

How to Ensure Machine and Plant Safety:
Standardization and Services

Safety Services from SEW-EURODRIVE



CE Conformity:
MD 2006/42/EC

Services throughout the value creation chain

Being a specialist in drive technology means we never stop moving. In addition to constantly optimizing our own processes, we therefore also offer a comprehensive range of services along your entire value chain. This defines the approach to adopt, while our services focus on the relevant process steps.

Engineering & selection

- Engineering consulting
- Engineering tools
- Training from SEW-EURODRIVE
- Safety services
- Energy consulting



www.sew-eurodrive.de/engineering-selection

Inquiry & order

- Shopping cart
- Transaction overview
- Electronic data interchange (EDI)
- Electronic invoicing



www.sew-eurodrive.de/inquiry-order

Startup & maintenance

- 24h Service Hotline
- Installation Consulting Service
- Startup Service
- Inspection and Maintenance Service
- etc.



www.sew-eurodrive.de/startup-maintenance

Delivery & material flow

- Electronic delivery notification
- Intelligent material flow with DriveTag



www.sew-eurodrive.de/delivery-material-flow

Individuality coupled with long-standing international expertise

In addition to customized system solutions, MAXOLUTION® also stands for a comprehensive and adaptable modular service portfolio. Thanks to our years of experience in providing system solutions for international projects, we have built

up a modular service portfolio for optimizing your project implementation. The portfolio covers every phase of the product life cycle – from consulting, planning, and engineering to implementation, startup, and production monitoring.

We offer you a comprehensive solution geared to your specific needs and coordinated with our system solutions.

MAXOLUTION® modular service portfolio

Customized
consulting /
engineering

Customer-focused
project
management

Software
Programming and
startup

Training

Project-specific
system modifications
and testing

System and
machine simulation

Emulation and
virtual startup

Process simulation
and visualization

Safety services

Energy consulting

Worldwide delivery
logistics

Production
monitoring



Further information about MAXOLUTION® system solutions is available here.

Comprehensive Functional Safety Management

Companies that want to present themselves as technological leaders and global innovators on today's market have to provide top-quality products, customer-oriented services, and perfectly implemented process solutions. SEW-EURODRIVE fulfills these requirements in all processes and products.

According to international standard IEC 61508, Functional Safety Management (FSM) is about planning all necessary activities and implementing them in integrated processes. The declared aim is to ensure the functional safety of all products

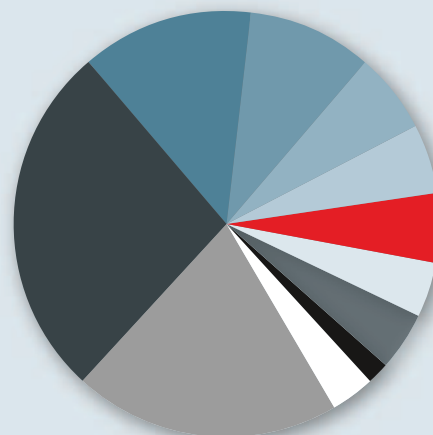
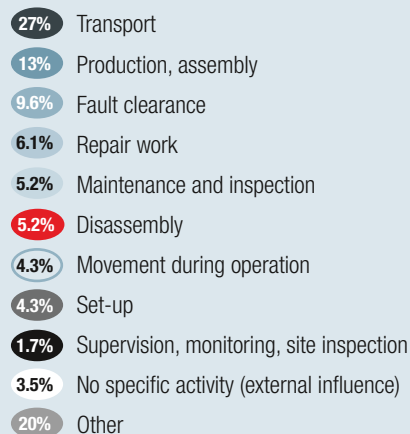
during all development, production, and sales processes. This is why a corporate safety guideline has been formulated that applies throughout the company.

Tracing the causes

Every hazard can be traced back to a source of danger. This source can have very different causes and be influenced by a variety of factors. By

applying the "double-checking principle" and giving safety officers maximum independence, companies can effectively close any gaps.

Primary causes of accidents (error distribution)



Source: Dangerous products 2016. Information on product safety.
German Federal Institute for Occupational Safety and Health (BAuA)

One of the key focal points in Functional Safety Management is ensuring that staff have the necessary qualifications for the relevant topics and standards.

All the FS services that are available have been successfully certified by TÜV Rheinland. The certificate issued to SEW-EURODRIVE confirms the following points:

- The conformity of the documentation supplied
- The quality of the package contents
- The qualifications of the employees
- The practical suitability of the software tools used

As a result, SEW-EURODRIVE can provide an extensive product and service portfolio for drive technologies that satisfies Machinery Directive 2006/42/EC.

By issuing this certificate, TÜV Nord is verifying that SEW-EURODRIVE has successfully introduced and applied Functional Safety Management and complied with the requirements of the following standards:

- IEC 61508:2010
- IEC 61511:2005 (Corrigendum 1)

Another reason to opt for FS services, products, and consulting from SEW-EURODRIVE.



The processes of the product life cycle must be defined and monitored in Functional Safety Management. Technical safety services from SEW-EURODRIVE ensure compliance with process requirements and optimum utilization of internal resources.

Machinery Directive 2006/42/EC

The basis for machine and plant safety

Innovations in machines and plants have always been the basis for faster and more efficient solutions and, consequently, for economic progress and growth. European mechanical and plant engineers in particular are setting global standards with their products. Besides taking into account technical considerations, companies must also observe legal regulations and standards when developing, building, and selling machinery and plants.

On December 29, 2009, the new Machinery Directive 2006/42/EC came into effect, stipulating important new conditions for mechanical and plant engineering. The new directive replaced the old 98/37/EC directive without a transition phase and applies to all machines and plants sold in the European Economic Area.

Machinery Directive 2006/42/EC comprises several standards that are intended to improve machine safety. These include EN ISO 13849-1+2 and EN 62061, which regulate the functional safety of safety-related electric, electronic, and programmable electronic control

systems. In addition, there is the IEC 61508 standard for Functional Safety Management (FSM), which defines the necessary requirements for processes, responsibilities, and organization. When combined with other specific safety standards, a network is formed that affects all areas of mechanical and plant engineering. The purpose of all these measures is to increase the safety of machines and plants. SafetyDRIVE from SEW-EURODRIVE doesn't just ensure that machines and plants can be operated safely, it can also help improve efficiency, optimize safety functions, and thus drive down costs.



The CE marking indicates that a product complies with the requirements of the Machinery Directive.

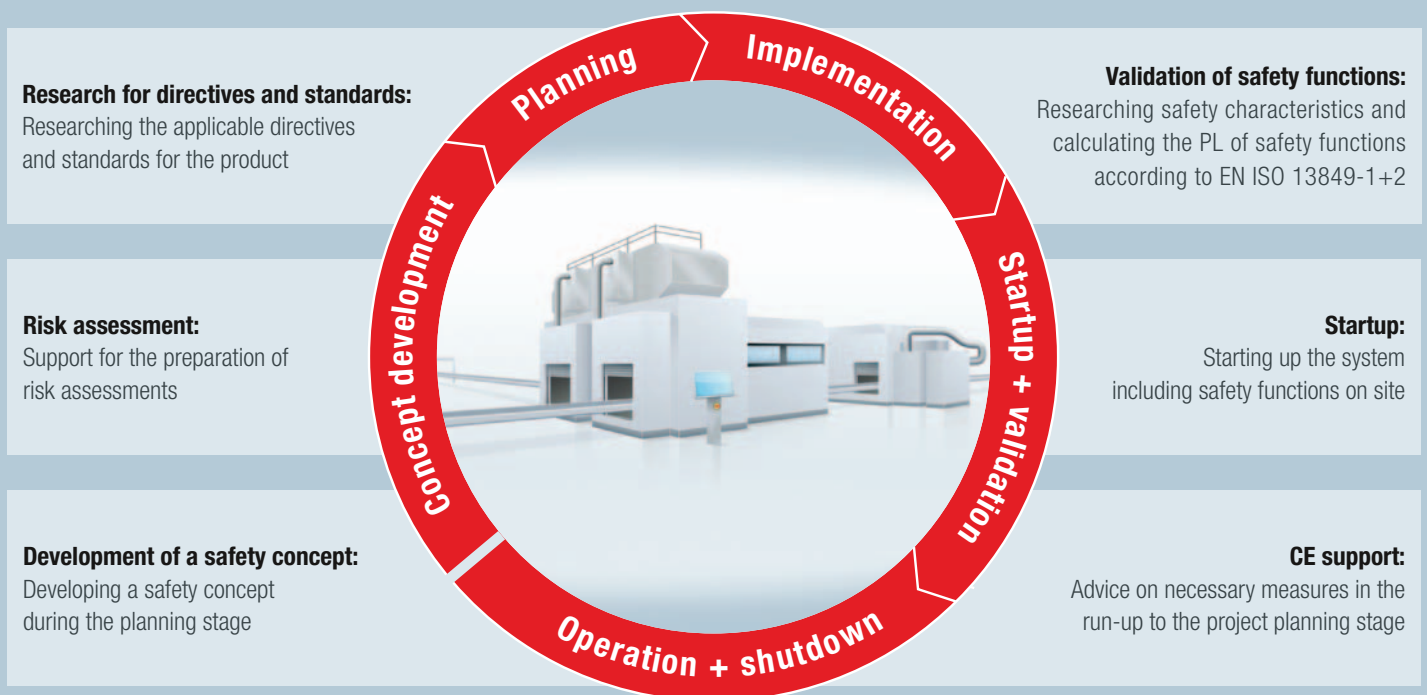
By displaying the CE marking, the responsible body declares that:

- The product complies with all applicable Community rules and
- All stipulated conformity evaluation processes have been performed.

The CE marking enables the unrestricted movement of goods within the European Economic Area.

Safety services from the safetyDRIVE program

We offer you safety components and characteristic values in the form of data sheets and a SISTEMA library. Our portfolio is rounded off with modular safety service packages that have been certified by TÜV Rheinland.



All-in-one package of certified safety services

We have grouped the 16 phases of the safety life cycle of the IEC 61508 standard into practical units and offer you corresponding service packages.

Your benefits

- ✓ **Cost-effective planning**
Because our safety services provide skilled consulting, certified service packages, and safety solutions
- ✓ **Confidence**
Because our Functional Safety Management offerings and observance of all the necessary steps ensure you can enjoy legal certainty and quality

- ✓ **Efficiency**
Because our modular and customizable safety services ensure you can make the most of safe and reliable drive automation solutions
- ✓ **Lower outlay**
Because our employees are on hand to offer the benefits that come with years of experience

We will guide you step by step to the safe machine

1

Definition of the machine/plant limits

Limits relating to space, time, or usage

2

Identification of hazards, risk assessment, and risk evaluation

3

Assessing the risk for every hazard and dangerous situation that has been identified

EN ISO 13849-1:

Determining the required performance level (PLr) for safety-related parts of controllers and machines of any type (including hydraulic, pneumatic, mechanical, etc.)

4

Evaluation of the risk and selection of measures to minimize the risk through safe construction, functional safety, or user information.

5

Elimination of the hazard or minimization of the risk. Configuration of the safety function and calculation of the achieved SIL/PL

Achievable PL/SIL = lowest PL/SIL in the chain

Achievable PFH/MTTF = sum of the individual PFH/MTTF

6

Validation of the results and verification of the implementation of specific safety functions:

Planning – testing/verification – documentation in line with EN ISO 13849-2, EN 62061, IEC 61508

7

Configuration / installation / startup functional safety

8

CE marking:

- Support for issuing of declarations of conformity / incorporation
- General support for the CE conformity procedure

9

Update / retrofit

- Evaluation of substantial modification to machinery

① ②

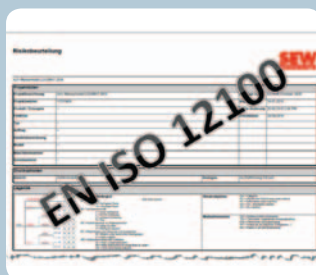


Research for directives and standards

Service package 01

"Research for directives and standards with risk assessment"

① ② ③



Risk assessment

Service package 01

"Research for directives and standards with risk assessment"

④ ⑤

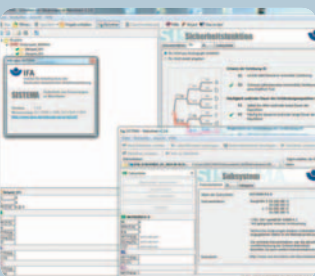


Development of a safety concept

Service package 02

"Safety concept development" / SCL (Safety Configuration Library)

⑥



Validation of safety functions

Service package 03

"Researching safety characteristics / Calculating performance level"

⑦ ⑨



Startup

Service package 04

"Startup / CDM® maintenance management"

⑧ ⑨



CE support

Service package 05

"CE support"

Safety Services “made by SEW-EURODRIVE”

Minimizing risks – lowering costs

+ Service package 01

Research for directives and standards with risk assessment

Researching the applicable and relevant directives and standards for a specific product is quite a challenge. SEW-EURODRIVE offers reliable research into the directives and standards that are relevant for your product. Risk assessment is the basis for all safety technology considerations. SEW-EURODRIVE supports you with comprehensive experience regarding applications, standards, and safety. To find the best possible solution, we work directly with the designers and engineers of your company.



+ Service package 02

Development of a safety concept

The results of the risk assessment are the basis for developing safety concepts during the planning stage for machines and plants. Experts from SEW-EURODRIVE help you select the right combination of components to suit your specific safety requirements. This ensures that an optimum combination of safe design, required safety equipment, and safety-related control technology is implemented during the subsequent project stages.



+ Service package 03

Validation of safety functions according to EN ISO 13849-1+2

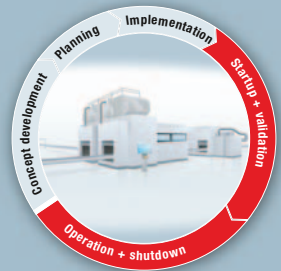
By validating safety functions, SEW-EURODRIVE reduces the customer's liability risks to a small unavoidable residual risk. The safety technology functions of the plant are validated and documented in line with the relevant standards using SISTEMA software. The experience of the SEW-EURODRIVE experts ensures that the right combination of components is found as quickly as possible during the startup and run-up phase.



+ Service package 04

Starting up safety-relevant drive systems

After planning safe integration, the team of safety experts from SEW-EURODRIVE also implements the safety-related drive system in the machine or plant on site. Professional component startup, perfectly coordinated software functionality, and complete documentation ensure your machines and plants are up and running quickly and smoothly.



+ Service package 05

Safety technology training by SEW-EURODRIVE

The skill level of staff and the quality of safety technology processes are essential to ensure the safe operation of a plant. Customized training courses – carried out either on-site or at the DriveAcademy® of SEW-EURODRIVE – are a practical and concrete way to ensure familiarity with the required content and procedures, either regarding products from SEW-EURODRIVE or the necessary basic conditions related to safety management.



+ Service package 05

CE support

SEW-EURODRIVE offers comprehensive consulting for the CE conformity procedure as early as the preparation phase for project planning. The optimum approach can also be adapted to requirements during project-related consulting. This prevents the need for expensive and time-consuming measures at a later stage in the project. This approach makes it much easier to achieve timely delivery and regulation-compliant machine and plant design.



The advantages that will impress anyone with practical experience in this field:

- One partner for the entire product life cycle of your machine or plant
- Comprehensive Functional Safety Management and observance of the required steps ensure legal certainty and quality
- Modular and individually adaptable services for safe drive technology
- Support from highly qualified SEW-EURODRIVE experts with years of experience
- Skilled consulting reduces the need for modifications and reworking

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