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INTERNATIONAL STANDARD

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Safety of machinery – Application of protective equipment to detect the presence of persons

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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SAFETY OF MACHINERY – APPLICATION OF PROTECTIVE EQUIPMENT TO DETECT THE PRESENCE OF PERSONS

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62046 has been prepared by IEC technical committee 44: Safety of machinery – Electrotechnical aspects.

This first edition cancels and replaces IEC TS 62046, published in 2008. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC TS 62046:2008:

a) additional annexes relating to muting and vision systems,
b) muting requirements have been updated,
c) blanking requirements have been updated,
d) addition of IEC 61496 series Types and capping the Safety Integrity level according to IEC 62061 and performance levels according to ISO 13849-1,
e) alignment to changes in IEC 61496 series.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
44/803/FDIS	44/812/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This International Standard provides requirements and information on the application of protective equipment, which employs (a) sensing device(s) to detect person(s), in order to reduce or minimize a risk from hazardous parts of machinery, without providing a physical barrier.

The objective of this document is to assist standards writing committees responsible for developing machine standards ("C" Standards), machine designers, manufacturers and refurbishers, machine safety certification organizations, workplace authorities and others on the proper application of protective equipment to machinery.

Figure 1 and Figure 2 show the general context and the intended use of this standard.

Clauses 1 to 5, 7 and 8 of this document apply to all protective equipment included in the scope, Clause 6 contains guidance for the application of specific kinds of protective equipment.

The principles of this document can be useful in the application of devices using other detection technologies but this document does not give specific requirements for devices other than those listed above.

This document considers devices standardised in the IEC 61496 series and the ISO 13856 series. Unless a product-specific safety-related standard for devices using other sensing technologies is published, their suitability as the sole means of protection from machine hazards is unknown. Great care should be taken in the selection and use of devices for which there is no product-specific safety-related standard because their behaviour, particularly under fault conditions, is not known to be sufficiently predictable.

An SILCL (SIL claim limit, see IEC 62061) or PL (Performance Level, see ISO 13849-1) or SIL (Safety Integrity Level, see IEC 61508) is not sufficient as an indication of a device's suitability for use as a safeguard. Suitability depends on appropriate sensing means, environmental conditions especially noise that can affect the detection capability, behaviour under fault conditions, etc

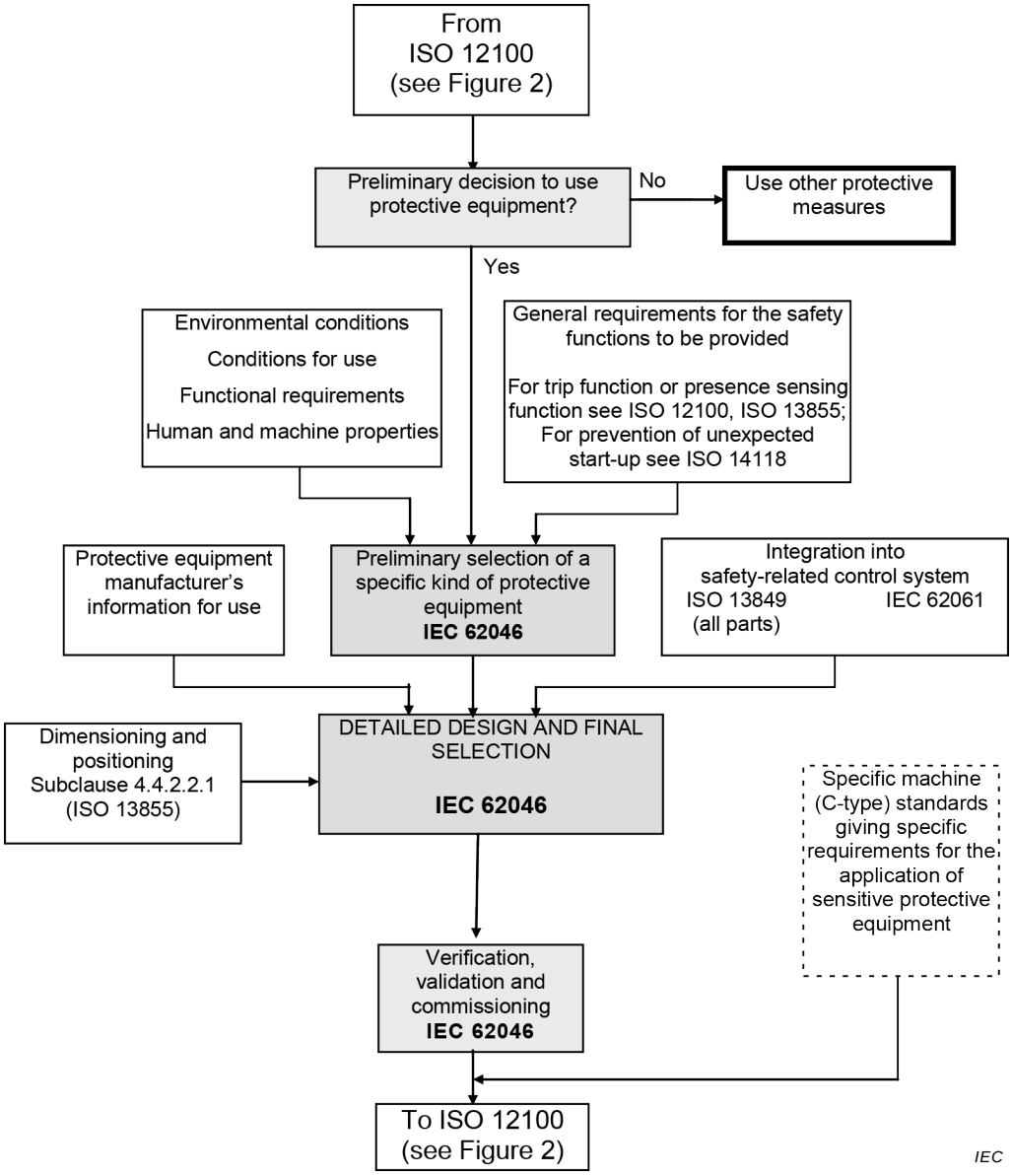

Figure 1 – Relationship of this International Standard to other standards

(see also Figure 2)

SAFETY OF MACHINERY – APPLICATION OF PROTECTIVE EQUIPMENT TO DETECT THE PRESENCE OF PERSONS

1 Scope

This International Standard specifies requirements for the selection, positioning, configuration and commissioning of protective equipment to detect the momentary or continued presence of persons in order to protect those persons from dangerous part(s) of machinery in industrial applications. This standard covers the application of electro-sensitive protective equipment (ESPE) specified in IEC 61496 (all parts) and pressure sensitive mats and floors specified in ISO 13856-1.

It takes into account the characteristics of the machinery, the protective equipment, the environment and human interaction by persons of 14 years and older.

This document includes informative annexes to provide guidance on the application of protective equipment to detect the presence of persons. These annexes contain examples to illustrate the principles of this standard. These examples are not intended to be the only solutions to a given application and are not intended to restrict innovation or advancement of technology. The examples are provided only as representative solutions to illustrate some of the concepts of integration of protective equipment, and have been simplified for clarity, so they may be incomplete.

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.

IEC 62061, *Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems*

ISO 12100:2010[1], *Safety of machinery – General principles for design – Risk assessment and risk reduction*

ISO 13849 (all parts), *Safety of machinery – Safety-related parts of control systems*

ISO 13855:2010, *Safety of machinery – Positioning of safeguards with respect to the approach speeds of parts of the human body*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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[1] ISO 12100:2010 constitutes a consolidation without technical changes of ISO 12100-1:2003, ISO 12100-2:2003, ISO 14121-1:2007 and related amendments. This consolidation does not require updates or revisions to type B- and type C- standards or other documents (e.g. for risk assessment) based on the previous standards.