



# SLOVENSKI STANDARD

## SIST EN 1673:2002

01-september-2002

Glavni namen: Ujca fubYDY jnj fhj ja jcn] \_ca EJUfbcglbY]b\ ] [ Ybg\_Y  
nU hYj Y

Food processing machinery - Rotary rack ovens - Safety and hygiene requirements

Nahrungsmittelmaschinen - Stikken-Backöfen - Sicherheits- und Hygieneanforderungen

Machines pour les produits alimentaires - Fours a chariot rotatif - Prescriptions relatives  
a la sécurité et l'hygiene

[SIST EN 1673:2002](#)

<https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481->

[fe363c68f71/sist-en-1673-2002](https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f71/sist-en-1673-2002)

Ta slovenski standard je istoveten z: **EN 1673:2000**

### ICS:

67.260	Tovarne in oprema za živilsko industrijo	Plants and equipment for the food industry
97.040.20	Stikne, delovne mize, peči in podobne naprave	Cooking ranges, working tables, ovens and similar appliances

**SIST EN 1673:2002**

en

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 1673:2002

<https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68b71/sist-en-1673-2002>

EUROPEAN STANDARD

EN 1673

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2000

ICS 67.260; 97.040.20

English version

**Food processing machinery - Rotary rack ovens - Safety and hygiene requirements**

Machines pour les produits alimentaires - Fours à chariot rotatif - Prescriptions relatives à la sécurité et l'hygiène

Nahrungsmittelmaschinen - Stikken-Backöfen - Sicherheits- und Hygieneanforderungen

This European Standard was approved by CEN on 11 June 2000.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 1673:2002

<https://standards.iteh.ai/catalog/standards/sist/10c59371-bb5b-4fc9-8481-fe363c68b714/en-1673-2002>EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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

**Contents**

<b>Foreword .....</b>	<b>3</b>
<b>0 Introduction .....</b>	<b>4</b>
<b>1 Scope .....</b>	<b>4</b>
<b>2 Normative references .....</b>	<b>4</b>
<b>3 Description.....</b>	<b>6</b>
<b>4 List of hazards .....</b>	<b>8</b>
4.1 Mechanical hazards.....	8
4.2 Electrical hazards .....	9
4.3 Thermal hazards .....	9
4.4 Explosion and fire hazards .....	9
4.5 Hazard from being trapped inside.....	10
4.6 Hazard generated by neglecting hygienic design principles.....	10
4.7 Hazards generated by neglecting ergonomic principles.....	10
<b>5 Safety and hygiene requirements and/or measures .....</b>	<b>11</b>
5.1 Mechanical hazards.....	11
5.2 Electrical hazards .....	13
5.3 Thermal hazards .....	14
5.4 Fire hazards due to overheating .....	15
5.5 Hazard from being trapped inside.....	15
5.6 Hygiene requirements .....	15
5.7 Hazards generated by neglecting ergonomic principles.....	16
<b>6 Verification of the safety and hygiene requirements and/or measures.....</b>	<b>17</b>
<b>7 Information for use.....</b>	<b>18</b>
7.1 Marking .....	18
7.2 Noise declaration.....	18
<b>Annex A (normative) Principles of design to ensure the cleanability of rotary rack ovens .....</b>	<b>19</b>
A.1 Definitions.....	19
A.2 Materials of construction.....	19
A.3 Design .....	21
<b>Annex B (normative) Noise test code - Grade 2 of accuracy .....</b>	<b>40</b>
B.1 Definitions.....	40
B.2 Installation and mounting conditions.....	41
B.3 Operating conditions.....	42
B.4 Measurements.....	42
B.5 Emission sound pressure level determination.....	42
B.6 Sound power level determination.....	42
B.7 Measurement uncertainties .....	43
B.8 Information to be recorded .....	43
B.9 Information to be reported .....	43
B.10 Declaration and verification of noise emission values .....	43
<b>Annex C (informative) Bibliography .....</b>	<b>45</b>
<b>Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU Directives .....</b>	<b>46</b>

## Foreword

This European Standard 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 March 2001, and conflicting national standards shall be withdrawn at the latest March 2001.

This European Standard 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.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 1673:2002](https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f71/sist-en-1673-2002)

<https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f71/sist-en-1673-2002>

## 0 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.

## 1 Scope

This standard specifies safety and hygiene requirements for the design and manufacture of rotary rack ovens with one or more rotary racks.

These ovens are used in the food industry and shops (bakeries, pastry-making, etc.) for the batch baking of foodstuffs containing flour, water and other additives. This standard applies to ovens used only for food products except for those containing volatile flammable ingredients.

The control of the humidity of the air in the baking chamber is by the production and introduction of steam around normal atmospheric pressure.

The following machines are excluded :

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

This standard covers the technical safety requirements for the installation, 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 this standard are mechanical (shearing, trapping, impact, loss of stability), electrical, thermal, ergonomic and those resulting from lack of hygiene. They are specifically listed in 4. Noise is not considered to be a significant hazard from rotary rack ovens. 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 hazards from the use of gaseous fuel by gas appliances are not covered by this standard.

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

**iTeh STANDARD PREVIEW**

## 2 Normative references (standards.iteh.ai)

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 + A1	1991 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 563	1994	Safety of machinery - Temperatures of touchable surfaces - Ergonomics data to establish temperature limit values for hot surfaces.
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.
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 ISO 3743-1	1995	Acoustics - Determination of sound levels of noise sources - Engineering methods small movable sources in reverberant fields - Part 1 : Comparison method.
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 4871	1996	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.

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

[https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-](https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f371/sist-en-1673-2002)

[fe363c68f371/sist-en-1673-2002](https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f371/sist-en-1673-2002)

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 specifying requirements.

### 3 Description

A rotary rack oven usually consists of the following parts (see figure.1) :

- a) container built with insulated panels ;
- b) baking chamber with access door ;
- c) heat production unit ;
- d) hot air circulation system ;
- e) rack and trays ;
- f) drive unit for rack rotation ;
- g) steam generator ;
- h) steam extractor ;
- i) control panel ;
- j) miscellaneous devices (e.g.combustion product flue where gas or fuel fired) ;
- k) device to hold the removable rotary racks.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 1673:2002](https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f71/sist-en-1673-2002)

<https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f71/sist-en-1673-2002>



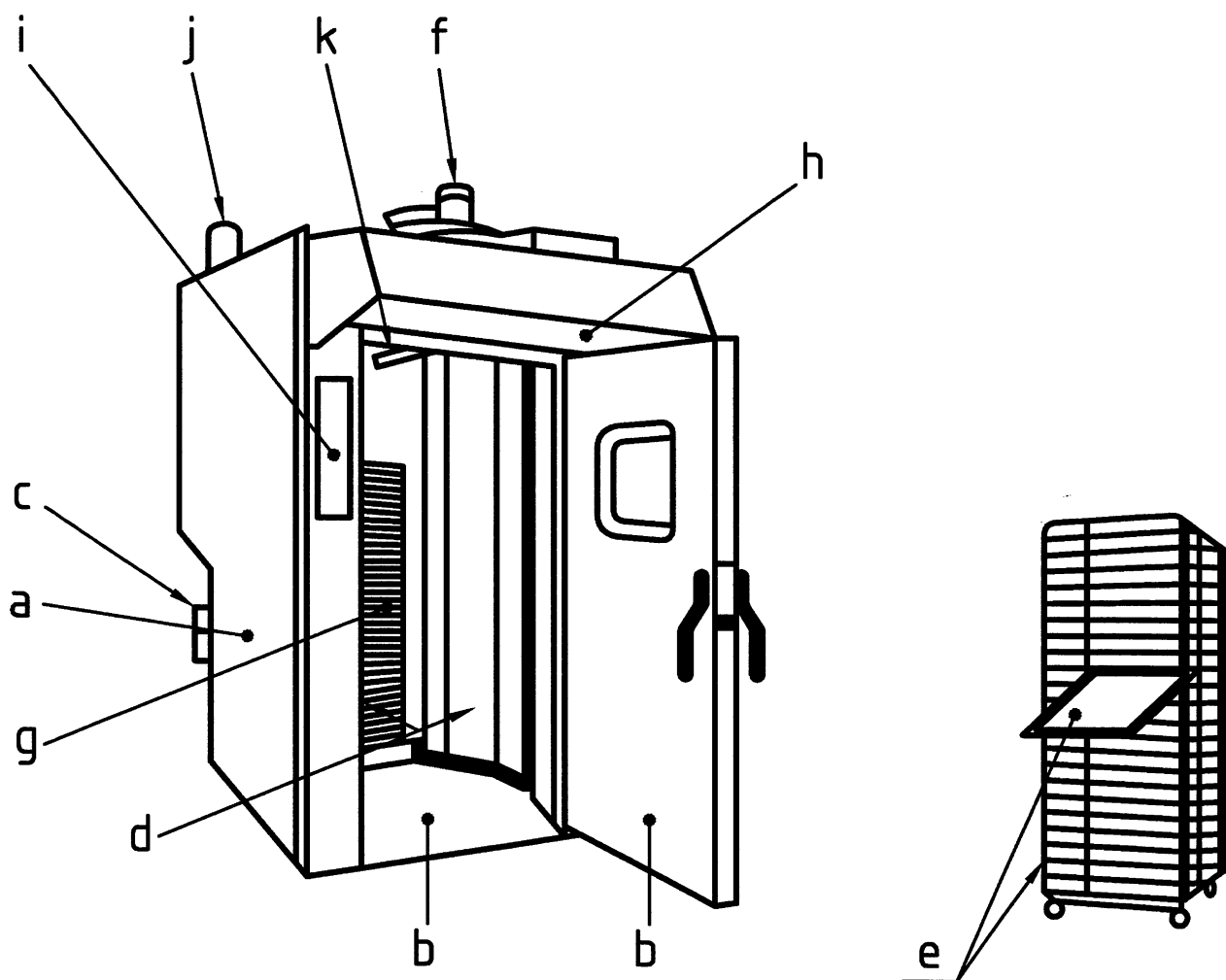


Figure 1 : Parts of a rotary rack oven

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

<https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f71/sist-en-1673-2002>

#### 4 List of hazards

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

##### 4.1 Mechanical hazards

The significant mechanical hazards are :

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

The example in figure 2 shows the danger zones :

Zone 1 : rotation of the rack inside the oven  
hazards of shearing, trapping, impact ;

Zone 2 : drive mechanism  
hazards of shearing, trapping ;

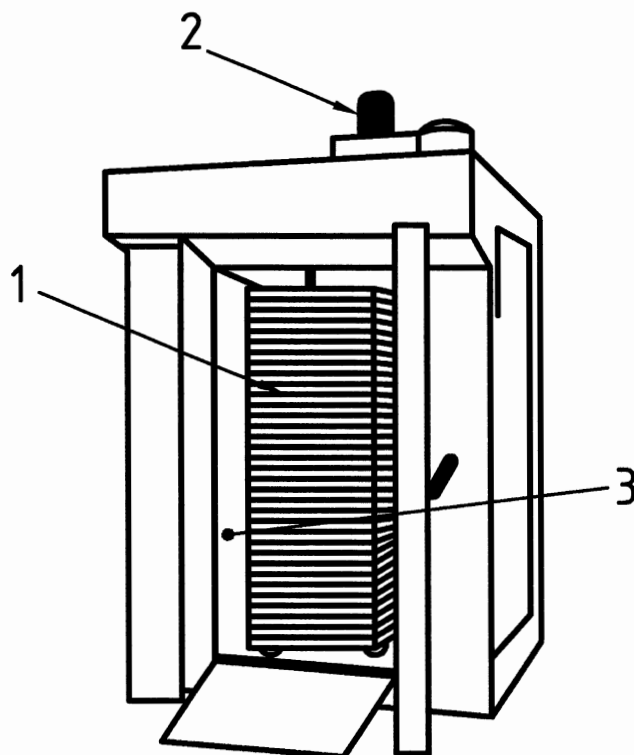
Zone 3 : space between the rack and the door frame  
hazards of shearing, trapping, impact ;

All zones : sharp corners and edges on touchable parts hazards of cutting.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 1673:2002](https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f71/sist-en-1673-2002)

<https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f71/sist-en-1673-2002>



**Figure 2 : Danger zones of a rotary rack oven**

There is also a hazard relating to loss of stability of the trays and of the rack during rotation and on entering the baking chamber.

#### **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 Thermal hazards**

**4.3.1** Escape of steam from the baking chamber on opening the door creates a hazard of burns.

(standards.iteh.ai)

**4.3.2** High temperature of external parts and hand operated components creates a hazard of burns.

[SIST EN 1673:2002](https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68b71/sist-en-1673-2002)

<https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68b71/sist-en-1673-2002>

#### **4.4 Explosion and fire hazards**

**4.4.1** Overpressure of steam inside the baking chamber creates a hazard of explosion.

**4.4.2.1** The use in the oven of combustible substances (for example sugar) can create a hazard of fire.

**4.4.2.2** Improper operation of control and adjustment components of the combustion equipment can create a hazard of overheating of the oven and of fire.

#### **4.5 Hazard from being trapped inside**

Hazard of burns and suffocation.

#### **4.6 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.

#### **4.7 Hazards generated by neglecting ergonomic principles**

During loading and unloading racks, cleaning and maintenance, there is a risk of injury or chronic damage to the body resulting from awkward body postures, heavy lifting, pushing and pulling.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 1673:2002](https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f71/sist-en-1673-2002)

<https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-fe363c68f71/sist-en-1673-2002>

## 5 Safety and hygiene requirements and/or measures

### 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.

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

#### 5.1.1 Zone 1 : Rotation of the rack inside the oven

If the force required to stop the rotating rack is greater than or equal to 150 N, access to the baking chamber, while the rack is rotating, shall be prevented by an interlocking door (e.g. using a rotary cam operated switch). Opening the door shall cause the rack to stop within 3 s. Any operation which requires the rack to rotate under power, with the door open, shall be controlled by a hold-to-run control.

#### 5.1.2 Zone 2 : Drive mechanism

If the sum of distances from the floor to danger point is less than 2,5 m, access to the external transmission shall be prevented by fixed guards in accordance with EN 953 : 1997.

#### 5.1.3 Zone 3 : Space between the rack and the door frame

Means shall be provided to prevent hand injury when moving the rack in and out of the oven.

Since the movement is manual and controlled by the operator, this may be achieved by providing a clearance of 50 mm between the rack and the sides of the door frame.

#### 5.1.4 All zones - External surfaces and edges

External rough surfaces and sharp edges on the oven shall be at least in accordance with 3.1 in EN 292-2:1991.

## iTeh STANDARD PREVIEW

### 5.1.5 Loss of stability (standards.iteh.ai)

#### 5.1.5.1 Stability of the rack during the rotation

<https://standards.iteh.ai/catalog/standards/sist/10e59321-bb5b-4fc9-8481-856560b17481/en-1673-2002>  
To prevent overturning of the rack during rotation and engagement/disengagement of the drive, one of the solutions shown as examples in figure 3 may be adopted. Other technical solutions giving the same level of safety level are also permitted.

In figure 3 b), the rack is manually pushed onto the rotation system lifting hook and then lifted off the ground. The rack shall remain stable during rotation on the oven floor. This may be achieved by a coupling at its axis of rotation or by other means.