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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

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- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 12895

Safety of machinery — Identification of whole body access and prevention of associated risk(s)

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ISO/TC 199

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 199, *Safety of machinery*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The structure of safety standards in the field of machinery is as follows:

- a) **type-A standards** (basic safety standards) giving basic concepts, principles for design, and general aspects that can be applied to all machinery;
- b) **type-B standards** (generic safety standards) dealing with one safety aspect or one or more type(s) of safeguard that can be used across a wide range of machinery:
 - type-B1 standards on particular safety aspects (e.g. safety distances, surface temperature, noise);
 - type-B2 standards on safeguards (e.g. two-hand controls, interlocking devices, pressure-sensitive devices, guards);
- c) **type-C standards** (machine safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

This document is a type-B standard as stated in 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 organisations, market surveillance);

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.

In addition, this document is intended for standardization bodies elaborating type-C standards.

The requirements of this document can be supplemented or modified by a type-C standard.

For machines which are covered by the scope of a type-C standard and which have been designed and built according to the requirements of that type-C standard, the following applies: if the requirements of that type-C standard deviate from the requirements in type-B standards, the requirements of that type-C standard take precedence over the provisions of other standards.

The effectiveness of certain measures described in this document to minimize or reduce risk relies, in part, on the relevant parts of that equipment being correctly positioned in relation to the hazard zone. In deciding on these positions, a number of aspects are taken into account, such as:

- the necessity of a risk assessment according to ISO 12100:2010;
- the practical experience in the use of the machine;
- the bio-mechanical and anthropometric data;
- the possibility of undetected access to the hazard zone;
- the possible undetected presence of a person inside the safeguarded space and the hazard zone(s).

Safety of machinery — Identification of whole body access and prevention of associated risk(s)

1 Scope

This document specifies the criteria to evaluate if whole body access exists in machinery and provides a methodology to determine the requirements to reduce the associated risk(s).

Protection against the risks from hazards arising from emissions (e.g. the ejection of solid or fluid materials, radiation, electric arcs, heat, noise, fumes, gases) are not covered by this document.

Protection against the risks from hazards arising from breaking of parts of the machine or gravity falls are not covered by this document.

This document is applicable for safeguards used on machinery for the protection of persons 14 years and older.

NOTE It is not practical to specify dimensions for all persons. Therefore, the values presented are intended to cover the 95th percentile of the population.

This document is not applicable to machinery 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.

ISO 12100:2010, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*

ISO 13855¹⁾, *Safety of machinery — Positioning of safeguards with respect to the approach of the human body*

ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by the upper and lower limbs*

ISO 14118, *Safety of machinery — Prevention of unexpected start-up*

ISO 14119²⁾, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

IEC 60204-1:2021³⁾, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

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

- 1) Under preparation. Stage at the time of publication: ISO/FDIS 13855:2024.
- 2) Under preparation. Stage at the time of publication: ISO/FDIS 14119:2024.
- 3) i.e. Edition 6.1 which combines IEC 60204-1:2016 and Amendment 1, AMD 1:2021.

ISO and IEC maintain terminological 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/>

3.1.1

effective detection capability

d_e

sensing function parameter limit set by the integrator of the device that will cause its actuation

[SOURCE: ISO 13855: – 2, 3.1.4]

3.1.2

electro-sensitive protective equipment

ESPE

assembly of devices and/or components working together for protective tripping or presence-sensing purposes and comprising as a minimum:

- a sensing device,
- controlling/monitoring devices,
- output signal switching devices and/or a safety-related data interface.

Note 1 to entry: ESPE's refer only to non-contact sensing devices.

[SOURCE: IEC 61496-1:2020, 3.5, modified – A new Note to entry has been introduced and the original Notes 1 and 2 to entry have been removed.]

3.1.3

detection zone

zone within which a specified test piece is detected by the sensitive protective equipment

Note 1 to entry: The detection zone can also be a point, line or plane or volume.

Note 2 to entry: ISO 13856-1 uses the term “effective sensing area” when describing pressure-sensitive mats and floors. In this document, the terms “detection zone” and “effective sensing area” are used synonymously.

[SOURCE: ISO 13855: – 2, 3.1.7, modified – “..or volume” has been added at the end of Note 1 to entry.]

3.1.4

presence sensing function

detection of the presence of a person, or a part of a person, to enable prevention of hazardous situations

[SOURCE: IEC 62046:2018, 3.1.32, modified – “while in a hazardous zone” and “such as unexpected/unintended start-up of the machine” have been removed.]

3.1.5

separation distance

S

minimum distance required between the actuation position of the sensitive protective equipment and the hazard zone to prevent the human body or its parts from reaching the hazard zone before achieving the intended risk reduction

Note 1 to entry: Different separation distances may be determined for different conditions or approaches, but the greatest of these separation distances is used for selecting the position of the safeguard.

Note 2 to entry: previously referred to as minimum distance.

[SOURCE: ISO 13855: – 2, 3.1.8]

3.1.6

reference plane

level at which persons would normally stand during the use of the machine or access to the hazard zone or safety-related manual control device

Note 1 to entry: The reference plane is not necessarily the ground or the floor (for example, a working platform could be the reference plane).

[SOURCE: ISO 13855: – 2, 3.1.10]

3.1.7

reset function

a function within the SRP/CS used to restore one or more safety functions

3.1.8

restart interlock

means of preventing automatic restarting of a machine after actuation of a protective device during a hazardous part of the machine operating cycle, after a change in mode of operation of the machine, and/or after a change in the means of start control of the machine

Note 1 to entry: Modes of operation include inch, single stroke, automatic. Means of start control include foot switch, two-hand control, and single or double actuation of the electro-sensitive protection equipment (ESPE) sensing device.

[SOURCE: IEC 61496-1:2020, 3.22, modified – “..the sensing device” has been replaced with “..a protective device”]

3.1.9

span-of-control

predetermined portion of the machinery under control of a specific device or safety function

Note 1 to entry: A protective device could initiate a stop of a machine or a portion of a machine. For example, an emergency stop pushbutton could cause a local stop or a global stop (see ISO 13850).

[SOURCE: ISO 11161: 2007, 3.23, modified – Hyphens have been introduced to the term. “IMS” has been replaced by “machinery” and “or safety function” has been added at the end of the definition. The given Note to entry has been added.]

3.1.10

safeguarded space

area or volume enclosing a hazard zone(s) where guards and/or protective devices are intended to protect persons

3.1.11

whole body access

situation where a person can be completely inside a safeguarded space

3.1.12

safety-related manual control device

SRMCD

control device which requires deliberate human action and whose actuation can result in an increase of the risk(s)

Note 1 to entry: Examples include actuating devices such as pushbuttons, selector switches, or foot pedals designed for functions such as reset, start/restart, unconditional guard unlocking or hold-to-run control (e.g. jog, inching).

Note 2 to entry: Safety-related manual control devices can be an integral part of the safeguard.

[SOURCE: ISO 13855: – 2, 3.1.14, modified – Note 2 to entry has been added.]

3.1.13

visual line-of-sight

VLOS

situation where a person has view of the span-of-control