

English version

**Safety of machinery -
Electro-sensitive protective equipment -
Passive infra-red protective devices (PIPDs)**

This Technical Specification was approved by CENELEC on 2003-11-01.

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CENELEC

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Foreword

This Technical Specification was prepared by the Technical Committee CENELEC TC 44X, Safety of machinery: electrotechnical aspects.

The text of the draft was submitted to the formal vote and was approved by CENELEC as CLC/TS 50418 on 2003-11-01.

This Technical Specification is to be read in conjunction with EN 61496-1:1997.

The following date was fixed:

- latest date by which the existence of the CLC/TS (doa) 2004-04-16
has to be announced at national level

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Introduction

The Technical Specification CLC/TS 50418 has been prepared by CENELEC Technical Committee TC 44X: Safety of machinery – Electrotechnical aspects, in collaboration with IEC Technical Committee 44: Safety of machinery – Electrotechnical aspects.

This Technical Specification is to be read in conjunction with EN 61496-1 and supplements or modifies the corresponding clause in EN 61496-1.

Where a particular clause or subclause of EN 61496-1 is not mentioned in this Technical Specification, that clause or subclause applies. Where this Technical Specification states "*addition*", "*modification*" or "*replacement*", the relevant text of EN 61496-1 is to be adapted accordingly.

This document is being issued in the Technical Specification series of publications (according to the CEN/CENELEC Internal Regulations subclause 11.3) as a "prospective standard for provisional application" in the field of safety of machinery because there is an urgent need for guidance in this field. This document is not to be regarded as a "European Standard". It is proposed for provisional application so that information and experience of its use in practice may be gathered. Comments on the content of this document should be sent to the Secretary of CENELEC TC 44X.

A review of this Technical Specification will be carried out not later than 3 years after its publication with the options of

- extension for another 3 years
- conversion into a European Standard; or
- withdrawal.

An electro-sensitive protective equipment (ESPE) is applied to machinery that presents a risk of personal injury. It provides protection by causing the machine to revert to a safe condition before a person can be placed in a hazardous situation.

This Technical Specification provides general design and performance requirements of ESPEs for use over a broad range of applications. Essential features of equipment meeting the requirements of this Technical Specification are the safety-related performance provided and the built-in periodic functional checks/self-checks that are specified to ensure that this level of performance is maintained. It may be used as guidance in dedicated product standards for the safety of machinery.

This Technical Specification has been prepared as a specification of particular requirements for electro-sensitive protective equipment (ESPE) using PIPDs specifically related to machinery safety and has been developed to meet the needs of manufacturers, industrial users and safety enforcement authorities.

Each type of machine presents its own particular hazards and it is not the purpose of this Technical Specification to recommend the manner of application of the ESPE to any particular machine. The application of the ESPE should be a matter for agreement between the equipment supplier, the machine user and the enforcing authority; in this context, attention is drawn to the relevant guidance established internationally, for example ISO 12100, IEC TS 62046.

Only PIPDs designed for safety-related applications should be used as protective equipment. PIPDs use a relatively new technology which is under consideration by TC44X for possible inclusion in EN 61496. Until a product standard for PIPDs is published, care should be taken in the selection and use of these devices. It is recommended to consult the PIPD manufacturer and other sources of information about their application.

PIPDs can detect the difference between a person and an inanimate object, provided that the thermal radiation from the person is different from that of the background. Some PIPDs can only detect moving persons so they shall not be used as presence sensing devices.

PIPDs detect thermal radiation, and spurious tripping can be caused by the thermal radiation from objects other than persons, e.g. hot process material, space heaters.

1 Scope

This clause of EN 61496-1 is replaced by the following:

This Technical Specification is to be read in conjunction with EN 61496-1:1997. It specifies requirements for the design, construction and testing of electro-sensitive protective equipment (ESPE) for the safeguarding of machinery, employing passive infra-red protective devices (PIPDs) for the sensing function. Special attention is directed to features that ensure an appropriate safety-related performance is achieved. An ESPE may include optional safety-related functions, the requirements for which are given in Annex A of EN 61496-1.

This Technical Specification does not specify the different means of thermal radiation detection nor the dimensions or configurations of the detection zone and its disposition in relation to hazardous parts for any particular application, nor what constitutes a hazardous state of any machine. It is restricted to the functioning of the ESPE and how it interfaces with the machine.

PIPDs are devices that have a detection zone specified in three dimensions wherein persons or parts of persons are detected as a result of their thermal radiation.

Excluded from this part are PIPDs operating at wavelengths outside the range 6 μm to 14 μm .

This Technical Specification may be relevant to applications other than those for the protection of persons, for example the protection of machinery or products from mechanical damage. In those applications additional requirements may be necessary, for example when materials that are not intended to be recognized by the sensing function have similar properties to those of persons.

This Technical Specification does not deal with electromagnetic compatibility (EMC) emission requirements.

2 Normative references

This clause of EN 61496-1 is applicable with the following addition:

EN 61496-1:1997, Safety of machinery - Electro-sensitive protective equipment – Part 1: General requirements and tests (IEC 61496-1)

3 Definitions

This clause of EN 61496-1 is applicable except as follows:

Amendment: replace 3.5 of EN 61496-1 by the following

3.5 detection zone (DZ)

zone within which the specified test piece(s) will be detected by the electro-sensitive protective equipment (ESPE) under all conditions specified in this standard (see Figures 1 and 2)

Additional definitions:

3.401 passive infrared protective device (PIPD)

device whose sensing function is performed by a receiving element(s) detecting thermal radiation emitted by an object placed in, or moving within, the specified detection zone