

Machine safety

Creating a safe workplace
across the board



Vicoma improving connections

Vicoma has been bringing people and knowledge together to improve processes and installations for over 60 years.

Now and in the future:

The importance of m

The moment you start working with machines or equipment that have powered components, one topic is essential: Machine safety. Machines generally have moving parts that pose risks to people and the surrounding area. Machine safety is therefore a precondition to achieve zero workplace accidents for everyone who is in contact with the machine: from the manufacturer to the operator to the service engineer. At the same time, machines are constantly evolving and becoming more complex since the emergence of Industry 4.0 (connecting machines) and 5.0 (the interaction between humans, technology and sustainability), artificial intelligence and advanced automation. In future-proof environments, too, ensuring machine safety is crucial. Vicoma has extensive expertise in this area and is happy to offer customers support.

Laws and regulations

The basic safety requirements that must be complied with until 2027 to counter potential hazards (of a mechanical, electrical or thermal nature) are laid down in Machinery Directive 2006/42/EC. From 2027, machinery regulation 2023/1230 will apply. A manufacturer or assembler is obliged to certify a machine or machine assembly according to CE standards.

Many companies purchase machinery that meet the Machinery Directive, meaning that these machines already have the CE mark. Whenever you make a substantial modification to a machine, however, you become liable as the owner of the machine, and no longer the original manufacturer. At that point, you become manufacturer of the change. What's more, many industrial settings, for instance in production lines, have two or more machines linked together so that they function as a single unit or serve the same purpose. In these set-ups, the assembly of machinery must also comply with the Machinery Directive.

Machine safety

Safe working conditions

In addition to the Machinery Directive, you take to consider the working conditions and the occupational health and safety legislation, and the building that houses the machinery must comply with the Dutch Buildings Decree. Depending on the sector and environment, the hygiene guidelines (EHEDG/HDN) must also be followed, a HAZOP* needs to be conducted and a review of the PGS (Publication Series on Dangerous Substances) is required. To sum up, there are many laws and standards that companies need to know and follow. Vicoma provides support on one or more facets in this area. Vicoma can conduct both a risk assessment of the assembly of machines and a complete safety analysis of the entire plant.

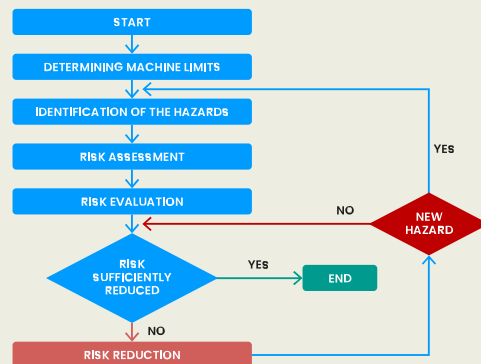
** **Hazard and Operability study**, a structured systematic examination of a process installation at P&ID level to identify hazards to personnel, equipment or the environment, as well as operability problems that could affect operations efficiency.*



Machinery Directive requirements

Anyone designing or manufacturing a machine – or assembly of machines – must meet at least the following conditions:

- The machinery must be designed in a way that guarantees mechanical and electrical safety, and functional safety (e.g. safe control circuits) measures must be implemented.
- The machine is as safe as possible at the time of its release.
- Everything possible has been done to minimise the risks and it is not easy to bypass machine safety or protection devices.
- The risk assessment has been completed.
- After a successful assessment, a declaration of conformity must be drawn up and the CE mark is required.
- Technical documentation and operating instructions should be prepared that immediately draw the attention of machine users/operators to the labelled, existing residual risks and must also be available in the national language where the machine is located.



Safety assessment

During a safety assessment, Vicoma looks at all possible safety aspects: mechanical, electrical and thermal hazards, noise risks, danger from vibrations, radiation, high pressures, and so on. Vicoma is also a member of the HDN (Hygiene Design Network) and can monitor compliance with the hygiene requirements of the food and pharmaceutical sectors. Vicoma has TUV-certified engineers who can design SIL-classified instrumentation loops.

What can you expect from a comprehensive safety assessment?

After an initial meeting, we arrange an on-site visit. The purpose of this visit is for a safety expert to look closely at the plant according to clear steps. This involves taking photographs in order to capture essential details. A 360° camera is used to map the entire plant and the surrounding area. After this, the safety expert conducts a risk assessment and discusses the findings with the client. If required, this is followed by a gap analysis containing the main areas of concern and actions to be taken.

Procedure for CE declaration

The CE mark is an important part of the Machinery Directive. It is a declaration by the supplier that it complies with European legal guidelines and standards. A number of steps need to be completed before a manufacturer or assembler is allowed to affix CE marking:

- Confirm whether the product requires CE marking.
 - Define the **boundaries** of the assembly or machine.
 - Check the **product-specific requirements**. Not every requirement in a directive or standard applies to every product. Therefore, define what the product does and does not need to meet.
 - Check that the **documents** supplied comply with CE regulations.
 - **Visit the site** and ask questions to operators, maintenance engineers and other staff involved. The Machinery Directive does not stop after the manufacturing is complete. Usage and maintenance also need to be taken into account. Some of these considerations are measures that enable safe cleaning, repair and maintenance.
 - Fill in the **checklist** that has all essential health and safety requirements in order to comply with the Machinery Directive.
- Prepare a **risk inventory and evaluation** (RI&E) that, if necessary, includes proposals for risk mitigation measures.

- Draw up an overarching **operation & maintenance manual**.
- Set up a **technical file** that enables you to demonstrate that the product meets the directive's requirements. This document must be kept for at least 10 years unless the directive prescribes a longer period. This technical file must be kept up-to-date. Any changes to the product, for example, must be recorded in the file.
- Apply a **CE mark** and prepare a CE declaration. The **CE declaration** is an acknowledgement by the manufacturer that it is responsible for the conformity of its products with the applicable directives.

Client	
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	DESIGNATION OF TYPE
	Client
	Configuration of machines
	TYPE: 3191 / 001
	RELEASE DATE: 2024



Risk Inventory and Evaluation (RI&E)

- To avoid having to take risk mitigation measures afterwards, it is recommended to assess the design for safety as early as the design phase. Vicoma can support companies in this with a review on the 3D layout, optionally including 3D scan and PID (Process Instrumentation Diagram). Visualisation allows you to uncover potential risks before manufacture or assembly. Making changes to the design is usually still relatively straightforward in this phase.
- At this stage, functional safety (PL/SIL) is also determined by means of an RI&E. If required, Vicoma's Electrical & Instrumentation department can help set up an SRS (Safety Requirement Specification). This indicates the specifications the safety functions need to meet. At a later stage, it be used as an inspection mechanism during validation.

In summary:

What can Vicoma do for you?

Vicoma can play a role by supporting companies in complying with the Machinery Directive. There are several ways that Vicoma can help:

- Checking whether a notified body is needed.
- Checking which standards and guidelines apply.
- Conducting a risk inventory and evaluation.
- Determining the functional safety (PL/SIL).
- Creating an operation & maintenance manual, technical file.
- Preparing the declaration of conformity and making the name plate.
- Setting up an SRS (Safety Requirement Specification).
- Performing a safety assessment of the entire plant.
- Contributing ideas for technical solutions to safety risks.

The engineers at Vicoma are experts in managing a wide variety of projects from start to finish and safeguarding machine safety. After all, machine safety is a precondition for zero accidents at the workplace. We also act quickly with flexible multidisciplinary teams and short lines of communication.



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An innovative, flexible, and independent Consultancy & Engineering firm

Our consultancy and engineering firm has been working for 60 years with a wide array of clients on single and multidisciplinary projects. What can you expect from us? A pragmatic and flexible approach.

Our engineers are capable of overseeing diverse projects from start to finish, handling the engineering aspect efficiently. We also operate swiftly with flexible teams and streamlined communication channels. Being an independent family-owned business, it's inherent for us to prioritize your interests alone. As such, we are not publicly listed and are not tied to specific contractors.

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