

Australian Standard™

**Safety of machinery**

**Part 1502: Design of safety related parts  
of control systems—Validation**



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 11 April 2006.  
This Standard was published on 29 June 2006.

---

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 Primary Industries, Mine Safety, NSW  
Engineers Australia  
Federal Chamber of Automotive Industries  
Human Factors and Ergonomics Society of Australia  
Institution 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

---

### **Keeping Standards up-to-date**

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Web Shop at [www.standards.com.au](http://www.standards.com.au) and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Global Standard*, has a full listing of revisions and amendments published each month.

Australian Standards™ and other products and services developed by Standards Australia are published and distributed under contract by SAI Global, which operates the Standards Web Shop.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at [mail@standards.org.au](mailto:mail@standards.org.au), or write to the Chief Executive, Standards Australia, GPO Box 476, Sydney, NSW 2001.

---

Australian Standard™

**Safety of machinery**

**Part 1502: Design of safety related parts  
of control systems—Validation**

Originated as part of AS 4024.1(Int)—1992.  
Previous edition part of AS 4024.1—1996.  
Revised in part and redesignated as AS 4024.1502—2006.

**COPYRIGHT**

© Standards Australia

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher.

Published by Standards Australia GPO Box 476, Sydney, NSW 2001, Australia

ISBN 0 7337 7484 9

## PREFACE

This Standard was prepared by the Standards Australia Committee SF-041, as a revision, in part, of AS 4024.1—1996, *Safeguarding of machinery, Part 1: General principles*.

During its work, the Committee considered a number of Standards 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 in this new edition. This action will maintain consistency with previous editions of AS 4024.1 and other machine-specific Australian Standards.

This edition has been published as a series of Parts rather than the single Standard previously published as AS 4024.1. In doing this, the Committee has cleared the way for simple revisions in the future. When a new edition of a relevant Standard becomes available at the international level, it will be adopted and published within the framework of AS 4024 with a minimum delay, so ensuring continued international alignment.

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.

## CONTENTS

	<i>Page</i>
1 SCOPE.....	4
2 OBJECTIVE .....	4
3 REFERENCED DOCUMENTS.....	4
4 VALIDATION PROCESS.....	5
5 VALIDATION BY ANALYSIS .....	9
6 VALIDATION BY TESTING .....	10
7 VALIDATION OF SAFETY FUNCTIONS .....	12
8 VALIDATION OF CATEGORIES.....	12
9 VALIDATION OF ENVIRONMENTAL REQUIREMENTS .....	14
10 VALIDATION OF MAINTENANCE REQUIREMENTS .....	14
 APPENDICES	
A VALIDATION TOOLS FOR MECHANICAL SYSTEMS .....	15
B VALIDATION TOOLS FOR PNEUMATIC SYSTEMS .....	20
C VALIDATION TOOLS FOR HYDRAULIC SYSTEMS .....	31
D VALIDATION TOOLS FOR ELECTRICAL SYSTEMS .....	40

## STANDARDS AUSTRALIA

### Australian Standard Safety of machinery

#### Part 1502: Design of safety related parts of control systems—Validation

#### 1 SCOPE

This Standard specifies the procedures and conditions to be followed for the validation by both analysis and testing of the safety functions provided, and the category achieved for the safety related parts of the control system in compliance with AS 4024.1501, using the design rationale provided by the designer.

This Standard does not give complete validation requirements for programmable electronic systems and therefore can require the use of other standards.

NOTE: Requirements for programmable electronic systems, including embedded software, are given in the AS 61508 series.

#### 2 OBJECTIVE

The objective of this Standard is to provide designers, manufacturers, suppliers, installers and users of safety related parts of control systems with the means of minimizing risks to the health and safety of those working with or otherwise near machinery fitted with safety related parts within their control systems.

#### 3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard.

##### AS

1447	Hot-rolled spring steels
4024	Safety of 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
4024.1501	Part 1501: Design of safety related parts of control systems—General principles for design
4024.1602	Part 1602: Design of controls, interlocks and guarding—Interlocking devices associated with guards—Principles for design and selection
4024.1603	Part 1603: Design of controls, interlocks and guarding—Prevention of unexpected start up
4024.1604	Part 1604: Design of controls, interlocks and guarding—Emergency stop—Principles for design
60204	Safety of machinery—Electrical equipment of machines
60204.1	Part 1: General requirements (IEC 60204-1 Ed.5 (FDIS) MOD)
60269	Low-voltage fuses
60269.1	Part 1: General requirements
60529	Degrees of protection provided by enclosures (IP Code)
60947	Low-voltage switchgear and control gear
60947.2	Part 2: Circuit-breakers