



**SLOVENSKI STANDARD**  
**SIST EN ISO 18497-4:2024**

**01-oktober-2024**

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**Kmetijski stroji in traktorji - Varnost delno avtomatiziranih, polavtonomnih in avtonomnih strojev - 4. del: Metode preverjanja in načela validacije (ISO 18497-4:2024)**

Agricultural machinery and tractors - Safety of partially automated, semi-autonomous and autonomous machinery - Part 4: Verification methods and validation principles (ISO 18497-4:2024)

Landmaschinen und Traktoren - Sicherheit von teilautomatisierten, halbautonomen und autonomen Maschinen - Teil 4: Verifizierungsmethoden und Validierungsgrundsätze (ISO 18497-4:2024)

Tracteurs et matériels agricoles - Sécurité des machines partiellement automatisées, semi-autonomes et autonomes - Partie 4: Méthodes de vérification et principes de validation (ISO 18497-4:2024)

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**Ta slovenski standard je istoveten z: EN ISO 18497-4:2024**

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**ICS:**

65.060.01	Kmetijski stroji in oprema na splošno	Agricultural machines and equipment in general
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**SIST EN ISO 18497-4:2024**

**en,fr,de**



EUROPEAN STANDARD

EN ISO 18497-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2024

ICS 65.060.01

Supersedes EN ISO 18497:2018

English Version

Agricultural machinery and tractors - Safety of partially  
automated, semi-autonomous and autonomous machinery  
- Part 4: Verification methods and validation principles  
(ISO 18497-4:2024)

Tracteurs et matériels agricoles - Sécurité des  
machines partiellement automatisées, semi-autonomes  
et autonomes - Partie 4: Méthodes de vérification et  
principes de validation (ISO 18497-4:2024)

Landmaschinen und Traktoren - Sicherheit von  
teilautomatisierten, halbautonomen und autonomen  
Maschinen - Teil 4: Verifizierungsmethoden und  
Validierungsgrundsätze (ISO 18497-4:2024)

This European Standard was approved by CEN on 21 July 2024.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye 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

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## European foreword

This document (EN ISO 18497-4:2024) has been prepared by Technical Committee ISO/TC 23 "Tractors and machinery for agriculture and forestry" in collaboration with 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 February 2025, and conflicting national standards shall be withdrawn at the latest by February 2025.

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 ISO 18497:2018.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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

## Endorsement notice

The text of ISO 18497-4:2024 has been approved by CEN as EN ISO 18497-4:2024 without any modification.

## Annex ZA (informative)

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

This European Standard has been prepared under a Commission's standardization request "M/396 Mandate to CEN and CENELEC for Standardisation in the field of machinery" to provide one voluntary means of conforming to essential requirements of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast).

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 European Standard and Annex I of Directive 2006/42/EC**

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1.1.2. Principles of safety integration	-----	
1.1.2(a)	4	
1.1.2(c)	4	
1.1.2(d)		NOT COVERED
1.1.2(e)		NOT COVERED
1.1.3. Materials and products		NOT COVERED
1.1.4. Lighting		NOT COVERED
1.1.5. Design of machinery to facilitate its handling		NOT COVERED
1.1.6. Ergonomics	4.2, 4.3	
1.1.7. Operating positions		NOT COVERED
1.1.8. Seating		NOT COVERED
1.2. CONTROL SYSTEMS	-----	
1.2.1. Safety and reliability of control systems	4.2, 4.3	
1.2.2. Control devices		NOT COVERED
1.2.3. Starting	4.2, 4.3	
1.2.4. Stopping		NOT COVERED
1.2.5. Selection of control or		NOT COVERED

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
operating modes		
1.2.6. Failure of the power supply	4.2, 4.3	
1.3. PROTECTION AGAINST MECHANICAL HAZARDS	----	
1.3.1. Risk of loss of stability		NOT COVERED
1.3.2. Risk of break-up during operation		NOT COVERED
1.3.3. Risks due to falling or ejected objects		NOT COVERED
1.3.4. Risks due to surfaces, edges or angles		NOT COVERED
1.3.5. Risks related to combined machinery		NOT COVERED
1.3.6. Risks related to variations in operating conditions		NOT COVERED
1.3.7. Risks related to moving parts	4.2, 4.3	
1.3.8. Choice of protection against risks arising from moving parts		NOT COVERED
1.3.9. Risks of uncontrolled movements		NOT COVERED
1.4. REQUIRED CHARACTERISTICS OF GUARDS AND PROTECTIVE DEVICES	----	
1.4.1. General requirements		NOT COVERED
1.4.2. Special requirements for guards		NOT COVERED
1.4.3. Special requirements for protective devices	4.2, 4.3	
1.5. RISKS DUE TO OTHER HAZARDS	----	
1.5.1. Electricity supply		NOT COVERED
1.5.2. Static electricity		NOT COVERED
1.5.3. Energy supply other than electricity		NOT COVERED
1.5.4. Errors of fitting		NOT COVERED

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The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1.5.5. Extreme temperatures		NOT COVERED
1.5.6. Fire		NOT COVERED
1.5.7. Explosion		NOT COVERED
1.5.8. Noise		NOT COVERED
1.5.9. Vibrations		NOT COVERED
1.5.10. Radiation		NOT COVERED
1.5.11. External radiation		NOT COVERED
1.5.12. Laser radiation		NOT COVERED
1.5.13. Emissions of hazardous materials and substances		NOT COVERED
1.5.14. Risk of being trapped in a machine		NOT COVERED
1.5.15. Risk of slipping, tripping or falling		NOT COVERED
1.5.16. Lightning		NOT COVERED
1.6. MAINTENANCE	----	
1.6.1. Machinery maintenance		NOT COVERED
1.6.2. Access to operating positions and servicing points		NOT COVERED
1.6.3. Isolation of energy sources		NOT COVERED
1.6.4. Operator intervention		NOT COVERED
1.6.5. Cleaning of internal parts		NOT COVERED
1.7. INFORMATION	----	
1.7.1. Information and warnings on the machinery	4.2, 4.3	
1.7.1.1. Information and information devices	4.2, 4.3	
1.7.1.2. Warning devices	4.2, 4.3	
1.7.2. Warning of residual risks	4.2, 4.3	
1.7.3. Marking of machinery		NOT COVERED
1.7.4. Instructions	4.2, 4.3	
2.4. MACHINERY FOR PESTICIDE APPLICATION	----	
2.4.2. General		NOT COVERED



The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
2.4.3. Controls and monitoring		NOT COVERED
2.4.4. Filling and emptying		NOT COVERED
2.4.5. Application of pesticides	----	
2.4.5.1. Application rate		NOT COVERED
2.4.5.2. Distribution, deposition and drift of pesticide		NOT COVERED
2.4.5.3. Tests		NOT COVERED
2.4.5.4. Losses during stoppage		NOT COVERED
2.4.6. Maintenance	----	
2.4.6.1. Cleaning		NOT COVERED
2.4.6.2. Servicing		NOT COVERED
2.4.7. Inspections		NOT COVERED
2.4.8. Marking of nozzles, strainers and filters		NOT COVERED
2.4.9. Indication of pesticide in use		NOT COVERED
2.4.10. Instructions		NOT COVERED
3.2 WORK POSITIONS	---	
3.2.1. Driving position	SIST EN ISO 18497-4:2024	NOT COVERED
3.2.2. Seating		NOT COVERED
3.2.3. Positions for other persons		NOT COVERED
3.3 CONTROL SYSTEMS	---	
3.3.1. Control devices	4.2, 4.3	
3.3.2. Starting/moving	4.2, 4.3	
3.3.3. Travelling function		NOT COVERED
3.3.4. Movement of pedestrian-controlled machinery		NOT COVERED
3.3.5. Control circuit failure		NOT COVERED
3.4 PROTECTION AGAINST MECHANICAL HAZARDS	---	
3.4.1. Uncontrolled movements		NOT COVERED
3.4.2. Moving transmission parts		NOT COVERED
3.4.3. Roll-over and tip-over		NOT COVERED
3.4.4. Falling objects		NOT COVERED

## EN ISO 18497-4:2024 (E)

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
3.4.5. Means of access		NOT COVERED
3.4.6. Towing devices		NOT COVERED
3.4.7. Transmission of power between self-propelled machinery (or tractor) and recipient machinery		NOT COVERED
3.5 PROTECTION AGAINST OTHER HAZARDS	----	
3.5.1. Batteries		NOT COVERED
3.5.2. Fire		NOT COVERED
3.5.3. Emissions of hazardous substances		NOT COVERED
3.6 INFORMATION AND INDICATIONS	----	
3.6.1. Signs, signals and warnings	4.2, 4.3	
3.6.2. Marking		NOT COVERED
3.6.3. Instructions	----	
3.6.3.1. Vibrations		NOT COVERED
3.6.3.2. Multiple uses		NOT COVERED

**Table ZA.2 — Applicable Standards to confer presumption of conformity as described in this Annex ZA**

Column 1 Reference in Clause 2	Column 2 International Standard Edition	Column 3 Title	Column 4 Corresponding European Standard Edition
ISO 12100:2010	ISO 12100:2010	Safety of machinery — General principles for design — Risk assessment and risk reduction	EN ISO 12100:2010
ISO 13849-1:2023	ISO 13849-1:2023	Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design	EN ISO 13849-1:2023
ISO 13849-2:2012	ISO 13849-2:2012	Safety of machinery — Safety-related parts of control systems — Part 2:	EN ISO 13849-2:2012

Column 1 Reference in Clause 2	Column 2 International Standard Edition	Column 3 Title	Column 4 Corresponding European Standard Edition
		Validation	
ISO 18497-1:2024	ISO 18497-1:2024	Agricultural machinery and tractors — Safety of partially automated, semi-autonomous and autonomous machinery — Part 1: Machine design principles and vocabulary	EN ISO 18497-1:2024
ISO 18497-2:2024	ISO 18497-2:2024	Agricultural machinery and tractors — Safety of partially automated, semi-autonomous and autonomous machinery — Part 2: Design principles for obstacle protective systems	EN ISO 18497-2:2024
ISO 18497-3:2024	ISO 18497-3:2024	Agricultural machinery and tractors — Safety of partially automated, semi-autonomous and autonomous machinery — Part 3: Autonomous operating zones	EN ISO 18497-3:2024
ISO 25119-1:2018	ISO 25119-1:2018 ISO 25119-1:2018/A1:2020	Tractors and machinery for agriculture and forestry — Safety-related parts of control systems — Part 1: General principles for design and development	EN ISO 25119-1:2023 EN ISO 25119-1:2023/A1:2023
ISO 25119-2:2019	ISO 25119-2:2019	Tractors and machinery for agriculture and forestry — Safety-related parts of control systems — Part 2: Concept phase	EN ISO 25119-2:2023
ISO 25119-3:2018	ISO 25119-3:2018 ISO 25119-3:2018/A1:2020	Tractors and machinery for agriculture and forestry — Safety-related parts of control systems — Part 3: Series development, hardware and software	EN ISO 25119-3:2023 EN ISO 25119-3:2023/A1:2023
ISO 25119-4:2018	ISO 25119-4:2018 ISO 25119-	Tractors and machinery for agriculture and	EN ISO 25119-4:2023 EN ISO 25119-4:2023/

**EN ISO 18497-4:2024 (E)**

<b>Column 1 Reference in Clause 2</b>	<b>Column 2 International Standard Edition</b>	<b>Column 3 Title</b>	<b>Column 4 Corresponding European Standard Edition</b>
	4:2018/A1:2020	forestry — Safety-related parts of control systems — Part 4: Production, operation, modification and supporting processes	A1:2023

The documents listed in the Column 1 of Table ZA.2, in whole or in part, are normatively referenced in this document, i.e. are indispensable for its application. The achievement of the presumption of conformity is subject to the application of the edition of Standards as listed in Column 4 or, if no European Standard Edition exists, the International Standard Edition given in Column 2 of Table ZA.2.

WARNING 1 Presumption of conformity stays valid only as long as a reference to this European 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.

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# International Standard

**ISO 18497-4**

## **Agricultural machinery and tractors — Safety of partially automated, semi-autonomous and autonomous machinery —**

### **Part 4: Verification methods and validation principles**

*Tracteurs et matériels agricoles — Sécurité des machines  
partiellement automatisées, semi-autonomes et autonomes —*

*Partie 4: Méthodes de vérification et principes de validation*

**First edition  
2024-07**

## ISO 18497-4:2024(en)

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