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Safeguarding of machinery

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Z432-16

October 2016

Title: *Safeguarding of machinery*

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Z432-16
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Published in October 2016 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3

To purchase standards and related publications, visit our Online Store at shop.csa.ca
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ISBN 978-1-4883-0482-8

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Preface

This is the third edition of CSA Z432, *Safeguarding of machinery*. It supersedes the previous editions published in 2004 and 1994.

This Standard specifies requirements for the design, manufacture (including remanufacture and rebuilding), installation, maintenance, operation, and safeguarding of industrial equipment to prevent injuries and accidents and enhance the safety of personnel who operate, assemble, and maintain machinery.

The scope of this new edition has been expanded to incorporate new international Standards on machinery design and performance and to provide additional information for the identification of hazards, including non-mechanical hazard(s). It contains the methodology for performing a comprehensive risk assessment. As indicated in Clause 4, this Standard is intended to be applied to newly manufactured, rebuilt, and redeployed machinery. However, it may also be used to set upgrade targets for existing machinery. This Standard provides advice on the basic principles of safeguarding and safety control performance to the extent that a manufacturing engineer, plant engineer, manager, or safety manager may interpret the advice and apply it to any particular machine. Additional illustrations are used to demonstrate the general application of these principles, although alternative safeguarding solutions may be equally effective.

The need for a new edition was prompted by the changing technology related to these machines and the wish of stakeholders, including regulators, employers, manufacturers, and labour, for a document that would reflect the latest thinking concerning operator and equipment safety. It was the intent of the Technical Committee to harmonize, where possible and where appropriate, with international Standards. For that reason, parts of this Standard are based on the latest editions of ISO 12100 and ISO 13849. Clauses 6.1 to 6.2.7, 6.2.9 to 6.3.4.1, 6.3.4.3, 6.3.4.4, and 6.3.5 to 6.4.5.3 are reproduced from ISO 12100 with permission.

The major changes to this edition include the following:

- a) this Standard has been updated to harmonize with the latest ISO standards;
- b) additional Annex material has been added to provide additional guidance and information for users;
- c) Clause 5 on risk assessment has been significantly expanded and, where possible, harmonized with CAN/CSA-Z1002; and
- d) allowable minimum (safe) distances have been changed to allow for the use of CAN/CSA-ISO 13857.

CSA Group acknowledges that the development of this Standard was made possible, in part, by the financial support of federal, provincial, and territorial occupational health and safety government agencies.

This Standard was prepared by the Technical Committee on Safeguarding of Machinery, under the jurisdiction of the Strategic Steering Committee on Occupational Health and Safety, and has been formally approved by the Technical Committee.

Notes:

- 1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
- 2) *Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.*

- 3) *This Standard was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as “substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity”. It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.*
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 - d) *rationale for the change.*

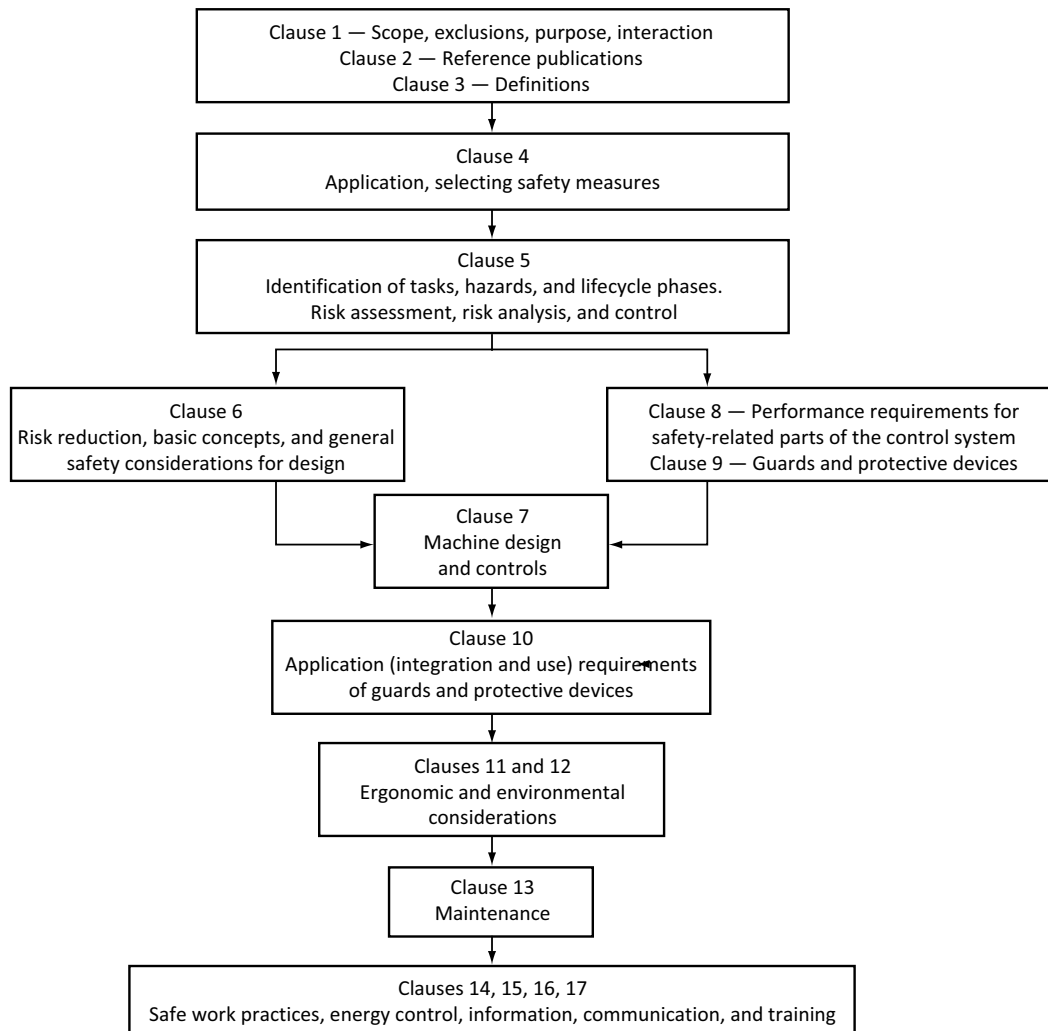
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Safeguarding of machinery

0 Introduction

This Standard assigns responsibilities for machinery safety to manufacturers, integrators, installers, and the user. Proper safeguarding of personnel is determined utilizing the methodology in Clause 5, risk assessment. This Standard is best read in its entirety for full comprehension of requirements. Figure 0.1 gives a graphic presentation of the flow of responsibilities as outlined in the Standard.

Figure 0.1
Flow of responsibilities
(See Clause 0.)



1 Scope

1.1 General

This Standard applies to the protection of workers from the hazards arising from the use of mobile or stationary machinery. It provides the criteria to be observed and the description, selection, and application of guards and protective devices. Where a current CSA Standard exists for a specific type of machinery (e.g., CSA B167, CAN/CSA-B354.2, CSA M424.1, CSA Z142, CAN/CSA-Z248, and CAN/CSA-Z434), it is to be used in conjunction with this Standard to provide the most effective protection.

Note: *This Standard is intended to be applied to newly manufactured and newly installed machinery as of the publication date of this Standard. The aim of this Standard is to promote a high standard of machinery safety during use.*

This Standard describes and illustrates a variety of protective measures and explains methods by which it is possible to assess which measure(s) it is reasonable to adopt in particular circumstances. As a minimum it will, however, be necessary to consult specific legislation in applying the principles set down. Although reference is made to specific types of machines, specific recommendations are not given for every type of machine. This Standard applies to rebuilt or redeployed machinery. The Standard can be used for enhancing the safety of existing machinery.

1.2 Exclusions

This Standard does not apply to portable hand tools.

1.3 Purpose

This Standard is intended for those who design, build, modify, install, use, operate, or maintain machinery, machinery guarding, or protective devices. It is also intended to be used by those concerned with information for use of the machinery and the development and implementation of instructions, and training and the effective implementation of administrative controls.

1.4 Interaction with other standards

Machinery safeguarding is not performed in isolation from other protective measures. Typically, industrial machinery is installed in workplaces where other associated activities take place (e.g., movement of materials, cables, pipes, and hoses supplying energy, gases, and liquids, and workers on foot and operating vehicles). Other machinery and work environment standards applicable to any place where this Standard is being implemented should therefore be reviewed.

1.5 Terminology

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the Standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the Standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.