

Australian/New Zealand Standard™

Safety of machinery

Part 1201: General principles for design—Risk assessment and risk reduction



AS/NZS 4024.1201:2014

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee SF-041, General Principles for the Guarding of Machinery. It was approved on behalf of the Council of Standards Australia on 5 June 2014 and on behalf of the Council of Standards New Zealand on 24 April 2014. This Standard was published on 30 June 2014.

The following are represented on Committee SF-041:

Australian Chamber of Commerce and Industry
Australian Industry Group
Australian Manufacturing Workers Union
Department of Mines and Petroleum, WA
Department of the Premier and Cabinet, SA
Engineers Australia
Federal Chamber of Automotive Industries
Human Factors and Ergonomics Society of Australia
Institute of Instrumentation, Control and Automation
National Safety Council of Australia
New Zealand Electrical Institute
NSW Department of Trade and Investment, Regional Infrastructure and Services
Safety Institute of Australia
University of Melbourne
Winery Engineering Association
WorkCover New South Wales
WorkSafe NZ
WorkSafe Victoria

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 Standards may also be withdrawn.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 joint Australian/New Zealand Standards can be found by visiting the Standards Australia Web Site at www.standards.org.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

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 4024.1201.

AS/NZS 4024.1201:2014

Australian/New Zealand Standard™

Safety of machinery

Part 1201: General principles for design—Risk assessment and risk reduction

Originated in Australia as part of AS 4024.1(Int)—1992.
Revised in part and redesignated as AS 4024.1201—2006 and AS 4024.1301—2006.
AS 4024.1201—2006 and AS 4024.1301—2006 jointly revised, amalgamated and redesignated as AS/NZS 4024.1201:2014.

COPYRIGHT

© Standards Australia Limited/Standards New Zealand

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, unless otherwise permitted under the Copyright Act 1968 (Australia) or the Copyright Act 1994 (New Zealand).

ISBN 978 1 74342 774 3

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 4024.1201—2006, *Safety of machinery, Part 1201: General principles—Basic terminology and methodology*, and AS 4024.1301—2006, *Safety of machinery, Part 1301: Risk assessment—Principles of risk assessment*.

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 specify basic terminology, principles and methodology for achieving safety in the design of machinery. It specifies principles of risk assessment as it relates to safety of machinery, with procedures for identifying hazards and estimating, evaluating and minimizing risks.

This Standard is identical with, and has been reproduced from ISO 12100:2010, *Safety of machinery—General principles for design—Risk assessment and risk reduction*.

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

- (a) In the source text ‘this International 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:

| <i>Reference to International Standard</i> | <i>Australian/New Zealand Standard</i> |
|--|--|
| IEC | AS |
| 60204 Safety of machinery—Electrical equipment of machines | 60204 Safety of machinery—Electrical equipment of machines |
| 60204-1 Part 1: General requirements | 60204.1 General requirements (IEC 60204-1, Ed. 5 (FDIS) MOD) |

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

| | | |
|---------------|--|-----------|
| 1 | Scope | 1 |
| 2 | Normative references | 1 |
| 3 | Terms and definitions | 1 |
| 4 | Strategy for risk assessment and risk reduction | 9 |
| 5 | Risk assessment | 12 |
| 5.1 | General | 12 |
| 5.2 | Information for risk assessment | 12 |
| 5.3 | Determination of limits of machinery | 13 |
| 5.3.1 | General | 13 |
| 5.3.2 | Use limits | 13 |
| 5.3.3 | Space limits | 14 |
| 5.3.4 | Time limits | 14 |
| 5.3.5 | Other limits | 14 |
| 5.4 | Hazard identification | 14 |
| 5.5 | Risk estimation | 16 |
| 5.5.1 | General | 16 |
| 5.5.2 | Elements of risk | 17 |
| 5.5.3 | Aspects to be considered during risk estimation | 19 |
| 5.6 | Risk evaluation | 21 |
| 5.6.1 | General | 21 |
| 5.6.2 | Adequate risk reduction | 21 |
| 5.6.3 | Comparison of risks | 21 |
| 6 | Risk reduction | 22 |
| 6.1 | General | 22 |
| 6.2 | Inherently safe design measures | 23 |
| 6.2.1 | General | 23 |
| 6.2.2 | Consideration of geometrical factors and physical aspects | 23 |
| 6.2.3 | Taking into account general technical knowledge of machine design | 24 |
| 6.2.4 | Choice of appropriate technology | 25 |
| 6.2.5 | Applying principle of positive mechanical action | 25 |
| 6.2.6 | Provisions for stability | 25 |
| 6.2.7 | Provisions for maintainability | 26 |
| 6.2.8 | Observing ergonomic principles | 26 |
| 6.2.9 | Electrical hazards | 27 |
| 6.2.10 | Pneumatic and hydraulic hazards | 27 |
| 6.2.11 | Applying inherently safe design measures to control systems | 28 |
| 6.2.12 | Minimizing probability of failure of safety functions | 33 |
| 6.2.13 | Limiting exposure to hazards through reliability of equipment | 33 |
| 6.2.14 | Limiting exposure to hazards through mechanization or automation of loading (feeding)/ unloading (removal) operations | 34 |
| 6.2.15 | Limiting exposure to hazards through location of setting and maintenance points outside danger zones | 34 |
| 6.3 | Safeguarding and complementary protective measures | 34 |
| 6.3.1 | General | 34 |
| 6.3.2 | Selection and implementation of guards and protective devices | 35 |
| 6.3.3 | Requirements for design of guards and protective devices | 40 |
| 6.3.4 | Safeguarding to reduce emissions | 43 |

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-