



SLOVENSKI STANDARD
SIST EN 12043:2002

01-november-2002

Glavni namen tega standarda je opredeliti zahtevane varnostne in higienske pogoje za stroje in opremo za obdelavo hrane, ki se uporabljajo v proizvodnji živil.

Food processing machinery - Intermediate products - Safety and hygiene requirements

Nahrungsmittelmaschinen - Zwischengärschrank - Sicherheits- und Hygieneanforderungen

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

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Ta slovenski standard je istoveten z: EN 12043:2000

ICS:

67.260

Tovarne in oprema za živilsko industrijo

Plants and equipment for the food industry

SIST EN 12043:2002

en

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English version

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Foreword

This document has been prepared by CEN /TC 153, "Food processing machinery".

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of an identical text or by endorsement, at the latest by March 2001, and conflicting national standards shall be withdrawn at the latest by March 2001.

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 standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

The extent to which hazards are covered is indicated in the scope of this standard. In addition, machinery shall comply as appropriate with EN 292 for hazards which are not covered by this standard.

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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 used in the food industry, pastry-making, bakeries, etc. for giving a resting time to dough between dividing and moulding processes.

The standard covers the technical safety requirements for the design, manufacture, installation, adjustment, operation, cleaning and maintenance of these machines, as defined in 3.12 of EN 292-1 : 1991 and in the manufacturer's instruction handbook.

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.

It applies only to machines manufactured after the date of issue of the standard.

The following machines are excluded :

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

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 292-1:1991, *Safety of machinery - Basic concepts, general principles for design - Part 1 : Basic terminology, methodology.*

EN 292-2:1991 +A1:1995, *Safety of machinery - Basic concepts, general principles for design - Part 2 : Technical principles and specifications.*

EN 294:1992, *Safety of machinery - Safety distances to prevent danger zones being reached by the upper limbs.*

EN 418:1992, *Safety of machinery - Emergency stop equipment, functional aspects - Principles for design.*

EN 614-1:1995, *Safety of machinery - Ergonomic design principles - Part 1 : Terminology and general principles.*

EN 953:1997, *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.*

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EN 1050:1996, *Safety of machinery - Principles for risk assessment.*

EN 1088:1995, *Safety of machinery - Interlocking devices associated with guards - Principles for design and selection.*

EN 1672-2:1997, *Food processing machinery - Basic concepts - Part 2 : Hygiene requirements.*

prEN 1760-2, *Safety of machinery - Pressure sensitive protective devices - Part 2 : General principles for the design and testing of pressure sensitive edges and pressure sensitive bars.*

EN 60204-1:1997, *Safety of machinery - Electrical equipment of machines - Part 1 : General requirements.*

EN 60529:1991, *Degrees of protection provided by enclosures.*

EN ISO 4871:1997, *Acoustics - Declaration and verification of noise emission values of machinery and equipment.*

EN ISO 11201:1995, *Acoustics - Noise emitted by machinery and equipment - Measurement of emission sound pressure levels at the work station and at other specified positions - Engineering method in an essentially free field over a reflecting plane.*

EN ISO 11688-1:1997, *Acoustics - Recommended practice for the design of low-noise machinery and equipment - Part 1 : Planning.*

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

ISO 468:1982, *Surface roughness - Parameters values and general rules for determining specifications.*

3 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.

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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.

4 List of hazards

This clause contains all hazards identified by risk assessment (see EN 1050) as specific and significant for intermediate provers and which require action to reduce risk.

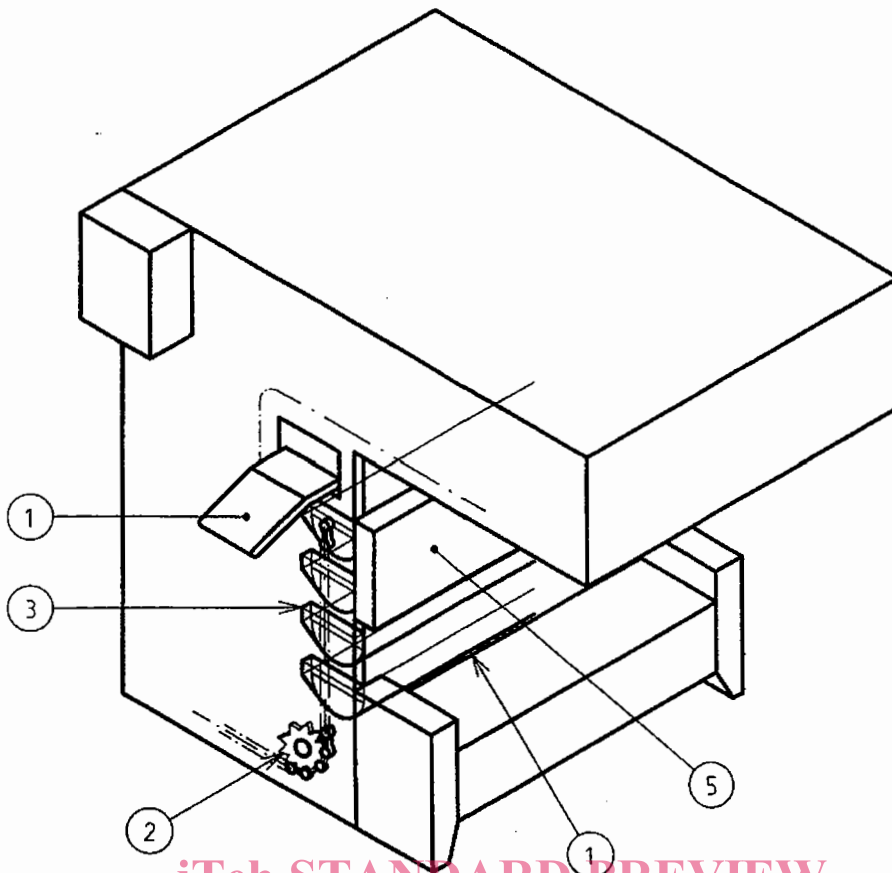
4.1 Mechanical hazards

The significant mechanical hazards are : [SIST EN 12043:2002
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- shearing hazard ;
- trapping hazard ;
- cutting hazard ;
- loss of stability.

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

- 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.



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Figure 1 a) - Front loading, side unloading

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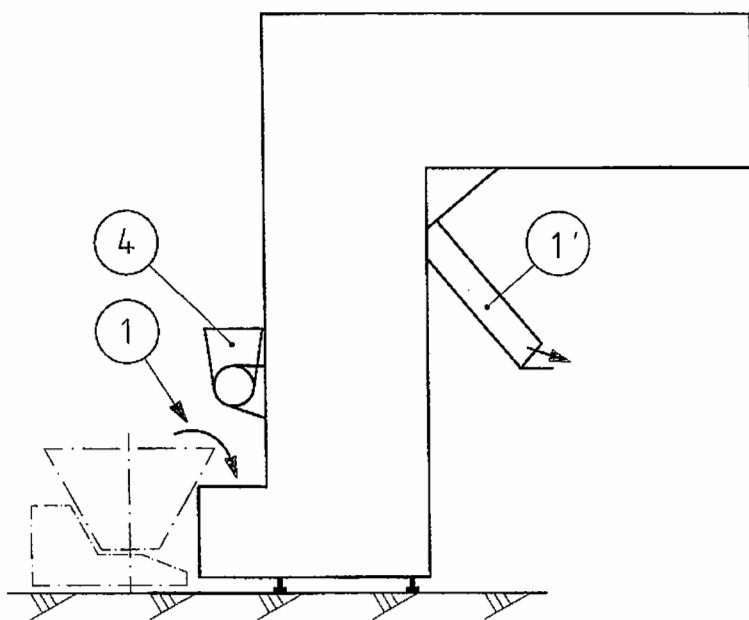


Figure 1 b) - Front loading, rear unloading

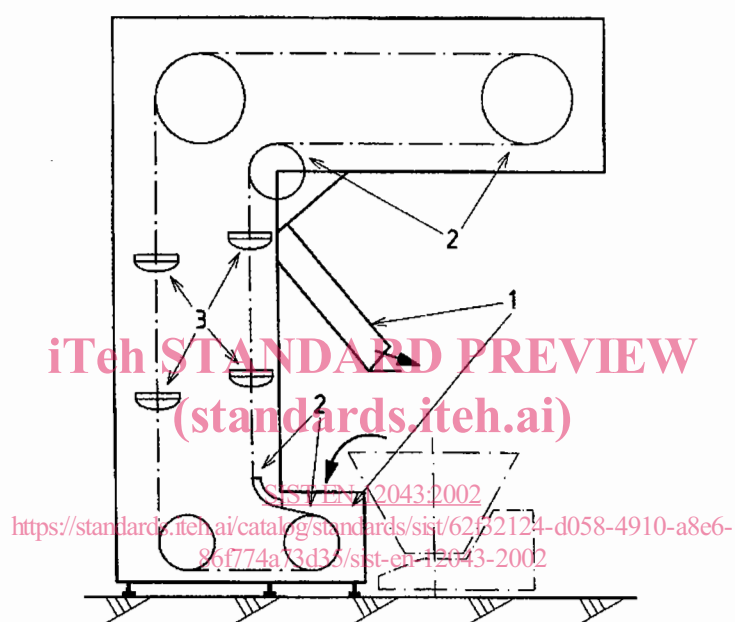


Figure 1 c) - Front loading, front unloading

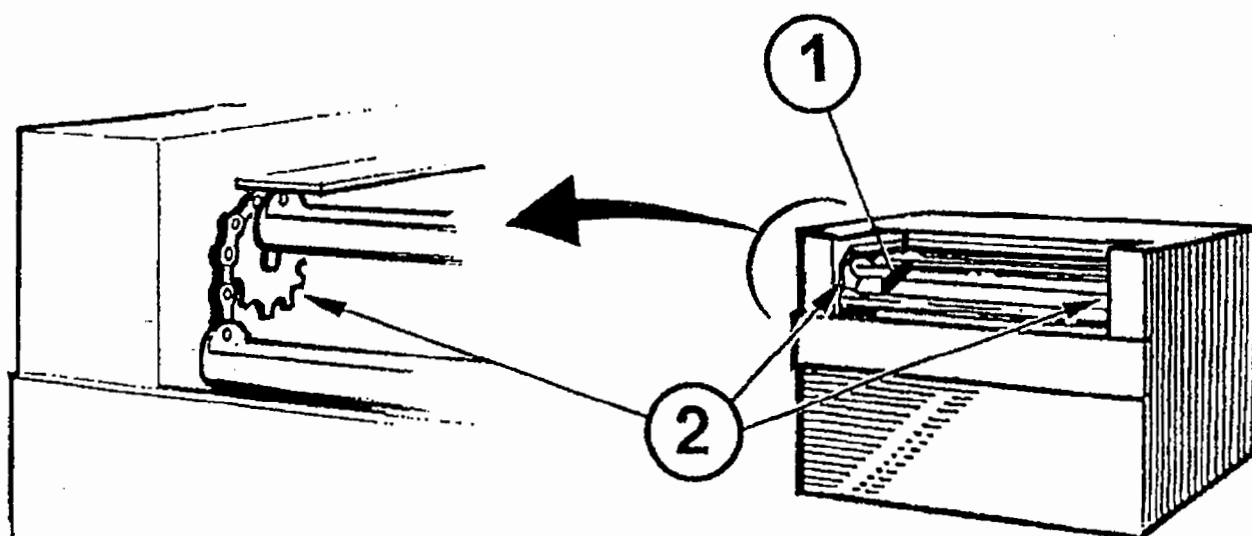


Figure 1 d) - Manual loading and unloading in the same position

Figure 1 - Danger zones for various types of intermediate provers

4.2 Electrical hazards

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

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

4.3 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.

4.4 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.

4.5 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.

5 Safety and hygiene requirements and/or measures

This clause states the requirements and/or measures to reduce the effect of the hazards detailed in clause 4.

5.1 Mechanical hazards

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

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).

Safety related control systems shall be to category 1 of EN 954-1:1996.

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

5.1.1.1 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 2a and 2b) ;
- providing a pressure sensitive trip bar or wire (see prEN 1760-2) covering the opening where the trapping may occur (see figure 2c) 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.

5.1.1.2 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)) ;
- 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.

5.1.1.3 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.

5.1.2 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. 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 2e.

5.1.3 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.

5.1.4 Zone 4 : Flour duster

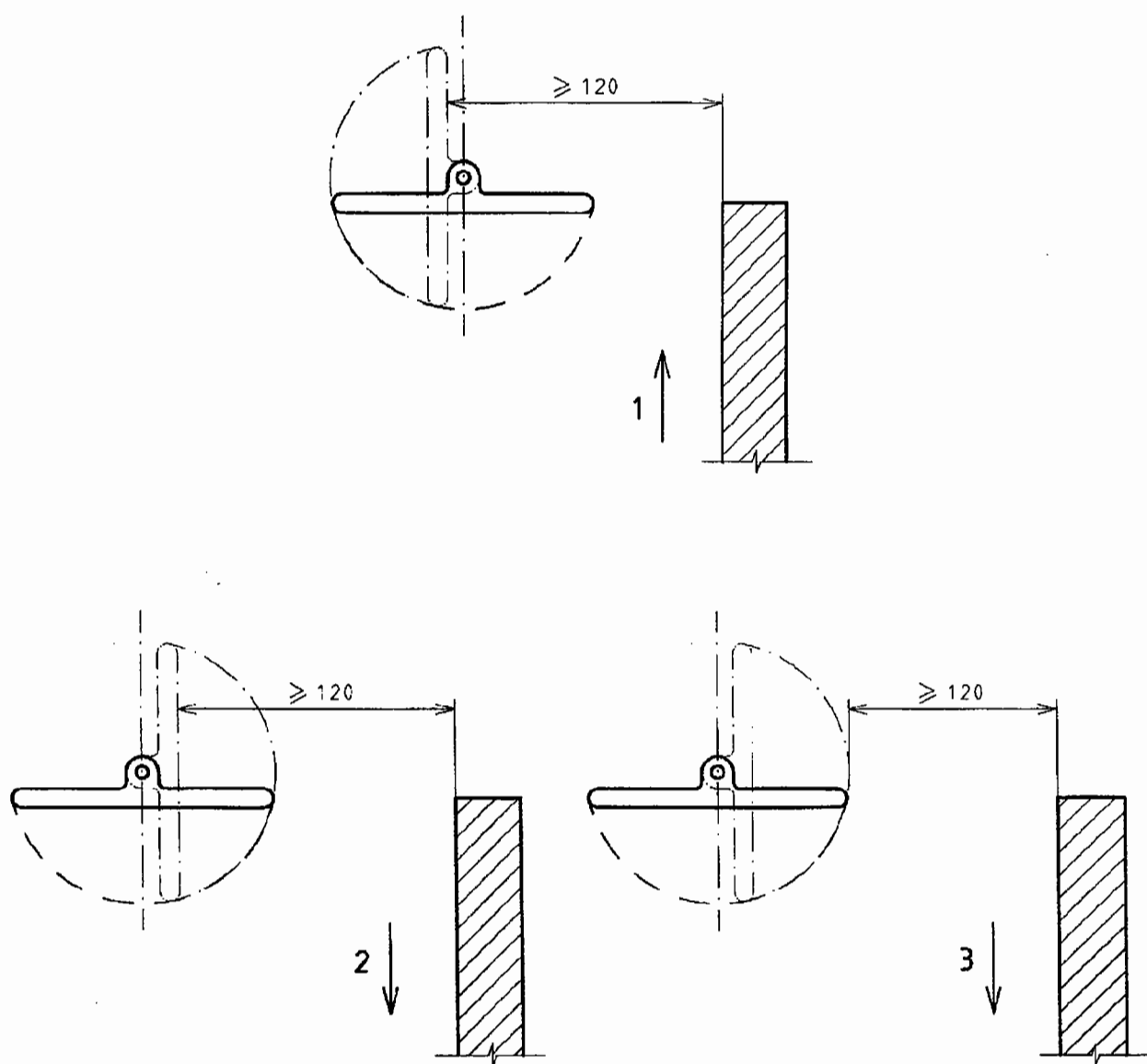
If the force necessary to stop the moving parts of the flour duster is more than 150 N, the flour duster shall be protected by a fixed or interlocking guard.

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).

5.1.5 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

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