SLOVENSKI STANDARD
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Oprema za komercialne kuhinje - Sestavni deli za prezračevanje v komercialnih kuhinjah - 3. del: Prezračevanje kuhinjskih stropov - Projektiranje in varnostne zahteve

Equipment for commercial kitchens - Components for ventilation in commercial kitchens - Part 3: Kitchen ventilation ceilings - Design and safety requirements

Großküchengeräte - Einrichtungen zur Be- und Entlüftung von gewerblichen Küchen - Teil 3: Küchenlüftungsdecken

Equipement pour cuisines professionnelles - Eléments de ventilation pour cuisines professionnelles - Partie 3: Plafonds ventilés de cuisine - Conception et exigences de sécurité

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Equipment for commercial kitchens - Components for ventilation in commercial kitchens - Part 3: Kitchen ventilation ceilings - Design and safety requirements

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 156.

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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (prEN 16282-3:2011) has been prepared by Technical Committee CEN/TC 156 “Ventilation for buildings”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

The activities of CEN/TC 156, WG 14, cover the calculation of the air volume and the design and testing of major components of ventilation equipment for commercial kitchens.

The structure of the standard series is as follows:

prEN 16282 *Equipment for commercial kitchens – Components for ventilation in commercial kitchens*

— ***Part 1: General requirements including calculation method***

— ***Part 2: Kitchen ventilation hoods; Design and safety requirements***

— ***Part 4: Air inlets and outlets; Design and safety requirements***

— ***Part 5: Air duct; Design and dimensioning***

— ***Part 6: Aerosol separators; Design and safety requirements***

— ***Part 7: Installation and use of fixed fire suppression systems***

— ***Part 8: Installation for treatment of cooking fumes; Requirements and testing***

— ***Part 9: Ventilation of buildings – capture and containment performance of extraction systems for commercial kitchen – test methods***

1 Scope

This standard applies to kitchen ventilation ceilings (hereinafter called "ceilings") in kitchens and other companiesthe processing foodstuffs intended for commercial use from their nature and finish. It does not apply to household kitchens.

This standard stipulates the requirements covering the construction and operation, including the technical safety, ergonomic and hygienic features and their testing.

Unless otherwise specified, the requirements of this standard will be checked by way of inspection and/or measurement.

Additional or alternative national regulations on installation, appliance requirements and inspection, maintenance, operation have to be complied with.

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.

prEN 16282-1, *Equipment for commercial kitchens – Components for ventilation in commercial kitchens – Part 1: General requirements including calculation method*

prEN 16282-2, *Equipment for commercial kitchens – Components for ventilation in commercial kitchens – Part 2: Kitchen ventilation hoods; Design and safety requirements*

prEN 16282-4, *Equipment for commercial kitchens – Components for ventilation in commercial kitchens – Part 4: Air inlets and outlets; Design and safety requirements*

prEN 16282-5, *Equipment for commercial kitchens – Components for ventilation in commercial kitchens – Part 5: Air duct; Design and safety requirements*

prEN 16282-6, *Equipment for commercial kitchens – Components for ventilation in commercial kitchens – Part 6: Aerosol separators; Design and safety requirements*

prEN 16282-7, *Equipment for commercial kitchens – Components for ventilation in commercial kitchens – Part 7: Installation and use of fixed fire suppression systems*

prEN 16282-8, *Equipment for commercial kitchens – Components for ventilation in commercial kitchens – Part 8: Installation for treatment of cooking fumes; Requirements and tests*

prEN 16282-9, Ventilation of buildings – capture and containment performance of extraction systems for commercial kitchen – test methods

EN 573-3, *Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition.*

EN 1825-2, *Grease separators - Part 2: Selection of nominal size, installation, operation and maintenance*

EN 10088-1, *Stainless steels - Part 1: List of stainless steels*

EN 12464-1, *Light and lighting - Lighting of work places - Part 1: Indoor work places*

EN 12665, *Light and lighting - Basic terms and criteria for specifiying lighting requirements*

Standards of the series
EN 50164, *Lightning Protection Components (LPC).*

EN 50274, *Low-voltage switchgear and controlgear assemblies - Protection against electric shock - Protection against unintentional direct contact with hazardous live parts*

EN 60204-1, *Electrical equipment of machines - Part 1: General requirements*

EN 60529, *Degrees of protection provided by enclosures (IP code)*

EN ISO 3274, *Geometrical Product Specifications (GPS) - Surface texture: Profile method - Nominal characteristics of contact (stylus) instruments*

EN ISO 4287, *Geometrical product specification (GPS) - Surface texture: Profile method - Terms, definitions and surface texture parameters*

EN ISO 4288, *Geometrical Product Specifications (GPS) - Surface texture: Profile method - Rules and procedures for the assessment of surface texture*

EN ISO 13565-1, *Geometrical Product Specifications (GPS) - Surface texture: Profile method - Surfaces having stratified functional properties - Part 1: Filtering and general measurement conditions*

EN ISO 13565-2, *Geometric product specifications (GPS) – Surface texture: profile method - surfaces having stratified functional properties - Part 2: Height characterisation using the linear material ratio curve*

HD 22, *Rubber insulated cables of rated voltages up to and including 450/750 V*

Regulation 1935/2004/EC, *Materials and articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC*

3 Terms and definitions

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

3.1
kitchen ventilation ceiling
ventilation system that covers either the entire ceiling or only the active cooking area of a kitchen. This element incorporates the air inlets, exhaust air outlets (including grease filters), and light fittings. It can be equipped with integrated hoods in accordance with prEN 16282-2.

3.2
kitchen
rooms and parts of a building in which food is stored, meals are prepared, given out and distributed as well as where crockery and appliances are being cleaned

3.3
show kitchen area
part of a room in which food is stored, meals are prepared, given out and distributed as well as where crockery and appliances are being cleaned

3.4
air inlets and outlets

3.4.1
air inlet
terminal element of a ventilation system in commercial kitchens for controlled supplytreated air, through the opening

3.4.2
air outlet
ceiling installation element without aerosol separation function for flush installation with added air collection box and air duct connecting branches or for direct installation into existing exhaust air ducts. With easy-to-operate regulation device. With easy-to-remove front panel for regular cleaning

3.5
ceiling panel
fixed or removable elements of a ceiling installed horizontally, vertically or at any angle on a sub-construction

3.6
aerosolate (cooking fumes)
separated aerosol (in this standard, the separated grease/oil/water mixture)

3.7
aerosolate collection channel system
channel system to take parts separated from the exhaust air and for controlled removal of liquid components and of cleaning fluid

3.8
removal device
device used to remove aerosolate and cleaning fluid at the lowest point of the channel system. Drain cocks, stoppers, drawers (pots) or water-removal lines connected firmly with the channel system can be used

3.9
separator
device in accordance with 3.8.1 to 3.8.2 for separation of air-borne solid or liquid particles

3.9.1
aerosol separator
device for efficient separation of air-borne solid or liquid particles. It is based on the effect of forces (mechanical forces or electric field forces), which lead to a deflection of the particles from the flow path

3.9.2
filter
specific design of storage separators comprising an ordered and/or unordered structure of a number of individual fibres/wires (e.g. fabric filters) or porous surfaces/bodies (e.g. activated carbon)

3.10
function gap
aerosol separator in the ceiling, frequently as a longitudinal section

3.11
baffle plates
plate used to compensate air volume flows of the individual aerosol separators and the defined arrangement of aerosol separators (focal points of suction removal)

3.12
supply air field
area in ceilings for insertion of supply air

3.13
exhaust air field
area in ceilings for collection of exhaust air

3.14
air chamber
enclosed area with positiv pressure for distribution of supply air or negative pressure for collection of exhaust air

3.15
ceiling pressure room
air chamber formed by the ceiling of the building, upper parts of the limiting walls or vertical bulkheads and ceiling panels or air in-/outlet areas

3.16
air housing
enclosed air chamber formed by horizontal bulkheads, vertical bulkheads and ceiling panels or air in-/outlet areas

3.17
plenum chamber
enclosed component for supply and exhaust air – integrated into the ceiling – with positiv pressure for distribution of supply air or negative pressure for collection of exhaust air

3.18
exhaust air connector
connection element of the air chamber or the plenum chamber to the exhaust air line in closed ceiling system of the ceiling (see 3.21)

3.19
open ceiling system
ceiling system in which the supply and/or exhaust air is guided – totally or partly – via a ceiling pressure room.

3.20
closed ceiling system
ceiling system in which the supply and/or exhaust air is guided via an air housing or a plenum chamber

3.21
area ventilation
ceiling system in which supply and/or exhaust air fields are used

3.22
points of exhaust
concentrated exhaust outlet in ceilings used above catering equipment with significant emissions

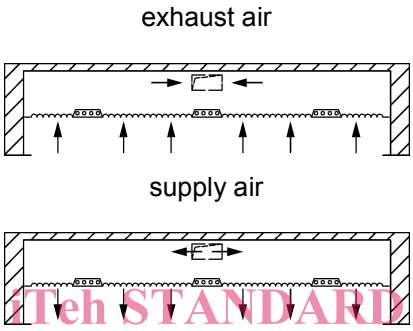
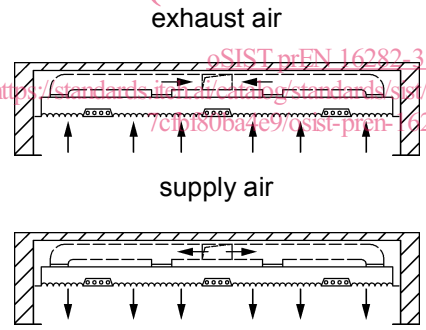
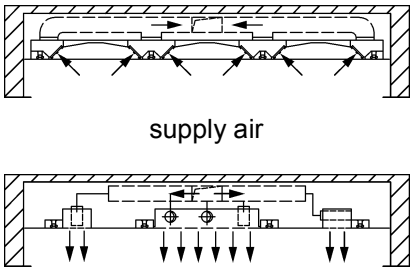
3.23
exhaust air connection
connection between the air housing and the ducts

4 Designs of ceilings

Ceiling designs and their classification are shown in Table 1:

The following text shows example of current ceiling configuration and design criteria, but manufacturers are free to use alternative designs and configuration, provided, that the product/equipment comply with the essential requirements of the relevant directives and/or national regulations.

Table 1 — Examples for different ceiling design

Design	Schematic portrayal	Standard designation		
		Designations	EN number	Classification
Open ceiling system with ceiling pressure room		Kitchen ventilation ceiling	EN 18869	-C1
Closed ceiling system with air housing		Kitchen ventilation ceiling	EN 18869	-C2
Closed ceiling system with plenum chamber		Kitchen ventilation ceiling	EN 18869	-C3

EXAMPLE The designation of a kitchen ventilation ceiling on the supply air side in open ceiling system with ceiling pressure room (supply air C1), on the exhaust air side with closed ceiling system with plenum chamber (exhaust air C3):

Kitchen ventilation ceiling EN XXX - supply air C1 – exhaust air C3

5 Construction and function

5.1 General remarks

Aerosol-loaded exhaust air from kitchens such as cooking areas, rooms for portioning out, meal distribution areas, meal serving areas (also in the dining hall), crockery and washing-up rooms has to be treated prior to entering the air duct using effective aerosol separation equipment.

In commercial kitchens, hoods in accordance with prEN 16282-2 or ceilings in accordance with DIN EN XXX-3 are to be used for ventilation.

Ceilings shall be arranged over the entire area of the rooms in question. At leastshow kitchen areas shall be covered by the ventilated ceiling. For ceilings materials shall be used according to Table 2.

It is recommended, that a secure sensor port which can be easily accessed once installed should be provided to measurethe differential pressure in the outgoing air area. The default dimension for this port is either an external diameter of 4 mm or a round sensor aperture with a diameter of 12 mm.

5.2 Features of ceiling components

The flow openings for the exhaust air in the ceiling pressure room are preferably to be arranged horizontally.

Bulkheads shall masmooth-surfaced, pressure-stable, air-tight and also tight against aerosolate for the exhaust air area.

Supply air housings/plenum chambers and exhaust air housings/plenum chambers shall be provided with volume flow setting devices on the connections for even distribution/correct collection of exhaust air.

5.3 Air supply (into the kitchen)

Supply air fields have to be equipped with removable air inlets for cleaning and access to duct work.

Air flow adjustment devices have to be provided and shall be accessible after removing air inlets.

The supply air from the ceiling shall be inserted with low induction. Supply air inlets shall be arranged in such a way that undisturbed collection of the rising thermal flow is ensured. Disturbance of the thermal flow by supply air shall be avoided prEN 16282-1 has to be fulfilled.

Supply air fields can be arranged within the ceiling or separately.

Air supply fields shall not be located above thermal cooking equipment taking into account the overhang according to figure 1.

Air velocities at the face of a bellmouth shall not exceed 3 m/s.

An air supply area is limited by a collateral minimum distance of 1.5 m from the thermal appliances.