AS 4024.2801—2008

Australian Standard®

Safety of machinery

Part 2801: Safety distances and safety gaps—Positioning of protective equipment with respect to the approach speed of parts of the human body

This Australian Standard® was prepared by Committee SF-041, General Principles for the Guarding of Machinery. It was approved on behalf of the Council of Standards Australia on 27 May 2008.
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The following are represented on Committee SF-041:

- Australian Chamber of Commerce and Industry
- Australian Electrical and Electronic Manufacturers Association
- Department for Administration and Information Services, SA
- Department of Consumer and Employment Protection, WorkSafe Division, WA
- Department of Industrial Relations, Qld
- Department of Primary Industries, Mine Safety, NSW
- Engineers Australia
- Federal Chamber of Automotive Industries
- Human Factors and Ergonomics Society of Australia
- Institute of Instrumentation, Control and Automation Australia
- National Electrical and Communications Association
- National Safety Council of Australia
- Office of the Australian Safety and Compensation Council
- Safety Institute of Australia
- The University of Melbourne
- Tractor and Machinery Association of Australia
- Victorian WorkCover Authority

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PREFACE

This Standard was prepared by the Standards Australia Committee SF-041, General Principles for the Guarding of Machinery to supersede, (in part), AS 4024.2—1998, *Safeguarding of machinery*, Part 2: *Installation and commissioning requirements for electro-sensitive systems—Optoelectronic devices.*

In common with other Parts of AS 4024, this Standard is based upon documents originating within the European Community in the field of safety of machinery. Many of these European Standards are being adopted virtually unchanged as International Standards by the International Organization for Standardization (ISO) and the committee has agreed to continue to use material emanating from both CEN and ISO.

The Standard is based upon but not equivalent to ISO 13855:2002 *Safety of machinery—Positioning of protective equipment with respect to the approach of parts of the human body.*

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

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FOREWORD

The effectiveness of certain types of protective equipment described in this Standard to minimize risk relies, in part, on the relevant parts of that equipment being correctly positioned in relation to the danger zone. In deciding on these positions, a number of aspects are to be taken into account, such as—

(a) the need to identify hazards and to assess risks;

(b) the practical experiences of users, including accident statistics;

(c) the state of the art and possible future technical developments;

(d) the type of equipment to be used;

(e) the response times of protective equipment used;

(f) the time taken to ensure the safe condition of the machine following operation of the protective equipment, for example to stop the machine;

(g) the bio-mechanical and anthropometric data of body parts;

(h) the path taken by the body part when moving from the sensing or actuating means towards the danger zone;

(i) the possible presence of a person between the device and the danger zone; and

(j) the possibility of undetected access to the danger zone.

If these aspects are further developed, the current state of the art, reflected in this Standard, will be updated.

This Standard gives guidance based on the assumption that the correct device has been chosen either by reference to the appropriate machine specific standard or by carrying out a risk assessment.

The calculated distances, when implemented, will provide sufficient protection for persons against the risks caused by approaching a danger zone which generate any of the following mechanical hazards, such as: crushing, shearing, cuffing or severing, entanglement, drawing-in or trapping, friction or abrasion, stabbing or puncture and impact.

Protection against the risks from mechanical hazards arising from the ejection of solid or fluid materials and non-mechanical hazards, such as toxic emissions, electricity, radiation etc., are not covered by this Standard.

The distances are derived from data that take into account population groups likely to be found in European countries and are consequently applicable to those groups.

NOTES:

1 If this Standard is to be used for non-industrial purposes, then the designer should take into account that this data is based on industrial experience.

2 Until specific data is available for approach speeds for children, this Standard uses adult speeds and lower detection factors, where relevant, to calculate the distances that could be within the reach of children.

STANDARDS AUSTRALIA

Australian Standard
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1 SCOPE

This Standard provides the means to determine the minimum distances from the sensing or actuating devices of protective equipment to a danger zone. The safety distances are based upon values for hand or arm approach speeds and the response time for the machine.

These specific devices are—

(a) trip devices as defined in AS 4024.1201 (specifically electro-sensitive protective equipment, pressure sensitive mats), including those used additionally to initiate operation; and

(b) two-hand control devices as defined in AS 4024.1201.

NOTES:

1 For the purposes of this Standard, hold-to-run controls, which are designed to be actuated with one hand, are not considered to be protective equipment.

2 Electro-sensitive protective equipment is a forms a family of trip devices which includes active opti-electronic protective devices (AOPD).

This Standard does not apply to protective equipment which is intended to be moved, without tools, nearer to the danger zone than the calculated distance, e.g. pendant two-hand control devices.

The minimum distances derived from this Standard do not apply to protective equipment used to detect the presence of persons within an area already protected by a guard or electro-sensitive protective equipment.

2 OBJECTIVE

The objective of this Standard is to provide designers, manufacturers, suppliers, installers and users of electro-sensitive protective equipment with the means of determining the minimum distance from a danger zone the equipment must be located in order to minimize the risk to health and safety of those working with or otherwise near machinery at which the equipment is installed.

3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard.

AS		
4024	Safety machinery	
4024.1201	Part 1201:	General principles—Basic terminology and methodology
4024.1202	Part 1202:	General principles—Technical principles
4024.1301	Part 1301:	Risk assessment—Principles of risk assessment
4024.1801	Part 1801:	Safety distances and gaps—Safety distances to prevent danger zones being reached by the upper limbs
4024.2601	Part 2601:	Design of controls, interlocks and guarding—Two-hand control devices—Functional aspects and design principles