



## Pilz Services

**pilz**  
the spirit of safety

Your projects belong in safe hands.

► Consulting, Engineering and Training



## ► Safety for men and machinery

Pilz offer a wide range of machinery lifecycle services, specialising in the protection of man, machine and the environment. We operate internationally as a technology leader in automation technology. Pilz has a tradition as a family-run company stretching back over 60 years. We have real proximity to our customers through our presence in over 30 Pilz subsidiaries, instilling confidence through individual consultation, total flexibility and reliable service.

### **Consulting, Engineering and Training**

We deliver our Services internationally – supported through our local organisations, enabling us to achieve a consistent level of high quality service.

We offer practical and tailored solutions for your company's individual needs and our service professionals provide global safety in all industry sectors. Our customers profit immensely from our ability to provide high levels of knowledge regarding national regulations and standards.

We have a long history in Machinery Safety Services and have conducted challenging and unique projects all over the world. Our professionals go the extra mile by consulting and implementing locally, while maintaining a global outlook. We are your reliable partner of Services for Automation, Plant and Machinery Safety – your projects belong in our safe hands!



### **We support you ...**

... in achieving your safety and business objectives by addressing issues arising when:

- Integrating safety in new manufacturing plants through the identification of risk



- You require plant or machine retrofit activities to increase productivity through automation and improve overall safety
- Integrating automation and machinery into production lines for compliance and certification
- Incorporating and safeguarding high technology machinery, like robotics
- Training personnel to gain national and international knowledge of machinery safety in order to ensure maximum availability and plant safety
- Seeking an accredited inspection body for machinery and safeguarding devices



## **CMSE® – Certified Machinery Safety Expert**

CMSE – Certified Machinery Safety Expert training deals with the complex technical issues surrounding machinery safety and enables an understanding of the safety lifecycle – from legislation, standards and safeguarding techniques to a detailed review of functional safety areas.

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

CMSE qualification is certified by TÜV NORD.

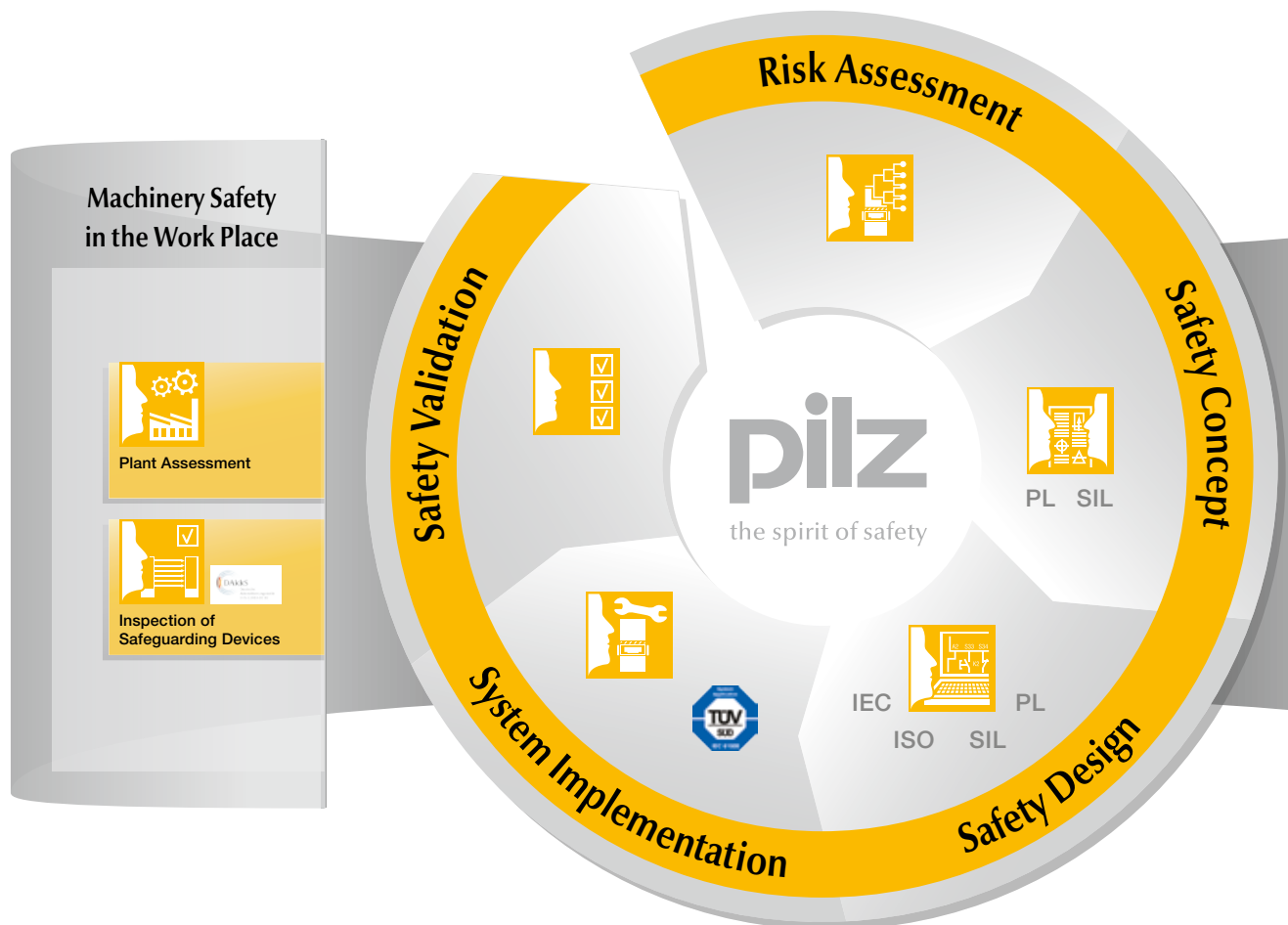
Learn more about CMSE on  
[www.cmse.com](http://www.cmse.com)

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**TÜV NORD**

## ► Consulting, Engineering, Training

As a solution supplier, Pilz can help you to apply optimum safety strategies worldwide. Services encompass the whole machine lifecycle. Our training package with practical, up-to-date course content completes the offering.



### Risk Assessment

We inspect your machines in accordance with the applicable standards and/or international standards and directives and assess the existing hazards.

### Safety Design

The aim of the Safety Design is to reduce or eliminate danger points through detailed planning of the necessary safeguards.

### System Implementation

The results from the Risk Assessment and Safety Design are implemented through selected, tailor-made safety measures.


### Safety Concept

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



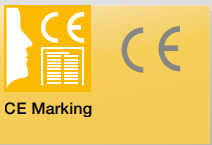
Our management system was certified in the field of system integration to EN/IEC 61508.

Keep up to date about Services from Pilz:

 Webcode 0427

Online information at [www.pilz.com](http://www.pilz.com)

## Machinery Compliance and Certification



### International Compliance Services

We perform the assessment procedure and develop the necessary strategies to enable compliance with the respective ISO, IEC, ANSI, EN or other national or international standards.

### Plant Assessment

We develop an overview of your entire plant in the shortest possible time. We use an on-site inspection to expose the risks and calculate the cost of optimising your safeguards.

### Inspection of Safeguarding Devices

With our independent, DAkkS accredited inspection body in accordance with ISO 17020, we guarantee objectivity and high availability for your machinery.



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

### Safety Validation

The Risk Assessment and the Safety Concept are mirrored and examined by competent specialist staff in the Safety Validation.

### CE Marking

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

### LOTO-System

Our customised Lock Out Tag Out procedures guarantee that employees can safely control hazardous energies.

### Training

Pilz offers two types of training: product-neutral seminars on machinery safety and specific product courses. And for a progress to the expert level in machinery safety we offer the qualification of CMSE® – Certified Machinery Safety Expert.

Knowledge gives you a competitive edge – Training from Pilz:

Webcode 0218

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## ► Risk Assessment



### Your need

Many tasks performed by workers who operate or maintain industrial machines present high levels of risk. When building, retrofitting, interlinking or using machines, a systematic technical Risk Assessment provides a structured method to identify hazards and define protective measures that reduce the degree of possible harm.



### What we do

We take responsibility to perform a documented physical examination and assessment of a machine, carried out under the guidelines of applicable national and/or international standards.

Safety improvement on existing machines can be prioritised and implemented based on known risk thereby ensuring compliance to standards and regulations throughout the working life of the machine. Early identification of hazards on new machines will save time and money by facilitating the integration of appropriate safety measures from the start.

The result of the Risk Assessment process is used to develop Safety Concepts and generate Safety Designs.

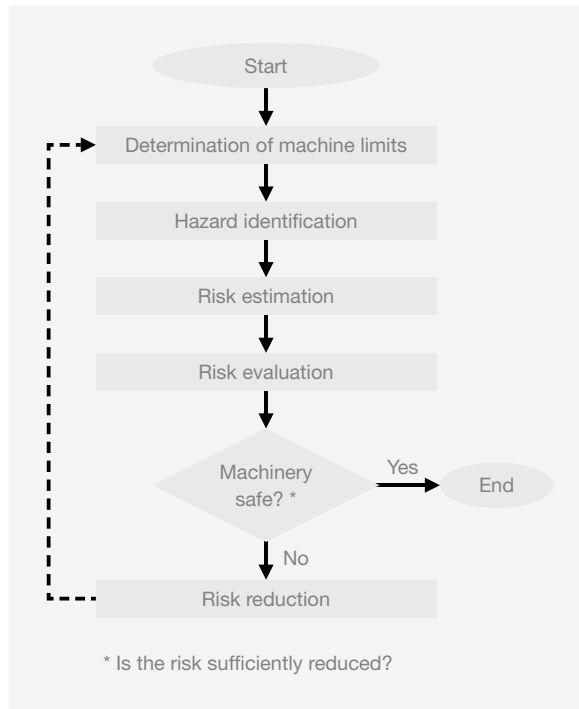
### Risk Assessment includes

- Identification of applicable standards, regulations and best industry practises
- Statement of machine limits
- Examination of all hazards throughout the relevant machinery lifecycle phases
- Estimation and evaluation of risk
- Recommended approach for risk reduction

**Risk Assessment in the machinery safety lifecycle**

In the safety process the importance of Risk Assessment is reflected in the global trend to oblige machine designers and users to follow a structured assessment in order to comply with various national and international standards and applicable legislations.

In Europe the Machinery Directive sets out the obligation “to assess the hazards in order to identify all those which apply to his machine”. In the USA, the American National Standards Institute, Robotics Industry Association and other industry groups promote standards relating to hazard identification and the estimation of risk. Many other national associations and the International Standards Organization (ISO) recommend a risk based approach to effectively addressing machinery safety.



**Your benefit**

Early identification of hazards and integration of appropriate safety measures will extend the working life of your machinery and save you time and money. We will support you by drawing from our experience of assessing machinery in accordance with applicable legislation and standards.

Pilz GmbH & Co. KG, Ostfildern operates an independent inspection body in accordance with ISO 17020 for the plant and machinery sector, accredited by the German Accreditation Body (DAkkS).

**Related services**

- ▶ Plant Assessment
- ▶ Safety Concept
- ▶ Safety Design
- ▶ System Implementation
- ▶ Safety Validation
- ▶ CE Marking
- ▶ International Compliance Services

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## ► Safety Concept



### Your need

When deploying increasingly complex and hazardous new machines and upgrading existing machines for more demanding applications, the right Safety Concept, which considers the interaction of machine operators, maintenance personnel and other workers with machines, is critical.



### What we do

Based on Risk Assessment, engineering solutions are proposed to achieve safety through mechanical, electrical and other measures following best industry practice national in accordance with international standards.

We work in close cooperation with our customers to refine the implementation costs, worker interaction with machinery, operational effectiveness and maintenance requirements.

### Customer story

“Pilz has been of great assistance to us in identifying and providing practical solutions to some complex technical problems.”

Richard Hamilton,  
National OH&S Manager, Bostik, Australia





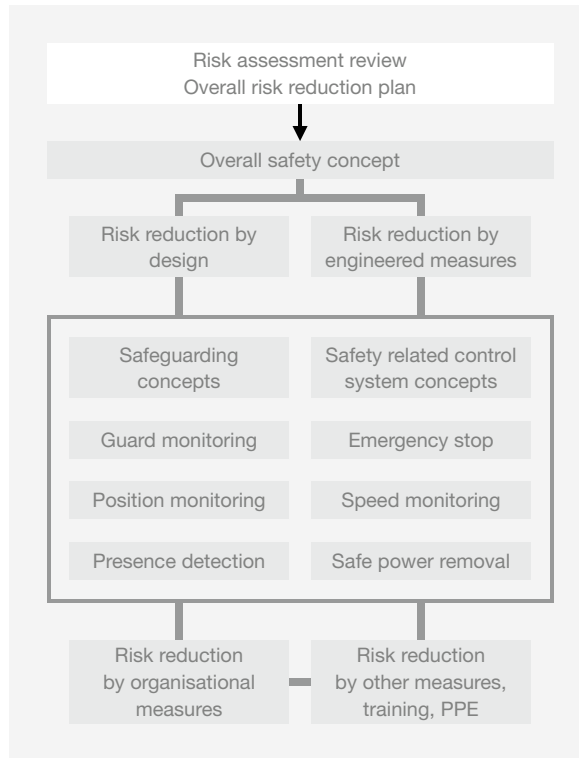
**Safety Concept – the process within the machinery lifecycle**

On completion of a Risk Assessment Pilz will conduct a review of the machine system, identify areas of improvement and suggest concepts required to achieve compliance and safety. This review will facilitate compliance with relevant standards identified as applicable by our safety experts.

Issues considered will include:

- ▶ Use of fixed and movable guards
- ▶ Implementation of line and machine safety related control system
- ▶ Means for safe removal of electrical pressurised fluid power and other applicable energy sources
- ▶ Detection of workers in hazardous areas

Intelligent solutions will be created to ensure safety can be achieved without sacrificing overall plant and machinery effectiveness.



**Your benefit**

Early consideration of best industry practise and innovative engineering measures will reduce risks and operating costs, while addressing compliance with legal and regulatory requirements.

Our practical engineering experience of integrating safety with other disciplines assures compliance and safety while minimising complexity and costs.

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**Related services**

- ▶ Plant Assessment
- ▶ Risk Assessment
- ▶ Safety Design
- ▶ System Implementation
- ▶ Safety Validation
- ▶ CE Marking
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## ► Safety Design



### Your need

When designing new machines or retrofitting existing machines, it is best to integrate safe design right from the initiation of a project.



Technical measures addressing hazards to achieve acceptable risk levels can be implemented with minimum impact on machine complexity, cost and productivity, if considered at an early stage.



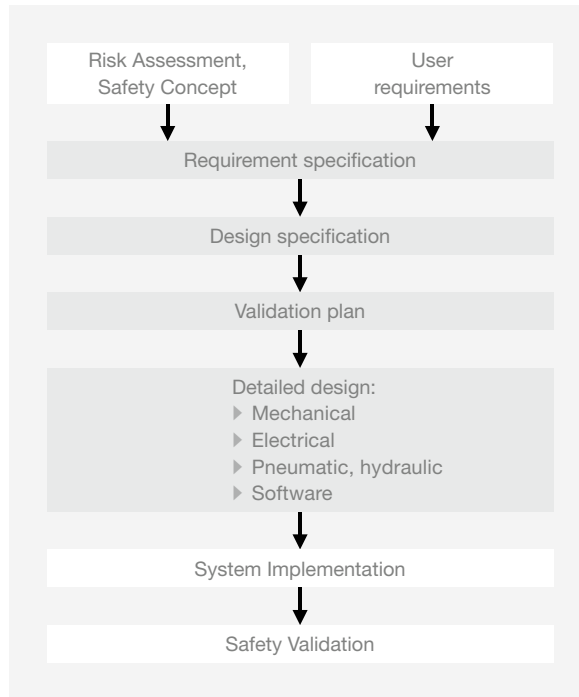
### What we do

With decades of experience in design techniques, standards and technologies required to achieve safety, our engineers will implement a structured design process to achieve results including:

- Safety requirements specification
- Allocation of safety measures to identified hazards
- Determination of integrity and performance levels
- Detailed mechanical, electrical, electronic, software and control system design
- Component selection
- Consideration of design reviews and safety validation

## Safety Design in the machinery safety lifecycle

Optimum results are achieved when a structured process is used at design stage to interpret the requirements, generate detailed designs and plan the following stages of System Implementation and Safety Validation.



### Your benefit

Our structured approach will save you time and money while ensuring safety is achieved with compliance to relevant standards.


When choosing us as your safety design partner you can trust on our reputation, the accreditation of our design systems to internationally recognised standards including IEC 61508.

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### Related services

- ▶ Plant Assessment
- ▶ Risk Assessment
- ▶ Safety Concept
- ▶ System Implementation
- ▶ Safety Validation
- ▶ CE Marking
- ▶ International Compliance Services

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## ► System Implementation



### Your need

Safety systems are critical elements in capital projects relating to automation and machinery. When integrating individual machines into a production line or upgrading existing machines, the time available for the implementation of safety measures and the integration of control systems is usually limited.



Concentrating on your competencies, you are looking for a services partner offering customized consulting and engineering services covering the entire machinery life cycle.



### What we do

Our project managers are experienced in dealing with the scheduling complexities within the constraints of installing and commissioning systems in busy industrial environments. System Implementation includes:

- Project planning and controlling
- Selection and procurement of the required components of actuators, sensors and control devices
- Construction and erection of required mechanical structures
- Construction and testing of required electrical panels
- Electrical and control system installation
- Programming of control and visualisation systems
- System commissioning
- Selection of suppliers and contractors where applicable
- Training of machine operators and maintenance personnel

## System Implementation with Pilz quality and reliability

As a certified safety expert we provide safety, quality and reliability through all our processes and methods. When managing the implementation of safety systems in plant and machinery you can be secure in the excellence and consistency of our work.

Our teams have managed the retrofit of safety systems on machinery in manufacturing plants across many industry sectors including automotive, aluminium and steel production, food and drink, paper converting, consumer goods and medical devices.

Operating to tight timeframes and budgets we incorporate mechanical, electrical, pneumatic, and hydraulic upgrades within the constraints of existing plants.

We have the ability to successfully implement complex automation solutions on high speed production systems.

### Your benefit

The assurance of quality and reliability combined with hands-on engineering experience are essential prerequisites for the success of your implementation.

With the knowledge gained from the Risk Assessment and Safety Design processes, we can deploy experienced engineers to execute rapid implementation of the selected measures.


The implementation will be carried out in accordance with regulations and standards with minimum cost and down time.

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### Related services

- ▶ Plant Assessment
- ▶ Risk Assessment
- ▶ Safety Concept
- ▶ Safety Design
- ▶ Safety Validation
- ▶ CE Marking
- ▶ International Compliance Services

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## ► Safety Validation



### Your need

When installing, retrofitting, modifying or upgrading machinery, you must be confident that work equipment is operating in full conformance with the required safety and comply to regulatory and government standards throughout the production life.



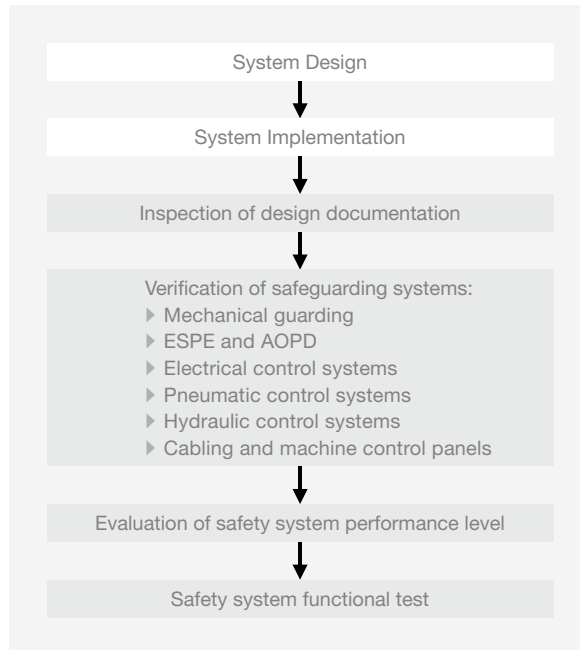
### What we do

By drawing from decades of experience in validating machinery, Pilz engineers have developed a structured method for verifying the safety critical elements of your plant and machinery, thereby validating the suitability of the safety measures implemented. The check used to validate such elements includes:

- Assessment of existing design versus safety requirements
- Evaluation of the components selected
- Check of sensor and actuator installation and wiring configuration
- Test of safety-related software and hardware functions
- Carry out a function test and fault simulation
- Production of reports detailing validation results

## Safety Validation in the machinery safety lifecycle

A structured systematic approach is critical for accurate and effective validation. Through validation planning at the design stage, the steps, inspection measures and resources required for validation are detailed. The required functions and performance levels are verified.



### Your benefit

Safety Validation processes are implemented by competent personnel in a manner that is objective and systematic.


Our practical engineering experience of assessing and integrating safety and our accreditation by internationally recognised bodies, assures compliance of your risk mitigation measures and the overall safety of your plant.

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### Related services

- ▶ Risk Assessment
- ▶ Safety Concept
- ▶ Safety Design
- ▶ System Implementation
- ▶ CE Marking
- ▶ International Compliance Services
- ▶ Inspection of Safeguarding Devices

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## ► CE Marking



### Your need

Machinery manufactured in the EU, imported from non EU countries or substantially modified are subject to the CE Marking process, when put into service or the European market.

The CE mark declares that your machines meet the essential requirements of all relevant EU directives.

Products that carry the CE mark may be imported and sold without restrictions from national regulations within the EAA. That's why the CE mark is also referred to as the "Passport to Europe."

Assemblies of machines such as robotic cells and production lines also fall under this obligation and will be required to be CE marked accordingly.



### What we do

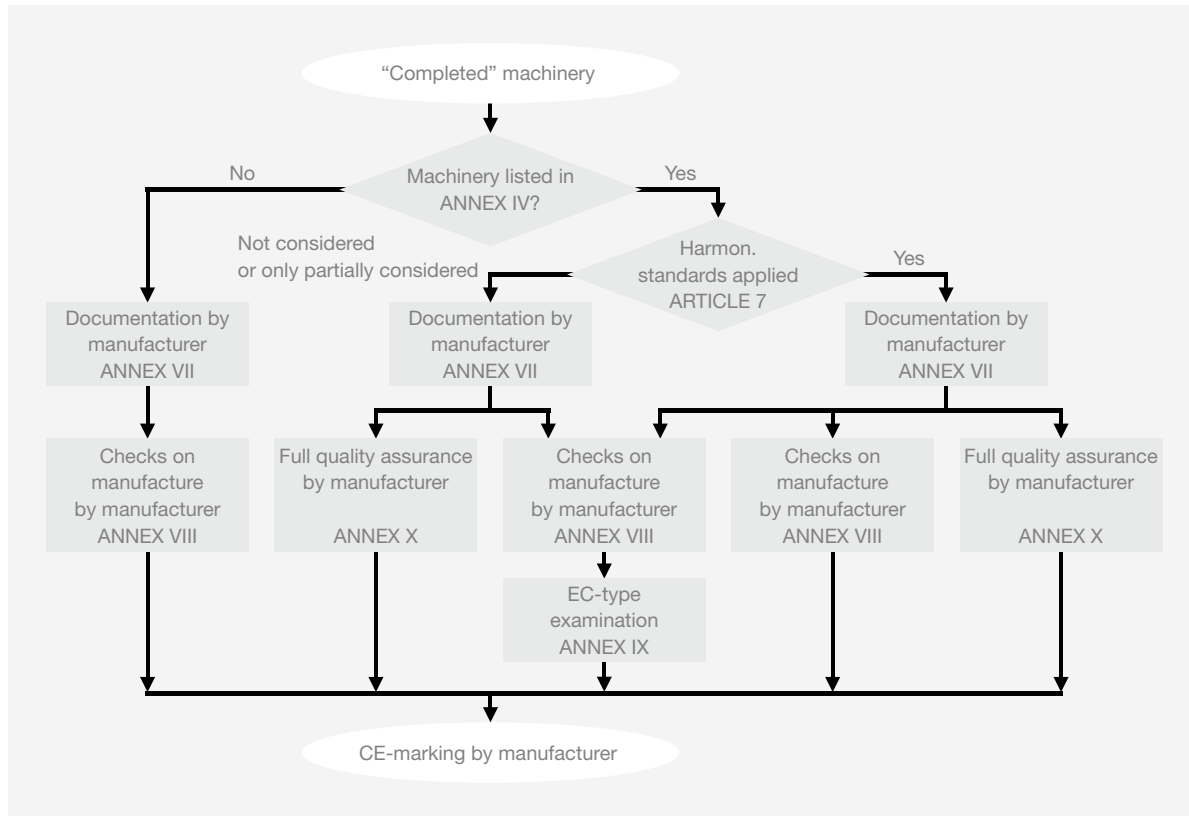
Pilz will manage the activities and processes generating the necessary compliance strategies, safety designs and documents. These include:

- Certification project management
- Determination and application of the relevant directives and standards
- Hazard analysis and Risk Assessment
- Creation of a Safety Concept and generation of related Safety Design / safety requirement specification
- Evaluation of compliance with the Machinery Directive in relation with EHSR
- Conducting required checks, tests, and measurements
- Compiling the legally required documents for inclusion in technical file
- Document archiving and management
- Authorised Representative Service where applicable



**Machinery directive and CE mark**

The CE Marking process and the interpretation of this directive, along with other CE directives and standards requires a high level of knowledge and expertise.



**Your benefit**

Pilz can act as your authorised representative and take responsibility for the conformance procedures for CE Marking. We manage the compliance and safety of individual machines and production lines (complex assemblies) in an ever changing environment. Pilz will help you plan for and achieve compliance with the new machinery directive 2006/42/EC.

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**Related services**

- ▶ Plant Assessment
- ▶ Risk Assessment
- ▶ Safety Concept
- ▶ Safety Design
- ▶ System Implementation
- ▶ Safety Validation
- ▶ International Compliance Services
- ▶ Lock Out Tag Out

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## ▶ International Compliance Services



### Your need

Users and exporters of machines are faced with complex compliance and regulatory issues when putting machinery into service or moving machinery from one country to another. A machine fully compliant with standards and regulations in one country may not conform to national rules in another. Ensuring freedom of movement with cost effective and timely compliance is critical to the success of manufacturing business. Access to the knowledge and resources of a competent compliance partner is therefore essential.



### What we do

In partnership with your compliance and engineering teams, Pilz will conduct the required assessment procedures and engineer the necessary compliance strategies to enable conformance with the appropriate ISO, IEC, ANSI and/or other standards.

We will interpret the regulations applying in the target jurisdiction and define which Occupational Safety and Health regulations apply. That includes those arising from OSHA in the USA, and European workplace safety directives and more.

### We provide

- ▶ Guidance on regulatory requirements when entering new markets
- ▶ Coordination of compliance assessment and test activities
- ▶ Determination and application of the relevant standards and regulations
- ▶ Liaison with local regulatory bodies
- ▶ Advice on Technical Design Approach to Machinery Compliance

## International standards and regulations

In an ideal world standards would recognise no international borders or geographical barriers, have no accent and carry no passport. While ISO (International Organisation for Standardisation) and IEC (International Electrotechnical Commission) prepare and publish standards, many countries, states and regions require compliance to local state or national standards.

Australia, Brazil, Canada, Europe, USA, Russia, Korea and all other major economic regions have mandated standards or regulations requiring machine builders to conduct Risk Assessments on machinery and implement

risk reduction by design, safeguarding or other measures. Structured conformance assessment with documentary evidence through maintenance of the required technical files, is a prerequisite.

Ensuring international compliance requires effective communication and information transfer systems to navigate the complexity of legislation and regulations.

### Your benefit

Reduced approval costs through local conformance analysis by Pilz experts. Reduced risk of market entry or production start up delays.


Our certification guarantees our competency to carry out the activities with a high level of reliability and necessary quality.

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### Related services

- ▶ Plant Assessment
- ▶ Risk Assessment
- ▶ Safety Concept
- ▶ Safety Design
- ▶ System Implementation
- ▶ Safety Validation
- ▶ CE Marking

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## ▶ Plant Assessment



### Your need

In manufacturing plants new machinery is often operated side by side with old machinery. New products also result in modification to existing machinery.



It is a challenge for the plant, and health and safety managers to prioritise the management of risk EHS posed by hazards and implement safety improvement plans and strategies.



### What we do

Our Plant Assessment service encompasses on-site assessment with subsequent evaluation of machinery status and formal presentations of our findings.

We analyse the lifecycle of the machines, with the help of plant and maintenance personnel to identify the main safety concerns. Plant Assessment includes:

- ▶ An analysis of the primary hazards on individual machines
- ▶ Evaluation of the existing risk reduction measures
- ▶ Judgement on compliance of machines with applicable regulations
- ▶ A review of the viability of upgrading the safety aspects of the machine
- ▶ Prioritised recommendations on approach to improve current status



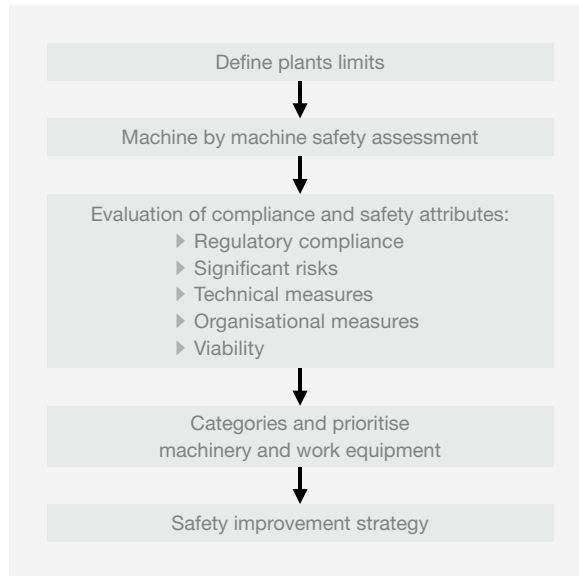
### Customer story

"Pilz conducted Plant Assessments in both of our Bailey's bottling and packaging plants. The reports received were concise yet comprehensive enabling our management team prioritise activities in pursuit of continuous improvements to set the highest standards in safety"

Aidan O'Donnell,  
Group Health and Safety Manager, DIAGEO, Ireland

## Methodology

Pilz have adapted a structured Risk Assessment methodology to use in the Plant Assessment service. With this approach we rapidly gain sufficient data and information to make judgements on the important compliance issues and safety factors impacting your plant. Each machine is assessed using a simple multi attribute smart rating system so as to establish a suitable estimate of safety requirements and priorities that should be provided for each machine.



### Your benefit


Drawing from the experience of projects with machine builders and machine users all around the world, our expertise and comprehensive report on the safety status of the machinery will provide you with information on which you can prioritise effective investments, thereby optimising profitability.

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### Related services

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- ▶ Safety Concept
- ▶ Safety Design
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# ► Inspection of Safeguarding Devices



## Your need

As an employer, you are responsible for always providing only safe work equipment. That's why in many judicial systems it is a legal requirement to regularly inspect safety-related equipment on machinery. That way any safety defects that have arisen during assembly or refitting, any manipulation of safeguards or changes to work procedures, can be identified early and rectified.



The scope and schedule of these inspections are defined in various national directives and laws, such as BetrSichV in Germany, OSHA in the USA, and PUWER in the UK, for example.



## What we do

With our experience of the industry and the technical competence of our staff, as a DAkkS accredited inspection body in accordance with ISO 17020 we can guarantee objectivity, high availability for your machinery and the highest possible safety for your staff.

You receive a detailed inspection report for your machine documentation. We are happy to discuss any defects that may have emerged or any other safety-related questions directly on site; we can also demonstrate potential solutions that are typical for your industry. If the inspection is passed, the machine is given a Pilz quality seal.

We inspect all technical safeguards with regard to installation, condition and safe function. This includes E-STOPs, safety fences, two-hand control devices as well as optoelectronic protective 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.

## Legal background

The use of safeguards and their subsequent inspection is regulated in various international and national legal provisions. OSHA 29 CFR 1900.1 (USA) and the European directive 2009/104/EC (Use of Work Equipment Directive) are among the most important. The latter has been incorporated into domestic law throughout almost the whole of Europe via statutory instruments such as the industrial safety regulations (Betriebssicherheitsverordnung) in Germany and "PUWER" in the UK.

Once the equipment is installed it is the responsibility of the machine operator to carry out an inspection before it is put into service for the first time and each time it is installed in a new location. Machines that are exposed to wear and may potentially have an adverse effect on safety equipment must be inspected regularly. The operator himself must define the intervals at which equipment is inspected; we recommend this is at least once a year.

## Scope of services

- ▶ Initial inspection of all technical safeguards: proper installation, safe function and incorporation of the machine control system
- ▶ Inspection of safety functions in the circuit diagram
- ▶ Overrun measurements (inspection of the safety distance specified by the manufacturer)
- ▶ Inspection of all technical safeguards: current condition, proper installation, safe function
- ▶ Inspection report is provided
- ▶ Quality seal is attached
- ▶ Test interval is defined




## Your benefit

Having been accredited by DAkkS (German accreditation body) as an independent inspection body in accordance with ISO 17020, we (Pilz GmbH & Co. KG, Ostfildern) can guarantee the capability of our inspectors through their technical competence and objectivity. This accreditation is your legal guarantee that you are booking a competent person as stipulated by law. It is valid internationally.

- ▶ Comply with safety regulations: Protect your employees and reduce risk as well as liability
- ▶ Minimise downtimes and maximise the availability of your machines
- ▶ Achieve higher plant availability and increased safety for your staff
- ▶ Place your trust in our professional inspection processes with our Pilz quality seal (DAkkS)

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Online information  
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**pilz**  
the spirit of safety



## ▶ LOTO System: Lock Out Tag Out – Control of Hazardous Energies



### Your need

There are many energy sources that can potentially pose a risk to industrial employees. These include electrical, mechanical, hydraulic, pneumatic, chemical, thermal etc. Employees operating, servicing or maintaining machines or equipment will be exposed to high risks if hazardous energy is not adequately controlled.



US Regulation 21 CFR 1910.147 and European Workplace Regulations 2009/104/EC and 2006/42/EC require that employers develop a system of work to ensure machinery and other work equipment is isolated from its energy sources and secured in a way that will not cause the energy to become accidentally re-energised.



### What we do

Pilz offers a complete LOTO System package, consisting of two stages: LOTO Analysis and LOTO Procedure Development. Both solutions are combined in a practical tailor-made package for our customers. Pilz will create customised Lock Out Tag Out procedures, which can be located at the machine to ensure that employees can safely control the potentially hazardous energy during services and maintenance.

### LOTO Services includes

- ▶ Analysis of existing equipment
- ▶ Analysis of company LOTO policy
- ▶ Analysis of existing procedures
- ▶ Creation of new procedures
- ▶ Compliance with regulatory requirements
- ▶ Clear graphical LOTO placards to be installed on equipment

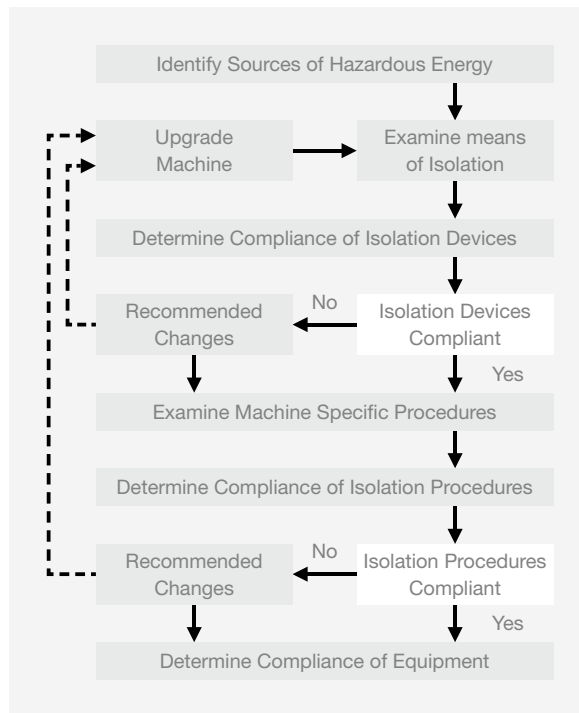


**Process**

The Pilz engineer will examine the existing documentation, such as the plant LOTO policy and Lock Out procedures. This is to ensure they meet the legal requirements in the relevant jurisdiction. The review of the documentation will look to ensure that:

- ▶ There is a clear policy covering LOTO
- ▶ Adequate procedures for LOTO are in place
- ▶ The procedures are followed on the floor
- ▶ Staff carrying out LOTO are competent to do so
- ▶ All energy sources identified
- ▶ Appropriate LOTO devices installed
- ▶ Appropriate verification devices available

Once the recommendations have been implemented, Pilz will develop detailed graphical procedure for each machine. The Procedure will detail the step by step requirements to ensure that all hazardous energies are controlled by the Lock Out Tag Out Procedure.




**Your benefit**

- ▶ Profit from a simple, safe and effective implement of LOTO
- ▶ Benefit from machine specific LOTO procedures created by Pilz located at your equipment
- ▶ Utilise alternative safeguards or partial de-energisation of the equipment
- ▶ Increase you productivity with our LOTO Service
- ▶ Ensure your LOTO policy reduces equipment downtime while achieve optimum safety
- ▶ Meet the different requirements across all jurisdictions through our international network of safety experts
- ▶ Take advantage of the proven reliability, flexibility and competitiveness of our approach

**Related services**

Pilz also offers 1 day Lock Out Tag Out training which provides a detailed overview of the specific practices and procedures.

Keep up to date with Safety Services:

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# ► Support

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Pilz develops environmentally-friendly products using ecological materials and energy-saving technologies. Offices and production facilities are ecologically designed, environmentally-aware and energy-saving. So Pilz offers sustainability, plus the security of using energy-efficient products and environmentally-friendly solutions.



Presented by:



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