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Cranes — Control devices and control stations

National foreword

This British Standard is the UK implementation of EN 13557:2024. It supersedes BS EN 13557:2003+A2:2008, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MHE/3/1, Crane design.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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EUROPEAN STANDARD

EN 13557

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2024

ICS 53.020.20

Supersedes EN 13557:2003+A2:2008

English Version

Cranes - Control devices and control stations

Appareils de levage à charge suspendue - Commandes
et postes de commande

Krane - Stellteile und Steuerstände

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 13557:2024) has been prepared by Technical Committee CEN/TC 147 “Cranes - Safety”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2024, and conflicting national standards shall be withdrawn at the latest by September 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13557:2003+A2:2008.

This document has the following significant technical changes with respect to EN 13557:2003+A2:2008:

- updating of normative references;
- revision of List of significant hazards and move to Annex A;
- revision and update of Table 2 (now Table 1) and Table A.1;
- revision of Annex ZA;
- reorganization of the clauses.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

For the relationship with other European Standards for cranes, see Annex B.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

This document has been prepared to be a harmonized standard to provide one means for crane access to conform with the essential health and safety requirements of the Machinery Directive, as mentioned in Annex ZA.

This document is a type-C standard as stated in EN ISO 12100:2010.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance etc.).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e.g. for maintenance (small, medium and large enterprises);
- consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate in the drafting process of this document.

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

When requirements of this type-C standard are different from those which are stated in type-A or type-B standards, the requirements of this type-C standard take precedence over the requirements of the other standards for machines that have been designed and built according to the requirements of this type-C standard.

1 Scope

This document specifies health and safety design requirements for control devices and control stations and their operating positions for all types of cranes.

Specific requirements for particular types of cranes are given in the appropriate European Standard for the particular crane type (see Annex B).

This document does not deal with noise hazards because these are dealt with in safety standards for specific types of cranes. It also does not address the design of the cabin with regard to its sound insulation properties.

This document covers specific hazards which could occur during the use of control devices and control stations. It does not cover hazards which could occur during transport, construction, modification, de-commissioning, or disposal. The hazards covered by this document are identified in Annex A.

This document is not applicable to cranes manufactured before the date of its publication.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN 13586:2020, *Cranes - Access*

EN ISO 13850:2015, *Safety of machinery - Emergency stop function - Principles for design (ISO 13850:2015)*

EN 14502-2:2005+A1:2008, *Cranes - Equipment for the lifting of persons - Part 2: Elevating control stations*

EN 62745:2017, *Safety of machinery - Requirements for cableless control systems of machinery*

EN 60068-2-27:2009, *Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock*

EN 60068-2-31:2008, *Environmental testing - Part 2-31: Tests - Test Ec: Rough handling shocks, primarily for equipment-type specimens*

EN 60204-32:2008, *Safety of machinery - Electrical equipment of machines - Part 32: Requirements for hoisting machines*

ISO 3795:1989, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 11112:1995,¹ *Earth-moving machinery - Operator's seat - Dimensions and requirements*

ISO 7296-1:1991², *Cranes — Graphic symbols — Part 1: General*

¹ As impacted by ISO 11112:1995/AMD1:2001.

² As impacted by ISO 7296-1:1991/AMD1:1996.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

cabin

enclosed operating position

3.2

cableless control

means by which the crane operator's commands are transmitted without any physical connection for at least a part of the distance between the control station and the crane

3.3

control station

assembly of one or more control devices fixed on the same panel or located in the same enclosure

[SOURCE: IEV 441-12-08, modified]

3.4

control device

physical unit that can combine – in a module/subassembly or device – a mode selector, an adjuster for manual control of the actuating drive and, if necessary, a reference-variable adjuster for the controller

[SOURCE: IEV 351-56-07]

3.5

hatch

access opening to allow the passage of persons, provided with a cover openable without use of tool

[SOURCE: EN 13586:2020]

3.7

operating position

place where the operators carry out their tasks

Note 1 to entry: *Cabin* (3.1) is also one type of an operating position.

3.8

console

fixed or moveable arrangement of control devices

[SOURCE: ISO 7752-1:2010, modified]

4 Requirements

4.1 Control devices

4.1.1 General

Control devices shall conform to the safety requirements and/or protective measures of this clause. In addition, control devices shall be designed in accordance with the principles of EN ISO 12100:2010, for hazards relevant but not significant which are not dealt with by this document.

In order to prevent unintended movement of a crane motion, the motion shall only be able to be initiated from the neutral position of the control device.

NOTE The typical arrangement of the control devices for a particular crane type is as specified in the appropriate European Standards for particular crane types.

Protection against electric shock for direct or indirect contact shall be as specified in Clause 5 of EN 60204-32:2008.

The temperature of control devices, as generated by the crane's operation, shall not exceed 43 °C.

4.1.2 Control levers and joysticks

The direction of movement of control levers and joysticks shall where possible be consistent with crane motion. Symbols in accordance with ISO 7296-1:1991 shall be fixed in such positions that there is a clear and unambiguous relationship between the movement of the control lever or joystick in the control station and the corresponding direction of motion. Control levers and joysticks for crane movements, when released, shall automatically return to the neutral position.

The force required to actuate the control levers and joysticks shall not exceed the following values:

- forwards or backwards: 20 N;
- sideways, to the left or to the right: 20 N.

A higher actuating force may be accepted for levers and joysticks where specified in a particular crane type standard.

Control levers or joysticks shall have an actuating force that prevents unintended movement of the machinery caused by friction, acceleration and/or vibration.

4.1.3 Push buttons

For push buttons actuated by finger or thumb, the force shall not exceed a value of 10 N.

For push buttons actuated by the foot the force shall not exceed a value of 100 N.

Push buttons for crane movements, when released, shall automatically return to the off position.

The emergency stop actuator installed on the control station shall be in accordance with the specification for emergency stop actuators given in EN ISO 13850:2015.

4.1.4 Pedals

The use of pedals shall only be used when operating the crane in a seated position.

For the pedals, the actuating force shall not exceed the following values:

- pedals actuated by a movement of the ankle: 50 N;
- pedals actuated by a movement of the leg: 100 N.

4.1.5 Touch screen controls

Where touch screens are used, protection against environmental influence e.g. rain, snow, waist, dust shall be provided. Touch screens shall not be used to control crane movements.

Starting of sequential functions by touch screens shall be differentiated from alarms or other display signals.

Visibility of the display and the touch points shall be provided to ensure correct control commands.

4.2 Control stations

4.2.1 General

Control stations shall conform to the safety requirements and/or protective measures of this clause. In addition, control devices shall be designed in accordance with the principles of EN ISO 12100:2010, for hazards relevant but not significant which are not dealt with by this document.

The logic of the control device arrangement shall be the same at each control station associated with operating the crane.

Where a crane has more than one control station, measures shall be taken to ensure that only one control station is operational at a given time. However, an emergency stop command from any control station shall be effective at all times for safety reasons.

Where vibration damping elements are also used as mountings for a control station, additional fixing(s) shall be provided to prevent detachment of the control station in the event of failure of the damping elements.

Fixings used for mounting the control station shall be of a type, which prevent unintentional loosening. Fixings, excluding vibration damping elements, shall be made from fire retardant materials.

4.2.2 Cable connected control stations

For situations where the operator has to follow the crane, its load or control station on foot, the speed of the travel motions shall not exceed 1,0 m/s.

Pendant control stations shall be so positioned that the crane operator is able to position himself outside the danger zone.

The distance from the underside of a pendant control stations to the floor shall be at least 0,9 m and the top of the pendant control station a maximum of 1,7 m to the floor.

With regard to pulling forces the electrical flexible cables and fittings used in cable connected control devices shall conform to the requirements of 13.4.2 and 13.4.3 of EN 60204-32:2008. Similar precautions shall be taken for other types of control system with physical connections.

Where the position or orientation of a console is variable with regard to the movement of the crane or a part of the crane there shall be symbols in accordance with ISO 7296-1:1991 placed so that there is a clear relationship between the actuating movement of the control lever and the direction of the crane movements.

Consoles and control devices shall be designed and protected so that the desired effect occurs only by an intentional operation.

This may be achieved by e.g.:

- recessing the actuator (lever, push buttons);
- mechanical interlock of the neutral position of the control lever;
- use of a set of actuators requiring sequential or simultaneous actions;

- surrounding the control levers on a panel by a guard rail;
- locating the actuator where it is not accidentally knocked.

NOTE For further guidance of the ergonomic design of control devices and its surroundings, see EN 894-4:2010, 5.3.3.3 and the EN 894 series of standards.

Crane consoles shall have a control device to activate an acoustic warning to alert persons in the vicinity of the crane, unless otherwise specified in the appropriate European Standard for the particular crane type. The control device for any acoustic warning shall have either different shape, colour, symbol or location compared to the crane operating control devices.

4.2.3 Cableless control stations

Cableless control devices shall be in accordance with EN 62745:2017.

4.3 Cabins

4.3.1 General

The cabin and supporting structure shall be designed for live load of 1000N per person designed to enter the cabin.

NOTE Guidance regarding reducing the effects of vibration on structures is found on particular crane type standards.

4.3.2 Windows

Each floor window shall prevent person from falling through.

NOTE Methods for preventing persons from falling through a floor window include e.g. fitting the window with a grid and/or designing for loading by safety floor windows fitted with multi-layered laminated glass.

Floor grids shall:

- a) not be supported by the window;
- b) enable cleaning of the window;
- c) minimize the effect on the crane operator's view.

Where the window can be opened person falling through shall be prevented.

Any wall window shall:

- a) be able to withstand without failure the application of 1,25 kN applied at 90° to any 500 mm² area of the window and its mounting, or
- b) be provided with protection up to a minimum height of 1 m from the cabin floor level:
 - where the protection is done by fusing horizontal bars, these shall have spaces between the bars not exceeding 0,4 m and the height between the cabin and the lowest bar shall not exceed 0,25 m;
 - where the protection is done by fusing vertical bars, these shall have spaces between the bars not exceeding 0,3 m.

The design of cabin windows shall take into account the need for reduction of the effects of glare and reflections, based on the location and environmental conditions where the crane is used.

NOTE The specific requirements for reduction of glare and reflection effect can be given in the appropriate European Standard for the particular crane types.

Windows shall be of tempered (toughened) and/or laminated glass.

Windows that open shall be provided with a locking mechanism to secure them in the closed and designated open positions.

A technical solution (e.g. automatic wipers and/or access to manual cleaning) shall be provided to clean the surfaces of the windows required in the work.

Window material shall maintain its transparency when cleaned.

4.3.3 Access

Access way from and to a cabin shall be of Type I in accordance with EN 13586:2020.

Any doors provided shall include a locking mechanism to secure them in the closed and the designated opening positions.

Doors shall be able to be opened from the inside whether locked or not.

The minimum dimensions for effective door apertures for use in an upright posture shall be 0,6 m width by 1,9 m height.

Where access is provided by a hatch in the floor, a minimum standing area of 0,4 m × 0,3 m shall be provided inside the cabin for each person expected to occupy the cabin when the hatch is in the open position. The minimum dimensions for effective hatch apertures shall be 0,6 m × 0,6 m, or 0,5 m × 0,65 m, or 0,6 m diameter.

Provisions shall be made to provide simultaneous three-point support (two hands and one foot, or two feet and one hand) while entering/leaving the cabin through a hatch.

Operator's seat or other permanent equipment in the cabin shall not prevent the hatch from being opened.

4.3.4 Emergency exit

If the risk analysis indicates that there is a risk of the normal exit becoming unusable (e.g. by a fire or overturning) in a manner that can block the normal exit, another escape route shall be provided.

The minimum dimensions for emergency exit effective apertures shall be 0,6 m × 0,6 m, or 0,5 m × 0,65 m, or 0,6 m diameter.

4.3.5 Roof

Where a cabin roof is expected to be used as a platform e.g. for maintenance, inspection, emergency escape, the roof shall be designed in accordance with EN 13586:2020.

4.3.6 Crane operator's seat

The cabin shall be provided with an adjustable seat:

- a) having dimensions in accordance with ISO 11112:1995;
- b) provided with adjustments achievable without the use of any tool;
- c) that shall reduce the effects of vibration as specified in particular crane type standards.

4.3.7 Cabin climate

The cabin shall be provided with ventilation or air conditioning facilities.

Within the limits of external climatic conditions given by the manufacturer in his instructions the following requirements shall be fulfilled:

- a) It shall be possible to attain an operative temperature of more than $t_o = 18\text{ °C}$, and a maximum operative temperature of $t_o = 30\text{ °C}$;
- b) It shall be possible to adjust the internal climate to a level where the difference in operative temperatures within the area of the crane operator do not exceed 5 °C. Under these conditions the air speed on unprotected parts of the body shall not exceed 0,2 m/s if the air temperature is less than 22 °C;
- c) A technical solution shall be provided to keep the insides of the windows free from mist and frost;
- d) Equilibrium of the cabin climate condition shall be reached within 20 min after start-up of the climate system, assuming constant external weather conditions, unless otherwise specified by the manufacturer in his instructions.

Where air-conditioning or heating is used in the cabin, the system shall be installed in such a way that it is possible to let the airflow and temperature be symmetrical on the left- and right-hand side of the crane operator's prescribed position.

Where heating is installed it shall be such that its exhaust gases cannot ingress into the cabin climate.

4.3.8 Fire protection

The floor of the cabins as well as the interior, upholstery and insulation shall be made of fire-retardant material. The material burning rate shall not exceed 150 mm/min when tested in accordance with ISO 3795:1989.

4.3.9 Fire extinguisher

Space for a fire extinguisher for the cabin shall be provided.

4.4 Other operating positions

4.4.1 General

The crane operator's view, when in the prescribed operating position, shall enable the operator to monitor the movement of the crane and its load.

4.4.2 Fixed operating positions on the crane

Minimum dimensions to permit ergonomically good working conditions and movements for the crane operator shall be as specified in the European Standards for particular crane types.

NOTE Operating position dimensions can be commensurate with the type of work and the length of continuous working periods of the crane operator.

Those parts of the operating position where no seat is provided, or where the crane operator is required to work in a standing position, shall have a minimum free-standing height of 2 m.

All standing areas shall be free of tripping hazards.

All standing and walking areas shall be slip resistant.

4.4.3 Moveable operating positions

Portable control stations shall:

- be provided with an adjustable strap to allow it to be carried without using hands unless there are other technical solutions to prevent it from being dropped;
- withstand the following tests:
 - free fall test EN 60068-2-31:2008, test Ec;
 - shock test EN 60068-2-27:2009, test Ea.

Elevating operating positions shall be in accordance with EN 14502-1:2005+A1:2008.

5 Verification of the safety requirements and/or measures

Verification of control devices and control stations is generally to be carried out when installed on a crane. However, when applicable, individual components may be separately verified or tested. Conformity to the safety requirements and/or measures (given in Clause 5) shall be verified by the methods detailed in Table 1.

Table 1 — Methods to be used to verify conformity with the safety requirements and/or measures

Clause	Method of verification
4.1.1, 4.2.1	Visual and functional check Measure the surface temperature
4.1.2	Visual and functional check
4.1.3	Visual and functional check
4.1.4	Functional check.
4.1.5	Visual and functional check
4.1.2	Visual and functional check
4.4.2	Visual check and measurement
4.4.3	Engineering assessment
4.4.3	Visual check.
4.2.2	Visual, functional and speed check.
4.2.3	Checks in accordance with EN 62745:2017
4.3.1	Visual check and check of calculation or application of equivalent test loads.
4.3.2	Visual check. Check specification of materials
4.3.3	Visual check, functional check and measurement of the specified dimensions.
4.3.4	Visual and functional check
4.3.5	Check of specification and calculation.
4.3.6	Visual and functional check
4.3.7	Measurement of operative temperature.

Clause	Method of verification
4.3.8	Check specification of materials.
4.3.9	Visual check.

6 Information for use

Information shall be provided how to clean the surfaces of the windows.

The operator's manual shall inform the user that a space for a fire extinguisher is provided and that a suitable extinguisher shall be fitted when the crane is in use.

Marking of controls shall be made in accordance with ISO 7296-1:1991 and EN 60204-32:2008.

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Annex A
 (informative)

List of significant hazards

Table A.1 — List of significant hazards and associated requirements

No.	Hazard	Relevant clause(s) in this document
1	mechanical hazards	
1.1	due to machine parts or workpieces inadequate mechanical strength	4.4.3
1.2	crushing	4.1.1, 4.1.2, 4.1.3, 4.1.5, 4.2.1, 4.2.2, 4.3.2
1.3	shearing	4.1.1, 4.1.2, 4.1.3, 4.1.5, 4.2.1, 4.2.2, 4.3.2
1.4	cutting or severing	4.1.1, 4.1.2, 4.1.3, 4.1.5, 4.2.1, 4.2.2, 4.3.2
1.5	slipping, tripping, falling	4.3.3, 4.4.2, 4.4.3
1.6	instability	4.3.4
2	electrical hazards	
2.1	touching live parts	4.1.1
5	vibration hazards	
5.1	vibrations transmitted to the operator when sitting during operation	4.2.1, 4.3.6
5.3	in conjunction with a rigid position (e.g. trauma of the spine, osteo-articular disorder, low-back morbidity)	4.2.1
7	material/substance hazards	
7.1	breathing difficulties, suffocation	4.3.7
7.2	fire	4.3.4, 4.3.5, 4.3.8, 4.3.9

No.	Hazard	Relevant clause(s) in this document
8.	ergonomic hazards	
8.1	unhealthy postures or excessive effort	4.1.2, 4.1.4,
8.2	inadequate consideration of anatomy	4.1.2, 4.1.4, 4.4.2
8.3	insufficient means for evacuation/emergency exit	4.3.1, 4.3.3, 4.3.4, 4.3.5, 4.4.2,
8.4	design or location of indicators and visual displays units	4.1.2
8.5	design, location or identification of control devices	4.1, 4.2
8.6	flicker, dazzling, shadow, stroboscopic effect	4.3.2
8.9	Human error during operation	4.4.3
9	Hazards associated with the environment in which the machine is used	
9.1	moisture	4.3.7
9.2	pollution	4.3.7
9.3	snow, water, wind, temperature	4.3.2, 4.3.7
9.4	exhaust gas/lack of oxygen at workplace	4.3.7
9.5	dust and fog	4.3.2

Annex B
(informative)

Selection of suitable set of crane standards for a given application

Is there a product standard in the following list that suits the application?	
EN 13000	Cranes — Mobile cranes
EN 14439	Cranes — Safety — Tower cranes
EN 14985	Cranes — Slewing jib cranes
EN 15011	Cranes — Bridge and gantry cranes
EN 13852-1	Cranes — Offshore cranes — Part 1: General-purpose offshore cranes
EN 13852-2	Cranes — Offshore cranes — Part 2: Floating cranes
EN 14492-1	Cranes — Power driven winches and hoists — Part 1: Power driven winches
EN 14492-2	Cranes — Power driven winches and hoists — Part 2: Power driven hoists
EN 12999	Cranes — Loader cranes
EN 16851	Cranes — Light crane systems
EN 13155	Cranes — Safety — Non-fixed load lifting attachments
EN 13157	Cranes — Hand powered cranes
EN 14238	Cranes — Manually controlled load manipulating devices

YES	NO
Use it directly, plus the standards that are referred to	

Use the following:	
EN 13001-1	Cranes — General design — Part 1: General principles and requirements
EN 13001-2	Cranes safety — General design — Part 2: Load actions
EN 13001-3-1	Cranes — General Design — Part 3-1: Limit States and proof competence of steel structures
EN 13001-3-2	Cranes — General design — Part 3-2: Limit states and proof of competence of wire ropes in reeving systems
EN 13001-3-3	Cranes — General design — Part 3-3: Limit states and proof of competence of wheel/rail contacts
EN 13001-3-4	Cranes — General Design — Part 3-4: Limit States and proof competence of machinery — Bearings
EN 13001-3-5	Cranes — General design — Part 3-5: Limits states and proof of competence of forged hooks

EN 13001-3-6	Cranes — General Design — Part 3-6: Limit States and proof competence of machinery — Hydraulic cylinders
EN 13135	Cranes — Safety — Design — Requirements for equipment
EN 12077-2	Cranes safety — Requirements for health and safety — Part 2: Limiting and indicating devices
EN 13586	Cranes — Access
EN 14502-1	Cranes — Equipment for the lifting of persons — Part 1: Suspended baskets
EN 14502-2	Cranes — Equipment for the lifting of persons — Part 2: Elevating control stations
EN 12644-1	Cranes — Information for use and testing — Part 1: Instructions
EN 12644-2	Cranes — Information for use and testing — Part 2: Marking

Annex ZA
(informative)

Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered

This European Standard has been prepared under a Commission's standardization request "M/396 Mandate to CEN and CENELEC for Standardisation in the field of machinery" to provide one voluntary means of conforming to essential requirements of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, amending Directive 95/16/EC (recast)

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Annex I of Directive 2006/42/EC

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1.1.2 (a)	4, 5, 6	
1.1.2 (c)	4, 5, 6	
1.1.2 (d)	4, 5, 6	
1.1.2 (e)	4, 5, 6	
1.1.6	4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.2, 4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.7, 4.4.2, 4.4.3	
1.1.7	4.3.1, 4.3.3, 4.3.4, 4.3.7	
1.1.8	4.3.6	
1.2.1	4.2.1, 4.2.2, 4.2.3, 4.4.2, 4.4.3	
1.2.2	4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.4.3	
1.2.4.3	4.1.1, 4.1.3, 4.1.5, 4.2.1, 4.2.2, 4.2.3	
1.2.5	4.1.5, 4.2.1	
1.3.2	4.4.2, 4.4.3	
1.3.3	4.2.3, 4.3.2, 4.3.3, 4.4.1, 4.4.2, 4.4.3	
1.3.6	4.2.2, 4.2.3, 4.3.1, 4.3.3, 4.3.4, 4.4.2, 4.4.3	
1.3.7	4.2.2, 4.2.3, 4.3.1, 4.3.3, 4.3.4, 4.4.2, 4.4.3	

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1.5.1	4.1.1, 4.2.1, 4.2.2, 4.4.3	
1.5.5	4.1.1	
1.5.6	4.1.1, 4.3.8, 4.3.9	
1.5.9	4.1.2, 4.2.1, 4.3.8	
1.5.13	4.3.7	
1.5.14.	4.3.3, 4.3.4, 4.4.1	
1.5.15	4.3.2, 4.3.3, 4.3.4, 4.4.2	
1.6.2	4.3.3, 4.3.4, 4.3.5	
1.7.1.1	4.1.2, 6	
1.7.1.2	4.1.5, 6	
1.7.4.1	6	
1.7.4.2	6	
3.2.1	4.3.2, 4.4.1, 4.4.2	
3.3.	4.1.1, 4.2.1, 4.2.2, 4.2.3	
3.3.1.	4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3	
3.4.5.	4.3.3, 4.3.4, 4.3.5	
3.5.2.	4.3.8, 4.3.9	
3.6.1.	4.1.2, 4.1.5, 4.2.2, 4.2.3, 6	
3.6.3.2.	4.1.1, 4.2.1, 6	
4.1.2.7	4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.4.1, 4.4.2, 4.4.3	
4.2.1	4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2.1, 4.2.2, 4.2.3, 4.4.1, 4.4.2, 4.4.3	
4.3.3	6	

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

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389 Chiswick High Road London W4 4AL UK