



NSAI
Standards

Irish Standard
I.S. EN ISO 14118:2018

Safety of machinery - Prevention of unexpected start-up (ISO 14118:2017)

I.S. EN ISO 14118:2018

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

EN ISO 14118:2018

Published:

2018-02-07

This document was published under the authority of the NSAI and comes into effect on:

2018-02-25

ICS number:

13.110

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

National Foreword

I.S. EN ISO 14118:2018 is the adopted Irish version of the European Document EN ISO 14118:2018, Safety of machinery - Prevention of unexpected start-up (ISO 14118:2017)

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

For relationships with other publications refer to the NSAI web store.

Compliance with this document does not of itself confer immunity from legal obligations.

In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

This page is intentionally left blank

EUROPEAN STANDARD

EN ISO 14118

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2018

ICS 13.110

Supersedes EN 1037:1995+A1:2008

English Version

Safety of machinery - Prevention of unexpected start-up (ISO 14118:2017)

Sécurité des machines - Prévention de la mise en
marche intempestive (ISO 14118:2017)

Sicherheit von Maschinen - Vermeidung von
unerwartetem Anlauf (ISO 14118:2017)

This European Standard was approved by CEN on 7 October 2017.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword	3
Annex ZA (informative) Relationship between this International Standard and the essential requirements of Directive 2006/42/EC aimed to be covered	4

European foreword

This document (EN ISO 14118:2018) has been prepared by Technical Committee ISO/TC 199 “Safety of machinery” in collaboration with Technical Committee CEN/TC 114 “Safety of machinery” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2018, and conflicting national standards shall be withdrawn at the latest by August 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1037:1995+A1:2008.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 14118:2017 has been approved by CEN as EN ISO 14118:2018 without any modification.

Annex ZA (informative)

Relationship between this International Standard and the essential requirements of Directive 2006/42/EC aimed to be covered

This International Standard has been prepared under a Commission's standardization request M/396 to provide one voluntary means of conforming to essential requirements of Directive 2006/42/EC.

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZA.1 — Correspondence between this International Standard and Directive 2006/42/EC

Essential Requirements of Directive 2006/42/EC	Clause(s)/subclause(s) of this standard	Remarks/Notes
Within the limits of the scope all relevant essential requirements are covered	All normative clauses	

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this International Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

INTERNATIONAL STANDARD

**ISO
14118**

Second edition
2017-12

Safety of machinery — Prevention of unexpected start-up

*Sécurité des machines — Prévention de la mise en marche
intempestive*



Reference number
ISO 14118:2017(E)

© ISO 2017

ISO 14118:2017(E)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 General measures to prevent unexpected start-up	2
4.1 General.....	2
4.2 Manual measures for isolation and energy dissipation.....	3
4.3 Other means to prevent unexpected (unintended) start-up.....	3
4.4 Signalling and warning (delayed start).....	3
5 Isolation and energy dissipation	3
5.1 Prevention of unexpected start-up upon restoration of any power supplies.....	3
5.2 Devices for isolation from power supplies.....	3
5.3 Locking (securing) devices.....	4
5.4 Devices for stored-energy dissipation or restraint (containment).....	4
5.4.1 General.....	4
5.4.2 Mechanical elements.....	5
5.4.3 Locking or securing facilities for the restraint (containment) devices.....	5
6 Other measures to prevent unexpected start-up	5
6.1 Design strategy.....	5
6.2 Measures to prevent unintended generation of start commands.....	6
6.2.1 Measures to prevent unintended actuation of manual start controls.....	6
6.2.2 Design of safety-related parts of the control system.....	7
6.2.3 Selection and location of power control elements.....	7
6.3 Measures to maintain stop commands.....	7
6.3.1 Principle.....	7
6.3.2 Maintained stop command generated by a stop control device (level A).....	7
6.3.3 Maintained stop command generated by machine control (level B/C).....	8
6.3.4 Mechanical disconnection (level D; see Figure 1).....	8
6.3.5 Moving-part immobilization (level E; see Figure 1).....	8
6.4 Automatic monitoring of the safe state (stopped condition) during a category 2 stop.....	8
7 Design requirements for verification	8
7.1 General.....	8
7.2 Provisions for verifying isolation.....	9
7.3 Provisions for verifying energy dissipation or restraint (containment).....	9
Annex A (informative) Examples of tasks which can require the presence of persons in danger zones	10
Bibliography	11

ISO 14118:2017(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 199, *Safety of machinery*.

This second edition cancels and replaces the first edition (ISO 14118:2000), which has been technically revised and contains the following changes:

- the text has been edited to facilitate implementation of this document;
- the Scope has been redefined to exclude the specification of performance levels or safety integrity levels for safety-related parts of control systems;
- [Figure 1](#) has been updated.

Introduction

The structure of safety standards in the field of machinery is as follows:

- a) type-A standards (basic safety standards) giving basic concepts, principles for design, and general aspects that can be applied to all machinery;
- b) type-B standards (generic safety standards) dealing with one safety aspect or one or more type(s) of safeguard that can be used across a wide range of machinery:
 - type-B1 standards on particular safety aspects (e.g. safety distances, surface temperature, noise);
 - type-B2 standards on safeguards (e.g. two-hand controls, interlocking devices, pressure sensitive devices, guards);
- c) type-C standards (machine safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

This document is a type-B standard as stated in ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

- machine manufacturers (small, medium and large enterprises);
- health and safety bodies (regulators, accident prevention organizations, market surveillance, etc.)

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

- machine users/employers (small, medium and large enterprises);
- machine users/employees (e.g. trade unions, organizations for people with special needs);
- service providers, e.g. for maintenance (small, medium and large enterprises);
- consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate at the drafting process of this document.

In addition, this document is intended for standardization bodies elaborating type-C standards.

The requirements of this document can be supplemented or modified by a type-C standard.

For machines which are covered by the scope of a type-C standard and which have been designed and built according to the requirements of that standard, the requirements of that type-C standard take precedence.

Keeping a machine in a stopped condition while persons are present in danger zones is one of the most important conditions of the safe use of machinery and hence, one of the major aims of the machine designer and machine user.

In the past, the concepts of “operating machine” and “stopped machine” were generally unambiguous; a machine was

- operating when its movable elements or some of them were moving;
- stopped when its movable elements were at rest.

Machine automation has made the relationship between “operating” and “moving” on one hand and “stopped” and “at rest” on the other hand, more difficult to define. Automation has also increased the

ISO 14118:2017(E)

potential for unexpected start-up and a significant number of hazardous events have occurred where machines, stopped for diagnostic work or corrective actions, started up unexpectedly.

Hazards other than mechanical hazards generated by movable elements (e.g. from a laser beam) also need to be taken into account.

The risk assessment relating to the presence of persons in a danger zone of a stopped machine needs to take into account the probability of an unexpected start-up of the hazard-generating elements.

This document provides machine designers and machinery safety standard technical committees with samples of built-in measures which can be used to prevent unexpected start-up.

Safety of machinery — Prevention of unexpected start-up

1 Scope

This document specifies requirements for designed-in means aimed at preventing unexpected machine start-up (see 3.2) to allow safe human interventions in danger zones (see Annex A).

This document applies to unexpected start-up from all types of energy source, i.e.:

- power supply, e.g. electrical, hydraulic, pneumatic;
- stored energy due to, e.g. gravity, compressed springs;
- external influences, e.g. from wind.

This document does not specify performance levels or safety integrity levels for safety-related parts of control systems. While available means to prevent unexpected start-up are identified, this document does not specify the means for the prevention of unexpected machine start-up for specific machines.

NOTE A type-C standard can define the required means for the prevention of harm arising from unexpected start-up. Otherwise, the requirements for a specific machine need to be determined by risk assessment outside the scope of this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

IEC 62061, *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

start-up

machine start-up

change from rest to motion or switch-on of a machine or of one of its parts

Note 1 to entry: An example of function other than motion is switch-on of a laser.

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](#)
-