



BSI Standards Publication

Agricultural machinery — Robotic feed systems — Safety

National foreword

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The UK participation in its preparation was entrusted to Technical Committee AGE/32, Agricultural implements and trailers.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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© The British Standards Institution 2025
Published by BSI Standards Limited 2025

ISBN 978 0 539 12676 1

ICS 65.060.99

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 November 2025.

Amendments/corrigenda issued since publication

Date	Text affected

English Version

Agricultural machinery - Robotic feed systems - Safety (ISO 3991:2025)

Matériel agricole - Systèmes d'alimentation robotisés -
Sécurité (ISO 3991:2025)

Landmaschinen - Roboter-Fütterungssysteme -
Sicherheit (ISO 3991:2025)

This European Standard was approved by CEN on 14 March 2025.

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European foreword

This document (EN ISO 3991:2025) 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of an identical text or by endorsement, at the latest by May 2026, and conflicting national standards shall be withdrawn at the latest by May 2026.

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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.

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The text of ISO 3991:2025 has been approved by CEN as EN ISO 3991:2025 without any modification.

Annex ZA (informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC amended by Directive 2009/127/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 EU Directive 2006/42/EC amended by Directive 2009/127/EC

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/subclause(s) of this EN	Remarks/Notes
	<i>To cover all the relevant safety requirements for the products(s) in its scope, this standard (providing global requirements and references to regional requirements for a machine) has to be applied together with one of those standards as specified in the scope (providing European regional requirements for a machine).</i>	
1.1.2. Principles of safety integration	---	
1.1.2(a)	4, 5, 6	
1.1.2(c)	4, 5, 6	
1.1.2(d)	4, 5, 6	
1.1.2(e)	4, 5, 6	
1.1.4. Lighting	4.5.2, 7.1	
1.1.5. Design of machinery to facilitate its handling	4.1, 4.6.1	
1.1.6. Ergonomics	4.1, 4.4, 4.10.1, 4.10.2.3	
1.1.7. Operating positions	4.2.1, 4.4, 4.10.2.3	
1.1.8. Seating	4.10.2.3	
1.2.1. Safety and reliability of control systems	4.1, 4.6.2.1, Annex C	
1.2.2. Control devices	4.10, 7.1	
1.2.3. Starting	4.6.1, 4.6.2.2.1, 4.6.2.3.1,	

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/subclause(s) of this EN	Remarks/Notes
	4.12, 5.3.3	
1.2.4.1. Normal stop	4.6.3, 4.10, 4.11.1, 4.11.3, 4.11.4	
1.2.4.2. Operational stop	4.6.2.2.5, 4.6.2.3.5, 4.6.3, 4.7, 4.11.1, 4.11.2	
1.2.4.3. Emergency stop	4.13	
1.2.4.4. Assembly of machinery		Not covered
1.2.5. Selection of control or operating modes	4.10.2.1, 4.11, 7.1	
1.2.6. Failure of the power supply	4.6.3, 4.11.1, 4.13	
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1.3.6. Risks related to variations in operating conditions		Not covered
1.3.7. Risks related to moving parts	4.1, 4.2, 4.4, 4.7, 4.10.1, 4.12, 5.3.3	
1.3.8. Choice of protection against risks arising from moving parts	4.1, 4.2, 4.2.1, 4.2.2, 4.3, 4.4, 4.6.6, 4.12, 5.2, 5.3.3	
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1.5.8. Noise		Not covered
1.5.9. Vibrations	4.6.1	
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The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/subclause(s) of this EN	Remarks/Notes
substances		
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1.5.15. Risk of slipping, tripping or falling	4.4, 5.2	
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1.6.5. Cleaning of internal parts	4.12	
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1.7.2. Warning of residual risks	7.1, 7.2, 7.3	
1.7.3. Marking of machinery	7.3	
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1.7.4.1. General principles for the drafting of instructions	7.1	
1.7.4.2. Contents of the instructions	7.1	
1.7.4.2 t) spare parts		not covered
1.7.4.3. Sales literature		not covered
3.2. WORK POSITIONS	4.1, 4.10.2.3	
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3.3.5. Control circuit failure		Not covered
3.4.1. Uncontrolled movements	4.1, 4.6.1, 4.6.6.1, 5.2	
3.4.3. Roll-over and tip-over		Not covered
3.4.4. Falling objects	4.3	
3.4.5. Means of access	4.4	
3.5.1. Batteries		Not covered
3.5.2. Fire	4.9, 4.15	
3.6.1. Signs, signals and warnings	4.6.4, 4.6.5, 7.3.2	

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/subclause(s) of this EN	Remarks/Notes
3.6.2. Marking	5.3, 7.2, 7.3	
3.6.3. Instructions	7.1	
4.1.2.2. Machinery running on guide rails and rail tracks	4.6.6.1, 4.6.6.4	
4.1.2.7. Movements of loads during handling	4.5, 4.6.2	
4.1.3. Fitness for purpose		Not covered

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 can be applicable to the product(s) falling within the scope of this standard.

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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.

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This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 3, *Safety and comfort*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 144, *Tractors and machinery for agriculture and forestry*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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.

Introduction

This document is a type-C standard as specified in ISO 12100:2010.

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.

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

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.

The purpose of this document is to establish specific design principles for semi-autonomous and autonomous functions of robotic feed systems (RFS) agricultural machinery. The application of other type C standards which deal with relevant significant hazards to the machinery covered in the scope of this document is explained in [Clause 4](#).

The requirements of this document concern designers, manufacturers and their authorized representatives of feed systems. This document also includes information to be provided by the manufacturer to the user.

Agricultural machinery — Robotic feed systems — Safety

1 Scope

This document specifies the safety requirements and their verification for the design and construction of robotic feed systems (RFS) (see [Annex A](#)), which distribute feed and perform at least one of the following functions without the need of human interaction:

- storing of feed;
- loading of mobile feed unit (MFU);
- mixing;
- travelling;
- cleaning (residual feed);
- pushing feed.

Additionally, it provides the type of information, to be provided by the manufacturer, on safe working practices (including information about residual risks).

This document is for feeding livestock (e.g. cows, sheep, pigs).

This document does not apply to:

- systems designed to be used at a fixed location and that discharge feed at a remote location (e.g. chain conveyor feed systems, belt conveyor feed systems or liquid feed systems);
- tractors;
- systems designed for field application.

This document deals with all the significant hazards, hazardous situations and events relevant to RFS, see [Annex B](#), when they are used as intended and under the conditions of misuse, which are reasonably foreseeable, by the manufacturer as listed in [Clause 4](#), except for the hazards arising from:

- internal combustion engines of RFS;
- requirements for the connections to the main electric power supply;
- RFS with interchangeable equipment;
- emission of airborne noise.

NOTE 1 Hazards related to internal combustion engines of robotic feed systems (e.g. exhaust emissions in buildings) will be considered in separate standards

NOTE 2 The main electric power supply is subject to national regulations or codes

NOTE 3 Sudden loud noises may cause farm animals to become startled. It is advised to consider this with the design of the RFS.

Environmental aspects (except noise) have not been considered in this document.

This document is not applicable to feed systems manufactured before the date of its publication.