AS/NZS 4024.1401:2014
EN 614-1:2006+A1:2009

AS/NZS 4024.1401:2014

Australian/New Zealand Standard™

Safety of machinery

Part 1401: Ergonomic principles—Design principles—Terminology and general principles

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The following are represented on Committee SF-041:

Australian Chamber of Commerce and Industry
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Australian Manufacturing Workers Union
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Federal Chamber of Automotive Industries
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We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

This Standard was issued in draft form for comment as DR AS/NZS 4024.1401.

Australian/New Zealand Standard™

Safety of machinery

Part 1401: Ergonomic principles—Design principles—Terminology and general principles

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee SF-041, General Principles for the Guarding of Machinery, to supersede AS 4024.1401—2006.

It is emphasized that this Standard is part of the AS(/NZS) 4024.1 series and it is imperative that it is used in conjunction with other applicable parts of the series. A complete listing of all current parts of the AS(/NZS) 4024.1 series can be found at the Standards Australia website <www.standards.org.au> and in AS/NZS 4024.1100, *Safety of machinery*, Part 1100: *Application Guide*.

The objective of this Standard is to establish the ergonomic principles to be followed during the process of design of machinery. It applies to the interactions between operators and machinery when installing, operating, adjusting, maintaining, cleaning, dismantling, repairing or transporting equipment, and outlines the principles to be followed in taking the health, safety and wellbeing of the operator into account. It provides a framework within which the range of more specific ergonomic Standards of this series (i.e. AS/NZS 4024.1901 to AS/NZS 4024.1907) is recommended to be applied.

This Standard is identical with, and has been reproduced from EN 614-1:2006, *Safety of machinery—Ergonomic design principles*, Part 1: *Terminology and general principles*, and its Amendment 1 (2009). The start and finish of text introduced or altered by amendment is indicated in the text by the tags [A1] ⟨A1⟩.

As this Standard is reproduced from an International Standard, the following applies:

(a) In the source text 'this European Standard' should read 'this Australian/New Zealand Standard'.

(b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*	
EN		AS/NZS	
894	Safety of machinery—Ergonomics requirements for the design of displays and control actuators	4024	Safety of machinery
894-3	Part 3: Control actuators	4024.1903	Part 1903: Displays, controls, actuators and signals—Ergonomic requirements for the design of displays and control actuators—Control actuators
EN ISO			
12100	Safety of machinery—Basic concepts, general principles for design		
12100-1	Part 1: Basic terminology, methodology (ISO 12100-1:2003)	4024.1201	Part 1201: General principles for design—Risk assessment and risk reduction
12100-2	Part 2: Technical principles (ISO 12100-2:2003)	4024.1201	Part 1201: General principles for design—Risk assessment and risk reduction
14121	Safety of machinery—Risk assessment		
14121-1	Part 1: Principles (ISO 14121-1:2007)	4024.1201	Part 1201: General principles for design—Risk assessment and risk reduction

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

CONTENTS

INTRODUCTION

Ergonomically designed work systems enhance safety, improve human working and living conditions and counteract adverse effects on human health. Also they usually improve the operator-machine system performance and reliability. In this European Standard the term "ergonomics" refers to a multidisciplinary field of science and its application. Applying ergonomics to the design of work systems, especially where the design of machinery is concerned, ensures that human capabilities, skills, limitations and needs are taken into account.

The work system includes operators, job design, work equipment (e.g. machinery), work space, work environment, work process and the interactions between them. It can vary in complexity from a workshop with a single operator using hand held equipment to a process plant and its operators. Good design takes into account how the operator is expected to interact with the work equipment and how the work equipment fits into the system as a whole. This is particularly important the more the work equipment is interdependent on other components of the system. In its whole complexity, the working system is described in generic standards (e.g. EN ISO 6385).

Compliance with harmonised standards prepared by CEN/CENELEC enables manufacturers and suppliers to meet requirements of European legislation. EN ISO 12100-1 and EN ISO 12100-2 contain the concepts and general principles to guide designers in achieving safety for machinery for occupational and private purposes. Ergonomic principles can be incorporated into the design process by following this standard. In this way both the technical design and ergonomic principles are considered at the same time. The aim to enhance the health, safety and well-being of workers is reached by systematically minimizing the risks according to ⟨A1⟩ EN ISO 12100 ⟨A1⟩. EN 13861 provides information concerning applicable ergonomic B-type standards related to specific hazards.

This standard is one of the European Standards covering specific topics identified in EN ISO 12100-1 and EN ISO 12100-2 as important to the safety of machinery.

AUSTRALIAN/NEW ZEALAND STANDARD

Safety of machinery

Part 1401:
Ergonomic principles—Design principles—Terminology and general principles

1 Scope

This European Standard establishes the ergonomic principles to be followed during the process of design of machinery.

This European Standard applies to the interactions between operators and machinery when installing, operating, adjusting, maintaining, cleaning, dismantling, repairing or transporting equipment, and outlines the principles to be followed in taking the health, safety and well-being of the operator into account. This European Standard provides a framework within which the range of more specific ergonomics standards and other related standards relevant to machinery design should be applied.

The ergonomic principles given in this European Standard apply to all ranges of human abilities and characteristics to ensure safety, health and well-being and overall system performance. Information will need to be interpreted to suit the intended use.

NOTE Although the principles in this European Standard are oriented towards machinery for occupational use, they are also applicable to equipment and machinery for private use.