SLOVENSKI STANDARD

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Ploskovni sistemi za ogrevanje in hlajenje z vodo - 1. del: Definicije in simboli

Water based surface embedded heating and cooling systems - Part 1: Definitions and symbols

Raumflächenintegrierte Heiz- und Kühlsysteme mit Wasserdurchströmung - Teil 1: Definitionen und Symbole

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Systèmes de chauffage et rafraîchissement hydrauliques intégrés - Partie 1: Définitions et symboles

Ta slovenski standard je istoveten z: **EN 1264-1:2011**

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01.075	Simboli za znake	Character symbols
91.140.10	Sistemi centralnega ogrevanja	Central heating systems

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EUROPEAN STANDARD

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Supersedes EN 1264-1:1997

English Version

Water based surface embedded heating and cooling systems - Part 1: Definitions and symbols

Systèmes de surfaces chauffantes et rafraîchissantes hydrauliques encastrées - Partie 1: Définitions et symboles

Raumflächenintegrierte Heiz- und Kühlsysteme mit Wasserdurchströmung - Teil 1: Definitionen und Symbole

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

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Foreword

This document (EN 1264-1:2011) has been prepared by Technical Committee CEN/TC 130 "Space heating appliances without integral heat sources", the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

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 supersedes EN 1264-1:1997.

The series of European Standards EN 1264 "*Water based surface embedded heating and cooling systems*" consists of the following parts:

— Part 1: Definitions and symbols;

— Part 2: Floor heating: Prove methods for the determination of the thermal output using calculation and test methods;

— Part 3: Dimensioning;

— Part 4: Installation;

— Part 5: Heating and cooling surfaces embedded in floors, ceilings and walls — Determination of the thermal output.

The main change with respect to EN 1264-1:1997 consists in the expansion of the scope over floor heating, now additionally includes ceiling and wall heating as well as cooling surfaces in floors, ceilings and walls.

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, Croatia, 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 the United Kingdom.

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1 Scope

This European Standard is applicable to water based surface embedded heating and cooling systems in residential, office and other buildings, the use of which corresponds to or is similar to that of residential buildings.

This European Standard applies to heating and cooling systems embedded into the enclosure surfaces of the room to be heated or to be cooled.

It also applies as appropriate to the use of other heating media instead of water.

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 1264-3:2009, *Water based surface embedded heating and cooling systems — Part 3: Dimensioning*

3 Terms and Definitions

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

3.1 Surface embedded heating and cooling system

3.1.1
surface embedded heating and cooling system

heating or cooling installation embedded into the enclosure surfaces of the room consisting of circuits of pipes, circuit distributors, and control equipment

3.1.2
floor, wall, ceiling heating and cooling system
system where pipes carrying water with or without additives as a heating or cooling medium are laid in the floor, wall or ceiling

3.1.3
circuit
section of pipes connected to circuit distributor which can be independently switched and controlled

3.1.4
circuit distributor
common connection point for several circuits

3.1.5
system components
- insulating layer for thermal and footstep noise insulation,

- protection layer (to protect the insulating layer),

- heating/cooling pipes or plane sections,

- floor covering,

- heat diffusion devices, peripheral strips, attachment items etc.,

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- weight bearing layer consisting of screed or timber, for type B systems,

- weight bearing and thermal diffusion layer consisting of screed, for type A, type C and type D systems,

NOTE   The components may be different depending on the system

3.1.6
types of heating/cooling structures

3.1.6.1
systems with pipes inside the screed type A and type C
systems with heating/cooling pipes completely embedded in the screed

NOTE   See Figure A.1 and A.3.

3.1.6.2
systems with pipes below the screed type B
systems with heating/cooling pipes laid with diffusion plates in the thermal insulating layer below the screed

NOTE   See Figure A.2.

3.1.6.3
systems with surface elements (plane sections) type D
system plates with hollow sections acting as water channels

NOTE   See Figure A.4.

3.1.7
system Insulation
insulation with the thermal resistance $R_{\lambda,ins}$ according to EN 1264-4:2009, Table 1 to limit the heat loss of heating and cooling systems

NOTE   In the case of floor heating and cooling systems, as a rule the thermal resistance $R_{\lambda,ins}$ is provided by the insulation layers which are integral parts of the system; on this topic, national rules shall be consulted. In the case of wall and ceiling heating and cooling systems, the thermal resistance $R_{\lambda,ins}$ may be determined taking into account the effective thermal resistance of the building structure.

3.1.8
interior walls
partitions of rooms within dwellings or similar used room groups

NOTE   Wall heating and cooling systems embedded in interior walls, are constructed with or without insulation, depending on their use.

3.2   Supplementary heating equipment

Additional heating facility, e. g. convectors, radiators with the additional required thermal output and possibly with its own control equipment

3.3   Parameters of design

3.3.1
standard heat load in a floor heated room
$Q_{N,f}$
rate of heat loss from the building to the outside and to neighbouring rooms under standardized conditions, depending on the regional climatic data, the location, its use and the thermal properties of the building

NOTE   When calculating the standard heat load, the thermal output from the embedded heating systems in the neighbouring room is not taken into account.

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3.3.2
standard cooling load
$Q_{C,f}$
rate of heat input into the building from the external environment and neighbouring rooms under standardized conditions and depending on the regional climatic data, location, its use and thermal properties of the building

3.3.3
additional thermal output
Q_{out}
thermal output of supplementary heating equipment

NOTE $Q_{out} = Q_{N,f} - Q_F$

3.3.4
heating/cooling surface
A_F
area of surface covered by the heating or cooling system, including a perimeter strip whose width should be half of one spacing, but not exceeding 0,150 m

3.3.5
furniture area
area of the floor surface not covered by a heating or cooling system, intended for permanent placement of furnishings forming part of the building

3.3.6
peripheral area
A_R
floor surface heated to a higher temperature and generally an area of 1,0 m maximum in width along exterior walls.

NOTE It is not an occupied area.

3.3.7
occupied area
A_A
area within the heated or cooled floor surface occupied for long periods

NOTE In case of floor heating, it consists of the heating floor surface less the peripheral area.

3.3.8
standard indoor room temperature
ϑ_i
resultant indoor temperature defined as the average of the dry air temperature and the mean radiant temperature

NOTE The resultant temperature is considered as the relevant for thermal comfort assessment and heat loss calculations. This value of internal temperature is used for the calculation method [1], [2].

3.3.9
regional dew point
$\vartheta_{Dp,R}$
dew point specified depending on the climatic conditions of the region

3.3.10
design dew point
$\vartheta_{Dp,des}$
dew point determined for the design

3.4 Thermal output

3.4.1
specific thermal output of floor heating systems
q
thermal output of floor heating systems divided by the surface area

3.4.2
specific thermal output of embedded heating systems
q_H
thermal output of embedded heating systems divided by the surface area

NOTE   For floor heating, index H is not used.

3.4.3
specific thermal output of embedded cooling systems
q_C
thermal output of embedded cooling systems divided by the surface area

3.4.4
limit of specific thermal output of floor heating systems
q_G
specific thermal output at which the permissible maximum floor surface temperature is achieved

NOTE   In the case of floor heating, this means the maximum value of surface temperature $\vartheta_{F,max}$ within the range of temperature distribution.

3.4.5
maximum limit of specific thermal output of floor heating systems
$q_{G,max}$
limit of specific thermal output of floor heating systems, calculated in accordance with the Basic Characteristic Curve due to maximum floor surface temperature $\vartheta_{F,max}$ together with isothermal surface temperature distribution

3.4.6
standard thermal output of floor heating systems
q_N
limit of specific thermal output of floor heating systems achieved without floor covering

3.4.7
standard specific thermal output of embedded heating systems
$q_{H,N}$
specific thermal output of embedded heating systems achieved with standard temperature difference between heating medium and room

NOTE   For heating systems (other then floor heating), $\Delta\vartheta_{H,N} = 10$ K is valid.

3.4.8
standard specific thermal output of embedded cooling systems
$q_{C,N}$
specific thermal output of embedded cooling systems achieved with standard temperature difference between room and cooling medium

NOTE   For cooling systems, $\Delta\vartheta_{C,N} = 8$ K is valid.

3.4.9
design value of specific thermal output of floor heating systems
q_{des}
amount due to the room, calculated with the standard heat load, divided by the heating floor surface area

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3.4.10
maximum value of specific thermal output

q_{max}
highest design value q_{des} within q_G of specific thermal output in circuits operated at the same design flow temperature

3.4.11
downward specific heat loss of floor heating systems

q_u
specific thermal output throughout the floor construction, to rooms beyond, the ground or cold void

3.4.12
design thermal output of floor heating systems

Q_F
sum of thermal output based on output of each area in relation to the total room floor area

3.4.13
design value of specific cooling load

$q_{C,Ld,des}$
standard cooling load divided by the cooling surface

3.4.14
design specific thermal output of cooling systems

$q_{C,des}$
value of specific thermal output achieved with design value of average temperature difference between room and cooling medium

3.5   Surface temperatures

3.5.1
maximum floor surface temperature

$\vartheta_{F,max}$
maximum temperature permissible for physiological reasons, for calculation of the limit curves, which may occur at a point on the floor in the occupied or peripheral area

NOTE $\vartheta_{F,max}$ limits the thermal output. In this case the highest point surface temperature on the floor need to be taken.

3.5.2
average surface temperature

$\vartheta_{F,m}$
average temperature value for each heated surface area, such as occupied or peripheral heated floors

NOTE   With the exception of floor heating, the limit of thermal output is identified by maximum value (heating systems) or minimum value (cooling systems) of $\vartheta_{F,m}$.

3.5.3
average temperature difference between surface and room
difference $\vartheta_{F,m}$ - ϑ_i between the average temperature of the heating or cooling surface and the standard indoor room temperature

NOTE   This determines the specific thermal output for heating and cooling.

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3.6 Temperatures of the heating/cooling medium

NOTE   In this standard series, the denotations medium and water are used as synonym.

3.6.1
temperature difference between heating medium and room
$\Delta\vartheta_H$
average difference between the temperatures of the heating medium and the standard indoor room temperature determined in a logarithmic equation

NOTE   See EN 1264-2:2008, equation (1) .

3.6.2
limit value of temperature difference between heating medium and room
$\Delta\vartheta_{H,G}$
temperature difference between heating medium and room at which the permissible maximum floor surface temperature is achieved

NOTE $\Delta\vartheta_{H,G}$ is determined by the specific thermal output q_G, see EN 1264-2:2008, equation (20)

3.6.3
standard temperature difference between heating medium and room for floor heating systems
$\Delta\vartheta_N$
limit value of temperature difference $\Delta\vartheta_{H,G}$ between heating medium and room floor heating systems without floor covering

NOTE $\Delta\vartheta_N$ is determined by the standard specific thermal output q_N.

3.6.4
standard temperature difference between heating medium and room for heating systems with the exception of floor heating
$\Delta\vartheta_{H,N}$
standard value set at 10 K

3.6.5
design temperature difference between heating medium and room of floor heating systems
$\Delta\vartheta_{H,des}$
value of temperature difference between heating medium and room taking into account the thermal resistance of the chosen floor covering, at q_{max}

3.6.6
heating circuit design temperature difference between heating medium and room of floor heating systems
$\Delta\vartheta_{H,j}$
value of temperature difference between heating medium and room with the thermal resistance of the chosen floor covering, at a required value of specific thermal output q_j which is less than maximum value of specific thermal output q_{max}

3.6.7
design temperature difference between flow of heating medium and room of floor heating systems
$\Delta\vartheta_{V,des}$
value of temperature difference between flow of heating medium and room with the thermal resistance of the chosen floor covering, at maximum value of specific thermal output q_{max}