

---

---

**Agricultural machinery — Safety —**  
**Part 1:**  
**General requirements**

*Matériel agricole — Sécurité —*  
*Partie 1: Exigences générales*



**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

This document is a preview generated by EVS



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2008

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

|  |     |
|--|-----|
| Foreword.....  | v   |
| Introduction .....   | vii |
| 1 Scope .....  | 1   |
| 2 Normative references .....   | 2   |
| 3 Terms and definitions .....  | 3   |
| 4 Safety requirements and/or measures applicable to all machines .....                   | 4   |
| 4.1 Fundamental principles, design guidance .....  | 4   |
| 4.2 Noise .....  | 4   |
| 4.3 Vibration .....  | 4   |
| 4.4 Controls .....   | 5   |
| 4.5 Operator stations .....  | 5   |
| 4.5.1 Boarding means .....   | 5   |
| 4.5.2 Platforms .....  | 7   |
| 4.6 Boarding means for other than operator stations .....                                | 9   |
| 4.7 Strength requirements for guards and barriers .....                                  | 10  |
| 4.8 Supports for service and maintenance .....   | 11  |
| 4.8.1 General .....  | 11  |
| 4.8.2 Mechanical supports .....  | 11  |
| 4.8.3 Hydraulic locking devices .....  | 11  |
| 4.9 Electrical equipment .....   | 11  |
| 4.10 Hydraulic components and fittings .....   | 12  |
| 4.11 Pneumatic systems .....   | 12  |
| 4.12 Operating fluids .....  | 12  |
| 4.13 Manual operation of individual assemblies .....                                     | 12  |
| 4.14 Service, maintenance and handling .....   | 12  |
| 5 Safety requirements and/or measures — Self-propelled ride-on machines .....            | 13  |
| 5.1 Operator station .....   | 13  |
| 5.1.1 Access to operator's seat .....  | 13  |
| 5.1.2 Operator's seat .....  | 13  |
| 5.1.3 Propulsion and steering .....  | 13  |
| 5.1.4 Shearing and pinching points .....   | 15  |
| 5.1.5 Emergency exit .....   | 15  |
| 5.1.6 Cab material burning rate .....  | 15  |
| 5.1.7 Visibility .....   | 16  |
| 5.1.8 Starting and stopping the engine .....   | 16  |
| 5.2 Moving the machine .....   | 16  |
| 5.2.1 Attachments for towing .....   | 16  |
| 5.2.2 Moveable attachments .....   | 16  |
| 5.2.3 Use of lifting jacks .....   | 16  |
| 5.3 Electric .....   | 17  |
| 5.4 Fuel tank .....  | 17  |
| 5.5 Hot surfaces .....   | 17  |
| 5.6 Exhaust gases .....  | 17  |
| 6 Safety requirements and/or measures — Mounted, semi-mounted and trailed machines ..... | 17  |
| 6.1 Controls .....   | 17  |
| 6.2 Stability .....  | 18  |
| 6.2.1 General .....  | 18  |
| 6.2.2 Mounted and semi-mounted machines .....  | 18  |
| 6.2.3 Trailed machines with vertical load on draw bar hitch > 500 N .....                | 18  |

|              |   |    |
|--------------|---|----|
| 6.3          | Hitches for towing .....  | 19 |
| 6.4          | Transmission of mechanical power between self-propelled machines/tractors and recipient machinery ..... | 19 |
| 6.4.1        | General .....   | 19 |
| 6.4.2        | Stationary operation .....  | 19 |
| 6.5          | Hydraulic, pneumatic and electrical connections with a self-propelled machine.....                      | 19 |
| 7            | Verification of safety requirements or protective measures .....  | 20 |
| 8            | Information for use .....   | 20 |
| 8.1          | Operator's manual .....   | 20 |
| 8.2          | Safety and instructional signs .....  | 21 |
| 8.3          | Marking.....  | 22 |
| Annex A      | (informative) List of significant hazards .....   | 23 |
| Annex B      | (normative) Noise test code (engineering method grade 2).....   | 28 |
| Annex C      | (normative) Strength tests .....  | 32 |
| Bibliography | .....   | 35 |

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 4254-1 was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 3, *Safety and comfort*.

This fourth edition cancels and replaces the third edition (ISO 4254-1:2005), which has been technically revised. It also incorporates the Final Draft Amendment ISO 4254-1:2005/FDAM 1:2007.

The following major changes were introduced:

- requirements related to vibration have been added in a new subclause 4.3;
- requirements related to ergonomics have been added in new subclauses 4.4.6 and 5.1.2.2;
- requirements related to the transmission of mechanical power between self-propelled machines/tractors and recipient machinery have been added in a new subclause 6.4.1;
- the requirements related to the guarding of moving parts for power transmission given in 4.6 and Annex C have been deleted.

For the purposes of global relevance, the requirements related to the guarding of moving parts for power transmission have been transferred and published as two separate Technical Specifications: ISO/TS 28923:2007, which includes the guard requirements taken from both 4.6 and Annex C of ISO 4254-1:2005, and ISO/TS 28924:2007, which includes only the requirements from 4.6.

ISO 4254 consists of the following parts, under the general title *Agricultural machinery — Safety*:

- *Part 1: General requirements*
- *Part 3: Tractors*<sup>1)</sup>
- *Part 5: Power-driven soil-working machines*
- *Part 6: Sprayers and liquid fertilizer distributors*

---

1) Under revision. To be replaced by ISO 26322 (see Reference [8]).

- *Part 7: Combine harvesters, forage harvesters and cotton harvesters*
- *Part 8: Solid fertilizer distributors*
- *Part 9: Seed drills*
- *Part 10: Rotary tedders and rakes*
- *Part 11: Pick-up balers*
- *Part 12: Rotary mowers and flail-mowers*

Part 4, *Forestry winches*, has been revised and replaced by ISO 19472 [7].

This document is a preview generated by EVS

## Introduction

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

- a) Type-A standards (basic standards) give basic concepts, principle for design, and general aspects that can be applied to machinery;
- b) Type-B standards (generic safety standards) dealing with one or more safety aspect(s) or one or more type(s) 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-hand controls, interlocking devices, pressure sensitive devices, guards);
- c) Type-C standards (machinery safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

This part of ISO 4254 is a type-C standard as stated in ISO 12100-1.

When provisions of this type-C standard are different from those which are stated in type-A or type-B standards, the provisions of this type-C standard take precedence over the provisions of the other standards for machines that have been designed and built according to the provisions of this type-C standard.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this part of ISO 4254. These hazards are specific to self-propelled ride-on, trailed, semi-mounted and mounted agricultural machines.

This document is a preview generated by EVS



# Agricultural machinery — Safety —

## Part 1: General requirements

### 1 Scope

This part of ISO 4254 specifies the general safety requirements and their verification for the design and construction of self-propelled ride-on machines and mounted, semi-mounted or trailed machines used in agriculture. In addition, it specifies the type of information on safe working practices (including residual risks) to be provided by the manufacturer.

This part of ISO 4254 deals with significant hazards (as listed in Annex A), hazardous situations and events relevant to this agricultural machinery used as intended and under the conditions foreseen by the manufacturer (see Clause 4).

This part of ISO 4254 is not applicable to

- tractors,
- aircraft,
- air-cushion vehicles, or
- lawn and garden equipment.

This part of ISO 4254 is not applicable to environmental hazards, road safety, electromagnetic compatibility, or to the power take-off (PTO) drive shaft; neither is it applicable to moving parts for power transmission except for strength requirements for guards and barriers (see 4.2), nor to vibration except in respect of declarations. It is not applicable to hazards related to maintenance or repairs to be carried out by professional service personnel.

NOTE ISO 14982 (see Reference [6]) specifies test methods and acceptance criteria for evaluating the electromagnetic compatibility of all kinds of mobile agricultural machinery.

This part of ISO 4254 is not applicable to machines which are manufactured before the date of its publication.

All of the hazards dealt with by this part of ISO 4254 will not necessarily be present on a particular machine. For any machine covered by this part of ISO 4254, the provisions of the part of ISO 4254 directly applicable to that type of machine, if available, take precedence over the provisions of this part of ISO 4254.

## 2 Normative references

The following referenced documents are indispensable for the application 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 3600:1996, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Operator's manuals — Content and presentation*

ISO 3744:1994, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane*

ISO 3767-1, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator controls and other displays — Part 1: Common symbols*

ISO 3767-2, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Symbols for operator controls and other displays — Part 2: Symbols for agricultural tractors and machinery*

ISO 3776-1:2006, *Tractors and machinery for agriculture — Seat belts — Part 1: Anchorage location requirements*

ISO 3776-2:2007, *Tractors and machinery for agriculture — Seat belts — Part 2: Anchorage strength requirements*

ISO 3795:1989, *Road vehicles, and tractors and machinery for agriculture and forestry — Determination of burning behaviour of interior materials*

ISO 4253:1993, *Agricultural tractors — Operator's seating accommodation — Dimensions*

ISO 4413:1998, *Hydraulic fluid power — General rules relating to systems*

ISO 4414:1998, *Pneumatic fluid power — General rules relating to systems*

ISO 5353:1995, *Earth-moving machinery, and tractors and machinery for agriculture and forestry — Seat index point*

ISO 11201:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Engineering method in an essentially free field over a reflecting plane*

ISO 11204:1995, *Acoustics — Noise emitted by machinery and equipment — Measurement of emission sound pressure levels at a work station and at other specified positions — Method requiring environmental corrections*

ISO 11684:1995, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Safety signs and hazard pictorials — General principles*

ISO/TR 11688-1:1995, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning*

ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*

ISO 13852:1996, *Safety of machinery — Safety distances to prevent danger zones being reached by the upper limbs*

ISO 15077:2008, *Tractors and self-propelled machinery for agriculture — Operator controls — Actuating forces, displacement, location and method of operation*