



MACHINE DIRECTIVE BASES FOR SAFE MACHINERY

SICK
Sensor Intelligence.

Werner Zipperer

Productmanagement „Industrial Safety & Motion
Control Sensors“

March 2021



- This webinar will be recorded!
- If you would like to receive the **presentation** and / or the **recording** afterwards, we ask for your **consent in accordance with the GDPR!**



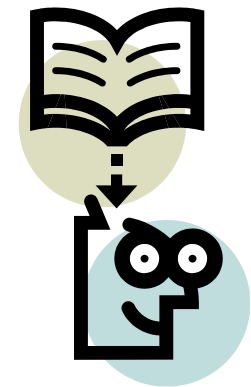
https://s.sick.com/newsletter_registration_at-de





The following points are considered in this lecture:

- : Sense and purpose of European Union (EU)
- : CE-Marking of products
- : Machine Directive – Terms and scope of application
- : Machine Directive – Conformity assessment





EU stands for: *Common basic values of all member states*

- Democracy
- Strive for **respect for human dignity**
- Equal Opportunities
- **Free Trade and Safety**
- Fair Trade
- Solidarity

„Equal Rights for All“



[Source and further Information: http://ec.europa.eu/deutschland/understanding/goals/index_de.htm]

Situation in Europa



: European Directives

.. are issued by the European Commission or the Council of the European Union. The EU member states must ratify them into national laws in accordance with Article 288 of the EU treaty.

European Directives are binding !!!

The Directives are freely available for everyone, e.g under <http://eur-lex.europa.eu/>



: European Standards / Norms

.. are drawn up by the standardization committees and support the directives. The standards propose solutions to questions regarding the construction and equipment of machines and assist the practical execution of the Machinery Directive ...





„MANUFACTURER“ UND „USER“ OF PRODUCTS

EVERONE HAS RIGHTS AND OBLIGATIONS

Single Internal Market

free movement of goods

Internal Markt Directives

- ... harmonising **Products** (*technology*)
- ... focus on Product-„**Manufacturer**“
- ...removal of trade barriers
- ... contain **Design and Equipment regulations**
- ... involve **high demands**
- ... expect possibly a **CE-MMarking**

Unchanged ratification in national law

Health Protection

for all EU citizens

Occupational Health and Safety Directive

- ... harmonising **Humans** (*sociality*)
- ... focus on „**User**“
- ... assuring Safety
- ... contain **provisions for use and safe work** (work equipment)
- ... include (only) **Basic Requirements**

National aggravation in national laws

EUROPEAN DIRECTIVES

HOUSE OF COMPETENCE

Single Internal Market
free movement of goods

Health Protection
for all EU citizens

„Market Placement“

„Providing“

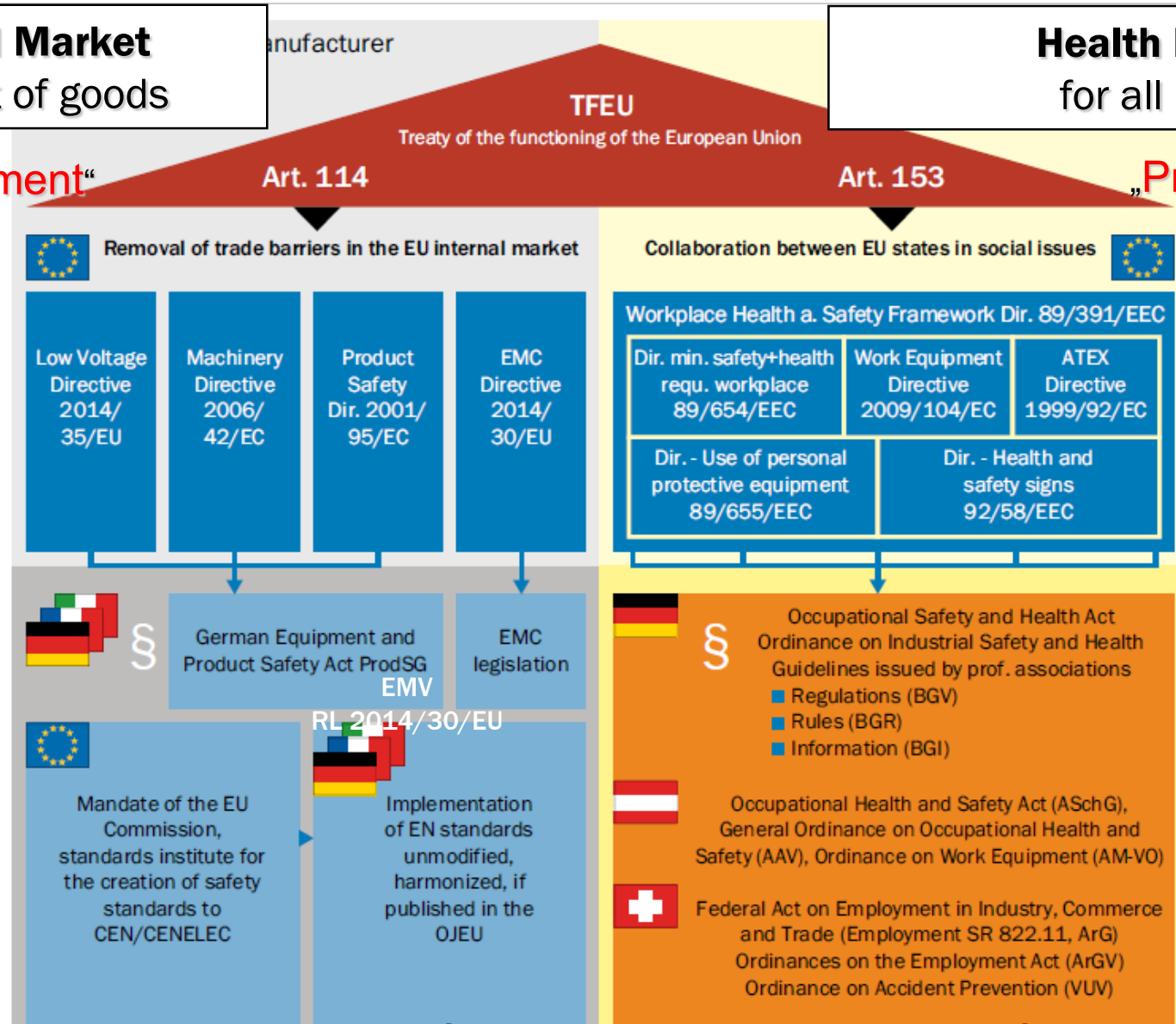
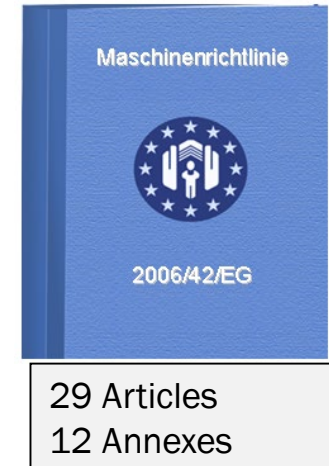




Table of content Machine Directive 2006/42/EG

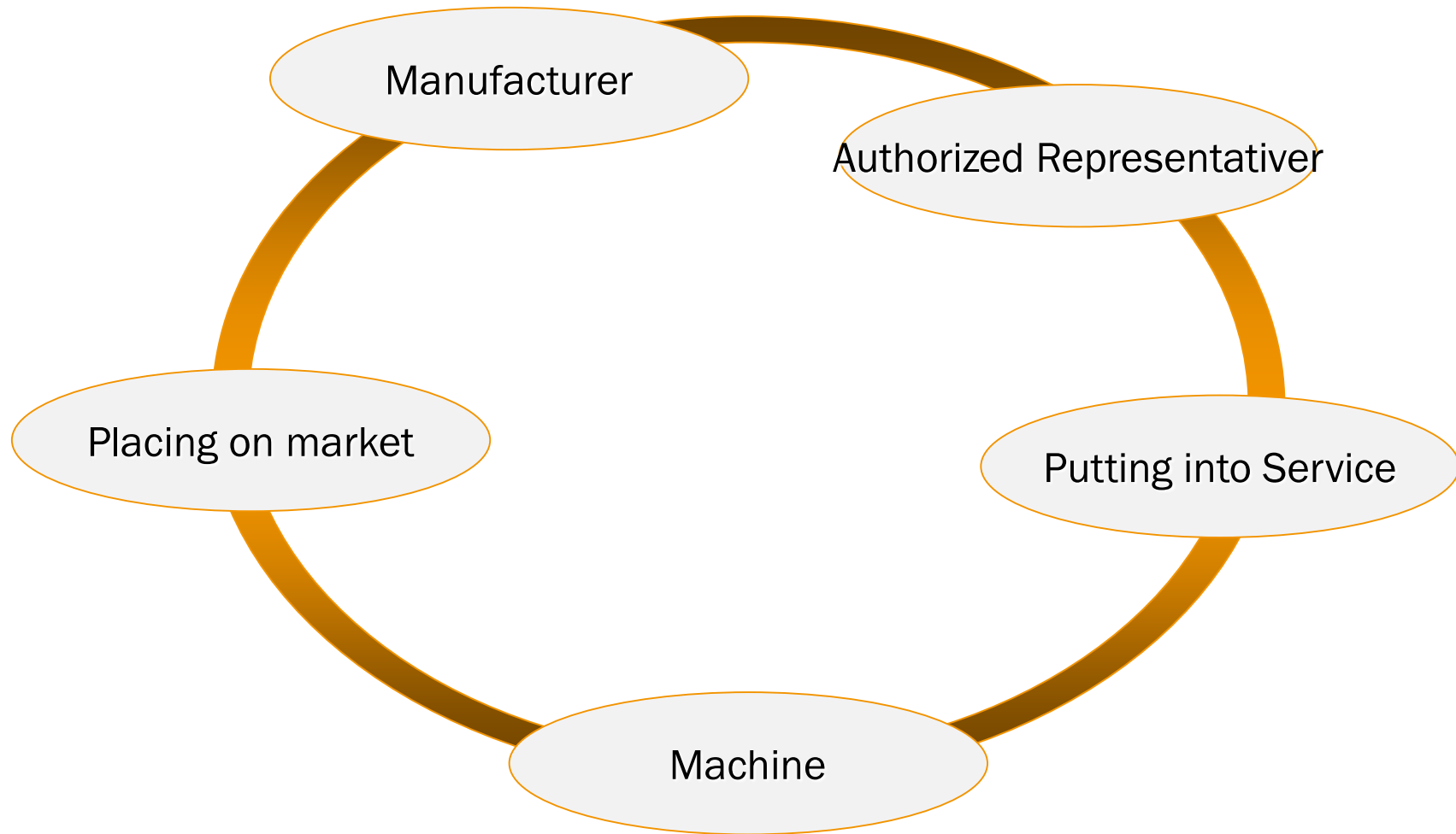
Artikel 1 - 29 : Enactment Part

Anhang I	:	Essential health and safety requirements relating to the design and construction of machinery
Anhang II	:	Declaration of Conformity / Incorporation
Anhang III	:	CE-Marking
Anhang IV	:	„Dangerous Machines“ – special procedure
Anhang V	:	Indicative list of the safety components (to Article 2c)
Anhang VI	:	Assembly instructions for partly completed machinery
Anhang VII	:	Technical files for machinery, technical documentation
Anhang VIII	:	Assessment of conformity with internal checks on the manufacture of machinery
Anhang IX	:	EC type-examination
Anhang X	:	Full quality assurance
Anhang XI	:	Minimum criteria to be taken into account by Member States for the notification of bod
Anhang XII	:	Correlation table (correlation to MD 98/37/EG)





Clarification of the following questions and terms





MACHINE DIRECTIVE 2006/42/EG

DEFINITION OF TERMS

„**Manufacturer**“ is (Article 2i – in a sense)

- any natural or legal person (eg corporations, societies,....
- who designs and / or manufactures
- a Machine¹ / partly completed Maschine¹ (1: ... to MD)
- and is responsible for the conformity of the machinery or the partly completed machinery with this Directive
- with a view to its being placed on the market

If no manufacturer exists within the meaning of the above definition, any natural or legal person who places a machine or incomplete machine covered by this guideline on the market or puts it into operation, is considered a manufacturer.

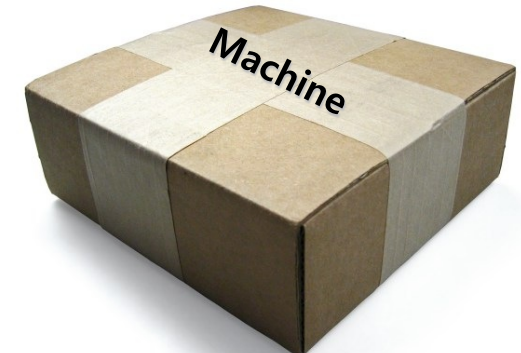


MACHINE DIRECTIVE 2006/42/EG

DEFINITION OF TERMS

„**Placing in the Market**“ means (Article 2h – in a sense)

- making available for the first time
- of a **Machine**¹ / **partly completed Maschine**¹
- whether for **reward** or **free of charge**
- within the **community** (EU)
- with a view to **distribution** or **use**



(1: ... to MD)



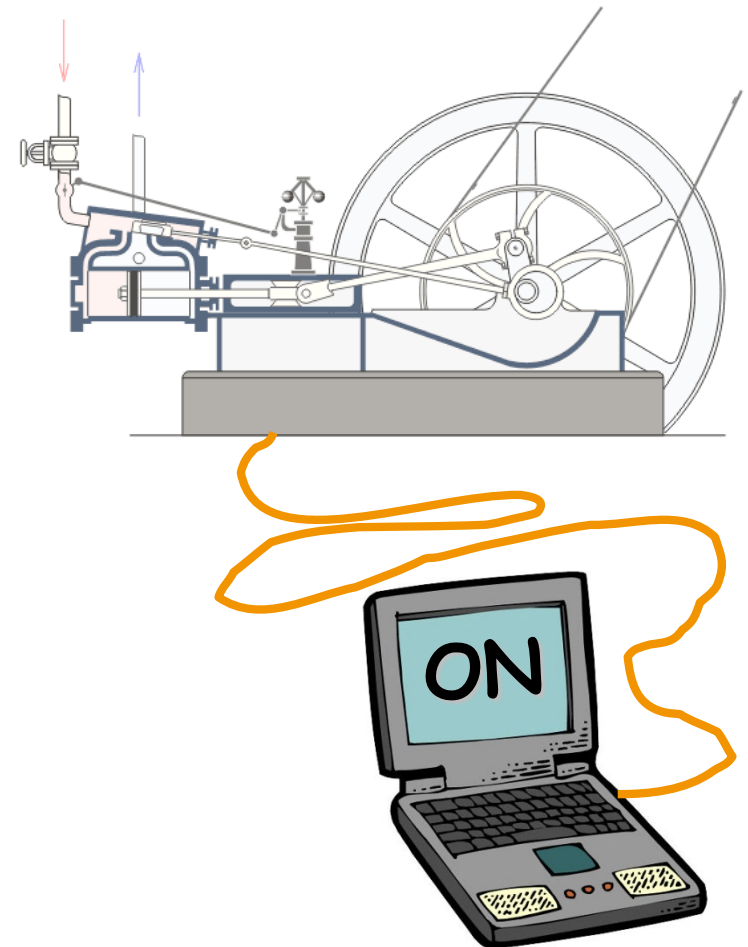


MACHINE DIRECTIVE 2006/42/EG

DEFINITION OF TERMS

„**Putting into Service**“ means (Article 2k – in a sense)

- first use
- of a machine
- for its intended purpose
- within the **community** (EU)

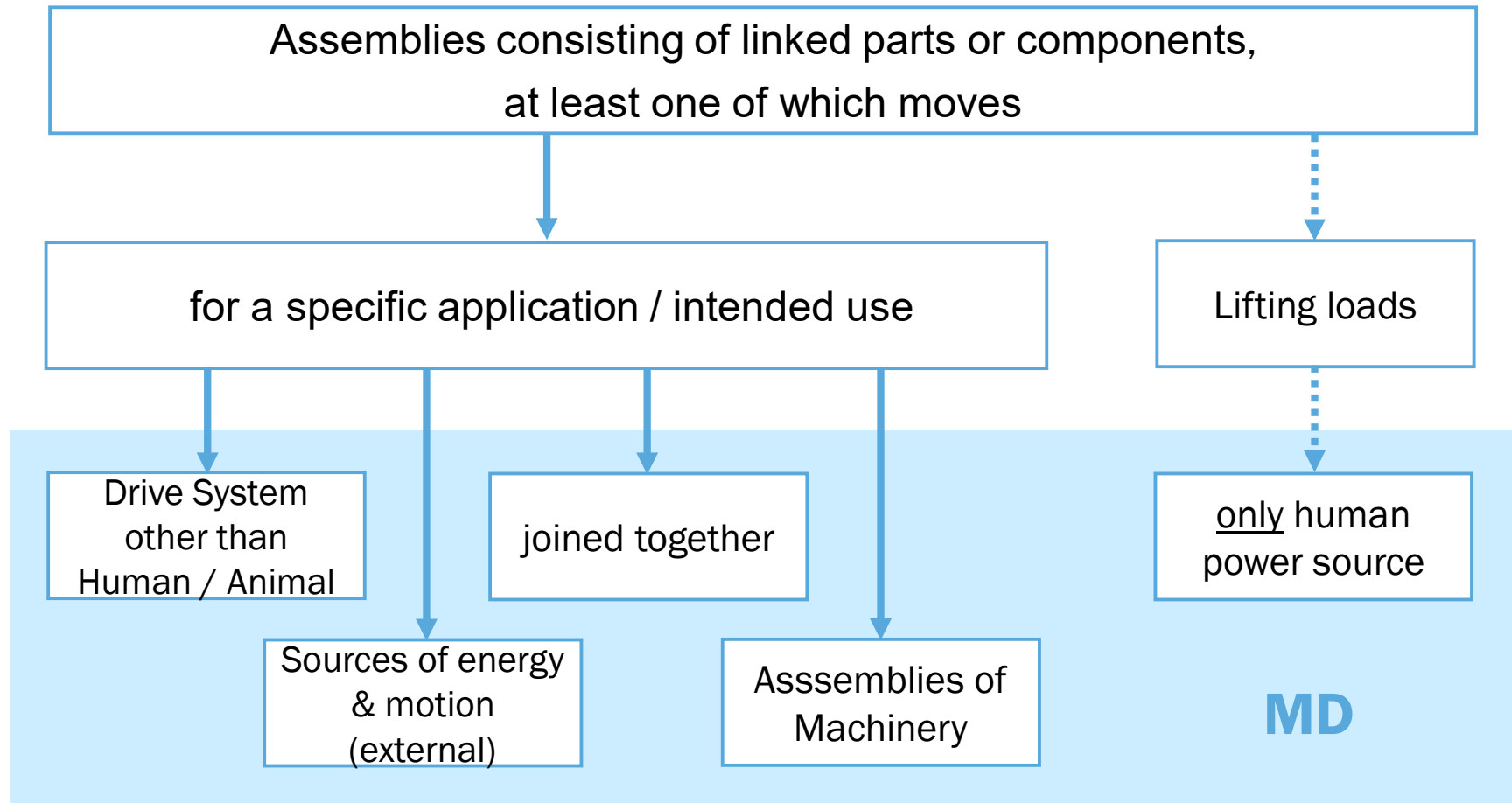




MACHINE DIRECTIVE 2006/42/EG

DEFINITION OF TERMS

„**Machine**“ means (Article 2a – in a sense)





MACHINE DIRECTIVE 2006/42/EG

DEFINITION OF TERMS

Machine

CE



partly complete
Machines



Safety Equipment

CE



Construction
Elevators

CE



Product Scope acc. MD Article 1 (1)

Loadhandling
Devices

CE



Chains, Ropes,
Belts

CE



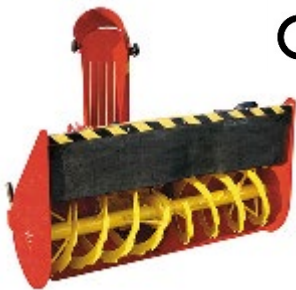
detachable
Driveshafts

CE



exchangeable
Devices

CE





Partly completed Machinery ...

- ... is not a machine yet (it cannot in itself perform a specific application)
- ... is only intended to be incorporated into or assembled with other machinery
- ... thereby making further assembly steps necessary
- ... placing into market requires a specific procedure (→ *Article 13*)



Machines that carry out their specific application on their own and where only the required protective devices or Safety components are missing, are NOT considered as partly completed machines!!



Safety Equipment ...

- ... serve to fulfill a **Safety Function**
- ... is independently placed on the market
- ... is not necessary in order for the machinery to function

failure and/or malfunction endangers the safety of persons

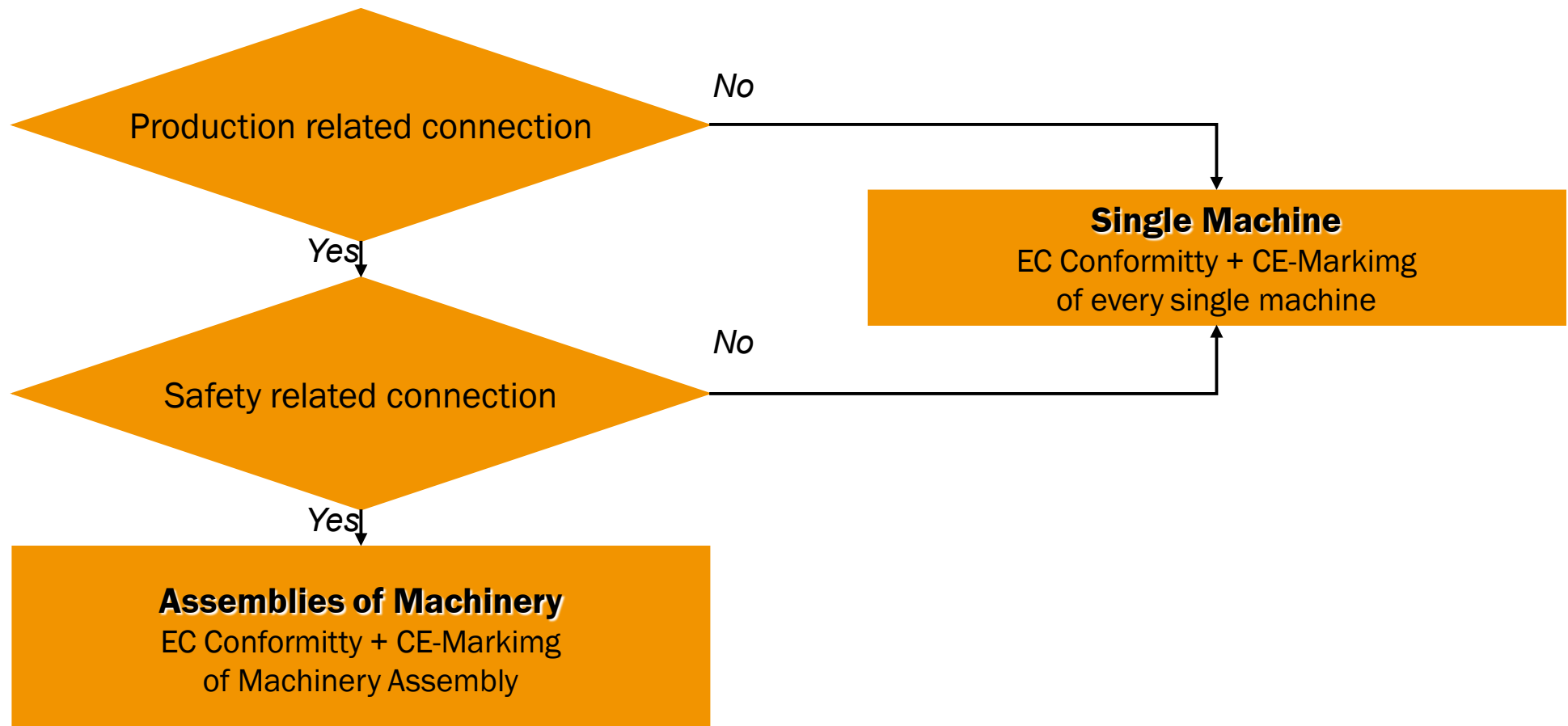


MRL – Anhang V

Indicative list of
safety components



Assemblies of Machinery ...



[Source : Interpretationspapier BMAS / 5. Mai 2011]



MACHINE DIRECTIVE 2006/42/EG

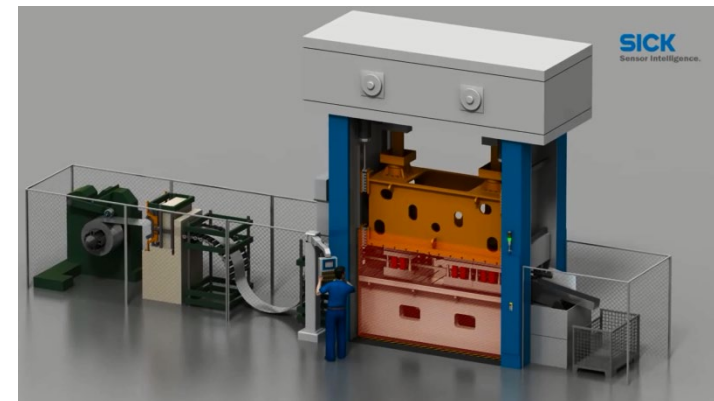
ARTICLE 5

Article 5(1) - „Placing into Market“ and „Putting into Service“ of a **Machine**:

Before placing machinery on the market and/or putting it into service, the manufacturer representative shall:



- 1.) ... *ensure that it satisfies the relevant essential health and safety requirements set out in Annex I;*
(= Essential Health and Safety requirements)



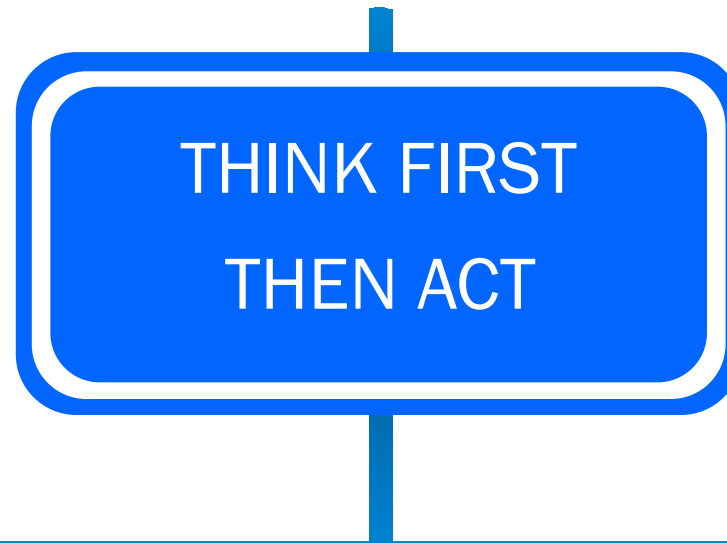


General Principles:



1.) The **manufacturer** of machinery must ensure that a **risk assessment is carried out** in order to **determine the health and safety requirements** which apply to the machinery.

The machinery must **then** be designed and constructed taking into account the results of the risk assessment





MACHINE DIRECTIVE 2006/42/EG

ANNEX I

General Principles:

(3) ***The essential health and safety requirements*** laid down in this Annex ***are mandatory***



(4) ***Nevertheless, it is essential to examine the whole of this Annex in order to be sure of meeting all the relevant essential requirements***



MD Anhang I is the “Guideline for Machinery Designers”



1.1 General Remarks

1.1.2 Principles of safety integration:

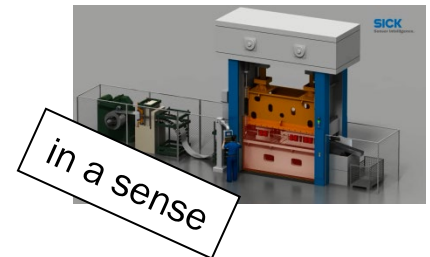
Machinery must be designed and constructed so that ...

... so it is fitted for its function,

... and measures taken must be to eliminate any risk throughout the foreseeable lifetime

- └─ ... envisaging „ **also any reasonably foreseeable misuse thereof**”
- └─ ... especially for **Operation, Setup, Maintenance**, ...

The measures taken must aim to eliminate risks during the anticipated life of the machine, including the time when the machine is **transported, assembled, disassembled, decommissioned and scraped.**



ERGO: Safety in all phases of the machine life cycle



1 Essential health and safety requirements

1.1 General



1.1.3. Materials and Products

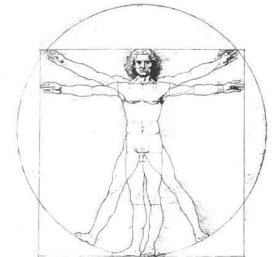
1.1.4. Lighting

1.1.5. Design of machinery to facilitate its handling

1.1.6. Ergonomics

1.1.7. Operating positions

1.1.8. Seating



1.2 Control Systems



1.2.1. Safety and reliability of control systems

1.2.2. Control devices

1.2.3. Starting

1.2.4. Stopping

1.2.4.1 Normal stop

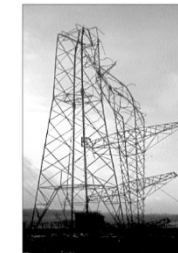
1.2.4.2 Operational stop

1.2.4.3 Emergency stop

1.2.4.4 Assembly of machinery

1.2.5. Selection of control or operating modes

1.2.6. Failure of the power supply





1 Essential Health and Safety Requirements

- 1.3 Protection against mechanical hazards
- 1.4 Required characteristics of guards and protective devices
- 1.5 Risks due to other hazards
- 1.6 Maintenance
- 1.7 Information

2 Supplementary Essential Health and Safety Requirements for certain machines

- 2.1 Foodstuff Machinery / Machines for Chosmetics- / Pharmaceutical Products
- 2.2 Portable hand held and / or hand- guided machines
- 2.3 Machinery for working wood and material with similar physical characteristics



MACHINE DIRECTIVE 2006/42/EG

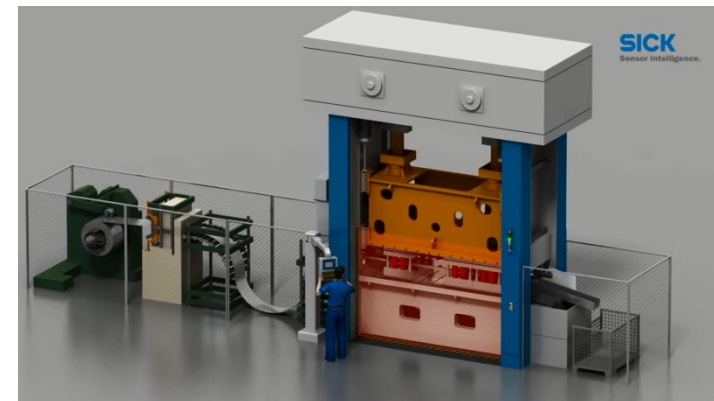
ARTICLE 5

Article 5(1) - „Placing into Market“ and „Putting into Service“ of a **Machine**:

Before placing machinery on the market and/or putting it into service, the manufacturer shall:



- 1.) ... *ensure that it satisfies the relevant essential health and safety requirements set out in Annex I;*
(= Essential Health and Safety requirements) ✓
- 2.) ... *ensure „Technical Files“ are present!*
(according Annex VII - Part A) ✓



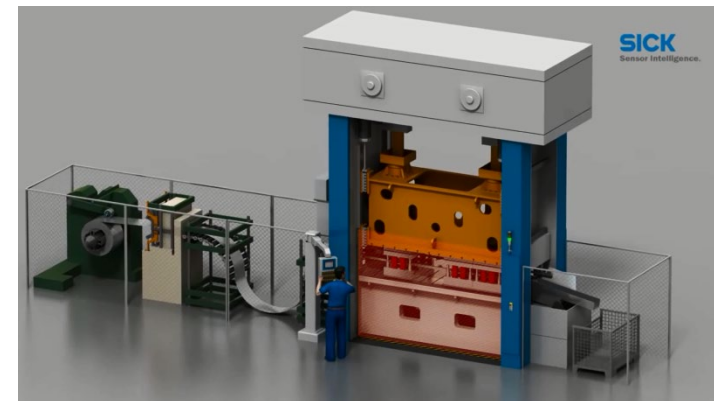


Article 5(1) - „Placing into Market“ and „Putting into Service“ of a **Machine**:



Before placing machinery on the market and/or putting it into service, the manufacturer shall:

- 1.) ... *ensure that it satisfies the relevant essential health and safety requirements set out in Annex I;*
(= Essential Health and Safety requirements) ✓
- 2.) ... *ensure „Technical Documentation“ is present!*
(according Annex VII - Part A) ✓
- 3.) ... *the required information is provided!*
(Operator manual, Brochure, ...)



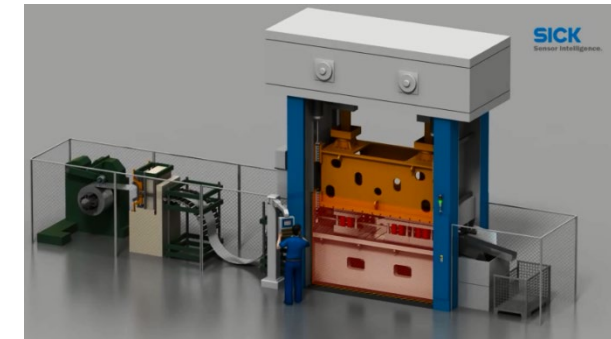


Article 5(1) - „Placing into Market“ and „Putting into Service“ of a **Machine**:

Before placing machinery on the market and/or putting it into service, the manufacturer shall:



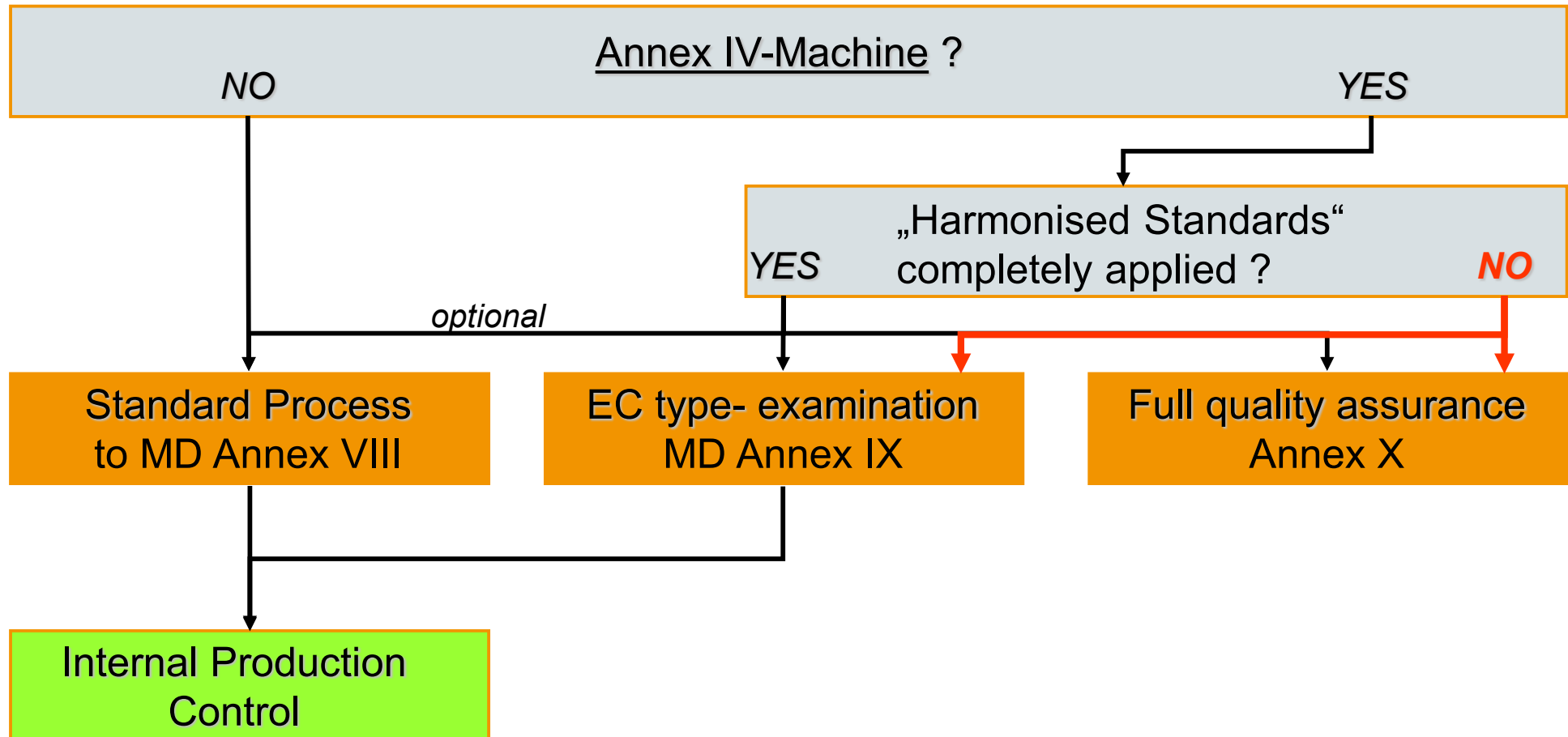
- 1.) ... *ensure that it satisfies the relevant essential health and safety requirements set out in Annex I;*
(= Essential Health and Safety requirements) ✓
- 2.) ... *ensure „Technical Documentation“ is present!*
(according Annex VII - Part A) ✓
- 3.) ... *the required information is provided!*
(Operator manual, Brochure, ...) ✓
- 4.) ... *apply one of the procedures to certify the conformity*
(procedure acc. Article 12)





Article 12 - Procedures for assessing the conformity of machinery:

„One of the three procedures must be applied !!!



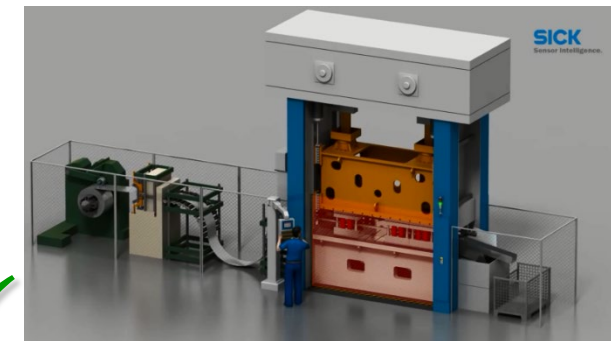


Article 5(1) - „Placing into Market“ and „Putting into Service“ of a **Machine**:



Before placing machinery on the market and/or putting it into service, the manufacturer shall:

- 1.) ... ensure that it satisfies the relevant essential health and safety requirements set out in Annex I;
(= Essential Health and Safety requirements) ✓
- 2.) ... ensure „Technical Documentation“ is present!
(according Annex VII - Part A) ✓
- 3.) ... the required information is provided!
(Operator manual, Brochure, ...) ✓
- 4.) ... apply one of the procedures to certify the conformity
(procedure acc. Article 12) ✓
- 5.) ... prepare the EC declaration of conformity and attach it to the machine!
(Declaration acc. Annex II – Part1 – Chapter A)





MACHINE DIRECTIVE 2006/42/EG

EC DECLARATION

Annex II: Declarations 1: **CONTENT** A: **EC DECLARATION OF CONFORMITY**

The EC declaration of conformity must contain the following information:

1. business name and full address of the manufacturer (...where appropriate his authorized representative)
2. name and address of the person authorized to compile the technical file, who must be established in the Community
3. description and identification of the machinery, including generic denomination, function, model, type...
4. a sentence expressly declaring that the machinery fulfils all the relevant provisions of this Directive and where appropriate, a similar sentence declaring the conformity with other Directives and/or relevant provisions with which the machinery complies
5. where appropriate, the name, address and identification number of the notified body which carried out the EC type-examination referred to in Annex IX and the number of the EC type-examination certificate
6. where appropriate, the name, address and identification number of the notified body which approved the full quality assurance system referred to in Annex X
7. where appropriate, a reference to the harmonized standards used, as referred to in Article 7(2);
8. where appropriate, the reference to other technical standards and specifications used
9. the place and the date of the declaration
10. the identity and signature of the person empowered to draw up the declaration on behalf of the manufacturer or his authorised representative

The declaration relates only to the machine in the state in which it was placed on the market

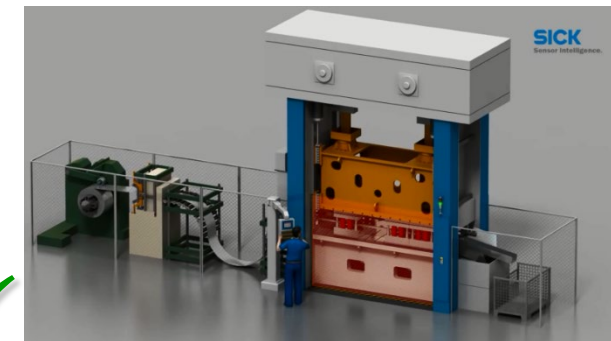


Article 5(1) - „Placing into Market“ and „Putting into Service“ of a **Machine**:



Before placing machinery on the market and/or putting it into service, the manufacturer shall:

- 1.) ... ensure that it satisfies the relevant essential health and safety requirements set out in Annex I;
(= Essential Health and Safety requirements) ✓
- 2.) ... ensure „Technical Documentation“ is present!
(according Annex VII - Part A) ✓
- 3.) ... the required information is provided!
(Operator manual, Brochure, ...) ✓
- 4.) ... apply one of the procedures to certify the conformity
(procedure acc. Article 12) ✓
- 5.) ... prepare the EC declaration of conformity and attach it to the machine!
(Declaration acc. Annex II – Part1 – Chapter A) ✓
- 6.) ... affix the CE-Marking !!!
(acc. Article 16) ✓





CE-MARKING OF PRODUCTS

A LITTLE SYMBOL WITH BIG IMPACT

REGULATION (EG) Nr. 765/2008 - 9. Juli 2008



Articel 2 - Definitons (20):

‘*CE marking*’: shall mean a marking by which the manufacturer indicates that the product is in conformity with the applicable requirements set out in Community harmonisation legislation providing for its affixing



MACHINE DIRECTIVE 2006/42/EG

CE-MARKING – ANNEX III

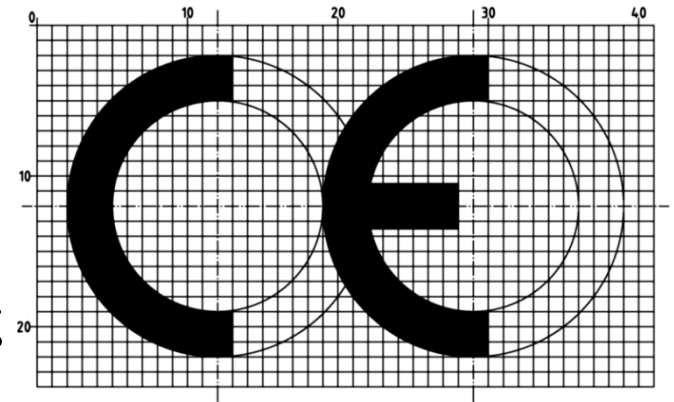
: not less than 5mm in size

: within the given proportion !!!

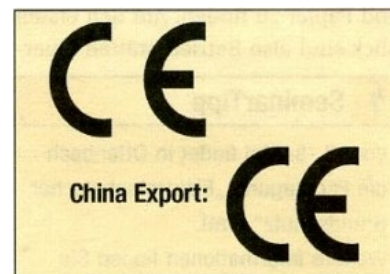
: same attachment technique as manufacturer name tag

: affixed in the immediate vicinity of the name of the manufacturer

: if applicable the identification number of the notified body



Markings that can be confused with the CE-Marking are not authorized for use





Werner Zipperer

Produktmanagement „Industrial Safety & Motion
Control Sensors“

werner.zipperer@sick.at