilities for safe control and shutdown of electrical, hydraulic, pneumatic and other potential energy sources
- Detection of workers in danger zones
- Definition of the performance level (PL_r) to be reached for safety-related measures or safety functions



**Safety concept –
the process within the machinery lifecycle**



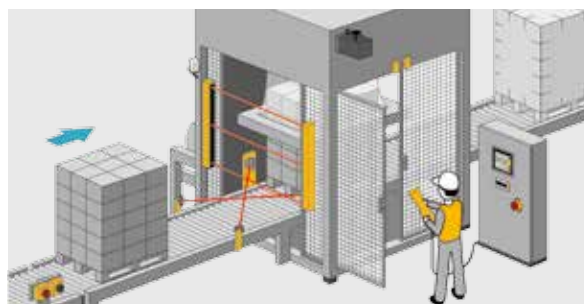
Together with the use of procedures typical for the sector, you lower the operating costs for your machinery over the long-term.

Benefits to you

**Functional safety and
guarantee of productivity**

With a safety concept from Pilz, you ensure not only conformity and safety, but you also improve the productivity of your plant and machinery:

- ▶ You benefit from our practical engineering experience in integrating safety
- ▶ You optimise interaction between operators and machinery
- ▶ You reduce complexity and costs
- ▶ You optimise the scope of maintenance work for your plant and machinery



- Risk assessment
- Safety concept
- Safety design
- System implementation
- Validation

Keep up-to-date on Pilz safety concept

Webcode: web7769

Online information at www.pilz.com

► Eliminating hazards as early as possible: with Pilz Safety Design

Pilz safety designs are developed based on your specific requirements and take potential hazards into account at the earliest stage possible. We make sure that the implementation has minimal impact on the complexity, costs and productivity of your plant and machinery.

Your requirements

Safety designs in the machine lifecycle

Projects such as a new design, a retrofit or a conversion are typical of upgrading machinery. Follow-up costs, poor machine availability or even the failure of plant and machinery are common occurrences. You can now actively pre-empt such eventualities: with a detailed safety design customised to your machinery.

Specially developed for you

Our safety designs follow the goal of reducing or eliminating identified hazards. We rigorously assess protective measures required for each customer. From experience we understand that optimal outcome for you can only be achieved if a structured process is followed when interpreting the requirements, drawing up a detailed safety design and integrating and validating the solution.

Our services

Detailed assignment of safety measures

As a global solution supplier for international companies, we can create bespoke safety designs that meet the relevant requirements and standards applicable worldwide.

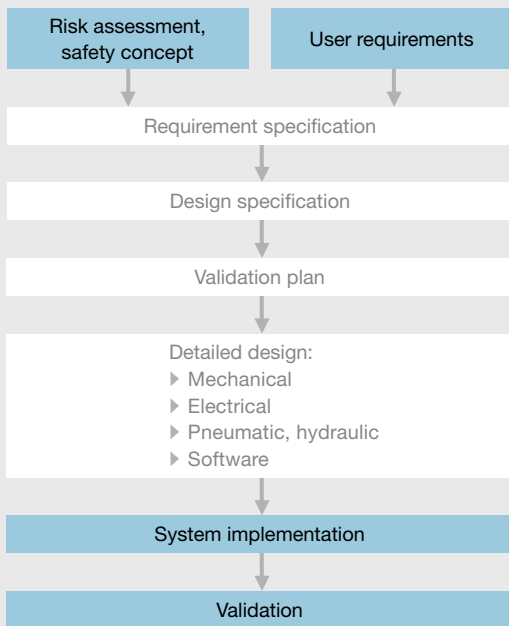
Based on our long-standing experience with design techniques, standards and safety technologies, we implement a structured design process for you.

Pilz safety design comprises the following phases:

- Specification of the safety requirements
- Detailed assignment of safety measures to address the defined hazards
- Selection of the components
- Consideration of design checks and validations
- Best practice engineering project management in accordance with IEC 61508



Safety design in the machine lifecycle



The design process of Pilz uses a comprehensive consideration of the necessary safety measures and foreseeable human error.

Benefits to you

Safe processes and optimised results

Our structured methodology means that you not only save time and money when implementing tailored concepts, you also make sure your machinery conforms to the directives:

- ▶ You operate in compliance with the relevant legal requirements, including the Machinery Directive and international standards
- ▶ You ease the strain on your resources by calling on our safety experts for support



Risk assessment

Safety concept

Safety design

System implementation

Validation



Keep up-to-date on Pilz safety design

Webcode: web7770

Online information at www.pilz.com

► Implementing safety swiftly: with System Implementation from Pilz

When you plan to install new machines into a plant or want to optimise the safety of existing machines, you usually only have a very limited time available. Pilz can help you to implement your safety measures safely and within the required timescale.

Your requirements

Swift implementation of safety measures

When interlinking new machinery or retrofitting legacy equipment, the integration of safety measures plays an important role. In practice, however, there is usually only a very limited amount of time to implement these measures. What plant manufacturers and operators want in such situations is a service partner that understands the lifecycle of their plant and machinery, and can carry out the required measures swiftly and in a targeted manner.

The direct route to increased machine safety

With customer-specific advice and technical services that cover the entire machine lifecycle, Pilz makes sure that safety systems and their implementation do not adversely affect project budgets for automation and safety projects.

Our services

Certified safety implementation for your machinery

When integrating safety functions, our experienced project managers keep any restrictions to the production process to an absolute minimum. For planning the installation of mechanical, electrical and hydraulic components, we take into account the existing plant conditions to minimise downtime. Our project workflow guarantees the highest quality level. We also ensure the successful integration of complex automation solutions in high-speed production.

System implementation by Pilz comprises the following phases:

- Project planning and management
- Selection and procurement of the necessary components such as actuators, sensors and control units
- Design and assembly of the necessary mechanical structures
- Design and testing of the necessary electrical panels
- Installation of electrical and control systems
- Programming of control and visualisation systems
- System commissioning
- Selection of suppliers and contractors
- Training of machine operators and maintenance personnel
- Provision of documentation tracking the development process, following structured processes



Based on the findings from the risk assessment and safety design, our experienced engineers quickly implement the selected safety measures. Pilz teams have successfully performed system integration in many different industry sectors around the world:

- ▶ Automotive engineering
- ▶ Aluminium production
- ▶ Steel production
- ▶ Food and beverage industry
- ▶ Paper processing
- ▶ Consumer goods industry
- ▶ Medical industry

Benefits to you

Quality and reliability

In Pilz, you not only have a partner that can offer you reliability in planning and quality in implementation. You also benefit from our practical know-how, because with our worldwide network we are in a position to complete projects professionally and efficiently:

- ▶ You delegate tasks to our experienced experts with many years of applications experience
- ▶ You implement your safety systems in accordance with the applicable standards and directives
- ▶ You implement your system at minimal cost and downtime



Risk assessment

Safety concept


Safety design

System implementation

Validation



Keep up-to-date on Pilz safety implementation

 Webcode: web7771

Online information at www.pilz.com

► Confirm the correct implementation of protective measures: with Validation by Pilz

Validation by Pilz experts ensures that protective measures are implemented correctly and that the safety system is functioning fully.

Your requirements

Validation in the machine safety lifecycle

International safety directives and standards such as ISO 13849, IEC 62061 and IEC 61508 require manufacturers and operators of machinery to validate their safety systems at regular intervals, irrespective of the functional design. This is a task for an experienced service provider that is familiar both with the machine safety lifecycle and with how to implement the necessary protective measures.

Safety always comes first

As an expert in this domain Pilz provides you with the assurance that the safety measures in place satisfy all requirements and have been implemented in accordance with the latest safety regulations and best practice. Our accreditation by internationally recognised official bodies means you have a safety partner that can validate the conformity for all your safety measures and ensure the safety of your facilities and your employees.

Our services

A structured approach for effective validation

When planning the validation process in the design phase, the key is to define all measures, steps and resources that are required for validation. With long-term experience in the validation of machinery, our engineers have developed a highly structured method for the inspection of safety-critical elements of plant and machinery as well as for checking the necessary safety functions.

Pilz validation covers the following services:

- Evaluating the given design based on safety requirements
- Evaluating the chosen components
- Checking the installed sensors, actuators and wiring
- Testing the safety-related software and hardware functions
- Performing function tests and fault simulations
- Preparing a test report with detailed information on the results and recommendations on what actions are needed

Keep up-to-date on Pilz validation

Webcode:
web7772

Online information at www.pilz.com





Risk assessment

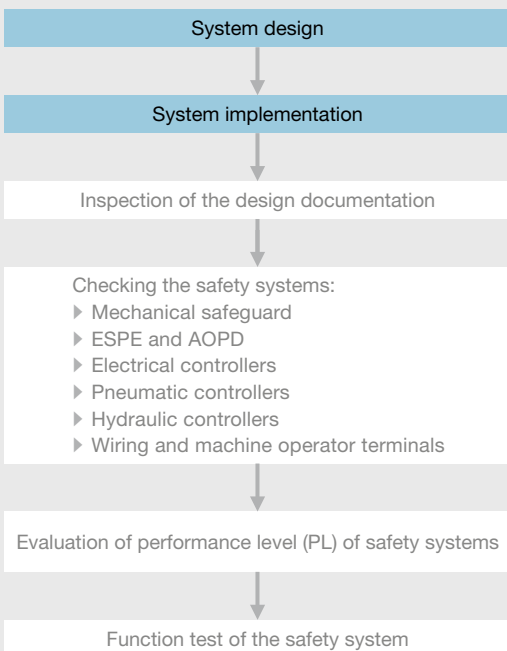
Safety concept

Safety design

System implementation

Validation

Validation in the machine safety lifecycle



Benefits to you

Objective and systematic validation process

For the validation of your safety systems, you benefit not only from our objective, systematic approach, but also from our experience in evaluating and implementing safety as well as our accreditation by internationally recognised official bodies:

- ▶ All relevant aspects of validation and certification are taken into account
- ▶ The conformity of all safety measures and therefore the overall safety of your facilities is maximised
- ▶ You can demonstrate compliance with standards that require independent safety validation

Human-robot collaboration. Safety guaranteed!

Pilz can help you to implement safe human-robot applications, with a service portfolio that is tailored to the individual life phases of a robot system.

We ensure that humans and robots can work together even more closely and safely. As part of the validation of human-robot collaborations, we use our HRC collision measurement set. This serves to record impact force and pressure to assess compliance with the limits specified in accordance with ISO/TS 15066.



Keep up-to-date on collision measurement set for human-robot collaboration (HRC)

Webcode: web182200

Online information at www.pilz.com





Pilz services for international compliance



- ▶ CE marking
- ▶ NR-12

▶ Machine safety compliance on all continents

Manufacturers, exporters and end users of machinery that wish to export their machines around the world are confronted with complex conformity and legal issues. Pilz can assist you throughout the conformity assessment.

The Pilz subsidiaries in each country clarify the formalities of safety compliance for the local acceptance. We will ensure that your machinery conforms to the regulatory requirements, be it CE marking in Europe for example or OSHA in the US, NR-12 in Brazil, KOSHA in Korea, GOST in Russia, or CCC in China.

► Successfully mastering CE Marking: with the Pilz conformity assessment

Pilz uses its proven expertise and comprehensive service offering to support manufacturers and operators with the CE marking process. This is required for new or modified machinery being imported or put into service in Europe.

Your requirements



Certificate of compliance with EU directives

Without CE marking, plant and machinery may not be imported into or sold in the European Economic Area (EEA). That applies to both new and used machinery. Machine manufacturers and operators need a service partner with extensive knowledge and experience when it comes to interpreting the applicable directives and standards, and specifically implementing the CE marking process. If stand-alone machines that are already CE certified are joined together to form an assembly of machines, a conformity assessment procedure, including CE marking, must be carried out for the assembly as a whole.

Quality the key to success

Our CE marking experts possess a high degree of technical competence that enables them to interpret the applicable technical standards and complete all necessary steps of the CE marking process.



Our services

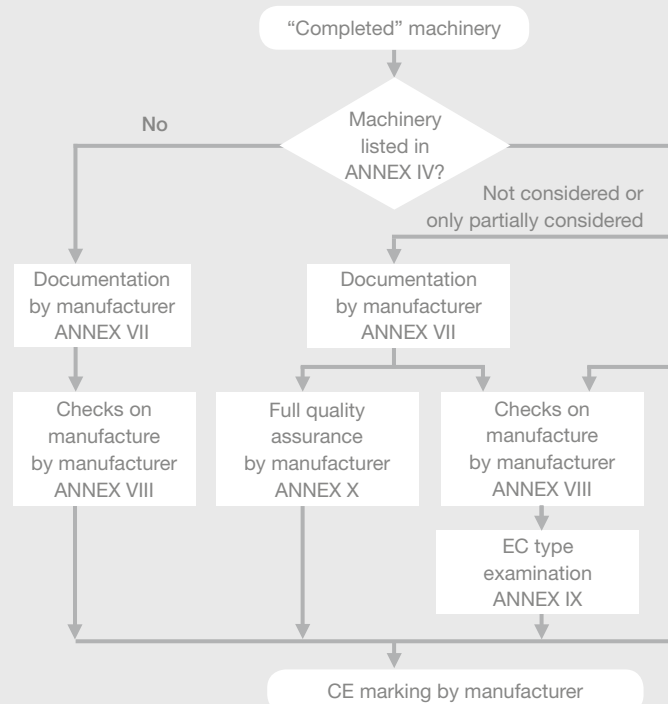
CE marking from a single source

Pilz is able to carry out the entire conformity assessment procedure on your behalf in accordance with Machinery Directive 2006/42/EC: from risk assessment and safety design to system implementation, followed by validation and finally CE marking.

What we can provide in the scope of CE marking:

- Determining and applying the relevant standards and directives
- Risk assessment

Machinery directive and CE mark



- ▶ Compiling a safety concept and/or a safety design
- ▶ Evaluating conformity with the Machinery Directive in terms of the essential safety and health protection requirements
- ▶ Carrying out the required checks, tests and measurements
- ▶ Collating the documents required by law for inclusion in the technical documentation
- ▶ Document archiving and management
- ▶ Performing the function of a party authorised to carry out CE marking, if necessary

Benefits to you

Structured process and customised support

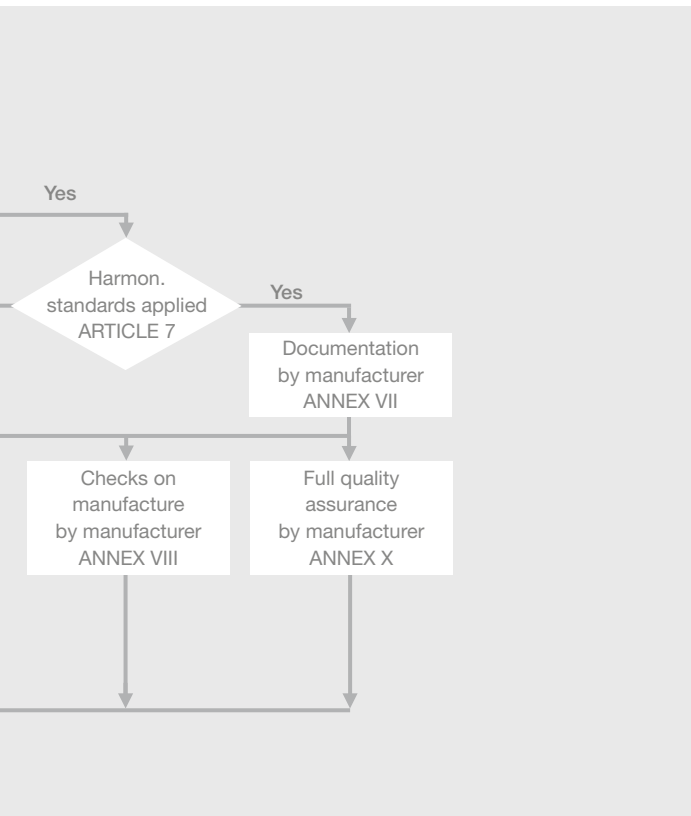
Pilz not only supports you during the interpretation and application of the standards and directives:

- ▶ For manufacturers based outside Europe, Pilz can act as your representative in the European market for CE marking purposes
- ▶ Our structured CE marking process saves you time and money
- ▶ If required, we will assume responsibility for the conformity assessment procedure in the capacity of authorised party and will confirm with our signature that the requirements of the Machinery Directive have been complied with



CE marking

NR-12



Keep up-to-date on CE marking

Webcode: web7773

Online information at www.pilz.com

► NR-12-compliant machinery worldwide: with the Pilz conformity assessment

Based on the requirements of the Brazilian regulatory standard NR-12, Pilz assists manufacturers and exporters during the conformity assessment of their machinery and offers operators on-site support when implementing the associated protective measures.

Your requirements

Our services



NR-12-compliant plant and machinery

To comply with the requirements of NR-12, manufacturers who export machinery to Brazil as well as operators of machinery in Brazil need a service partner to comprehensively advise and support them on the complex conformity and legal issues.

Conformity assessment by acknowledged specialists

Pilz experts in Brazil are acknowledged specialists in the field of NR-12 compliance and will support you throughout the entire NR-12 conformity assessment procedure. On your behalf, we thus make sure that you satisfy all the requirements of the Brazilian regulatory standards and that the health and safety of your workforce are assured.

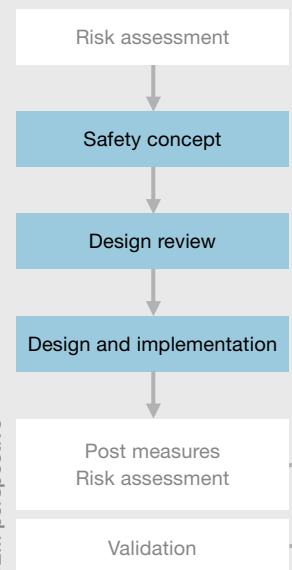
Structured approach to the NR-12 conformity assessment

As a complete supplier, we can provide support en route to final acceptance locally in Brazil. Pilz provides a full range of services from a single service provider: from risk assessment to validation and the provision of technical documentation at the machine manufacturer's facility through to acceptance by the operator in Brazil.

The safest route to NR-12-compliant machines. Worldwide!

We can support you with the following services:

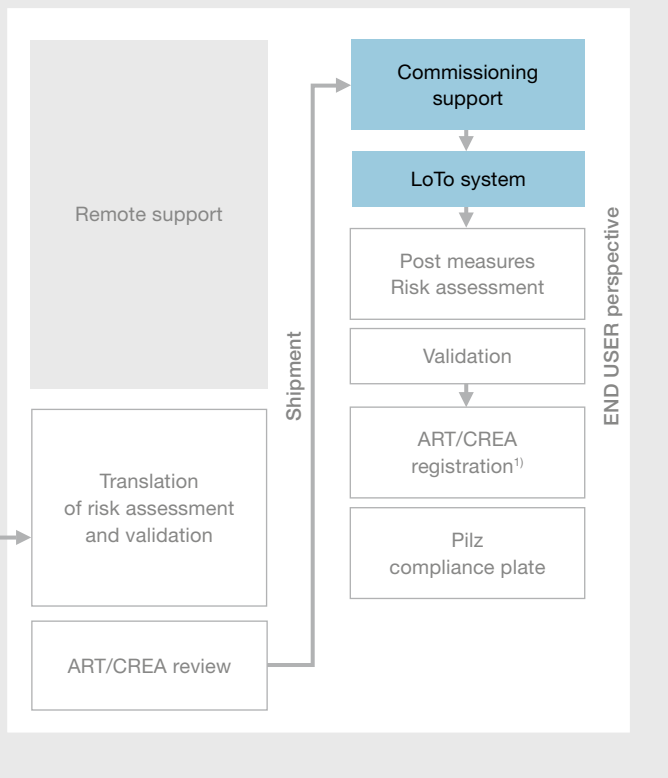
Services in machine's country of origin



Our offering spans the following services:

- ▶ Advice during the design process on compliance with all relevant standards and directive requirements
- ▶ Clarification of the local formalities for acceptance in Brazil
- ▶ Support during commissioning

Services in machine's country of destination (Brazil)



Benefits to you

Unrestricted NR-12 conformity and legal certainty

Regardless of whether you are a manufacturer wishing to export a machine to Brazil or wish to operate a machine in Brazil in accordance with the requirements of NR-12, in Pilz you have an experienced and expert partner.

- ▶ You will have an NR-12-compliant machine complete with the required regulatory documentation for the local authorities
- ▶ You save time and money thanks to our standardised approach that follows an internationally uniform procedure
- ▶ You receive internationally uniform documents for all phases from machine construction outside Brazil to installation in Brazil

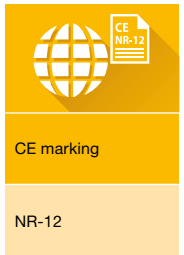
¹⁾ Through our subsidiary in Brazil Pilz will provide the technical documentation required by NR-12, called the Technical Responsibility Annotation (ART), and which can be created by our consultants who are formally registered with the relevant Regional Council of Engineering and Agronomy (CREA) in Brazil.

CREA

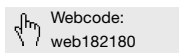
(Portuguese: Conselho Regional de Engenharia e Agronomia): Regional council for engineers, which assesses and registers safety specialists. Parts of the NR-12 documentation must be produced by an engineer registered with CREA.

ART

(Portuguese: Anotação de Responsabilidade Técnica): Mandatory document, which names the responsible engineer for a product/service.



Keep up-to-date on the NR-12 conformity



Online information at www.pilz.com





Pilz services for more safety in the workplace



- ▶ **Plant assessment**
- ▶ **Lockout tagout system**
- ▶ **Inspection of safeguarding devices**

▶ Machinery safety in the workplace

The continuing safety of your workers must always be a priority. Plant and machine operators are confronted with the challenge of taking all the necessary safety measures to ensure this safety.

Pilz offers you a comprehensive range of services for achieving compliance and optimisation of your safety status in the workplace.

► Identifying machinery safety risks: with the Pilz Plant Assessment

With the Pilz plant assessment and the resulting report recommendations, plant operators receive well-founded data on the safety status of their machinery along with a recommendation and set of priorities for essential improvements.

Your requirements

On-site plant assessment

In today's competitive world, production plants are subject to constant change. Wherever new and older machinery is operated side by side, the plant manager and safety leadership face the challenge of prioritising risk management in terms of health, safety and environmental risks, and of implementing safety strategies.

Tailor-made plant assessments

In close co-operation with you, our experts define the aims of the plant assessment for all your machinery and automation safety needs. We analyse workflow with input from your operational and maintenance personnel to identify the main potential hazards. Based on the plant assessment we will guide you on how the additional measures needed to comply with legal requirements can be achieved.

Our services

Methodical plant assessment

Our plant assessment of the machinery encompasses an on-site assessment with subsequent evaluation of the machinery's condition and a formal presentation of our findings.

For the plant assessment of the machinery, we use a structured risk assessment that builds on our experience gathered in projects involving machinery manufacturers and users from all over the world. This approach yields sufficient data and information to enable us to assess the key conformity and safety factors in your plant. All machinery is assessed in a multi-parameter analysis to obtain a suitable estimate of the essential safety requirements for every machine, in order of priority.

Plant assessment of the machinery spans:

- Analysis of the hazards at individual machines
- Assessing effectiveness of existing measures to minimise the risks
- Assessing how well machinery conforms to current regulations
- Checking scope for integrating safety functions into a machine
- Prioritising and recommending how improvements to the machinery can be implemented



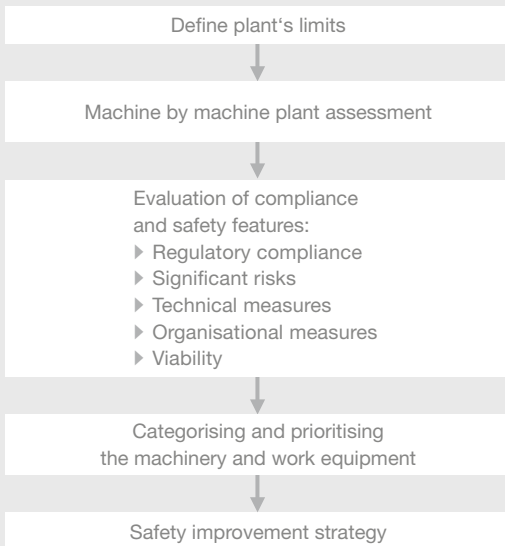


Plant assessment

Lockout tagout system

Inspection of safeguarding devices

Methodology



The comprehensive reports enable the company's safety managers to define and implement the necessary safety measures in order of priority.

Benefits to you

Status reports and strategic recommendations

Based on the plant assessment from Pilz, you will gain comprehensive understanding of the safety status of your machinery and also a clear recommendation on any essential improvements required:

- ▶ You obtain an overview of your entire plant and of any potential safety risks that you may be unaware of
- ▶ As an employer, you can enhance workplace and employee safety
- ▶ You obtain a firm basis to plan safety investments effectively and improve the profitability of your machinery
- ▶ This analysis and these recommendations can be applied to similar plants and machinery across your supply chain



Keep up-to-date on plant assessment

Webcode: web7775

Online information at www.pilz.com

► Manage hazardous energy safely: with the Pilz LoTo System

In the form of a lockout tagout (LoTo) system developed specially for your machinery, Pilz offers operators of plant and machinery a reliable solution with which their personnel can safely control hazardous energy during repair and maintenance routines.

Your requirements

More safety during maintenance and repairs

There are many energy sources that can pose a risk to personnel during maintenance and repair routines. To provide effective protection against these energy sources, machine operators adopt measures in the form of a LoTo system. These ensure that machinery and other work equipment is isolated from the electrical, mechanical or hydraulic power supplies, with measures put in place to prevent such sources from being activated inadvertently.

Machine-specific LoTo systems

Pilz is a proven expert in the field of designing and implementing machine-specific LoTo systems. Through a complete LoTo package, plant operators can implement solutions that reliably comply with current workplace legislation, such as the American standard 21 CFR 1910.147 or the European directives 2009/104/EC and 2006/42/EC.

Our services

Two-stage safety process

The LoTo system from Pilz comprises two stages: LoTo analysis and LoTo process development.

For the LoTo analysis, Pilz examines the existing documentation such as the LoTo guidelines for the plant and the restart lockout processes. This is to ensure they meet the relevant legal requirements or your own corporate standards.

Once the LoTo analysis has been successfully completed, Pilz develops a detailed LoTo procedure in graphic form for each specific machine. This describes, step by step, the individual requirements to ensure that all hazardous energy is governed by the lockout tagout procedure for that machine.

The Pilz LoTo services:

- Analysis of existing systems
- Analysis of corporate guidelines on LoTo
- Analysis of existing procedures
- Development of new procedures
- Conformity with official requirements
- Education and training for personnel on how to identify hazardous energy and how to follow the LoTo procedure



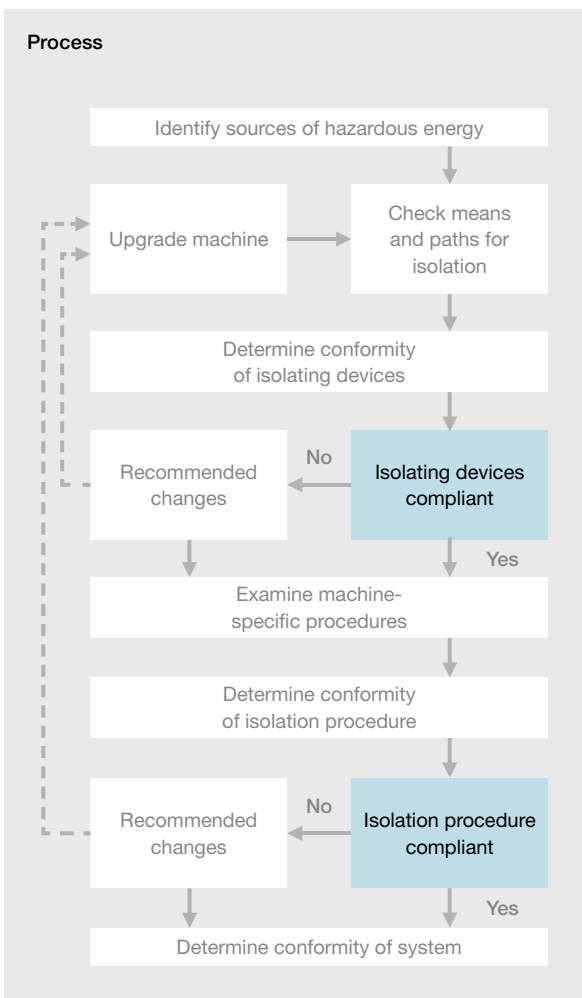


Plant assessment

Lockout tagout system

Inspection of safeguarding devices

Process



In the course of drawing up the LoTo solution, Pilz also develops alternatives for more minor maintenance work to machinery where it is not necessary to interrupt the energy supply to other machines on the line.

Benefits to you

Straightforward, safe and effective approach

The LoTo solution from Pilz gives you an overall lockout tagout strategy and enables you to profit from a practical, safe and effective approach:

- ▶ You increase the productivity of your plant with our LoTo service
- ▶ You reduce your plant's downtime while achieving optimum safety
- ▶ You satisfy the various country-specific regulations or recommendations



Keep up-to-date on Pilz LoTo system

Webcode: web9793

Online information at www.pilz.com

▶ Assuring permanent safety: with an Inspection of Safeguarding Devices by Pilz

By conducting regular inspections of the safeguarding devices in your plant, Pilz helps machine operators to satisfy safety regulations and lay the foundation for improved protection of personnel, minimising the risk and liability.

Your requirements

Inspecting technical safety equipment

Construction, upgrades, manipulation of safeguarding devices or changes to work processes can all undermine the level of protection, which, if undetected, can cause considerable damage and compromise the safety of personnel.

That's why in many countries it is a legal requirement to regularly inspect safety-related equipment on machinery. Machine operators are obliged to carry out an inspection before initial commissioning of a machine and must do so again if it is moved to a new location. Machinery that is subject to heavy use which has an adverse effect on its safety equipment must be inspected regularly. We recommend performing the inspection at least once a year.

Accredited inspection service

Pilz GmbH & Co. KG, Ostfildern, operates an independent inspection body to ISO/IEC 17020, accredited by the DAkkS accreditation body. Our process for the inspection of safeguarding devices is subject to these strict stipulations. This ensures you the maximum possible competence and compliance. Our experienced inspectors will show you which deficiencies are present in the machinery safeguarding. Once an inspection has been successfully completed, we apply the Pilz mark to your machine.

Our services

Inspection of safeguarding devices

Drawing on our industry experience and the technical expertise of our consultants and engineers, we examine all technical safety equipment on your machinery in terms of installation, condition and functionality. This includes E-STOPS, safety gates, two-hand control devices as well as optoelectronic safeguarding devices such as light curtains, laser scanners and camera-based systems. We use overrun measurements to check that specified safety distances correspond to the current condition of your machine.

Pilz inspection of safety equipment comprises:

- ▶ Initial inspection of all technical safety equipment: proper installation, safe functioning and integration into the machine control system
- ▶ Examination of safety functions in the circuit diagram
- ▶ Overrun measurements (to examine the safety clearance specified by the manufacturer)
- ▶ Inspections of all technical safety equipment: current condition, proper installation, safe functioning
- ▶ Handover of a detailed inspection report for the machine documentation
- ▶ Affixing of the test mark (if test passed)



Pilz will continue to support you after the inspection has been completed and will discuss any defects that may have emerged or any other safety-related questions directly on site. Based on these discussions, we can recommend potential solutions that are typical for your industry sector.

Benefits to you

Structured inspection processes and permanent safety

Regular inspections of your safeguarding devices are a reliable way to protect your employees and permanently reduce both the risk and liability:

- ▶ You benefit from our accredited, internationally recognised inspection processes as well as the expertise and objectivity of our inspectors
- ▶ You minimise downtimes and achieve greater plant availability
- ▶ You achieve compliance with the requirements of national directives and laws (for example BetrSichV in Germany, Arbeitsmittelverordnung in Austria, OSHA in the US, PUWER in UK, UWED in Europe)
- ▶ Above all you ensure maximum safety for your employees



Plant assessment

Lockout tagout system

Inspection of safeguarding devices



Keep up-to-date on inspection of safeguarding devices

Webcode: web7776

Online information at www.pilz.com





Pilz training on machinery safety and automation



► Qualifications for success

Anyone working with plant and machinery should above all be up-to-date on the topic of machinery safety and automation. Pilz offers a comprehensive range of training courses on the design, operation and maintenance of machines: this includes human-robot collaboration and future technologies.

Attend one of our certified courses and, following successful participation, you will receive an internationally valid TÜV certificate as proof of your qualification.

► Range of Pilz training courses: Qualifications for success

Benefit from our comprehensive range of training on machinery safety and automation.
Increase your chance of professional success: with Pilz training courses!

Risk Assessment Workshop



Contents and core areas:

- Risk assessments in line with EN ISO 12100
- Risk assessment legislation and standards
- Evaluation methodologies
- Hierarchy of control
- Practical workshops

Safety Design incorporating EN ISO 13849 and IEC 62061



Contents and core areas:

- Processes and standards related to safety control systems specification, design and validation
- Detailed review of principles for design of safety-related control systems

Global range of training courses

Continue your training all over the world with one of our subsidiaries.

Our experts have practical knowledge and can support you in applying optimum manufacturing processes to optimise the availability and productivity of your plants all over the world.

Electrical safety in industrial installations



Contents and core areas:

- ▶ Fundamentals of electrical safety on machinery
- ▶ Requirements of the IEC 60204 standard in relation to electrical safety
- ▶ Electrical installation requirements

Machinery Directive incorporating CE marking




Contents and core areas:

- ▶ European directives
- ▶ The process for CE marking a machine
- ▶ Examples of conformity assessment – step-by-step
- ▶ Risk assessment
- ▶ Functional safety



Training

Keep up-to-date
on Pilz training

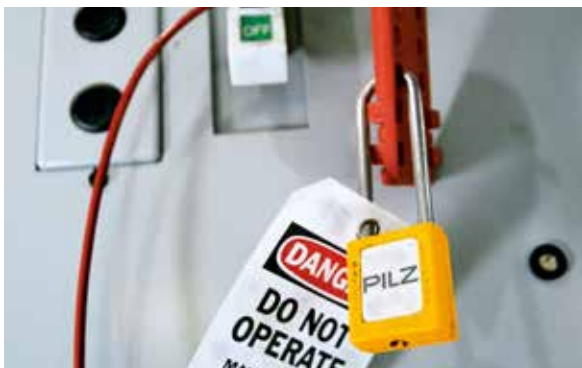
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web150535

Online information
at www.pilz.com

► Range of Pilz training courses: On the same level globally

We offer our training globally on the same level and of course in your local language.
Our tailor-made training courses are individually adapted to your needs.

LoTo: Lockout Tagout



Contents and core areas:

- Requirements and applications of lockout tagout
- E.g. safety-related locking and interlocking of various energy supplies
- Energy types and overview of LoTo processes

Management of risk in machinery procurement



Contents and core areas:

- Risk management and associated costs
- Procurement strategy
- Machinery delivery/acceptance process
- Purchasing used equipment
- Cross border movement of machinery

We also offer:

- A large selection of product and technology training courses
- Many options for further qualifications in all sectors of automation
- Courses with contents that are specially customised for the requirements in your country
- Training packages tailored to your individual needs

Robot safety



Contents and core areas:

- ▶ Safety requirements in the use of robot systems
- ▶ Relevant standards for safety integration in robot cells
- ▶ Assessment of hazards
- ▶ Robot protective measures and safety technology

Safe human-robot collaboration



Contents and core areas:

- ▶ Safety solutions compliant with relevant standards
- ▶ Risk assessments and safeguarding
- ▶ Collision measurement in accordance with ISO/TS 15066 limit values



Training

Further information on the complete range of training courses is available at www.pilz.com

Keep up-to-date on Pilz training

Webcode:
web150535

Online information at www.pilz.com

► Qualification as a CMSE® – Certified Machinery Safety Expert

With the title CMSE – Certified Machinery Safety Expert – you can demonstrate your competence for the whole lifecycle of machinery safety. Once you have passed the final examination you will receive a certificate that is issued by TÜV NORD and is internationally recognised.



More knowledge.
More safety.

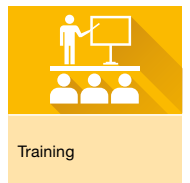
Become a CMSE® –
Certified Machinery Safety Expert!

Knowledge and competence in the field
of machinery safety. With TÜV certificate.

The international machinery
safety qualification.

PILZ
THE SPIRIT OF SAFETY

TÜV NORD



The four-day expert course includes the following content:

- ▶ Comprehensive knowledge of the machine lifecycle
- ▶ Information on current standards and legal practice
- ▶ Details on the risk assessment procedure
- ▶ Functional safety
- ▶ Implementation of compliance strategies

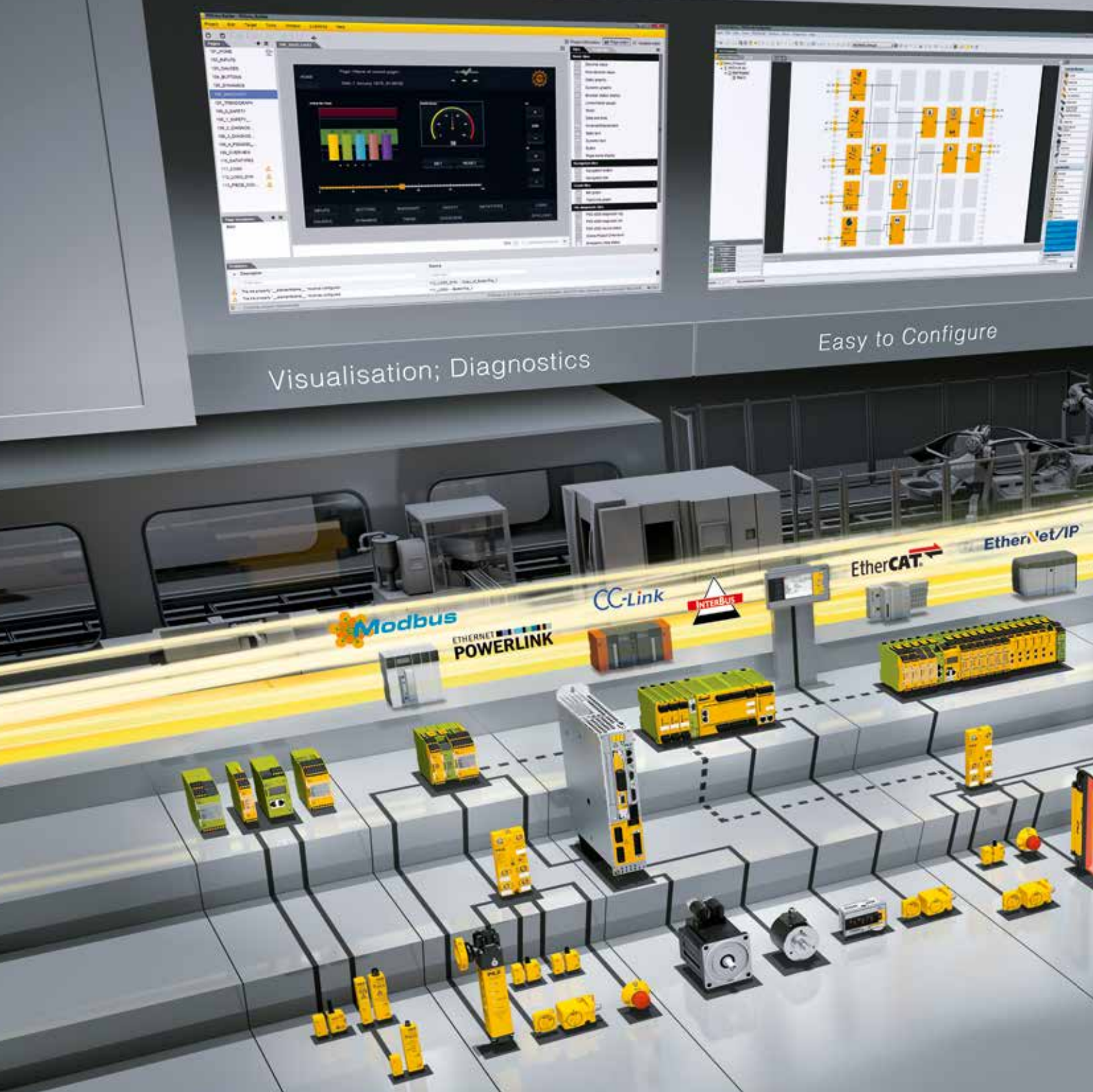
Multinational companies can implement CMSE worldwide as the standard qualification within the organisation. This enables a consistent level of machinery safety competence within the company.

Contents of the course, preconditions for participation and all additional information including the registration form to become a CMSE can be found at www.cmse.com



After being issued with their certificates, each CMSE is automatically granted free access to the exclusive CMSE online community:

- ▶ Forums that are geared to a specific topic to enhance your specialist knowledge
- ▶ Always up-to-date with the latest news about machinery safety
- ▶ Exclusive downloads of white papers, for example



Pilz automation solutions

Pilz offers everything that you need for the automation of your plant and machinery: Innovative components and systems in which safety and automation are merged within hardware and software.

From sensor and control technology to drive technology, the ease of commissioning, operation and diagnostics plays an important role for all components and systems from Pilz.

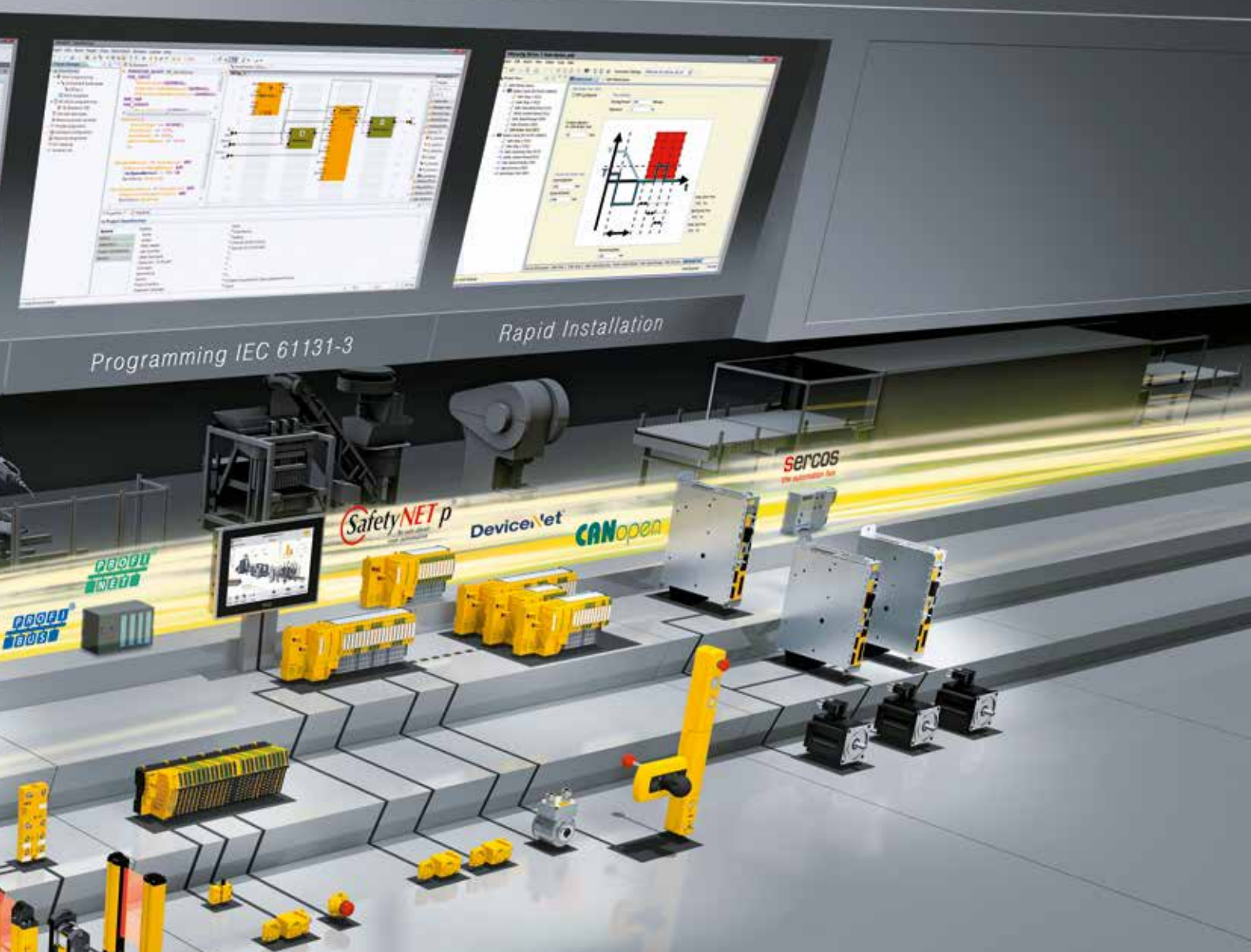
You benefit from flexible solutions for machines with an elementary function range through to large interlinked plants. With us you can standardise your safety, implement safety and automation in one periphery or find solutions for complete automation.

Pilz solutions are embedded into the relevant system environment – whether a new structure or a retrofit – and are open for a variety of interfaces and functionalities.

The perfect combination:

Control technology from Pilz offers numerous application options, including monitoring of electrical and functional safety, through to complete machine control.

Safe sensors and decentralised modules from Pilz guarantee the efficient, compliant use of plant and machinery in combination with various control systems.



Pilz automation solutions

- ▶ Simple configuration, programming and visualisation through innovative software solutions
- ▶ High flexibility due to individually expandable solutions
- ▶ Openness of communication
- ▶ High availability thanks to extensive diagnostic options
- ▶ One system for safety and automation

Our turnkey systems and universally compatible solutions offer a high savings potential.

Drive technology from Pilz is characterised by drive-integrated safety functions, safe logic functions and the connection of visualisation, sensor and actuator technology.

Operator and visualisation systems from Pilz complete your plant and machinery.

Automation software from Pilz allows you to quickly and easily implement your planning, programming, configuration, commissioning, diagnostics and visualisation.

Pilz offers you automation solutions for the safety of man, machine and the environment.

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► Support

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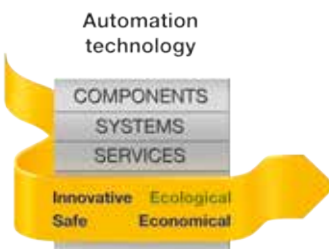
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