



**SLOVENSKI STANDARD**  
**SIST EN 12041:2001+A1:2009**  
**01-oktober-2009**

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**Stroji za predelavo hrane - Stroji za vzdolžno oblikovanje testa - Varnostne in higienske zahteve**

Food processing machinery - Moulders - Safety and hygiene requirements

Nahrungsmittelmaschinen - Langwirkmaschinen - Sicherheits- und Hygieneanforderungen

Machines pour les produits alimentaires - Façonneuses - Prescriptions relatives à la sécurité et à l'hygiène

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**Ta slovenski standard je istoveten z: EN 12041:2000+A1:2009**

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**ICS:**

67.260	Tovarne in oprema za živilsko industrijo	Plants and equipment for the food industry
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EUROPEAN STANDARD

**EN 12041:2000+A1**

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August 2009

ICS 67.260

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English Version

## Food processing machinery - Moulders - Safety and hygiene requirements

Machines pour les produits alimentaires - Façonneuses -  
Prescriptions relatives à la sécurité et à l'hygiène

Nahrungsmittelmaschinen - Langwirkmaschinen -  
Sicherheits- und Hygieneanforderungen

This European Standard was approved by CEN on 2 July 2000 and includes Amendment 1 approved by CEN on 16 July 2009.

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

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## Foreword

This document (EN 12041:2000+A1:2009) has been prepared by the Technical Committee CEN/TC 153 Machinery intended for use with foodstuffs and feed" the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by February 2010, and conflicting national standards shall be withdrawn at the latest by February 2010.

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 2009-07-16.

This document supersedes EN 12041:2000.

The start and finish of text introduced or altered by amendment is indicated in the text by tags  $\boxed{A_1}$   $\boxed{A_1}$ .

This European Standard has been prepared under a Mandate given to CEN by the Commission of the European Commission and the European Free Trade Association, and supports essential requirements of EU Directives(s).

$\boxed{A_1}$  For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document.  $\boxed{A_1}$

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, 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 12041:2000+A1:2009 (E)****Introduction**

The extent to which hazards are covered is indicated in the scope of this standard. In addition, machinery shall comply as appropriate with **A1** EN ISO 12100 **A1** for hazards which are not covered by this standard.

**1 Scope**

This standard applies to the design and manufacture of dough moulders of the types described in 3.1, 3.2 and 3.3 and illustrated in figures 3a, 3b and 3c. These moulders are used in the food industry and shops (bread making, pastry making, sweet industries, bakeries, confectioners, delicatessens, catering facilities, etc.) for flattening, rolling and elongating pieces of dough.

Other designs of moulder and type 1 moulders designed for other than hand crafted products using soft dough, e. g. French baguettes, are not covered by this standard.

The standard covers the technical safety and hygiene requirements for the design, manufacture, installation, adjustment, operation, cleaning and maintenance of these machines, as defined in **A1** 3.22 of EN ISO 12100-1:2003 **A1** and in the manufacturer's instruction handbook.

The significant hazards covered by this standard are mechanical (drawing in, trapping, entanglement, crushing, 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 by moulders. 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.

The following machines are excluded:

- experimental and testing machines under development by the manufacturer;
- domestic appliances;
- bagel machines.

This standard applies only to machines manufactured after the date of approval by CEN.

**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.

**A1** *deleted text* **A1**

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

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

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

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 - Common requirements – Part 2: Hygiene requirements*

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 60651:1994, *Sound level meters*

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

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*

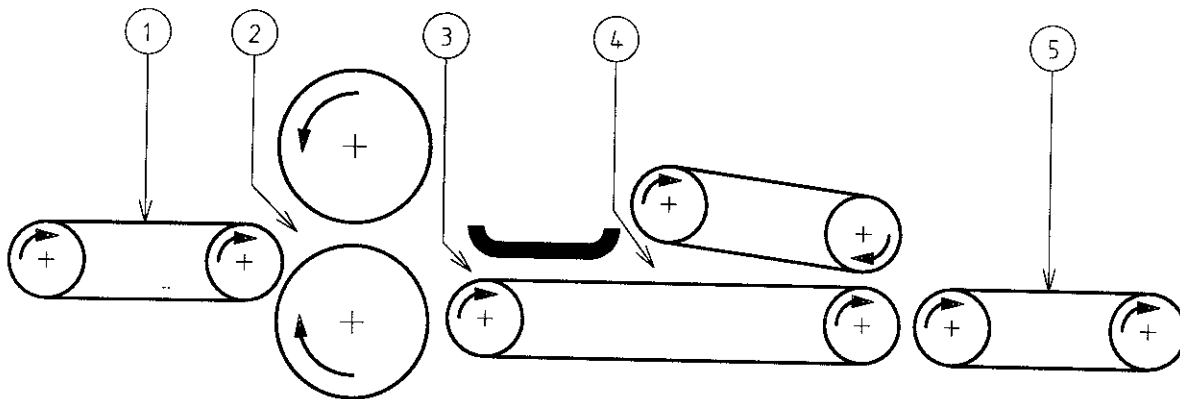
Ⓐ) EN ISO 12100-1:2003, *Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2:2003, *Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles (ISO 12100-2:2003)* Ⓐ) 1

ISO 468:1982, *Surface roughness - Parameters values and general rules for specifying requirements*

### 3 Description

Machines may be manually or automatically fed (for example by discharge conveyor from the prover). Dough pieces are flattened between two cylinders, rolled between two surfaces (either two moving belts or one belt and a fixed plate), and elongated in the same way. Discharge may be manual or by conveyor.



- ① Feeding
- ② Flattening
- ③ Rolling
- ④ Elongation
- ⑤ Discharge

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**Figure 1 — General principle**

<https://standards.iteh.ai/catalog/standards/sist/2e96fb7-355a-4bd9-bec6-34f21249acf4/sist-en-12041-2001a1-2009>

### 3.1 Type 1 moulder

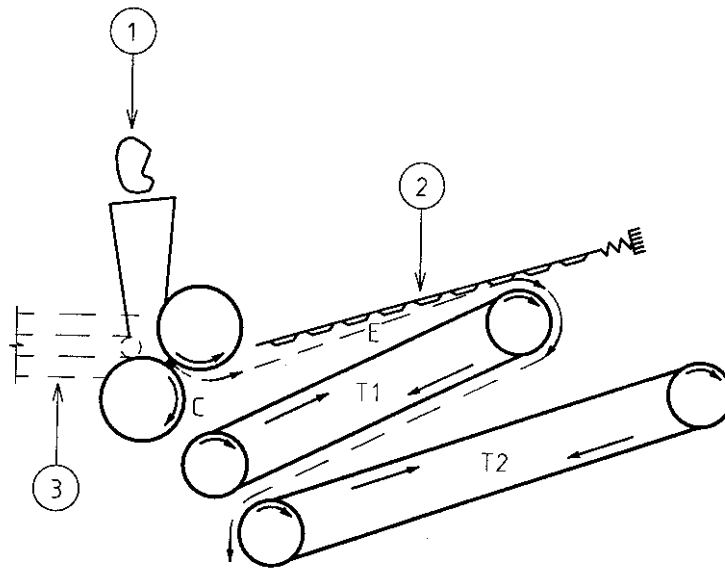
On machines used to produce soft dough products e.g. French baguette, product quality depends on careful handling of the dough and in particular on manual introduction of the dough without any excessive drop. The maximum dropping distance without causing harm is 20 cm.

In the case of manual feeding, the dough is elongated by hand and dropped into the rollers.

With this type of moulder, the dough introduced into the hopper is flattened by the rollers and becomes a thin sheet at C (see figure 2a). For tough dough or pastry, additional rollers can be placed in front of the two first rollers.

This thin sheet is rolled between the fixed and the mechanically driven belt T1 and progressively squeezed at E. After that, it is elongated between T1 and T2.





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- ① Lump, manual feeding
- ② Fixed cloth
- ③ Feeding by belts

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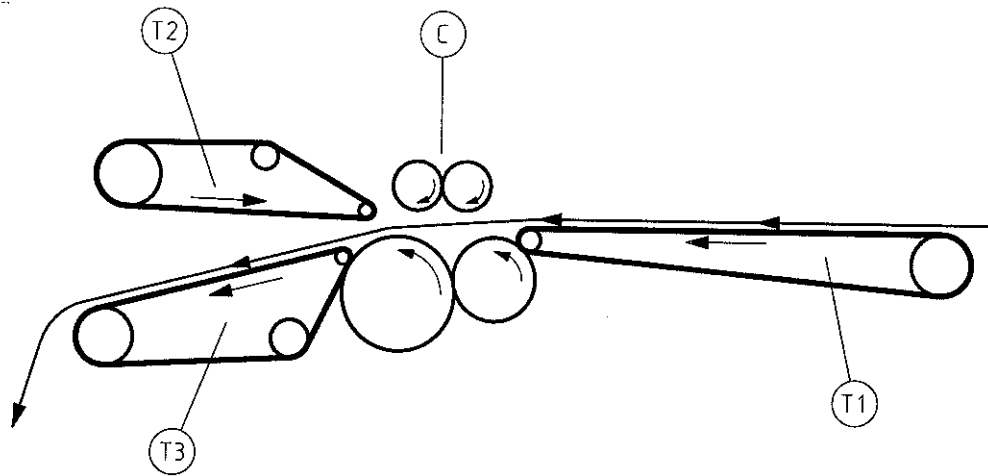
**Figure 2a — Type 1 moulder**

### 3.2 Type 2 moulder

These machines are used mainly to produce small rolled bread with soft and hard dough. The piece of dough is placed on the conveyor belt, at different angles from the axes of cylinders in order to obtain several shapes of bread (banana, mantovane, barilini, bocconcini, etc.).

This type of moulder (see figure 2b) consists of:

- a) a conveyor belt (T1) suitable to feed the piece of dough into the rollers (C);
- b) a train of rollers (C) of a variable number that flatten the piece of dough;
- c) two belts (T2 and T3) between which the piece of dough is moulded and/or elongated.



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Figure 2b — Type 2 moulder

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### 3.3 Type 3 moulder

These machines are mainly suitable for producing large rolled bread (long loaves) using soft dough.

This type of moulder (see figure 2c) consists of:

- a conveyor belt (T1) suitable to feed the piece of dough into the rollers (C);
- a train of rollers (C) of a variable number (generally from 2 to 6) that flattens the piece of dough;
- a fixed cloth (T2) called "heavy" that starts the moulding of the piece of dough;
- a fixed plate (P) coupled to a movable belt (T3) between which the piece of dough is moulded and/or elongated completely.

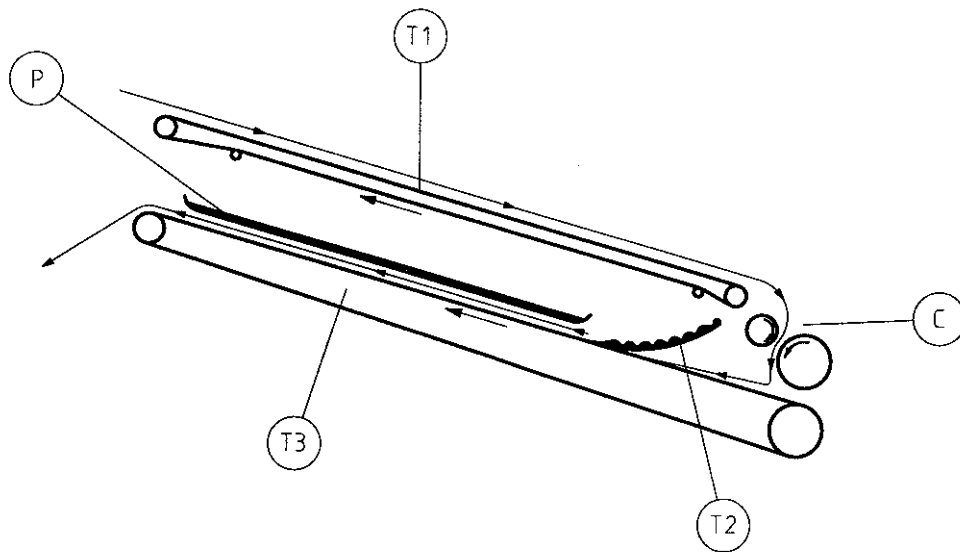


Figure 2c — Type 3 moulder

#### 4 List of hazards

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

Figures 3a (moulder type 1), 3b (moulder type 2) and 3c (moulder type 3) show the danger zones.

##### 4.1 Mechanical hazards

The significant mechanical hazards are:

- trapping hazard;
- crushing hazard;
- entanglement hazard;
- loss of stability.

Zone 1: gap between the rollers (hazards: fingers drawing-in and crushing);

Zone 2: drive mechanisms (hazards: trapping, shearing and entanglement);

Zone 3: input and output devices (hazardous inrunning nips) (hazards: crushing and entanglement)

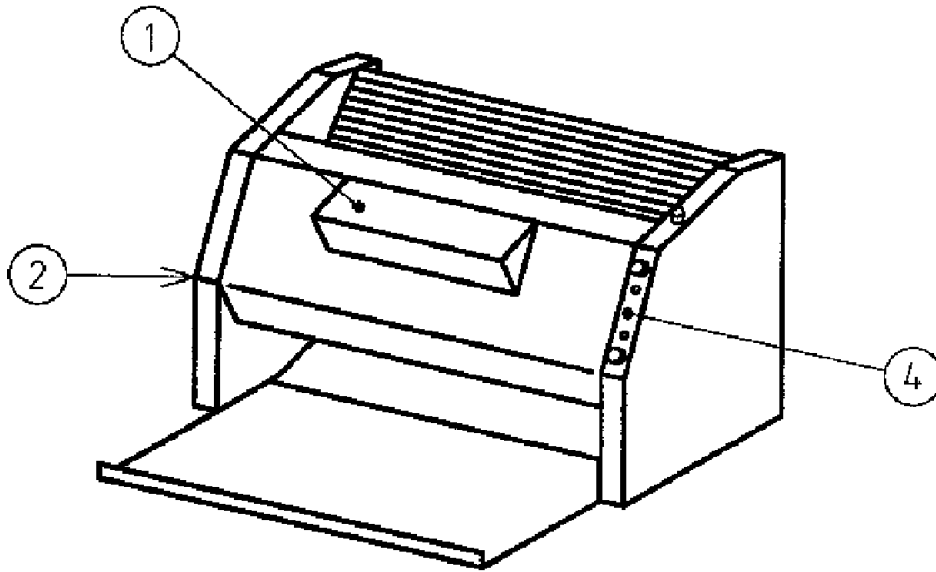


Figure 3a: Danger zones of moulders - Type 1 moulder

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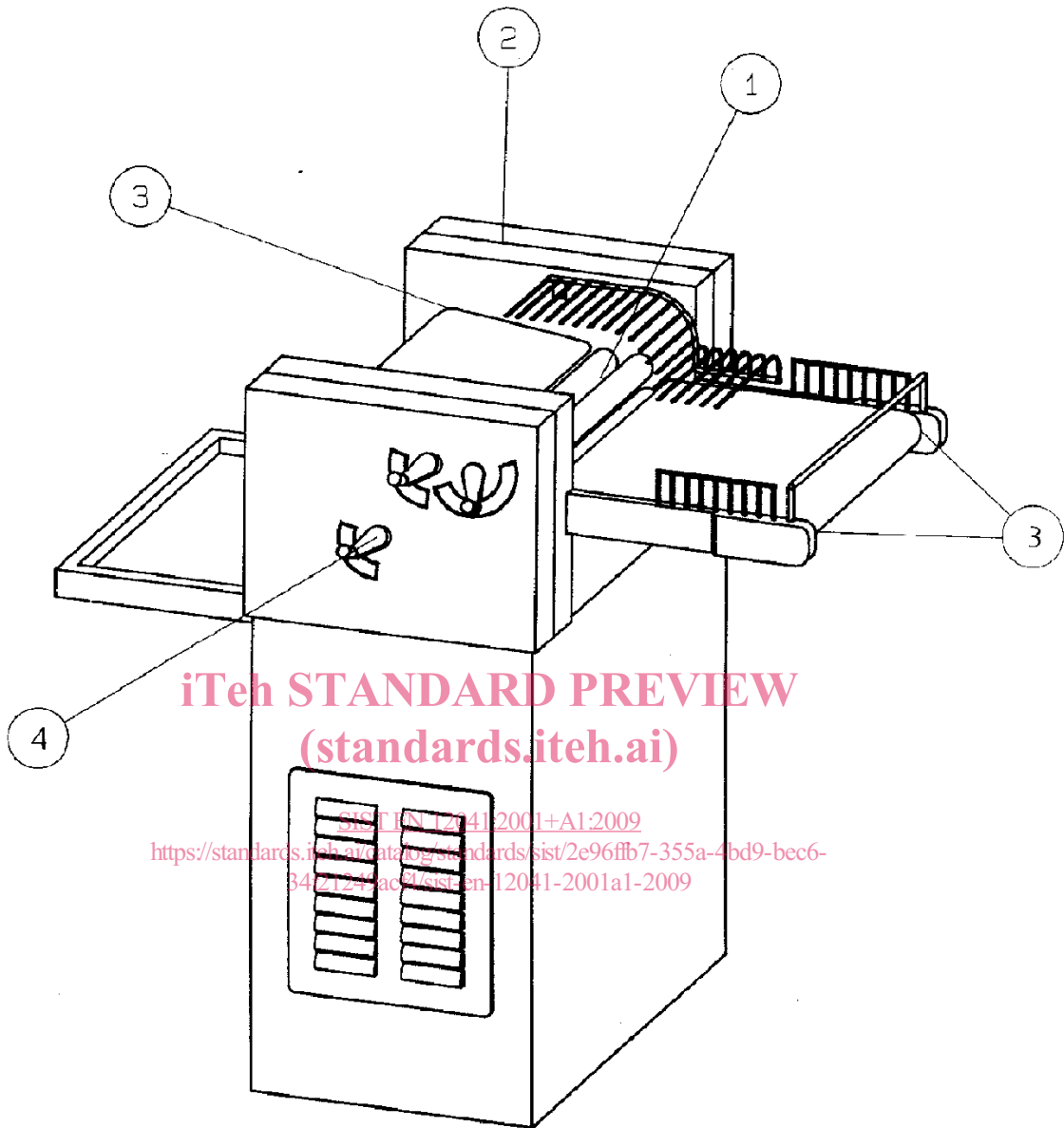
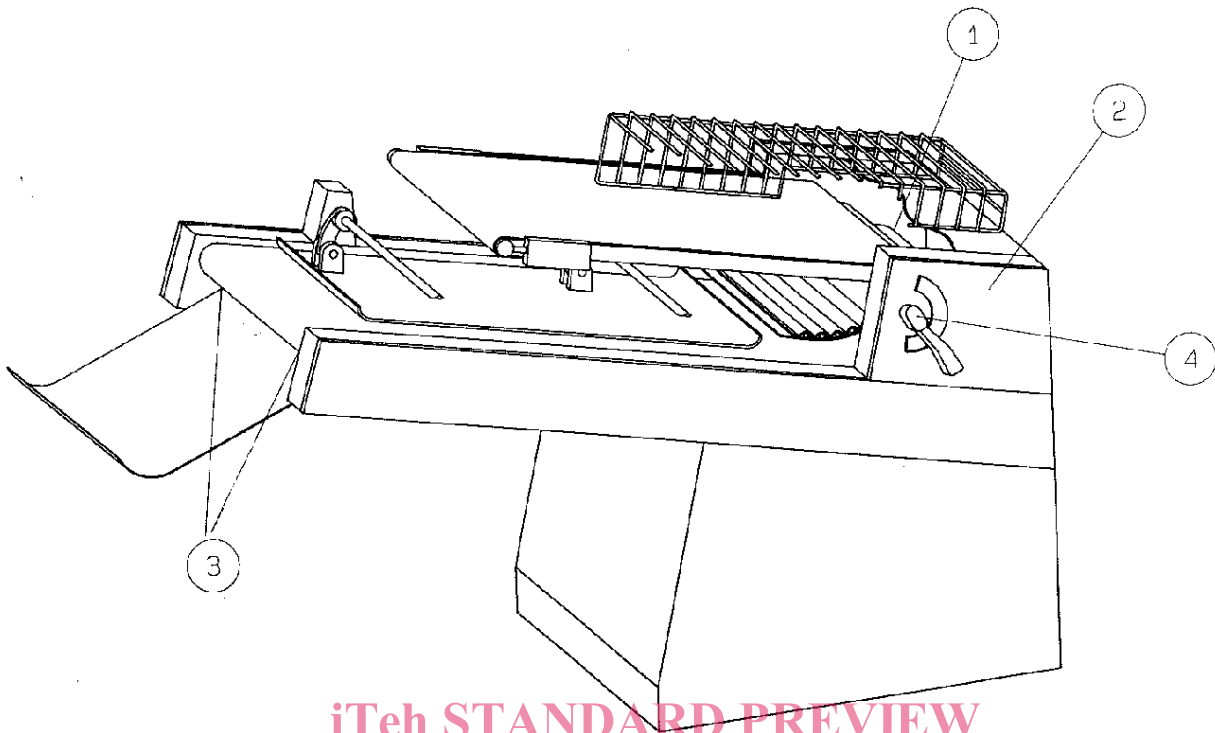


Figure 3b — Danger zones of moulders - Type 2 moulder



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Figure 3c — Danger zones of moulders - Type 3 moulder

#### 4.2 Electrical hazards

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

Hazards of external influences on electrical equipment (e.g. cleaning with water, dust).

#### 4.3 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.

#### 4.4 Hazards generated by neglecting ergonomic principles

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

Loading the machine with pieces of dough over prolonged periods using repetitive hand and arm movement may cause musculo-skeletal disorders.

The zone 4: "control mechanism to adjust the gap between the rolls and/or the gap between the belts" may be an ergonomic hazard zone.

## 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 throughout clause 5, they shall comply with clause 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.

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

**A1)** 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**

#### 5.1.1 Zone 1: gap between the two rollers

Access to the hazard zone shall be prevented, e.g. by the machine housing. Requirements for use shall also be taken into account. To achieve this, moulders shall be equipped with an interlocking guard and/or a device preventing the introduction of the hand into the danger zone through the feeding devices. Different ways of restricting access to the hazard zone are given for moulders of types 1, 2 and 3. Because of the particular operational requirements of these types of moulder, total prevention of access is not always possible. Risk assessment and accident history show that these measures provide a satisfactory level of safety.

The stopping time shall be less than or equal to 1 s from switch actuation.

When automatically fed, access shall be prevented to the in-running rollers. This may be achieved by the provision of:

- total enclosure;
- a feed tunnel and a conveyor, see table 4 of EN 294:1992;
- a chicane and conveyors as shown in figure 4d;

##### 5.1.1.1 Type 1 moulder

Restricting access to zone 1 may be achieved by means of one of the following devices:

- a mechanical device (see figure 4a);
- a hopper which acts as a stopping device (see figure 4b);
- a fixed hopper with a stopping device in the form of the bar (see figure 4c).

In figures 4b and 4c the upper edge of the hopper or the bar shall be at a minimum distance of 150 mm of the hazard zone. The distance between the upper edge of the hopper and the stopping device shall be less than 20 mm. The width of the upper opening of the hopper shall be less than or equal to 160 mm.