



2007-03-01

***The New Machinery Directive 2006/42/EC ("recast")***  
**Changes to the Essential Health and Safety Requirements**  
**and their possible significant consequences**  
**for (draft) harmonised European Standards**

## INTRODUCTION

The following pages contain a summary of the **new elements in the EHSR** <sup>(1)</sup> formulated in Annex I of the new Machinery Directive 2006/42/EC ("recast", English version) ***that may have significant consequences for the contents of the harmonised European Standards or draft Standards.***

This list is intended as a tool for a first verification of the standards or draft standards in relation with the EHSR of the new Directive. It should be used in combination with the text of the new Directive (as such or in the also available document "*Comparison Machinery Directive 2006-42-EC - 98-37-EC*" comparing the Essential Requirements from the new Directive with those of the present one). It is self-evident that in case of doubt the text of the Directive takes precedence over the information in the present list.

## NOTES

- Cited text of Annex I is presented in italics.
- In principle EHSR that are unchanged or with only smaller "editorial" changes, are not included in this summary.
- **Are also not included the more substantial changes to the EHSR that are not expected to require changes to correctly drafted European Standards or draft Standards. Such changes can be found in the document entitled "*All\_Changes\_in\_2006\_42\_EC*".**

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<sup>1</sup> EHSR: Essential Health and Safety Requirement

## ANNEX I

**Essential health and safety requirements relating to the design and construction of machinery**

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**1. Essential Health and Safety Requirements****1.1. General Remarks**

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**1.1.7. Operating positions** ("new" EHSR)

- Incorporates elements from the previous EHSR 3.2.1 for mobile machinery and EHSR 4.2.1.1 for lifting machinery concerning:
  - measures against exhaust gases and/or lack of oxygen;
  - good working conditions and protection of the operator position against hazards;
  - the need for an adequate cab and means for evacuation and emergency exit.
- **These requirements are now generally applicable and not only to mobile machinery or machines for lifting.**

**1.1.8. Seating** ("new" EHSR)

- Incorporates elements from the previous EHSR 3.2.2 and EHSR 3.2.3 for mobile machinery and EHSR 4.2.1.2 for lifting machinery concerning:
    - design for installation of seats where appropriate;
    - for integral sitting operator position seats to be provided with the machine;
    - stability of operator position and possibility of adapting the seat and its position;
    - reduction of vibrations, strength of seat mountings, slip-resistant footrests.
  - **These requirements are now generally applicable and not only to mobile machinery or machines for lifting.**
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## 1.2. Control systems (previously “Controls”)

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### 1.2.1. Safety and reliability of control systems

- **New** elements (besides smaller modifications of the formulation):
  - “The **parameters of the machinery** must not change in an uncontrolled way, where such change may lead to hazardous situations”.
  - “The safety-related parts of the control system must apply in a coherent way to the whole of an **assembly of machinery and/or partly completed machinery**”.
  - “For **cable-less control**, an automatic stop must be activated when correct control signals are not received, including loss of communication”.

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### 1.2.2. Control devices

- The preference for pictograms for marking of devices has been added.
- Concerning the possibility that **persons can be in a danger zone during starting** without being observed by the operator:
  - Addition of a **technical alternative** for (direct or indirect) observation of the danger zone: design of the control system in such a way that “**starting is prevented while someone is in the danger zone**”.
  - This requirement is now **applicable to “each control position”** (in the past only to the main control position).
- **A new provision** is added for ensuring that if necessary **machinery can only be controlled** from control positions located **in one or more predetermined zones or locations**.
- “**New**” **provisions** incorporating elements from previous 3.2.1 and thus making their application general and not only to mobile machinery:
  - Measures for ensuring that in **case of more than one control position** the use of one of them precludes the use of the others (except for stop controls and emergency stops).
  - When machinery has **two or more operating positions**, the presence of all required devices at each position and the design/location of these devices, without the operators hindering or putting each other into danger.

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### 1.2.3. Starting

#### **New requirement:**

- “If safety requires that **starting and/or stopping must be performed in a specific sequence**, there must be devices which ensure that these operations are performed in the correct order”.
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#### 1.2.4. **Stopping** (previously “Stopping device”)

##### 1.2.4.1. **Normal stop** (new numbering)

- The effect of the devices for normal stop is now expressed in terms of “**functions**” (previously in terms of “**moving parts**”).

##### 1.2.4.2. **Operational stop** (new requirement)

- “Where, for operational reasons, a stop control that does not cut off the energy supply to the actuators is required, **the stop condition must be monitored and maintained**”.

##### 1.2.4.3. **Emergency stop** (new numbering)

###### New elements:

- “The emergency stop function must be **available and operational at all times**, regardless of the operating mode”.
- “Emergency stop devices **must be a back-up to other safeguarding measures and not a substitute for them**”.

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#### 1.2.5. **Selection of control or operating modes** (previously “Mode selection”)

- Besides limited reformulation, the requirement concerning the (4) conditions in the control or operating modes for interventions with certain safety provisions disabled is **completed with the following**:

**“If these four conditions cannot be fulfilled simultaneously, the control or operating mode selector must activate other protective measures designed and constructed to ensure a safe intervention zone”.**

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#### 1.2.6. **Failure of the power supply**

- **Addition of the following criterion** in case of a failure of the power supply:
  - “the **parameters of the machinery** must not change in an uncontrolled way when such change can lead to hazardous situations”.

### 1.3. Protection against mechanical hazards

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#### 1.3.1. Risk of loss of stability (new heading)

- **Explicit extension** of the requirement to the different “phases of life” of the machinery: *“transportation, assembly, dismantling and any other action involving the machinery”*. (see also 1.1.2.a)

#### 1.3.9. Risks of uncontrolled movements (new requirement):

- This is in fact part of the previous EHSR 3.4.1 concerning mobile machinery : ***“When a part of the machinery has been stopped, any drift away from the stopping position, for whatever reason other than action on the control devices, must be prevented or must be such that it does not present a hazard”***.
- The modification makes the requirement generally applicable instead of only to mobile machinery.

### 1.4. Required characteristics of guards and protective devices

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#### 1.4.1. General requirements

- “New” requirement that ***guards and protective devices must “be securely held in place”***: previously in 1.4.2.1 for fixed guards (and thus made more general).
- “New” requirement that, ***“where possible, guards must protect against the ejection or falling of materials and objects”*** (previously in 1.4.2.2. for “type B” movable guards intended for moving parts directly involved in the process and in 1.4.2.3. for adjustable guards and thus made more general).
- New requirement adding to the previous point that, ***where possible, guards must protect against emissions generated by the machinery.***

#### 1.4.2.1. (Special requirements for guards) Fixed guards

- Additional requirement: ***“Their fixing systems must remain attached to the guards or to the machinery when the guards are removed”***.

## 1.5. Risks due to other hazards

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### 1.5.8. Noise

- Addition of the following text: “*The level of noise emission may be **assessed** with reference to **comparative emission data** for similar machinery*”.

### 1.5.9. Vibrations

- Addition of the following text: “*The level of vibration emission may be **assessed** with reference to **comparative emission data** for similar machinery*”.

### 1.5.15. Risk of slipping, tripping or falling

- **Addition concerning parts of machinery where persons are liable to move about or stand:** “*Where appropriate, these parts must be fitted with **handholds that are fixed** relative to the user and that enable them to maintain their stability*”.

### 1.5.16. Lightning (“New” requirement):

- This is the text of the previous EHSR 4.1.2.8 concerning machinery with lifting hazards: “*Machinery in need of protection against the effects of lightning while being used must be fitted with a **system for conducting the resultant electrical charge to earth***”.
- The modification makes the requirement generally applicable instead of only to machinery for lifting.

## 1.7. Information (previously: "Indicators")

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### 1.7.3 Marking of machinery

- *the business name and full address of the manufacturer **and, where applicable, his authorised representative,***
- ***designation of the machinery,***
- *the year of construction, **that is the year in which the manufacturing process is completed.***

***It is prohibited to pre-date or post-date the machinery when affixing the CE marking.***

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#### 1.7.4.1. General principles for the drafting of instructions

- Besides the new rules concerning languages and the message of previous 1.7.4.h), we find here the follow new provision ("c"): *"The contents of the instructions must cover not only the intended use of the machinery but also take into account any **reasonably foreseeable misuse thereof**".* See also comments to 1.1.2.a).
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#### 1.7.4.2. Contents of the instructions

##### General

- **The list of subjects** that must be included in the instructions is restructured and also **completed** with a more explicit citation of some items and also additional items (including elements from other EHSR):
  - *d) a general description of the machinery;*
  - *i) assembly, installation and connection instructions, including drawings, diagrams and the means of attachment and the designation of the chassis or installation on which the machinery is to be mounted;*
  - *l) information about the residual risks that remain despite the inherent safe design measures, safeguarding and complementary protective measures adopted;*
  - *m) instructions on the protective measures to be taken by the user, including, where appropriate, the personal protective equipment to be provided;*
  - *o) the conditions in which the machinery meets the requirement of stability during use, transportation, assembly, dismantling when out of service, testing or foreseeable breakdowns;*
  - *q) the operating **method to be followed in the event of accident or breakdown**; if a blockage is likely to occur, the operating method to be followed so as to enable the equipment to be safely unblocked;*
  - *t) the **specifications of the spare parts** to be used, when these affect the health and safety of operators;*
- **Note:** The items d), i), l), m), and o) above are normally covered in the standard by a correct reference to clause 6.5 of EN ISO 12100-2.

**Particular information on noise emissions**

- Concerning the information on airborne noise emissions to be given by the manufacturer, we find the following **new elements**:
  - The limit for the obligation to inform about the **sound power level** has been reduced from 85 to 80 dB(A).
  - *“Whenever sound emission values are indicated the **uncertainties** surrounding these values must be specified”.*
  - *“Where **specific Community Directives** lay down other requirements for the measurement of sound pressure levels or sound power levels, those Directives **must be applied** and the corresponding provisions of this section shall not apply”.*

**Some other particular modifications**

- Item g) of the old EHSR 1.7.4, concerning the specific information for machinery intended for use in a potentially explosive atmosphere, is deleted.
  - A **new item** has been added concerning the emission of **non-ionising radiation**:  
*“(v) where machinery is likely to emit non-ionising radiation which may cause harm to persons, in particular persons with active or non-active implantable medical devices, **information concerning the radiation emitted** for the operator and exposed persons”.*
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## 2. Supplementary EHSR for certain categories of machinery

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### 2.1. Foodstuffs machinery and machinery for cosmetics or pharmaceutical products (previously: "Agri-foodstuffs machinery")

- Extension of the scope of this chapter 2.1. to machinery for cosmetics or pharmaceutical products.

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### 2.2. Portable hand-held and/or hand-guided machinery

- **New element in 2.2.1:** Additional requirement for the **design of handles** for making starting and stopping straightforward.
- Concerning the information on **vibrations** to be given by the manufacturer, we find the following **changes and new elements in 2.2.1.1:**
  - The value to be given becomes "**the vibration total value to which the hand-arm system is subjected...**".
  - "**the uncertainty of measurement**" must be given.
  - Additional rules for the measurement methods.
- **New 2.2.2** with additional **general requirements** for portable fixing and other impact machinery and **specific requirements for cartridge operated** portable fixing and other impact machinery.

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### 2.3. Machinery for working wood and material with similar physical characteristics

- The requirement in b) about the "**risk of ejection of pieces of wood**" has been made more general by reformulation into "**the risk of ejection of work pieces and parts of them**".
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### 3. Supplementary EHSR to offset hazards due to mobility

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#### 3.2.2. Seating

- The **requirement for a “restraint system”** (previously “safety belt or equivalent device”) for the persons in case of ROPS is reformulated and also extended to TOPS and FOPS. It applies now to “*machinery equipped with*” such system(s) instead of machinery “*with provision for a ROPS*”.
- Such “*restraint system*” is **no longer required if this system “increases the risk”**.

#### 3.3. Control systems (previously “Controls”)

**Introduction added**, containing following elements:

- Detailed **general requirements** concerning **remote control**.

##### 3.3.1. Control devices

- The requirement from EHSR 1.2.2 concerning **acoustic and/or visual warning signals before starting** if the operator can not observe persons in the danger zone, in the past not applicable to the mobility function, **applies now in the case of reversing**.

##### 3.3.3. Travelling function

- More detailed requirements concerning **remote control**.

##### 3.4.3. Roll-over and tip-over (previously “Rollover”)

- Extension of the scope of this requirement to “**tipping over**”.
- The requirement is now for a **ROPS or TOPS (previously for “anchorage points”)** and exception from it in cases where the ROPS or TOPS “*increases the risk*”.
- **Deletion of the list with examples of machines** for which ROPS is required.

#### 3.4.4. Falling objects

- More general formulation concerning the persons to be protected (now including also “*other person(s)*”).
- The requirement is now for **FOPS (previously for “anchorage points”)**.

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#### 3.4.7. Transmission of power between self-propelled machinery (or tractor) and recipient machinery

- Addition of a rule concerning the design of the **guard of the driving device** (“*it must be possible to open this guard...*”).

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#### 3.5.3. Emissions of hazardous substances (previously “Emissions of dust, gases, etc.”)

- As for the exemption from the 2<sup>nd</sup> and 3<sup>rd</sup> paragraph of 1.5.13 where the main function of the machinery is the spraying of products, the text has been completed with the obligation of protecting the operator against the emissions.

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#### 3.6.1. Signs, signals and warnings (previously “Signs and warning”)

- Addition of a requirement as follows: “*where necessary, there must be an **appropriate connection between a trailer and the machinery** for the operation of signals*”.

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#### 3.6.3. Instructions (previously “Instruction handbook”)

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##### 3.6.3.1. Vibrations (title added to this item that was previously numbered a))

Concerning the information on **vibrations** to be given by the manufacturer, we find here the following **changes and new elements**:

- The values to be given become:
  - “**the vibration total value to which the hand-arm system is subjected...**”.
  - “**the highest root mean square value of weighted acceleration to which the whole body is subjected...**”.
- “**the uncertainty of measurement**” must be given.
- Additional rules for the measurement methods are formulated.

#### 4. Supplementary EHSR to offset hazards due to lifting operations

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##### 4.1.1. Definitions

- “Lifting operation”
  - “Carrier”
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**4.1.2.8. Machinery serving fixed landings** (New requirement, previously very limited, dealing with aspects concerning the extension of the scope of the Directive e.g. to construction site hoists, slow moving lifts...):

- **4.1.2.8.1. Movements of the carrier** (rigidity of the guidance)
  - **4.1.2.8.2. Access to the carrier** (including some elements from previous EHSR 4.2.3)
  - **4.1.2.8.3. Risks due to contact with the moving carrier** (during normal operation, inspection and maintenance)
  - **4.1.2.8.4. Risks due to the load falling off the carrier**
  - **4.1.2.8.5. Landings** (contact with moving parts, falling into the travel zone)
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##### 4.1.3. Fitness for purpose

- The previous requirement 4.2.4, applicable to powered lifting machinery, has been relocated under “4.1. General” and is now applicable to all lifting machinery. This is also confirmed by the reformulation, including now a more explicit requirement that “*The static and dynamic tests ... must be performed on all lifting machinery ready to be put into service*”.
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##### 4.3.3. Lifting machinery (previously “Machinery”)

- Besides some other reformulation, the term “*nominal load*” has been changed into “*working load*”.
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#### 4.4. Instructions

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##### 4.4.1. Lifting accessories

- Additionally the instructions must give "**the static test coefficient used**".
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##### 4.4.2. Lifting machinery (previously "Machinery")

- The information about the maximum working load is brought in line with the reformulation of EHSR 4.3.3.
  - Additional element in the instructions concerning the fitness for purpose testing: "*where appropriate, a **test report detailing the static and dynamic tests** carried out by or for the manufacturer or his authorised representative*".
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#### 5. Supplementary EHSR for machinery intended for underground work

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##### Old 5.3. Lighting

- This old EHSR containing an exception from the requirement of EHSR 1.1.4. concerning lighting of internal parts requiring frequent inspection and adjustment and of maintenance areas, has been deleted.
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## 6. Supplementary EHSR for machinery presenting particular hazards due to the lifting of persons

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### 6.1.1. **Mechanical strength** (previously "6.1.2" and including the message of the previous EHSR 6.4.1)

- The old requirement on space and strength of the floor of the carrier is now extended to the complete "*carrier, including any trapdoors*".
  - Additional details in the requirements concerning the "*suspension or supporting system*".
  - If ropes or chains are used, an additional more explicit requirement for at least **two independent ropes or chains, each with their own anchorage**.
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### 6.2. **Control devices** (previous 6.2)

- The exception from the obligation for a "*hold-to-run control device*" (previously called "*maintained command type control device*") applies now "*where the carrier itself is completely enclosed*" (instead of "*in the case of machinery serving specific levels*") (old 6.2.1).
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### "New" 6.3.1. **Risks due to movements of the carrier**

- This "new" requirement corresponds practically to the old EHSR 6.2.3. and 6.4.2 ("excess speeds" has been deleted).
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### 6.3.2. **Risk of persons falling from the carrier** (previously "6.3.")

- A requirement has been added concerning the **stability of the carrier and the prevention of dangerous movements when the carrier is designed as a work station**.
  - The requirement of old EHSR 6.3.2 has been reformulated by adding the need for prevention of **inadvertent opening of trapdoors**.
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### 6.3.3. **Risk due to objects falling on the carrier** (new requirement)

- "*Where there is a risk of objects falling on the carrier and endangering persons, the carrier must be equipped with a protective roof*".
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**6.4. Machinery serving fixed landings** (new)**6.4.1. Risks to persons in or on the carrier**

- Precautions against **contact of persons with fixed or moving elements**. If necessary the carrier shall be enclosed, with interlocking doors with locking.
- Measures and devices against **uncontrolled upward or downward movements of the carrier**. Devices must be able to stop the carrier at maximum load and speed.
- Prevention of harmful **decelerations** during stopping actions.

**6.4.2. Controls at landings**

- Controls at the landings other than for emergency use **shall not initiate movements when control devices in the carrier are operated or when the carrier is not at a landing**.

**6.4.3. Access to the carrier**

- Guarding at the landings and on the carrier must ensure a **safe transfer of goods and persons to and from the carrier**.

**6.5. Markings**

- Additional requirement for including in the marking of the carrier:
  - “*the number of persons permitted on the carrier*”
  - “*the maximum working load*”.