SLOVENSKI STANDARD
oSIST prEN 1673:2019

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Stroji za predelavo hrane - Peči z vrtljivim vozičkom - Varnostne in higienske zahteve

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

Nahrungsmittelmaschinen - Stikken-Backöfen - Sicherheits- und Hygieneanforderungen

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

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67.260	Tovarne in oprema za živilsko industrijo	Plants and equipment for the food industry
97.040.20	Štedilniki, delovni pulti, pečice in podobni aparati	Cooking ranges, working tables, ovens and similar appliances

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English Version

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

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

Nahrungsmittelmaschinen - Stikken-Backöfen - Sicherheits- und Hygieneanforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 153.

If this draft becomes a European Standard, 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.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (prEN 1673:2019) 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.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1673:2000+A1:2009.

The significant changes with respect to the previous version EN 1673:2000+A1:2009 of edition EN 1673:2000 are listed below:

— upgraded list of significant hazards and danger zones removed in a new informative Annex E;

— safety requirements was revised with regard to the new list of significant hazards (steam emission, hot surfaces, etc.);

— new clause regarding environmental aspects;

— Annex ZA was revised to be in line with European Commission recommendation.

Introduction

This European standard is a type C standard as stated in EN ISO 12100:2010.

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.

1 Scope

This document specifies safety and hygiene requirements for the design and manufacture of rotary rack ovens which can be used with one or more mobile racks.

These ovens are intended for professional use in the food industry and workshops (bakeries, pastry-making, etc.) for the batch baking of foodstuffs containing flour, water and other ingredients and/or additives. This document applies to ovens used only for food products except for those containing volatile flammable ingredients (volatile organic compound, e.g. alcohol, oil, …). This document applies to ovens where the steam is generated by an evaporation process of potable water on hot surfaces.

The following machines are excluded:

— experimental and testing machines under development by the manufacturer;

— machines for non-professional uses.

This document covers the technical safety requirements for the transport, installation, operation, cleaning and maintenance of these machines (see EN ISO 12100:2010, Clause 6).

This document deals with all significant hazards, hazardous situations and events relevant to rotary rack ovens, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see informative Annex E).

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

The following hazards are not covered by this document:

— hazards from the use of gaseous fuel by gas appliances;

— hazards arising from electromagnetic compatibility issues;

— hazards from the use of trays made of or coated by silicone.

This document is not applicable to rotary rack ovens which were manufactured before the date of its publication as an EN standard.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 203-2-2:2006, *Gas heated catering equipment — Part 2-2: Specific requirements — Ovens*

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

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 60204:2005, modified)*

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

EN 60529:1991/A1:2000, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989/A1:1999)*

EN 60529:1991/A2:2013, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989/A2:2013)*

EN ISO 3743-1:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for small, movable sources in reverberant fields — Part 1: Comparison method for a hard-walled test room (ISO 3743-1:2010)*

EN ISO 3744:2010, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane (ISO 3744:2010)*

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

EN ISO 4287:1998/A1:2009, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters (ISO 4287:1997+Amd 1:2009)*

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

EN ISO 11201:2010, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

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 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13732-1:2008, *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces — Part 1: Hot surfaces (ISO 13732-1:2006)*

EN ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2015)*

EN ISO 13849-2:2012, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation (ISO 13849-2:2012)*

EN ISO 13857-1:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

EN ISO 14119:2013, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection (ISO 14119:2013)*

EN ISO 14120:2015, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards (ISO 14120:2015)*

3 Terms, definitions and classification

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO online browsing platform: available at http://www.iso.org/obp

3.1.1
overpressure
positive difference between the pressure in the baking chamber and the pressure in the room where the oven operates

3.1.2
steam generator
system which generates steam through the evaporation process of potable water on hot surfaces

3.1.3
baking chamber
space where the baking process is carried out (including the frame of the access door) and all spaces reachable by the operator from there

3.1.4
restart
starting after a stoppage:

a) during a baking cycle execution;

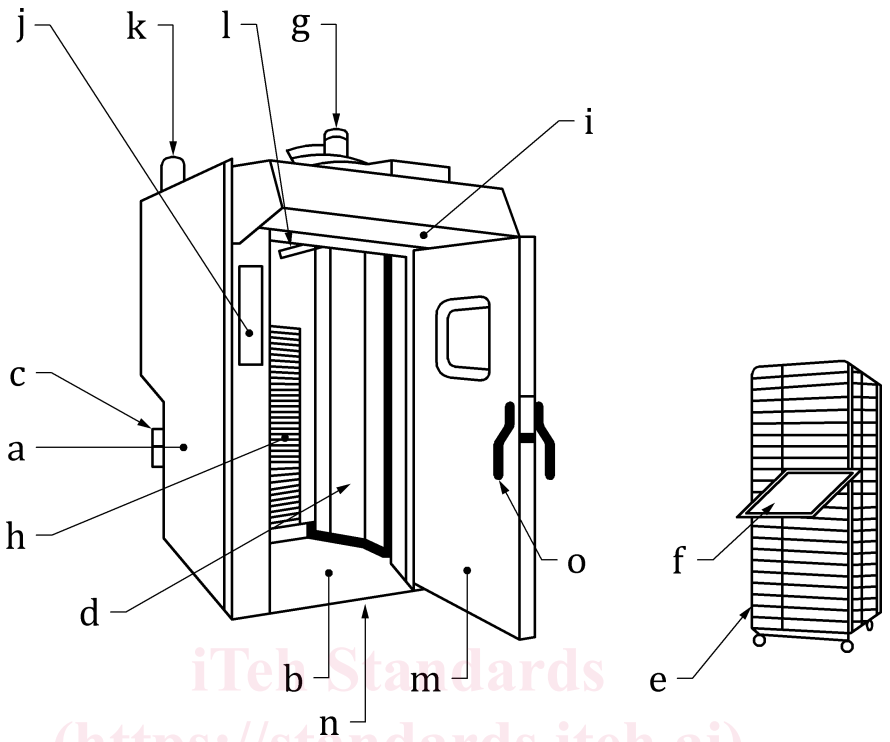
b) between two baking cycles without changing anything in the baking process;

c) after the end of the baking cycle only for maintaining the temperature level in the baking chamber

3.1.5
start
every start other than the ones defined in 3.1.4

3.2 Description

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



Key

a	container built with insulated panels
b	baking chamber
c	heat production unit
d	hot air circulation system
e	rack
f	trays
NOTE	Rack and trays are either provided by manufacturer or user
g	drive unit for rack rotation
h	steam generator
i	steam extractor
j	control panel
k	miscellaneous devices (e.g. combustion product flue where gas or fuel fired) (optional)
l	device to hold and/or rotate the removable rotary racks
m	access door
n	loading area
o	internal handle

Figure 1 —Example of parts of a rotary rack oven

4 List of significant hazards

The list of significant hazards is given in the informative Annex E.

5 Safety and hygiene requirements and/or protective measures

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 12100:2010 for relevant but not significant hazards, which are not dealt with by this document.

For hazards which are to be reduced by the application of the type-B-standards such as EN ISO 13857:2008, EN 614-1:2006+A1:2009, EN ISO 14120:2015, EN ISO 13849-1:2015, EN ISO 14119:2013, EN 60204-1:2006, EN 60529:1991, EN 60529:1991/A1:2000, EN 60529:1991/A2:2013, and EN ISO 12100:2010, the manufacturer shall carry out a risk assessment to establish the requirements of the type B-standard. This specific risk assessment shall be part of the general risk assessment of the machine.

Interlocking guards shall be at least interlocking without guard locking as defined in EN ISO 14119:2013.

The safety-related devices and their interface with the control systems shall meet at least a performance level c defined in accordance with EN ISO 13849-1:2015, unless it is differently specified in this document.

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.

In general, no emergency stop is required, unless the result of the risk assessment carried out by the manufacturer comes to the conclusion that such a device reduces the risk of injury.

5.2 Mechanical hazards

5.2.1 Zone 1: Drive mechanism

If the sum of distances from the floor to danger point is less than 2,5 m, access to the transmission parts outside of the baking chamber shall be prevented by fixed guards in accordance with EN ISO 14120:2015 and EN ISO 13849-1:2015.

5.2.2 Zone 2: Movement of the rack inside the oven

Where reference is made to interlocking devices throughout Clause 5, they shall comply with EN ISO 14119:2013.

If the force required to stop the rotating rack is greater than or equal to 150 N (for the measurement method, see normative Annex C) or the energy required to stop the rotating rack is greater than or equal to 10 J (for the calculation of the kinetic energy, see normative Annex D), access to the baking chamber, while the rack is rotating, shall be prevented by an interlocked door.

Opening the interlocked door shall control the stop of the rack when the opening clearance is not greater than 20 mm.

The stopping time of the device for providing the movement of the rack shall be less than or equal to 1 s, when the protective device is actuated.

Any operation which requires the rack to rotate under power, with the door open, shall be controlled by a hold-to-run control.

The ventilator shall be protected exclusively by fixed guards according to EN ISO 13849-1:2015, Table 2 and/or Table 3 and/or Table 4. For automatic lifting unit, the lifting and unlifting movement shall be

stopped when the door is open. Access to the automatic lifting system shall be prevented by an interlocked door. Opening the interlocked door shall control the stop of the lifting and unlifting movement when the opening clearance is not greater than 20 mm.

The stopping time of the device for providing the lifting and unlifting movement of the rack shall be less than or equal to 1 s when the protective device is actuated.

Restarting shall only be possible by actuating the starting or, if existing, restarting control (see 5.7).

5.2.3 Zone 2: Space between the rack and the door frame

To prevent hand injury when introducing and extracting the rack in/from the oven, the width of the clearance when the door is completely open shall be at least 100 mm larger than the width of the largest rack indicated in the instruction manual.

5.2.4 Zone 4: Area in the front of the door of the baking chamber

To prevent the unintended opening of the door of the baking chamber due to overpressure inside the baking chamber, the manufacturer shall provide a permanent exhaust duct shall be installed, eventually equipped with a flap, which limits the overpressure. The pushing force against the door of the baking chamber generated by the overpressure shall not exceed 500 N.

The manufacturer shall provide instructions about the method and the frequency for exhaust duct inspection and maintenance.

5.2.5 Loss of stability

5.2.5.1 Stability of the rack during the rotation

To prevent overturning of the rack during rotation and engagement/disengagement of the drive, one of the solutions shown as examples in Figure 2 may be adopted. Other technical solutions giving the same level of safety level are also permitted.

In Figure 2b), 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.

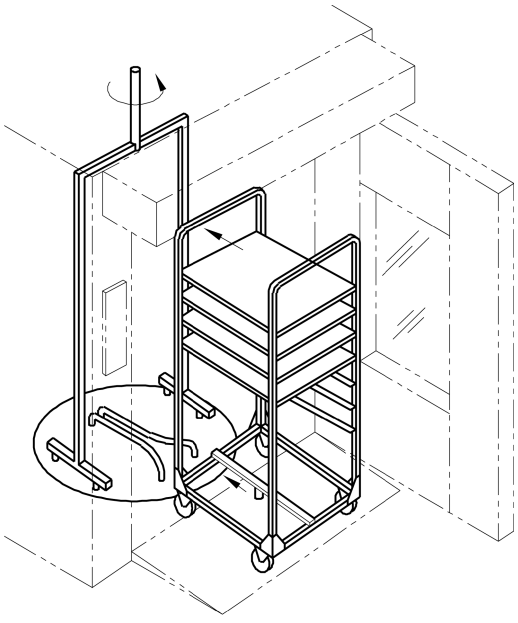


Figure 2a) — Rotating platform with ramp

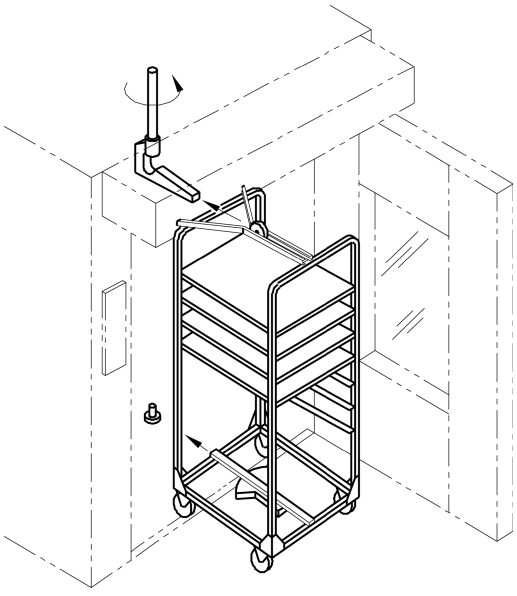


Figure 2b) — Rotating system lift hook

The rack is manually pushed onto the rotating platform.

The rack is manually engaged and lifted onto the rotating system.

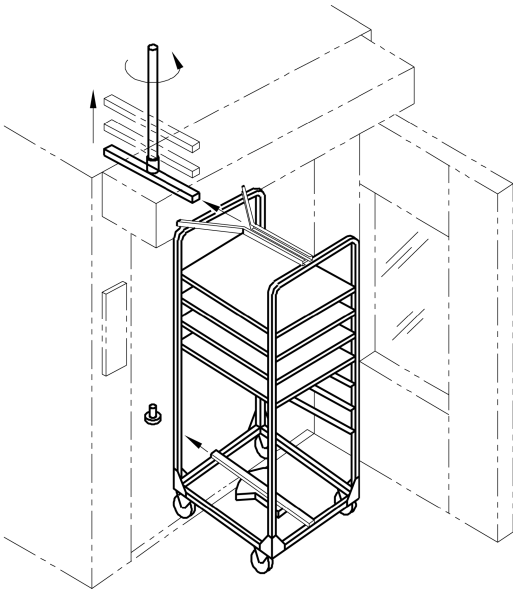


Figure 2c) — Automatic lifting unit

Figure 2 — Examples of rotary rack coupling systems

5.2.5.2 Stability of the rack entering the baking chamber

To prevent the rack overturning on entering the oven a ramp or other suitable device shall be provided if the difference in level exceeds 10 mm. The ramp shall be designed in such a way that the inclination of the rack does not exceed 7° while entering or leaving the oven with respect to the horizontal plane in any condition. However, the angle of the ramp with respect to the horizontal plane shall not exceed 10°.

5.2.5.3 Stability of the rack

The empty rack (without trays) shall not overturn when it is tilted by 7° with respect to the horizontal plane in the most unfavourable position and with wheels positioned as shown in Figure 3.