



SLOVENSKI STANDARD
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**Stroji za predelavo hrane - Komore za vmesno počivanje testa - Varnostne in
higienske zahteve (vključno z dopolnilom A1)**

Food processing machinery - Intermediate provers - Safety and hygiene requirements

Nahrungsmittelmaschinen - Zwischengärschrank - Sicherheits-und
Hygieneanforderungen

Machines pour les produits alimentaires - Chambres de repos - Prescriptions relatives à
la sécurité et à l'hygiène

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Tovarne in oprema za
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Plants and equipment for the
food industry

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EUROPEAN STANDARD

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Food processing machinery - Intermediate provers - Safety and hygiene requirements

Machines pour les produits alimentaires - Chambres de repos - Prescriptions relatives à la sécurité et à l'hygiène

Nahrungsmittelmaschinen - Zwischengärschrank - Sicherheits- und Hygieneanforderungen

This European Standard was approved by CEN on 3 July 2000 and includes Amendment 1 approved by CEN on 12 August 2010.

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Foreword

A1 This document (EN 12043:2000+A1:2010) has been prepared by Technical Committee CEN/TC 153 "Machinery intended for use with foodstuffs and feed", the secretariat of which is held by DIN. **A1**

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of an identical text or by endorsement, at the latest by March 2011, and conflicting national standards shall be withdrawn at the latest by March 2011.

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 includes Amendment 1, approved by CEN on 2010-08-12.

This document supersedes EN 12043:2000.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**.

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).

A1 For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document. **A1**

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EN 12043:2000+A1:2010 (E)**Introduction**

A1 This European Standard is a type C standard as stated 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 European Standard.

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. **A1**

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1 Scope

This standard specifies safety and hygiene requirements for the design and manufacture of intermediate provers with moving pocket carriers ^[A1] as described in Clause 3 ^[A1] used in the food industry, pastry-making, bakeries, etc. for giving a resting time to dough between dividing and moulding processes.

^[A1] This European Standard specifies all significant hazards, hazardous situations and events relevant to the installation, adjustment, operation, cleaning, maintenance, dismantling, disabling and scrapping of intermediate provers with moving pocket carriers when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4). ^[A1]

The significant hazards covered by the standard are mechanical (shearing, trapping, cutting, loss of stability), electrical, ergonomic and also those resulting from inhalation of flour dust and lack of hygiene.

Noise is not considered to be a significant hazard from intermediate provers. This does not mean that the manufacturer of the machine is absolved from reducing noise and making a noise declaration. Therefore a noise test code is proposed in Annex B.

^[A1] *deleted text* ^[A1]

The following machines are excluded:

- rack provers;
- experimental and testing machines under development by the manufacturer.

^[A1] This standard is not applicable to intermediate provers with moving pocket carriers which are manufactured before the date of its publication as EN. ^[A1]

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2 Normative references

^[A1] 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.

EN 294:1992, *Safety of machinery — Safety distance to prevent danger zones being reached by the upper limbs*

EN 614-1:2006+A1:2009, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 953:1997+A1:2009, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 954-1:1996, *Safety of machinery — Safety related parts of control systems — Part 1: General principles for design*

EN 1088:1995+A2:2008, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

EN 1672-2:2005+A1:2009, *Food processing machinery — Basic concepts — Part 2: Hygiene requirements*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005, modified)*

EN 60529:1991, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

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EN ISO 3743-1:2009, *Acoustics — Determination of sound power levels of noise sources — Engineering methods for small, movable sources in reverberant fields — Part 1: Comparison method for hard-walled test rooms (ISO 3743-1:1994)*

EN ISO 3744:2009, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane (ISO 3744:1994)*

EN ISO 4287:1998, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters (ISO 4287:1997)*

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*


EN ISO 11201:2009, *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 11201:1995, including Cor 1:1997)*

EN ISO 11688-1:2009, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)*

EN ISO 12001:2009, *Acoustics — Noise emitted by machinery and equipment — Rules for the drafting and presentation of a noise test code (ISO 12001:1996)*

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

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)*

EN ISO 13849-1:2008, *Safety of machinery — Safety related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)* 

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3 Terms, definitions and description

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 apply.

3.2 Description

As shown in Figure 1, an intermediate prover consists of:

- a variable number of fixed or hinged pockets supported in a carrier into which dough pieces are loaded. One pocket may hold more than one dough piece;
- a mechanical transfer system moving the pocket carrier along a fixed path inside the machine;
- a frame supporting or containing the transmission machinery. 

The following features may also be included:

- an automatic device to control the temperature and/or humidity inside the machine;
- a flour dusting device;

- other accessories e.g. germicidal lamp (device to prevent the formation of mould - generally an ultraviolet lamp), pocket drier (device to dry the pockets - generally an infra-red lamp or a ventilation system with or without heating).

The resting time is the period of time from loading until discharge of a single pocket. This time can be fixed or variable.

There are openings in the frame where dough portions are introduced into the machine (loading) and where they are taken out (discharge).

The position of loading and discharge depends on the frame shape and the path of movement of the pockets.

Some machines may have more than one discharge. These machines may provide different resting times depending on which of the discharges is being used.

There are two main types of intermediate provers. These are differentiated by the type of feeding which can be either manual or automatic.

Automatically fed machines may be loaded one portion of dough at a time, or the full carrier can be loaded, be it gutter or pocket shaped.

When the full carrier is loaded, the automatic loading device can be either internal or external.

The discharge of the machine may also be manual or automatic. When the discharge is manual, the dough portions are taken out from the pockets by hand through an opening in the frame. In some cases this aperture may be the same one used to load the machine.

The movement of the pockets may be continuous or intermittent.


In some cases, access to the path of movement of the pockets, in addition to the loading and discharge openings, is provided.

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4 List of significant hazards



4.1 General

This clause contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this Standard, identified by risk assessment as significant for this type of machinery, and which require action to eliminate or reduce the risks. 

4.2 Mechanical hazards

The significant mechanical hazards are:

- shearing hazard;
- trapping hazard;
- cutting hazard;
- loss of stability.

The examples in Figure 1 illustrate the danger zones associated with these hazards:

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- Zone 1: zone of loading and unloading of the dough portions, hazards of shearing, trapping;
- Zone 2: drive mechanisms, hazards of shearing, trapping, cutting;
- Zone 3: carrier transfer system (except zone 1), hazards of shearing, trapping;
- Zone 4: zone covered by moving parts of the flour duster (if fitted), hazards of shearing, trapping;
- Zone 5: fan with or without heating device, hazards of cutting, burns.

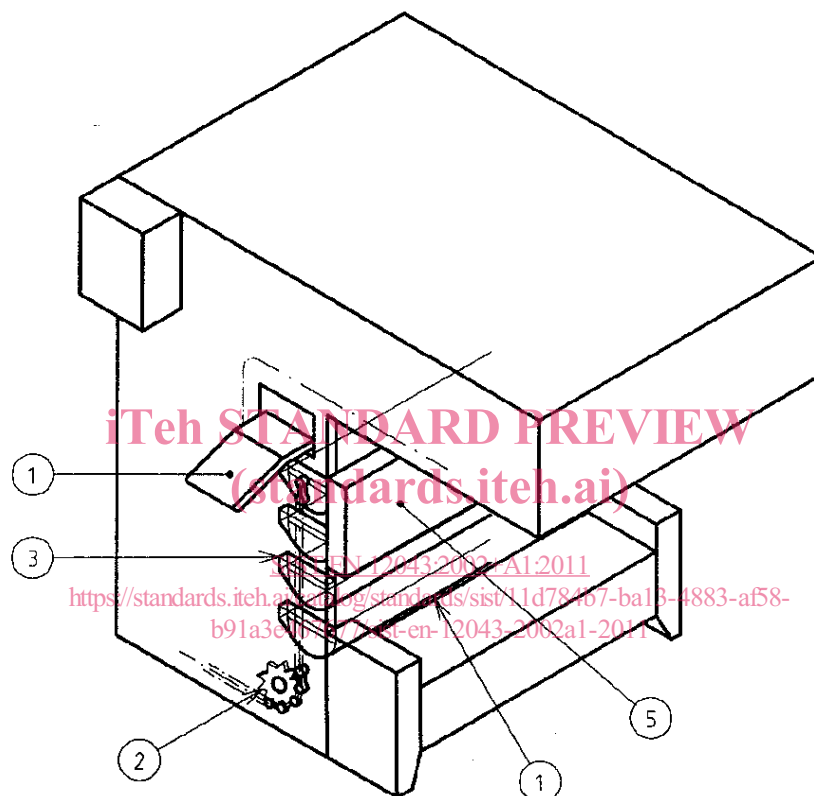


Figure 1 a) — Front loading, side unloading

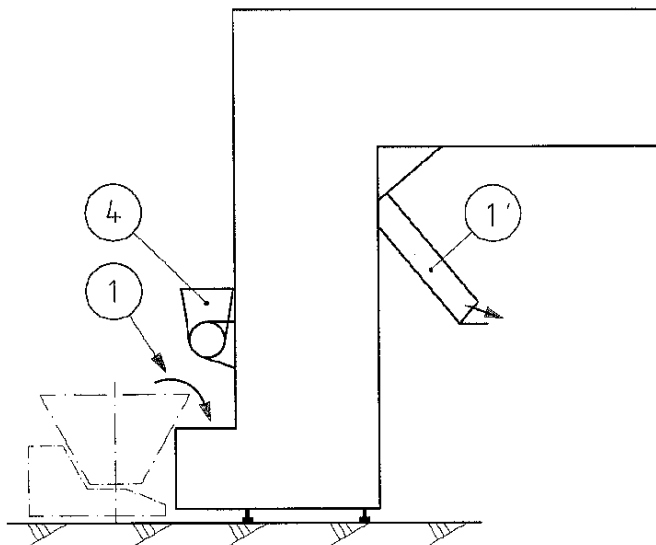


Figure 1 b) — Front loading, rear unloading

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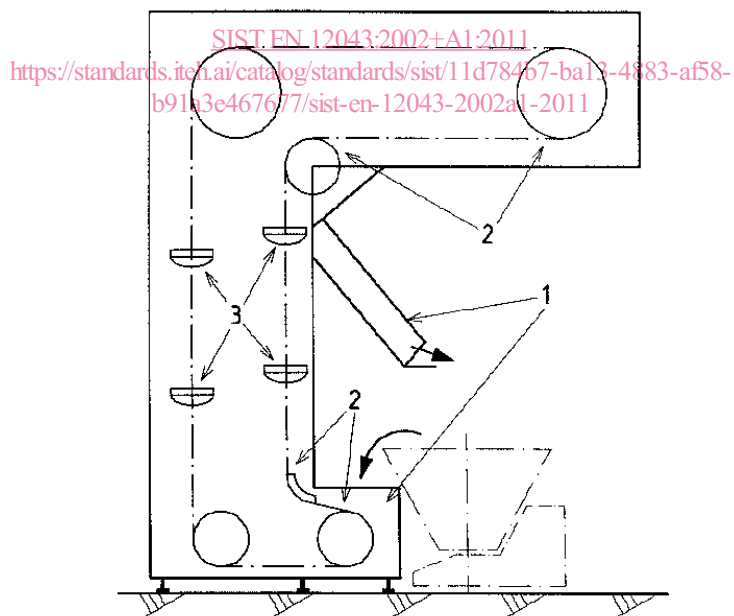


Figure 1 c) — Front loading, front unloading

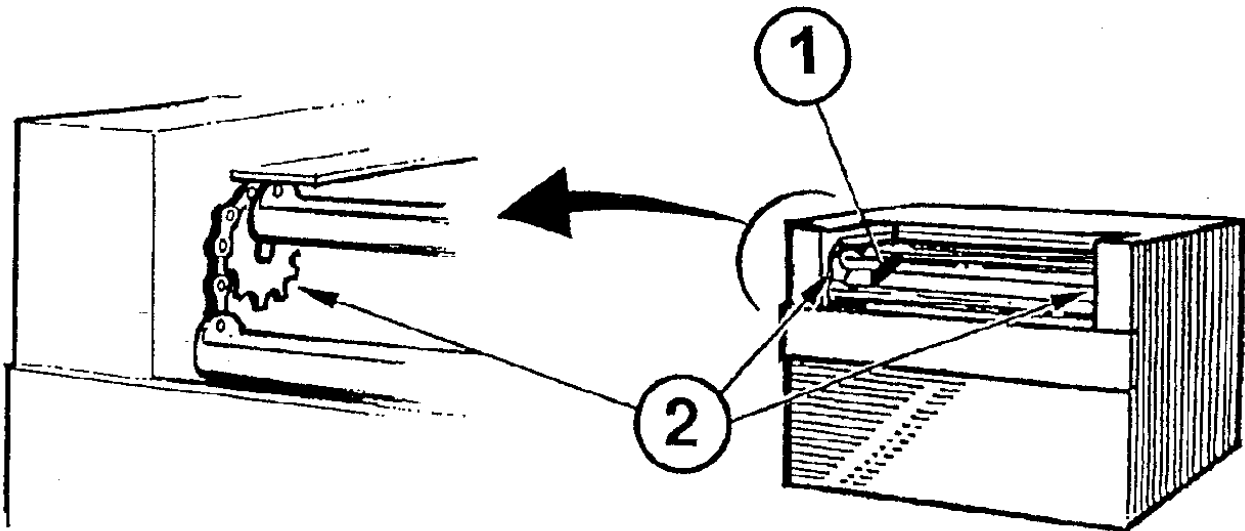


Figure 1 d) — Manual loading and unloading in the same position

Figure 1 — Danger zones for various types of intermediate provers
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4.3 Electrical hazards

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Hazard of electric shock from direct or indirect contact with live components.

Hazard of external influences on electrical equipment (e.g. cleaning with water).

4.4 Hazards resulting from inhalation of dust

Use of flour dusters may expose operators to dust including flour and ingredients which may be harmful to their health, causing rhinitis (running noses), watering eyes and possibly occupational asthma.

4.5 Hazard generated by neglecting hygienic design principles

The neglect of hygienic principles can create unacceptable modification of foodstuff and therefore a risk to human health, i.e. through physical, chemical or microbial pollution.

4.6 Hazards generated by neglecting ergonomic principles

During operation, cleaning and maintenance, there is a risk of injury or chronic damage to the body resulting from awkward body postures.

A1

5 Safety and hygiene requirements and/or protective measures A1

A1

5.1 General

Machinery shall comply with the safety requirements and/or protective measures of this clause.

In addition, the machine shall be designed according to the principles of EN ISO 12100-2 for relevant but not significant hazards, which are not dealt with by this document.

The safety related parts of the control systems shall meet at least category 1 of 6.2.2 of EN 954-1:1996 or present at least a performance level c defined in accordance with EN ISO 13849-1:2008.

When fixed guards, or parts of the machine acting as such, are not permanently fixed e.g. by welding, their fixing systems shall remain attached to the guards or to the machinery when the guards are removed. A1

5.2 Mechanical hazards

Where reference is made to interlocking devices, they shall comply with 4.2.1 and clauses 5 and 6 of A1 EN 1088:1995+A2:2008 A1.

Where the interlocking mechanism has movable parts, e.g. position switches, these shall be protected from contamination with dough or dry ingredients e.g. by mounting them within the machine body. Alternatively, magnetic switches may be used if total removal of any guard is required.

Where switches may be exposed to water, e.g. during cleaning, they shall be protected to an appropriate IP rating (EN 60529: 1991, e. g. IPX5).

A1 *deleted text* A1

5.2.1 Zone 1: Zone of loading and unloading of the dough portions

5.2.1.1 The risk of trapping the arm between the moving pocket carrier and the fixed edges of the loading or unloading openings shall be prevented by any of the following:

- ensuring the distance between the fixed edge of the opening and the nearest rigid part of the pocket carrier is a minimum of 120 mm (see Figures 2 a) and 2b);
- providing a pressure sensitive trip bar or wire (see A1 EN 1760-2 A1) covering the opening where the trapping may occur (see Figure 2 c) with a stopping time less than or equal to 1 s;
- ensuring the force required to stop the motion of the pocket carrier does not exceed 150 N either loaded or unloaded; this could be achieved e.g. by a torque limiting device;
- where pocket carrier movement is not continuous, the pressure sensitive bar or wire is not required. The indexing movement may be controlled by a timer or the operation of a manual control device. This method can only be used where both the loading and the unloading area are visible from the position of the control device.

5.2.1.2 The risk of trapping between adjacent descending and ascending pocket carriers shall be prevented by any of the following:

- ensuring the distance between the axis of the ascending pocket and the axis of the descending pocket carrier is a minimum of 200 mm (see Figure 2 d));

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- provision of a fixed plate behind the first line of carriers preventing through access;
- ensuring the force required to stop the motion of the pocket carrier does not exceed 150 N either loaded or unloaded.

5.2.1.3 Automatic loading systems

When loading is automatic (see examples in Figure 3):

- either the system is enclosed in the machine frame with at least one interlocking guard, in order to permit access for cleaning;
- or the system is outside the frame and access to any danger points shall be prevented by any of the following:
 - provision of a trip device with a stopping time less or equal to 1 s and with the dimensions shown in Figure 2 c);
 - provision of a fixed or an interlocking guard with any openings in accordance with EN 294: 1992, Table 4;
 - ensuring the force required to stop the motion of the dangerous elements does not exceed 150 N.

5.2.2 Zone 2: Drive mechanisms

Access to the primary drive system, for example motor and vee belt drives, shall be prevented. This may be achieved by use of fixed guards complying with EN 953:1997+A1:2009. The machine frame itself may act as a fixed guard.

Access to inrunning nips between drive chains and sprockets for the pocket carriers shall be prevented. The machine frame normally acts as a guard. If any nips cannot be made inaccessible by means of openings in accordance with the distances in EN 294:1992, they shall be individually safeguarded as shown for example in Figure 2 e).

5.2.3 Zone 3: Carrier transfer system

If access to the machine interior is required for maintenance or cleaning, doors or movable panels shall be designed as fixed or interlocking guards.

5.2.4 Zone 4: Flour duster

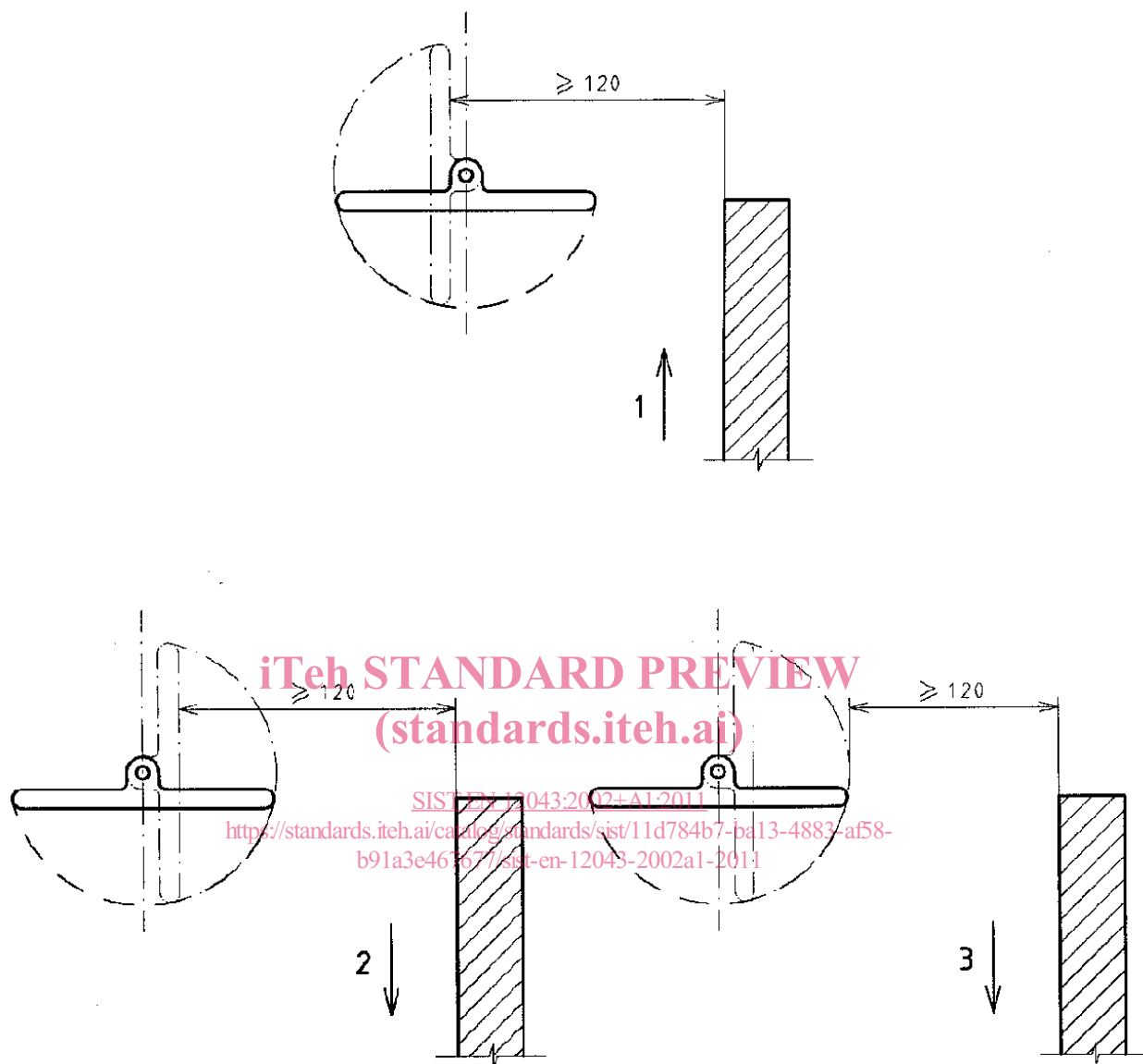
If the force necessary to stop the moving parts of the flour duster is more than 150 N, the flour duster shall be protected by a fixed or interlocking guard.

The flour container opening can be left unprotected if there is no risk from the flour feed system (e.g. if the feed consists of a spindle with rubber spokes or notches, or if the flour is sprinkled by a vibrating device).

5.2.5 Zone 5: Fan with or without heating device

Access to the fan and/or heater shall be prevented by any of the following:

- either the sum of the distances from the floor to the danger point is greater than or equal to 2,50 m;
- or access to the danger point is prevented by fixed guards, e.g. wire mesh with dimensions in accordance with EN 294: 1992, Table 4.

**Key**

- 1 Movement of tilting pocket
- 2 Movement of soft pocket
- 3 Movement of rigid pocket

Figure 2 a) — Gap between fixed edge and moving pocket carrier