SLOVENSKI STANDARD
SIST EN ISO 11855-3:2021/oprA1:2023

01-marec-2023

Načrtovanje notranjega okolja v stavbah - Vgrajeni sevalni ogrevalni in hladilni sistemi - 3. del: Načrtovanje in dimenzioniranje - Dopolnilo A1 (ISO 11855-3:2021/DAM 1:2023)

Building environment design - Embedded radiant heating and cooling systems - Part 3: Design and dimensioning - Amendment 1 (ISO 11855-3:2021/DAM 1:2023)

Umweltgerechte Gebäudeplanung - Flächenintegrierte Strahlungsheiz- und -kühlsysteme - Teil 3: Planung und Auslegung (ISO 11855-3:2021/DAM 1:2023)

Conception de l'environnement des bâtiments - Systèmes intégrés de chauffage et de refroidissement par rayonnement - Partie 3: Conception et dimensionnement - Amendement 1 (ISO 11855-3:2021/DAM 1:2023)

Ta slovenski standard je istoveten z: **EN ISO 11855-3:2021/prA1**

ICS:

91.140.10	Sistemi centralnega ogrevanja	Central heating systems
91.140.30	Prezračevalni in klimatski sistemi	Ventilation and air-conditioning systems

SIST EN ISO 11855-3:2021/oprA1:2023 **en,fr,de**

DRAFT AMENDMENT
ISO 11855-3:2021/DAM 1

ISO/TC **205** Secretariat: **ANSI**

Voting begins on: **2023-01-18** Voting terminates on: **2023-04-12**

Building environment design — Embedded radiant heating and cooling systems —

Part 3: Design and dimensioning

AMENDMENT 1

Conception de l'environnement des bâtiments — Systèmes intégrés de chauffage et de refroidissement par rayonnement —

Partie 3: Conception et dimensionnement

AMENDEMENT 1

ICS: 91.040.01

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING

Reference number
ISO 11855-3:2021/DAM 1:2023(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Building environment design — Embedded radiant heating and cooling systems —

Part 3: Design and dimensioning

AMENDMENT 1

Foreword

Modify to the following:

The main changes compared to the previous edition are as follows:

— the Scope clause was modified, series-related information has been moved to the Introduction section;

— normative references were modified;

— informative references have been moved to the Bibliography;

— Annex A was added for the calculation of the thermal resistance of the insulating layers;

— the radiant system types have been redefined and figures are updated based on the amendment;

— Typing error in formula (24) was modified;

2 Normative references

Modify to the following:

ISO 11855-2, *Building environment design — Embedded radiant heating and cooling systems — Part 2: Determination of the design heating and cooling capacity*

ISO 11855-5, *Building environment design —Embedded radiant heating and cooling systems — Part 5: Installation*

5 Radiant panel

5.1 Floor heating systems

5.1.4 Field of characteristic curves

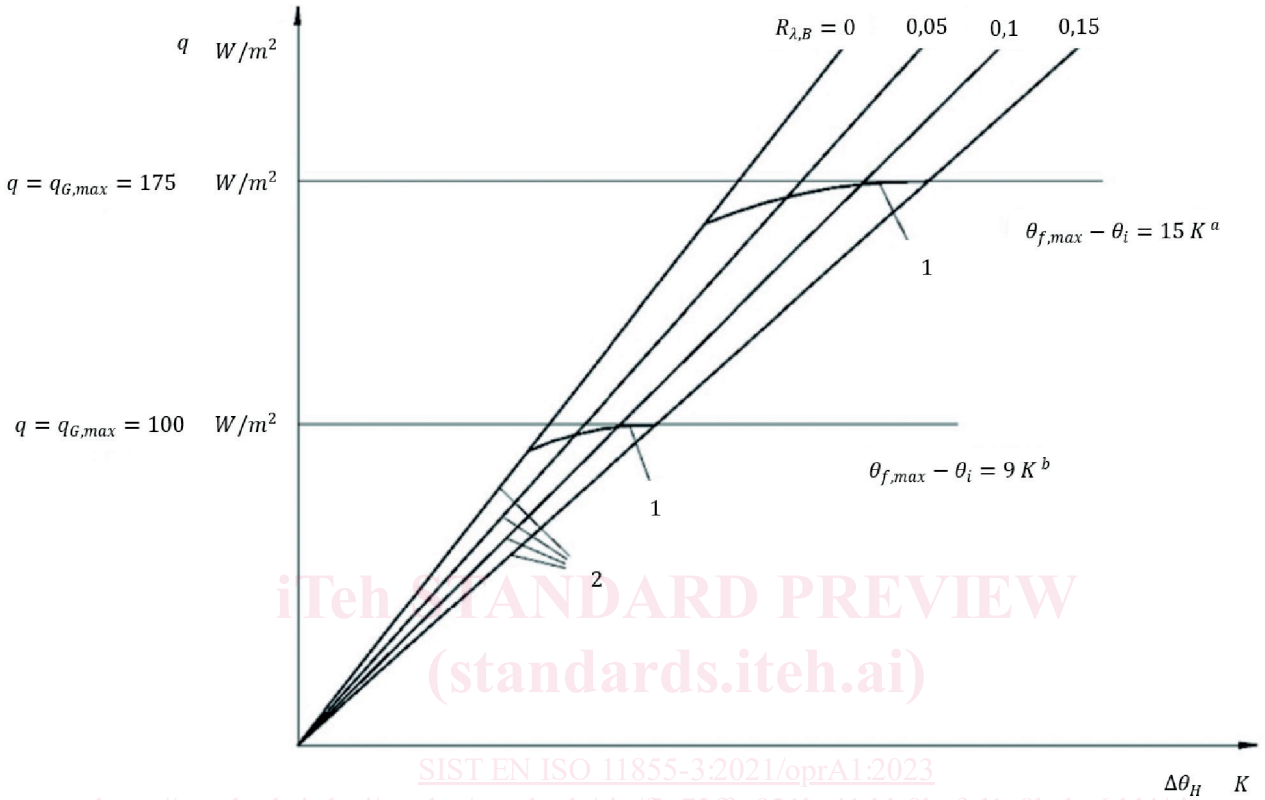
Modify to the following:

The field of characteristic curves of a floor heating system with a specific pipe spacing W shall at least contain the characteristic curves for values of the thermal resistance of surface covering $R_{\lambda,B}$ = 0, $R_{\lambda,B}$ = 0,05, $R_{\lambda,B}$ = 0,10 and $R_{\lambda,B}$ = 0,15 (m^2K/W), in accordance with ISO 11855-2 (see Figure 1). Values of $R_{\lambda,B}$ > 0,15 (m^2K/W) shall not be used if possible.

5.1.5 Limit curves

Figure 1

Modify to the following:



Key

X $\Delta\theta_H$ K
Y q W/m²
1 limit curves
2 performance characteristic curves
a Peripheral area.
b Occupied area.

Figure 1 — Field of characteristic curves, including limit curves for floor heating, for constant pipe spacing

5.1.6 Downwards thermal insulation

Modify to the following:

In order to limit the heat flow through the floor towards the space below, the required back-side thermal resistance of the insulating layer $R_{\lambda,\text{ins}}$ shall be specified in the design to be not lower than the value in ISO 11855-5, 5.1.2.3.2.

For systems which have a flat insulating layer (system types I, II and IV in ISO 11855-1), the back-side thermal resistance of the insulating layer $R_{\lambda,\text{ins}}$ is calculated by Formula (7) where there is no stud. And the effective thickness of thermal insulating layer s_{ins} is identical to the thickness of the thermal

insulating panel and the effective thermal conductivity of the thermal insulation layer λ_{ins} is calculated by Formula (7) where there are studs.

$$R_{\lambda,ins} = \frac{s_{ins}}{\lambda_{ins}} \tag{7}$$

$$\lambda_{ins} = \lambda_i \frac{l_p - l_{ws}}{l_{ps}} + \lambda_{ws} \frac{l_{ws}}{l_{ps}} \tag{8}$$

where

λ_i is thermal conductivity of the thermal insulation layer between the studs;

λ_{ws} is thermal conductivity of the stud;

l_{ps} is the distance between the studs (see Figure 2);

l_{ws} is the thickness of the stud (see Figure 2).

Depending on the construction of the floor heating system, the effective thickness of thermal insulating layer s_{ins} and effective thermal conductivity of the thermal insulation layer λ_{ins} are determined differently.

For floor heating systems with flat thermal insulating panels of system types I in ISO 11855-1, the effective thickness of thermal insulating layer s_{ins} is identical to the thickness of the thermal insulation, and the effective thermal conductivity of the thermal insulation layer λ_{ins} is identical to the thermal conductivity of the thermal insulation [ISO 11855-1, Figure 2]. For floor heating systems with thermal insulation panels with studs according to Annex A (system type I systems) (Figure A.1), only the flat part of the panel (without studs) shall be considered in the calculation of s_{ins}.

For the system with profiled thermal insulating panels of system type II in ISO 11855-1, Figure 3, the effective thickness of the insulating layer shall be determined by Formula (9).

$$s_{ins} = \frac{s_h \cdot (W - D) + s_l \cdot D}{W} \tag{9}$$

For the system with the light wooden radiant panel on the joist of system type IV in ISO 11855-1, Figure 5, the effective thickness of thermal insulating layer s_{ins} is identical to the thickness of the thermal insulating panel, and the effective thermal conductivity of the thermal insulation layer λ_{ins} is:

$$\lambda_{ins} = \lambda_i \frac{l_p - l_w}{l_p} + \lambda_w \frac{l_w}{l_p} \tag{10}$$

where

λ_i is thermal conductivity of the thermal insulation layer between the joists;

λ_w is thermal conductivity of the joist;

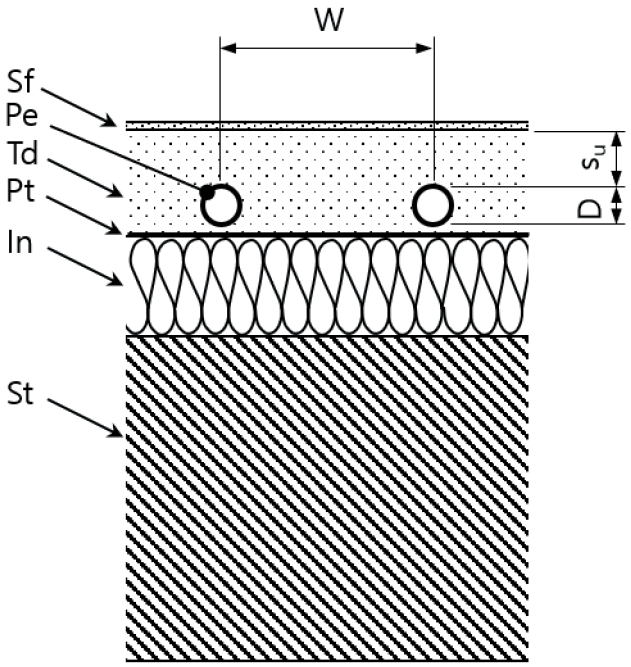
l_p is the distance between the joist (see Figure 5);

l_w is the thickness of the joist (see Figure 5).

For system type IV systems with air cavities, see ISO 11855-2, Annexes C and E.

Figure 2

Modify to the following:



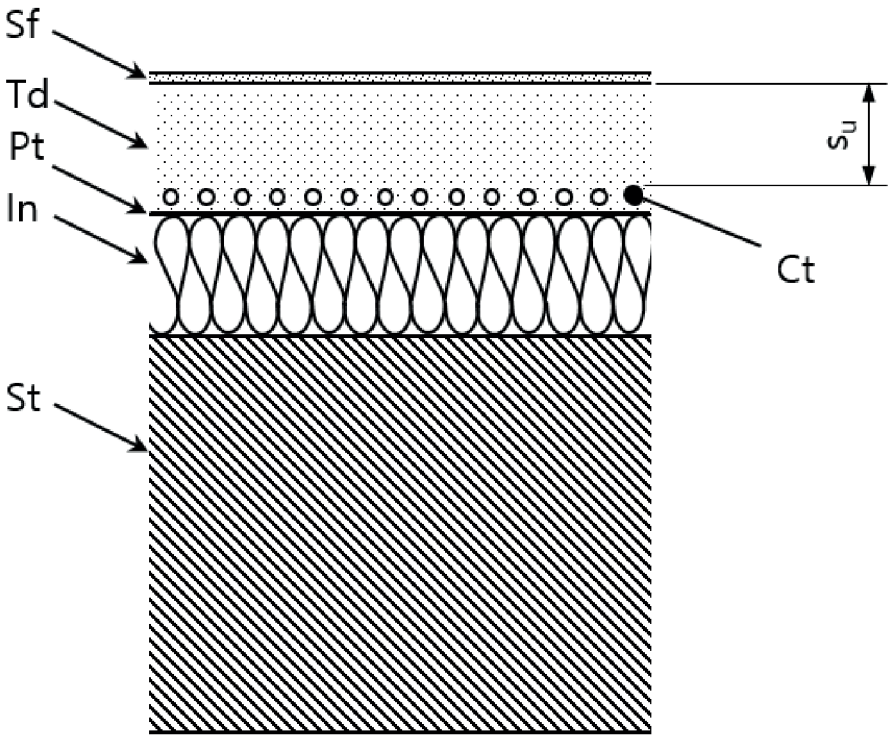
Key

D	external diameter of the pipe
In	thermal insulation layer
Pe	pipes or electric cables
Pt	protection layer
Sf	surface layer
St	structural layer
s_u	thickness of the layer above the pipe
Td	thermal diffusion layer
W	pipe spacing

Figure 2 — Effective thickness and effective thermal conductivity of thermal insulating layer of flat thermal insulating panel — System types I

Figure 3

Modify to the following:



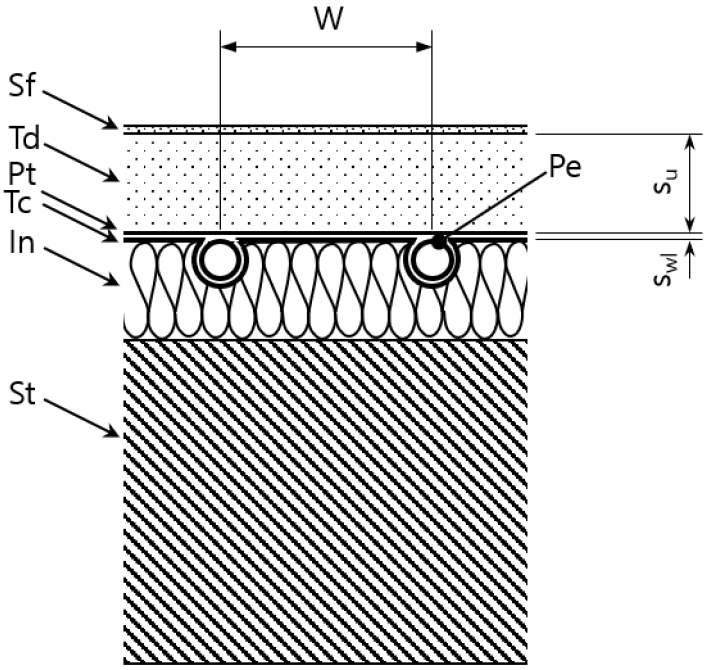
Key

Ct capillary tubes
In thermal insulation layer
Pt protection layer
Sf surface layer
St structural layer
s_u thickness of the layer above the pipe
Td thermal diffusion layer

Figure 3 — Effective thickness and effective thermal conductivity of thermal insulating layer of flat thermal insulating panel — System type III

Figure 4

Modify to the following:



Key

In thermal insulation layer
Pe pipes or electric cables
Pt protection layer
Sf surface layer
St structural layer
s_u thickness of the layer above the pipe
s_{wl} thickness of heat conducting device
Tc thermal conduction layer
Td thermal diffusion layer
W pipe spacing

Figure 4 — Effective thickness and effective thermal conductivity of thermal insulating layer of profiled thermal insulating panel — System type II

Figure 5

Modify to the following: