



WHITE PAPER:

Small mark, huge effect: CE

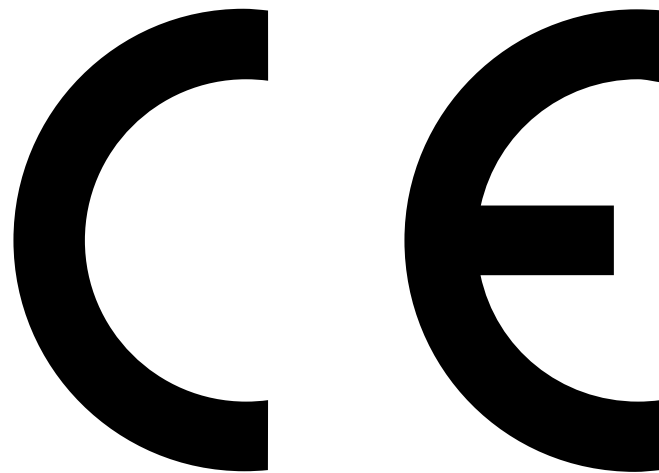
CE certification in commerce in the European Economic Area and in global exports

igus®

Introduction

In the area of growth, German mechanical engineering struggled even before there were trade barriers and partially homogenized world markets: in recent years, industry experts¹ have tended to refer to a flat trend rather than growth. In 2018, mechanical engineering and equipment construction were able to break away from the unusually long flat period and began to grow again. Nominal sales rose to 232.5 billion euros. Machine prices were often six figures, and costs for operating manuals, other documentation, and the CE marking are often minor in comparison. However, any change to the latter can have disastrous and expensive consequences. This white paper examines the standing of CE certification in commerce in the European Economic Area, but also addresses global exports. It shows why the CE marking can be a decisive factor in

ensuring the safety of people and machines in times of increasing globalization and can reduce costs if clear processes are followed.



Globally familiar CE marking
Source: igus®

CE – voluntary commitment to quality

No product leaves the factory without a CE marking – from a robot-supported manufacturing plant to a simple milling machine to complex medical products. The CE certification basis has come to encompass more than 25 EU directives.

The greatest difference between it and the many other certificates available worldwide is that CE stands for a kind of voluntary commitment. Those who sign for the issue of the CE marking or the affixing of it to a machine or product declare that planning, design and construction has been according to the standards.

Most other certifications are based on external testers who certify the quality of a product, confirming it with their signatures. In such cases, the certifying authority or tester must, in the first instance, make a statement if there are injuries to personnel or damage to material. Whether the external authority is then entirely liable, or the manufacturer must assume some of the liability, is a complex question. Only the courts can answer it.

The success of the principle of voluntary commitment is certainly related to the high quality requirements that have developed in the European Economic Community over many years. Engineers from industrial nations such as Germany and France know their responsibility and live up to it. History also contributes: over the years, the CE marking has found its way into more and more regulations,

from the Machinery Directive to the Electromagnetic Compatibility (EMC) Directive to the Low Voltage Directive (LVD) to RoHS substance restrictions to personal protective equipment. Even toys now boast the small marking.



Typical child's toy with a CE marking
Source: stock

¹ VDMA, Economics and Statistics; Mechanical engineering – figures and charts 2019.

CE certification: reduce risk, increase safety



Final CE marking process for system commissioning

Source: igus®

It is easy to see why this applies across all areas of life: the CE marking stands for safety. The most important task behind the complex CE certification regulations is to ensure safety for people and machines. The goal is to use complex testing to reduce risks that could result in accidents, including work accidents.

The rule in Europe is that machines must fulfill the requirements of Directive 2006/42/EC, the European Machinery Directive, before being placed on the market. An important component is the risk assessment during the design process, which is used to determine the health and safety requirements for the machine. Only then can the results of the risk assessment be taken into account during machine/system design and construction. By affixing the CE marking after completing a system, the manufacturers declare to all authorities, customers and markets, that their machine/product complies with valid legal requirements – no matter where in the world it is used.

Great expense and effort – huge advantages

Before affixing the marking, machine and system manufacturers go through an extensive, painstaking conformity assessment procedure. If these companies work exclusively with reputable suppliers who also place importance on verifiable quality, bought-in components are often also CE-certified. Remember: the marking stands for voluntary self-testing. So with the marking, the supplier can give customers a reason to trust its components. The supplier's decision to issue the CE marking for its products depends on whether the component is responsible for the intended use of the machine in which it is installed. That is why the CE marking can be found almost everywhere – from screws to small resistors. It grants component manufacturers the certainty needed to guarantee that screws, for instance, can be installed in any conceivable application and still deliver what the technical specifications promise.

Screws, motors, energy chains, control cabinets and robots: the conformity assessment procedure necessary for the CE marking always includes the risk assessment. If companies do not proceed with the required care or even completely disregard the mandatory regulations when they apply the marking, they are entirely liable for all injuries to personnel and damage to material.

If purchasers must decide between more or less cost-effective components, they should always consider the value added by the CE marking.

Ideally, a CE marking on an individual component simplifies the risk assessment that the system manufacturer must perform on the entire machine. Each system manufacturer must also undergo CE certification for their machine.

A painstaking but rewarding process.

igus® has undergone CE certification for its e-chain® and chainflex® cables, for example. The most important part of the process is the risk assessment. In this iterative process, experts examine the intended use of e-chain® and chainflex® cables and consider all conceivable, predictable incorrect uses of the components. The first step of such a risk assessment is for design engineers and planners to define the intended use of such chainflex® cables. The responsible parties then determined all relevant directives and standards that apply to cable manufacture. This might be the Machinery directive, the Low Voltage Directive, or the EMC Directive. They then determined the requirements and conditions for the use of chainflex® cables. Another point was the question of responsible "appointed authorities" that must be involved in a conformity assessment procedure. These national authorities are authorized in each EU country separately and then reported to the EU Commission. Deutsche Akkreditierungsstelle (DAkkS), which is responsible for monitoring all certification, testing and inspection offices provides an overview of German institutes. For chainflex® cables, the next step was comprehensive testing. The company used its own laboratory, which now encompasses 3,800 m², including outdoor areas.



igus®'s own test laboratory
Source: igus®



One of the many test set-ups
for cables
Source: igus®

The focus here was on endurance tests for e-chain® movements and also chainflex® cables, which are central components of applications which use e-chains®. On average, 800 tests that return data relevant to risk assessments are being performed on chainflex® cables at any one time. The more than two billion test strokes and the estimated 1,561 production and monitoring tests performed each year, generate data from around 292 million double strokes to support risk assessments for chainflex® cables. They are performed under all parameters that could conceivably occur once the devices reach the end customer, including fluctuating temperatures (climate chamber) and contamination (outdoor test set-up). The company uses this extensive cable testing to check chainflex® cables, taking into account all stages of life with respect to the relevant (European) standards. After the testing is completed, the responsible parties prepare technical documentation and translate it into all target languages.

Finally, a declaration of conformity is prepared. Based on that declaration, no chainflex® cable leaves any of our plants worldwide without the appropriate CE marking, whose certificate customers can also download from the company's website.

Conclusion

Whether they are producing a manufacturing plant or individual components, companies that wish to act with legal security and keep market and trade barriers low in non-European commerce will not be able to avoid compliance with harmonized standards published in the relevant official journals. The process of CE certification represents a painstaking but unique case of voluntary self-regulation that can ensure adherence to health and safety requirements – worldwide and across all industries.

If the complex CE certification process can be made more transparent in the future, it will lead to more understanding on the part of customers, who will be able to purchase measurably more quality.

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