



# SLOVENSKI STANDARD

## SIST EN 13591:2006

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Glavni namen tega standarda je opredeliti zahtevane pogoje za varnost in higieno pri uporabi strojne opreme za obdelavo hrane. Standard določa zahteve za varnost in higieno pri uporabi strojne opreme za obdelavo hrane.

Food processing machinery - Fixed deck oven loaders - Safety and hygiene requirements

Nahrungsmittelmaschinen - Ofenbeschickungseinrichtungen - Sicherheits- und Hygieneanforderungen

Machines pour les produits alimentaires - Elevateurs-enfourneurs - Prescriptions relatives a la sécurité et a l'hygiène

**Ta slovenski standard je istoveten z: EN 13591:2005**

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**ICS:**

67.260

Tovarne in oprema za živilsko industrijo

Plants and equipment for the food industry

**SIST EN 13591:2006**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 13591**

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ICS 67.260

English Version

## Food processing machinery - Fixed deck oven loaders - Safety and hygiene requirements

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

Nahrungsmittelmaschinen - Ofenbeschickungseinrichtungen - Sicherheits- und Hygieneanforderungen

This European Standard was approved by CEN on 1 August 2005.

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## Foreword

This European Standard (EN 13591:2005) has been prepared by Technical Committee CEN/TC 153 “Food processing machinery — Safety and hygiene specifications”, 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of an identical text or by endorsement, at the latest by April 2006, and conflicting national standards shall be withdrawn at the latest by April 2006.

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 EC Directive(s).

For relationship with EC Directives, see informative Annex ZA, which is an integral part of this document.

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

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**EN 13591:2005 (E)**

## **Introduction**

This European Standard is a type C standard as stated in EN ISO 12100-1.

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.

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## 1 Scope

This European Standard applies to the design and manufacture of fixed deck oven loaders used in the food industry, bakeries, pastry-making, etc. These machines are used to place dough pieces on each deck of fixed deck ovens and to remove the baked products from each deck.

This equipment may be:

- manual;
- semi-automatic (some movements powered, some movements requiring manual power).

The European Standard covers technical safety and hygiene requirements for the design, installation, adjustment, operating, cleaning and maintenance of this equipment.

This European Standard deals with the significant hazards, hazardous situations and events relevant to fixed oven deck loaders, when used as intended and under the conditions foreseen by the manufacturer.

Noise from fixed deck oven loaders is not considered to be a significant hazard. That 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 given in Annex A.

The following equipment are excluded:

- experimental equipment and equipment under development by the manufacturer;
- loaders for conveyor ovens;
- loaders integral to the oven;
- fully automated fixed deck oven loaders.

This European Standard is not applicable to fixed deck oven loaders that are manufactured before the date of publication of this European Standard by CEN.

## 2 Normative references

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 574:1996, *Safety of machinery — Two-hand control devices — Functional aspects — Principles for design*.

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

EN 953, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*.

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

EN 982, *Safety of machinery — Safety requirements for fluid power systems and their components — Hydraulics*.

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EN 983, *Safety of machinery — Safety requirements for fluid power systems and their components — Pneumatics.*

EN 1037, *Safety of machinery — Prevention of unexpected start-up.*

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

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

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

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

EN ISO 3744:1995, *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, *Geometrical product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters (ISO 4287:1997).*

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

EN ISO 11201, *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).*

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).*

### 3 Description

#### 3.1 Terms and definitions

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

NOTE Shifting, lifting, and loading in the oven are the three main functions of a fixed deck oven loader.

##### 3.1.1 shifting

movement of the whole oven loader to the oven face

##### 3.1.2 lifting

vertical movement up and down

##### 3.1.3 loading

action of placing pieces of dough on the oven loader



**3.1.4****loading in the oven**

action of introducing and placing pieces of dough on the decks of the oven

**3.1.5****unloading**

action of removing loaves from the oven deck once baking has finished

**3.1.6****nominal mass of dough**

the mass the loader is intended for

**3.2 General principle**

A fixed deck oven loader generally consists of a frame mounted on castors supporting a lifting device and a supporting platform with the loading device (see Figure 1).

The frame is mounted on castors to enable the loader to be positioned in front of the oven for loading and unloading.

The lifting device (e. g. scissors lifting mechanism, lifting mast,...) allows the height of the oven loader to be varied for loading and unloading at different levels in the oven.

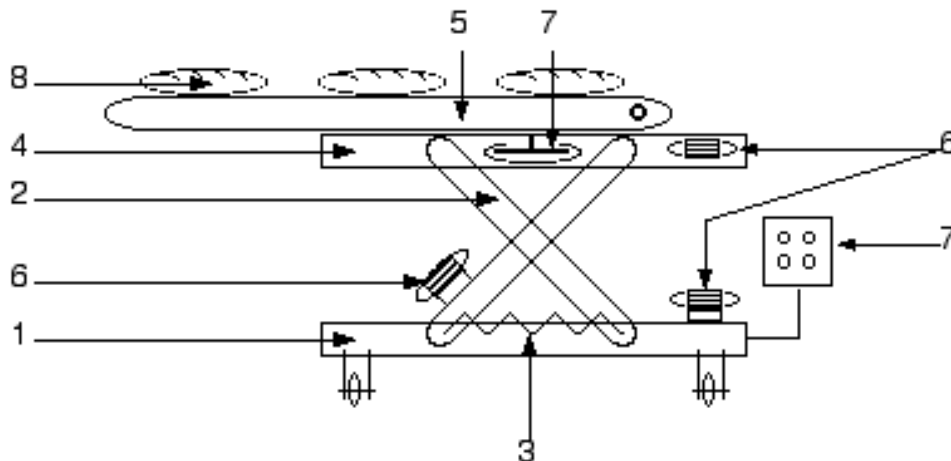
The loading device comprises a frame and a belt in order to place the pieces of dough in the oven and to take out the loaves when baking has finished.

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**Key**

- 1 Framework mounted on castors
- 2 Lifting device
- 3 Balancing system for the mobile parts in elevation (e. g.: springs, counterweights...)
- 4 Supporting platform
- 5 Loading device (frame and movable belt)
- 6 Transmission elements for carrying out various movements
- 7 Control devices for operating the 3 functions, (whether they be manually-controlled, semi-automatic or automatic)
- 8 Dough pieces to be loaded in the oven

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**Figure 1 — General principle of a fixed deck oven loader**  
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**3.3 Classification**

The different fixed deck oven loaders may be divided into 5 types, according to the three functions which they have in common (namely: loading in oven, lifting and shifting) and to whether these three phases are carried out manually or mechanically operated (see Table 1):

**Table 1**

Types	Functions		
	Loading in the oven	Lifting	Shifting
<b>Type 1</b>	Manual	Manual	Manual
<b>Type 2</b>	Power operated	Manual	Manual
<b>Type 3</b>	Power operated	Power operated	Manual
<b>Type 4</b>	Manual	Power operated	Manual
<b>Type 5<sup>a</sup></b>	Power operated	Power operated	Power operated

<sup>a</sup> Type 5 is excluded from the scope of this document.

NOTE Usual moving speeds of the mechanically operated equipment are as follows:

- loading in oven: 0,5 m/s;
- lifting: 0,1 m/s;
- shifting: 0,2 m/s.

## 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 document, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk.

Before using this document it is important to carry out a risk assessment of the fixed deck oven loaders to check that it has the hazards identified in this clause.

### 4.2 Mechanical hazards

The significant mechanical hazards are:

- abrasion hazard;
- shearing hazard;
- crushing hazard;
- impact hazard;
- drawing-in hazard;
- loss of stability.

Zone 1: range of movement of loading device and its belt in relation to its support: fixed table (abrasion and shearing hazards).

Zone 2: range of lifting movement of oven loader (shearing hazard due to access to scissors mechanism and crushing hazards for mast systems).

Zone 3: space below oven loader when lifting: deck oven loader support, oven loader and belt (crushing and impact hazards in the event of failure and falling).

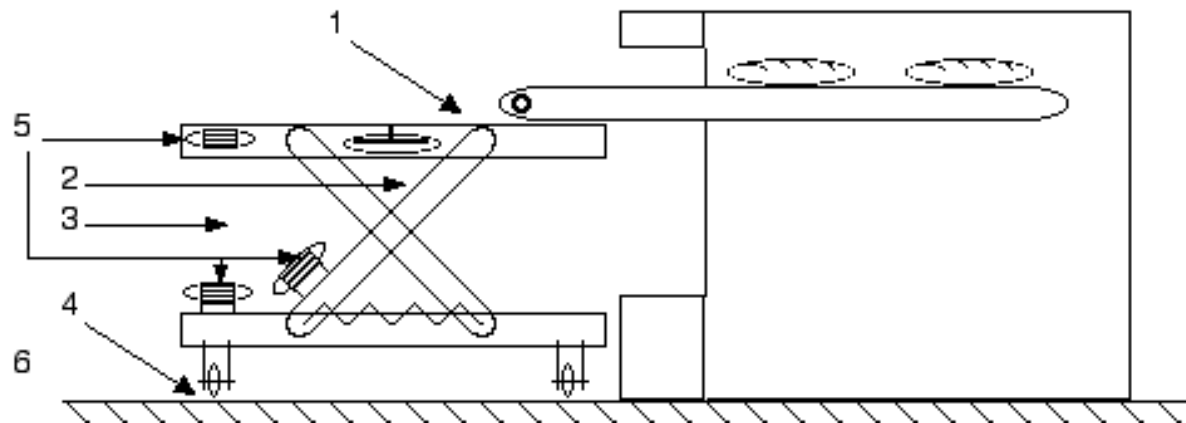
Zone 4: range of movement of the castors (crushing and impact hazards).

Zone 5: oven deck loader drive mechanisms (type 2 and 3 oven deck loaders), lifting movement mechanisms (type 3 and 4 deck oven loaders), shifting movement mechanisms (type 5 deck oven loaders only): crushing, shearing and drawing-in hazards.

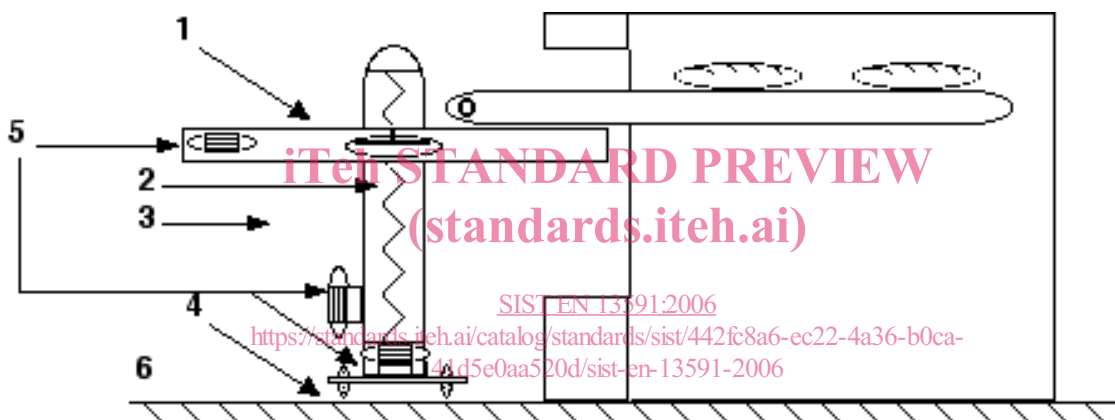
Zone 6: range of movement of the equipment (crushing and impact hazards including in the event of the loss of stability or failure).

Figure 2a (scissors system) and Figure 2b (mast system) show the danger zones.

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a) Danger zones – Scissors system



b) Danger zones – Mast system

Figure 2 — Danger zones for scissors and mast systems

#### 4.3 Electrical hazards

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

Hazard from external influences on electrical equipment (e. g. cleaning with water, dust).

During the movements of the equipment, there is a risk due to the damaging of the supply cable (e. g. short circuit).

#### 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.

Working on an oven deck loader may involve various repetitive hand and arm movements (loading the dough pieces, positioning and moving the equipment, as well as loading in the oven), which may cause repetitive strain injury.

#### 4.6 Pneumatic and hydraulic equipment

Pneumatic and hydraulic equipment presents crushing, shearing, ejection of parts, explosion and injection of fluids hazards. Stored energy in pneumatic or hydraulic systems may cause mechanisms to move unexpectedly even when power supplies are disconnected.

### 5 Safety and hygiene requirements and/or protective measures

#### 5.1 General

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

In addition, the machine shall be designed according to the principles of EN ISO 12100 for hazards relevant but not significant, which are not dealt with by this document (e. g. sharp edges).

NOTE For hazards which are to be reduced by the application of type B standards such as EN 574, EN 614-1, EN 953, EN 954-1, EN 982, EN 983, EN 1037, EN 1088 and EN 60204-1, the manufacturer should carry out a risk assessment to establish the requirements of that standard which are to be applied. This specific risk assessment is part of the general risk assessment of the machine.

Where the means of reducing the risk is by the physical arrangement or positioning of the installed machine, the manufacturer shall include in the information for use a reference to the reduction means to be provided, and to any limiting value of the requirement, and, if appropriate, to the means of verification.

Where the means of reducing the risk is by a safe system of working the machinery, the manufacturer shall include in the information for use details of the system and of the elements of training required by the operating personnel.

#### 5.2 Mechanical hazards

##### 5.2.1 General

Where reference is made to interlocking devices throughout Clause 5, they shall be interlocking devices without guard locking and comply with Clause 5 and Clause 6 of EN 1088:1995.

Safety related parts of the control system shall comply with the requirements of EN 954-1, Category 1 or better.

##### 5.2.2 Zone 1: Range of movement of oven loader and its belt, in relation to its support

###### 5.2.2.1 Type 1 and 4 fixed deck oven loaders: Manual loading in the oven

The gap between the oven loader ( $L_2$  in Figure 3) handle and any fixed part of the frame shall be greater than or equal to 40 mm.

NOTE EN 349:1993, Table 1 recommends 25 mm in order to avoid crushing fingers. Since the operator may wear gloves, this is not considered sufficient for the abrasion hazard.