



**SLOVENSKI STANDARD**  
**SIST EN 16246:2013**

**01-maj-2013**

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**Kmetijski stroji - Rovokopači na traktorski tritočkovni priključek - Varnost**

Agricultural machinery - Backhoes - Safety

Landmaschinen - Heckbaggerlader - Sicherheit

Matériel agricole - Pelles rétro - Sécurité

**Ta slovenski standard je istoveten z: EN 16246:2012**

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This European Standard was approved by CEN on 20 October 2012.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 16246:2012) has been prepared by Technical Committee CEN/TC 144 “Tractors and machinery for agriculture and forestry”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by May 2013, and conflicting national standards shall be withdrawn at the latest by May 2013.

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

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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## Introduction

This document is a type-C standard as specified in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this document. These hazards are specific to hydraulic backhoes.

Hazards that are common to all agricultural machines (self-propelled, mounted, semi-mounted and trailed) are dealt with in EN ISO 4254-1.

When provisions of this type C standard are different from those which are stated in type A or 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.

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## 1 Scope

This European Standard, when used together with EN ISO 4254-1 and EN 15811, specifies the safety requirements and their verification for the design and construction of hydraulic backhoes mounted to the three point linkage of a tractor. It describes methods for the elimination or reduction of hazards arising from the intended use of these machines by one person (the operator) in the course of normal operation and service. In addition, it specifies the type of information on safe working practices (including residual risks) to be provided by the manufacturer.

When requirements of this document are different from those which are stated in EN ISO 4254-1, the requirements of this document take precedence over the requirements of EN ISO 4254-1 for machines that have been designed and built according to the provisions of this document.

This European Standard, taken together with EN ISO 4254-1, deals with all the significant hazards, hazardous situations and events (as listed in Table 1) relevant to hydraulic backhoes mounted to the three point linkage of a tractor, when they are used as intended and under the conditions of misuse foreseeable by the manufacturer.

This European Standard is not applicable to lifting operations for the movement of unit loads with hooks or other similar devices. Materials connected with excavation activities are not intended as unit loads and their movement is covered by this standard.

This European Standard does not give requirements for quick hitch devices.

NOTE 1 An amendment of EN 474-1 is under preparation to deal with this issue. It will be evaluated for inclusion in this European Standard.

NOTE 2 Specific requirements related to road traffic regulations are not taken into account in this European Standard.

This European Standard is not applicable to hydraulic backhoes which are manufactured before the date of its publication as EN.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 4254-1:2009, *Agricultural machinery — Safety — Part 1: General requirements (ISO 4254-1:2008)*

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

ISO 3600, *Tractors, machinery for agriculture and forestry, powered lawn and garden equipment — Operator's manuals — Content and presentation*

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

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

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

**EN 16246:2012 (E)****3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN ISO 12100:2010, EN ISO 4254-1:2009 and the following apply.

NOTE An example of the machine types covered by this standard is illustrated in Annex A.

- 3.1 rear-mounted hydraulic backhoe**  
machine with hydraulically powered arms mounted to the rear three point linkage of the tractor, used with an attachment for various operations, such as excavating, elevating, swinging, discharging
- 3.2 primary loading arm**  
loading arm located between the frame of the machine and the secondary arm
- 3.3 secondary loading arm**  
loading arm located between the primary loading arm and the attachment
- 3.4 telescopic arm**  
arm capable of being extended in a longitudinal direction
- 3.5 swing pivot**  
device which pivotally connects the frame with the primary loading arm, in order to let it swing about a vertical axis
- 3.6 outriggers**  
device to keep the machine stable on the ground when the backhoe is in use
- 3.7 side shifting**  
device to allow horizontal movement within limits of the backhoe swing pivot
- 3.8 attachment**  
tool or interchangeable equipment that can be attached to the secondary loading arm, such as a bucket or an inverted bucket, as indicated by the manufacturer
- 3.9 inverted bucket**  
rearward facing bucket for the excavating, elevating, swinging and discharging of the material

**4 List of significant hazards**

Table 1 gives the significant hazard(s), the significant hazardous situation(s) and hazardous event(s) covered by this standard that have been identified by risk assessment as being significant for this type of machine, and which require specific action by the designer or manufacturer to eliminate or to reduce the risk.

Attention is drawn to the necessity to identify any additional significant hazards associated with a specific machine and to provide suitable safety measures. Such additional safety measures are not dealt with by this standard.



Table 1 — List of significant hazards associated with hydraulic backhoes

No. <sup>a</sup>	Hazard	Hazardous situation and event	Clauses/subclauses of EN ISO 4254-1:2009	Clause/subclause of this standard
<b>A.1</b>	<b>Mechanical hazard</b>			
A.1.1	Crushing hazard	<ul style="list-style-type: none"> <li>— Controls</li> <li>— Boarding means</li> <li>— Platforms</li> <li>— Working tools</li> <li>— Service/maintenance</li> <li>— Shearing/pinching points</li> <li>— Moving the machine</li> <li>— Stability</li> <li>— Mounting of machines</li> </ul>	4.4.3; 5.1.3.2; 5.1.8; 6.1 4.5.1.1.2; 4.5.1.2.5; 4.5.2; 4.6 6.4 4.7 4.14.6 5.1.2.3 5.1.4 5.2 6.2 6.2.2; 6.2.3; 6.3	5.3.1 5.1, 5.5 5.1, 5.4 5.7.1 6 5.1 5.2 5.2 5.2
A.1.2	Shearing hazard	<ul style="list-style-type: none"> <li>— Controls</li> <li>— Boarding means</li> <li>— Platforms</li> <li>— Working tools</li> <li>— Service/maintenance</li> <li>— Shearing/pinching points</li> <li>— Moving the machine</li> <li>— Stability</li> <li>— Mounting of machines</li> </ul>	4.4.3; 5.1.3.2; 5.1.8; 6.1 4.5.1.1.2; 4.5.1.2.5; 4.5.2; 4.6 6.4 4.7 4.14.6 5.1.2.3 5.1.4 5.2 6.2 6.2.2; 6.2.3; 6.3	5.3.1 5.1, 5.5 5.1, 5.4 5.7.1 6 5.1 5.2 5.2 5.2
A.1.6	Impact hazard	<ul style="list-style-type: none"> <li>— Boarding means</li> </ul>	4.5.1.2.5	5.1, 5.4, 5.5
A.1.8	Friction or abrasion hazard	<ul style="list-style-type: none"> <li>— Controls</li> <li>— Electrical equipment</li> <li>— Boarding means</li> </ul>	4.4.3; 5.1.3.2 4.9.1 4.5.1.1.2	5.3.1 5.6 5.4, 5.5
A.1.9	High-pressure fluid injection or ejection hazard	<ul style="list-style-type: none"> <li>— Hydraulic components</li> </ul>	4.10; 6.5	5.7
<b>A.2</b>	<b>Electrical hazards</b>			
A.2.1	Contact of persons with live parts (direct contact)	<ul style="list-style-type: none"> <li>— Electrical equipment</li> </ul>	4.9; 5.3; 6.5	5.6
A.2.2	Contact of persons with parts which have become live under faulty conditions (indirect contact)	<ul style="list-style-type: none"> <li>— Electrical equipment</li> </ul>	4.9.1	-

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No. <sup>a</sup>	Hazard	Hazardous situation and event	Clauses/subclauses of EN ISO 4254-1:2009	Clause/subclause of this standard
A.2.3	Approach to live parts under high voltage	— Overhead power lines	8.1.3	8.1
A.2.4	Thermal radiation or other phenomena such as the projection of molten particles and chemical effects from short circuits, overloads, etc.	— Electrical equipment	4.9.2; 5.3.1	5.6
<b>A.3 Thermal hazards</b>				
	Burns, scalds and other injuries by possible contact of persons with objects or materials with an extreme high or low temperature, by flames or explosions and also by the radiation of heat sources	— Operating fluids — Cab material — Hot surfaces	4.12 5.1.6 5.5	5.7
<b>A.4 Hazards generated by noise</b>				
	Hearing loss (deafness), other physiological disorders (e.g. loss of balance, loss of awareness)  Accidents due to interference with speech communication and acoustic warning signals	— Noise	4.2	5.1
<b>A.5 Hazards generated by materials and substances</b>				
A.5.1	Hazards from contact with, or inhalation, of harmful fluids, gases, mists, fumes and dusts	— Operating fluids	4.10; 5.4	5.7
<b>A.6 Hazards generated by neglecting ergonomic principles in machinery design</b>				
A.6.1	Unhealthy	— Controls	4.4	5.3

No. <sup>a</sup>	Hazard	Hazardous situation and event	Clauses/subclauses of EN ISO 4254-1:2009	Clause/subclause of this standard
	postures or excessive effort	<ul style="list-style-type: none"> <li>— Boarding means</li> <li>— Service and maintenance</li> <li>— Operator station</li> </ul>	4.5; 4.6 4.14.2; 4.14.4 5.1.1; 5.1.3; 5.1.5.2	5.4, 5.5 6 5.4
A.6.2	Inadequate consideration of hand-arm or foot-leg anatomy	<ul style="list-style-type: none"> <li>— Controls</li> <li>— Boarding means</li> <li>— Operator station</li> </ul>	4.4 4.5; 4.6 5.1	5.3 5.4, 5.5 5.4
A.6.3	Neglected use of personal protective equipment	<ul style="list-style-type: none"> <li>— Operator's manual</li> </ul>	8.1.3	8.1
A.6.5	Mental overload and under load, stress	<ul style="list-style-type: none"> <li>— Controls</li> </ul>	4.4	5.3
A.6.6	Human error, human behaviour	<ul style="list-style-type: none"> <li>— Controls</li> <li>— Operator's manual</li> <li>— Signs</li> </ul>	4.4 8.1 8.2	5.3 8.1 8.2
A.6.7	Inadequate design, location or identification manual controls	<ul style="list-style-type: none"> <li>— Controls</li> </ul>	4.4; 5.1.3; 6.1	5.3
<b>A.7</b>	<b>Combination of hazards</b>	<ul style="list-style-type: none"> <li>— Individual assemblies</li> <li>— Operator's manual</li> </ul>	4.13 8.1/f618be6e-d8f1-4a4	- 8.1eb7-
<b>A.8</b>	<b>Unexpected start-up, unexpected overrun/overspeed</b>			
A.8.1	Failure/disorder of the control system	<ul style="list-style-type: none"> <li>— Service and maintenance</li> <li>— Electrical equipment</li> <li>— Connections</li> </ul>	4.8 4.9 6.5	5.7 5.6 5.6
A.8.3	External influences on electrical equipment	<ul style="list-style-type: none"> <li>— Cables</li> </ul>	4.9.1	5.6
A.8.4	Other external influences (gravity, wind, etc.)	<ul style="list-style-type: none"> <li>— Stability</li> </ul>	6.2.1.1; 6.2.1.2	5.3, 5.6
A.8.5	Errors made by the operator (due to mismatch of machinery with human characteristics and abilities)	<ul style="list-style-type: none"> <li>— Controls</li> <li>— Boarding means</li> <li>— Operator station</li> <li>— Moving the machine</li> <li>— Mounting of machines</li> </ul>	4.4; 6.1.2 4.5; 4.6 5.1 5.2 6.2; 6.3 4.14 8.1.3	5.3 5.4, 5.5 5.4 5.8 5.2 6 8.1

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No. <sup>a</sup>	Hazard	Hazardous situation and event	Clauses/subclauses of EN ISO 4254-1:2009	Clause/subclause of this standard
		— Service and maintenance — Operator's manual		
A.9	Impossibility of stopping the machine in the best possible conditions	— Controls	4.4; 6.1	-
A.11	Failure of power supply	— Supports — Electrical equipment — Connections	4.8 4.9 6.5	5.7 5.6
A.13	Errors of fitting	— Mounting of machines — Operator's manual	6.2; 6.3 8.1.3	5.2 8.1
A.14	Break-up during operation	— Hydraulic components	4.10	5.7
A.15	Falling or ejected objects or fluids	— Hydraulic components	4.10	5.7
A.16	Loss of stability/overturning of machinery	— Stability — Roll-over	6.2 5.1.2.3	5.2, 5.8 -
A.17	Slip, trap and fall of persons  (related to machinery)	— Boarding means	4.5; 4.6	5.2, 5.4, 5.5
<b>Additional hazards, hazardous situations and hazardous events due to mobility</b>				
A.19	<b>Link to the work position</b>			
A.19.1	Fall of persons during access to (or at/from) the work position	— Boarding means	4.5; 4.6	5.4, 5.5
A.19.4	Mechanical hazards at the working position:  a) contact with	— Shearing/pinching points	4.4.3; 4.5.1.2.5; 5.1.4	-