

This is a preview of "ISO 18497:2018". [Click here to purchase the full version from the ANSI store.](#)

First edition
2018-11

Agricultural machinery and tractors — Safety of highly automated agricultural machines — Principles for design

Tracteurs et matériels agricoles — Sécurité des machines hautement automatisées — Principes de conception



Reference number
ISO 18497:2018(E)

© ISO 2018

This is a preview of "ISO 18497:2018". [Click here to purchase the full version from the ANSI store.](#)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of "ISO 18497:2018". [Click here to purchase the full version from the ANSI store.](#)

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Safety requirements and protective or risk reduction measures	4
4.1 General.....	4
4.2 Principles for protection.....	4
4.3 Machine enabling operations.....	5
4.3.1 General requirements.....	5
4.3.2 Labelling and identification.....	5
4.3.3 Functional requirements.....	5
4.4 Operational procedures.....	5
4.4.1 General requirements.....	5
4.4.2 Automated engine control.....	5
4.4.3 Automated motion control.....	7
4.5 Machine operational status.....	8
4.6 Overriding of highly automated operation.....	9
4.7 Remote stopping of highly automated operation.....	9
4.8 Pendant control.....	9
4.9 Operational speeds of the machine.....	9
4.10 Communication system.....	9
4.11 Perception system.....	10
4.11.1 General.....	10
4.11.2 Possible risk and failure modes.....	10
4.11.3 Fault management.....	11
4.12 Safeguarding system.....	12
4.13 Visual and audible alarms.....	12
4.13.1 Visual alarm.....	12
4.13.2 Audible alarm.....	13
5 Verification and validation of the safety requirements and protective or risk reduction measures	13
5.1 General.....	13
5.2 Verification methods.....	13
5.3 Test object specification.....	14
5.4 Verification of minimum performance of the systems perception and safety.....	14
6 Information for use	15
Annex A (informative) List of significant hazards	16
Bibliography	18

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 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 3, *Safety and comfort*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This is a preview of "ISO 18497:2018". [Click here to purchase the full version from the ANSI store.](#)

Introduction

This document is a type-B1 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 organisations, 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.

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

- Type-A standards (basis standards) give basic concepts, principles for design, and general aspects that can be applied to machinery.
- Type-B standards (generic safety standards) deal with one or more safety aspects or one or more types of safeguards 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-hands controls, interlocking devices, pressure sensitive devices, guards).
- Type-C standards (machinery safety standards) deal with detailed safety requirements for a particular machine or group of machines.

Highly automated agricultural machine operations are an enabling technology. Customer benefits are increased; productivity and increased operator comfort.

Highly automated operation is a departure from traditional machine applications in the agricultural machinery and mobile equipment sectors that up to now required an on-board operator to perform work. Highly automated operations require unique safety considerations.

The objective of this document is to specify principles for the design of highly automated agricultural machine operations to achieve safe operation. Should requirements of this document for highly automated operation be different from those which are stated in a machine-specific standard dealing with highly automated operation, the requirements of the machine-specific standard take precedence over the requirements of this document.