



**International
Standard**

ISO 24142

**Safe design aspects for machinery
in feed processing mills**

*Aspects liés à la sécurité de la conception des machines dans les
usines de transformation des aliments pour animaux*

**First edition
2026-09**

Sample Document

get full document from standards.iteh.ai

Sample Document

get full document from standards.iteh.ai



COPYRIGHT PROTECTED DOCUMENT

© ISO 2026

All rights reserved.

This ISO publication is protected by copyright and is owned by ISO and/or its licensors.

The content of this ISO publication is provided under licence, not sold. Use is subject to the applicable licence terms issued by ISO, an ISO member body, or an authorized third-party distributor.

Except as required for implementation or expressly permitted by a separate licence, no part of this ISO publication may be reproduced, distributed, modified, used, or made available in any form or by any means – electronic or mechanical, including photocopying, scanning, recording, or posting on internal or external digital platforms.

Any use beyond the scope of the granted rights is prohibited and may result in legal action.

ISO copyright office
CP 401 • CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Safety requirements and/or protective/risk reduction measures	3
4.1 General	3
4.2 Mechanical and electrical systems	3
4.2.1 Mechanical	3
4.2.2 Electrical	4
4.3 Rejected materials	4
4.4 High pressure fluids and steam and extreme temperature	4
4.5 Reduction of fire and explosion risks	4
4.5.1 General	4
4.5.2 Explosion and fire prevention	5
4.5.3 Static electricity	5
4.6 Reduction of slip, trip, and fall hazards	5
4.7 Noise reduction	6
4.8 Confined spaces	6
5 Verification of safety requirements and/or protective/risk reduction measures	6
5.1 Mechanical and electrical systems	6
5.2 High pressure fluids and steam and extreme temperature	6
5.2.1 High pressure fluids and steam	6
5.2.2 Extreme temperature	6
5.3 Fire and explosion	6
5.3.1 Static electricity	7
5.4 User safety and stability	7
5.4.1 Noise reduction	7
5.4.2 Ergonomic design	7
5.4.3 Confined spaces	7
6 Information for use	7
6.1 General	7
6.2 Marking	7
6.3 Instruction handbook	7
Annex A (informative) Suggestions to enhance safe machinery design	8
Annex B (informative) Hazards associated with machinery used in feed mills	15
Annex C (informative) Regional Standards	22
Bibliography	23

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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 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 293, *Feed machinery*.

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 stated in ISO 12100 [\[1\]](#).

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 (e.g. regulators, accident prevention organizations, market surveillance).

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 opportunity 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. These hazards are specific to machinery used in feed mills and feed processing facilities.

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

get full document from standards.iteh.ai

Sample Document

get full document from standards.iteh.ai

Safe design aspects for machinery in feed processing mills

1 Scope

This document specifies safety aspects for the design of machinery used for production of formulated feed in feed processing mills. Relevant hazards are identified with recommended solutions so as to provide the best options for the safe design during the life cycle of the machine types identified. Existing standards for safe machine design are not duplicated as machinery used for the production of feed for animals has been significantly addressed by other industries. Significant hazards that are unique to machinery found in feed mills and feed processing facilities are addressed in this document. Excluded from this document are explosive environment, noise testing, and hazards not inherent to the design of the machines typically found in feed mills.

This document excludes machinery intended for liquid feed, and wet and semi-moist pet foods. This document excludes machinery intended for the processing of food for human consumption.

This document is not applicable to machinery intended for feed processing mills manufactured before the date of its publication.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 284, *Conveyor belts — Electrical conductivity — Specification and test method*

ISO 3746, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Survey method using an enveloping measurement surface over a reflecting plane*

ISO 4413, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

ISO 4414, *Pneumatic fluid power — General rules and safety requirements for systems and their components*

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

ISO 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*

ISO 14119, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

ISO 14120, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

ISO 14122-1, *Safety of machinery — Permanent means of access to machinery — Part 1: Choice of fixed means and general requirements of access*

ISO 14122-2, *Safety of machinery — Permanent means of access to machinery — Part 2: Working platforms and walkways*

ISO 19353:2019, *Safety of machinery — Fire prevention and fire protection*

ISO 19353, *Safety of machinery — Fire prevention and fire protection*

ISO 24378, *Feed machinery — Vocabulary*

ISO 80079-36, *Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements*

IEC 60079-0, *Explosive atmospheres - Part 0: Equipment - General requirements*

IEC 60079-14, *Explosive atmospheres - Part 14: Electrical installation design, selection and installation of equipment, including initial inspection*

IEC 60204-1, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements*

IEC 60204-1:2016 ED6:2016, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 24378 and ISO 12100 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

confined space, noun

enclosed or partially enclosed space or area, where ventilation or access, or both, can be limited

3.2

explosive atmosphere

mixture with air, under atmospheric conditions, of combustible substances in the form of gas, vapour, mist or dust in which, after ignition, permits self-sustaining propagation

[SOURCE: IEC 60079-0:2017 [2], 3.38, modified — “flammable” substituted by “combustible”.]

3.3

liquid feed, noun

feed product not solid and not aeriform

Note 1 to entry: A liquid feed contains sufficient moisture to flow readily and can contain molasses.

[SOURCE: EN ISO 6498:2012 [3], 2.3.14]

3.4

normal operation, noun

situation when the equipment is operating within its design parameters

Note 1 to entry: Normal operation also includes possible expected operational disturbances (e.g. tearing off of a bag) or the release of dust. Normal operation also includes the startup and shutdown of plants and activities such as local cleaning, minor adjustments, inspection and testing.

3.5

semi-moist pet food

meat-based feed product for pets or aquatic animals that has been partially dried to prevent microbial decomposition

[SOURCE: ISO 20588:2019 [4], 3.2.46]

3.6

tramp material, noun

part of the machinery, or outer equipment, capable of falling into the feed stream

4 Safety requirements and/or protective/risk reduction measures

4.1 General

Machinery shall comply with the safety requirements and/or protective/risk reduction measures of this clause. In addition, the machine shall be designed according to the principles of ISO 12100 for relevant but not significant hazards which are not dealt with by this document. Specific hazards associated with machinery used in the manufacture of animal feed are found in informative [Annex B](#).

Risks shall be reduced for all phases of the life cycle of the machine, using the hazard control hierarchy given in ISO 12100. This document purposely omits the reference of any standard cited in the normative references to avoid duplication and confusion. Documents listed in ISO 12100 shall be followed as requirements as they relate to the specific needs of feed machinery design. As such the normative references listed in this document have been identified as specific to the feed industry machinery rather than general machinery.

NOTE There are regional regulations that can state further requirements. See [Annex C](#) for information on regional standards which can provide additional guidance.

4.2 Mechanical and electrical systems

4.2.1 Mechanical

4.2.1.1 Rotating parts

Regarding feed machines with internal rotating parts, the rotating direction shall be clearly marked.

4.2.1.2 Moving parts

All exposed moving parts (except rotary screens, vibrating screens and pan sifters) shall be equipped with protective devices, the structure of which shall ensure that the safe distance from upper and lower limbs of the operator to the hazardous area shall be in accordance with the provisions of ISO 13857 as referenced in normative references.

4.2.1.3 Reduction of mechanical risks

Hazardous movements shall be safeguarded, conforming with ISO 14120 and ISO 14119 for interlocking.

Machine design shall ensure that the door body and parts do not fall when the equipment is cleaned, parts are replaced, or when the equipment has abnormal working conditions, which includes the following.

- a) Positioning the door of conditioners to ensure that the door does not fall when opened for cleaning inside the conditioner.
- b) Installing a screen bed fall protection device for the vibration grading screen to avoid wire fracture which can result in the screen bed falling.
- c) Designing the lifting device for pellet mill ring dies and rollers for manual replacement of ring dies and rollers so as to reduce the risk of ring dies and rollers falling.
- d) Designing coolers with a flip plate positioning protection device to ensure that the flip plate position is stable and reliable and it does not fall when the cooler is cleaned.
- e) Designing an impeller positioning protection device for the airlock to avoid rotation of the impeller causing harm to personnel when the airlock is blocked and manually cleaned.