

Dipl.-Ing. G. Werner - Dr.-Ing. D. Werner
Beratende Ingenieure BDB DWA vfdB
Staatl. anerk. Sachverständige
- für die Prüfung des Brandschutzes
- für Schall- und Wärmeschutz

Isaac-Newton-Straße 1 · 59423 Unna
Telefon 0 23 03 / 98 358 - 0
Telefax 0 23 03 / 98 358-24
e-mail: info@ing-werner.de
www.ing-werner.de

Baustatik
Bauwerksprüfung
Betonsanierung
Brandschutz
Rettungs- u. Feuerwehrpläne
Schall- u. Wärmeschutz
Blower-Door-Test
Bebauungspläne
Gewässerplanung
Kanal- u. Straßenbau
SiGe - Koordination

Calculation of the temperature factor f_{RSI} , as far as of the linear thermal transmittance ψ of a roller shutter box in a built-in situation; here: Brickwork with outside insulation

I. Details concerning the roller shutter box

1. Specification: **CBR 205x215 N**
2. Report number: 15 624-26-EN
3. Client: BeClever Sp. zo.o.
u.l. Malinowa 1
62-300 Września
4. Assignment: Examination of the thermal process technology characteristics of the above mentioned roller shutter box in a built-in situation (brickwork with core insulation and brick frontage)
5. Basis of calculation: All calculations concerning the roller shutter box are based on the original drafts of the client
6. Method of analysis: Software: BISCO computer program to calculate two-dimensional steady state heat transfer in free-form objects; Version 11.0w
7. Rules / Standards: DIN 4108 Bbl 2: 2006-03
DIN EN ISO 10077-2:2012-06
DIN EN ISO 10211:2008-04

List of specified criteria for buildings A Part 1
2015/2
8. Spec. material values (roller shutter box): According to declaration of the client
PVC: $\lambda = 0,170 \text{ W/(mK)}$
Heat insulation: $\lambda = 0,032 \text{ W/(mK)}$

II. Calculation results

The roller shutter box complies with the proof of equivalency corresponding to image 62 DIN 4108 Bbl 2: 2006-03 in accordance with the conditions and construction materials mentioned on page 2

Temperature factor:

$$f_{RSI} = 0,76 \geq 0,70$$

Psi-value:

$$\psi = 0,12 \text{ W/(mK)} \leq 0,23 \text{ W/(mK)}$$

III. Signature

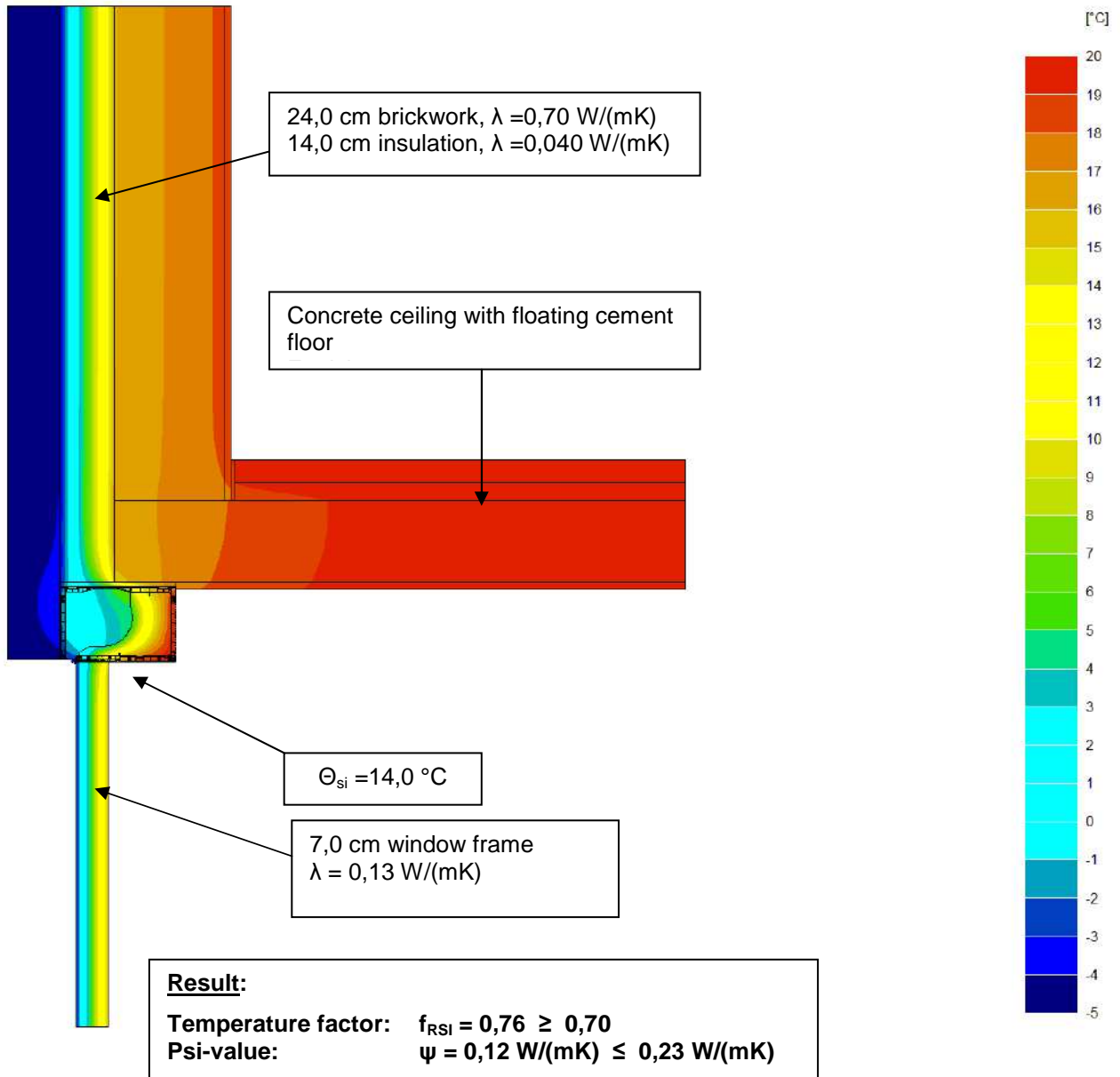
Unna, 22.09.16



(Stamp and signature of the officially recognized appraiser)

Image 1: Temperature gradation; brickwork with core insulation and brick frontage

Conditions: f_{RSI} : $R_{se} = 0,04 (m^2K)/W$, $\theta_e = -5^\circ C$; $R_{si} = 0,13 (m^2K)/W$ resp. $0,25 (m^2K)/W$;
 $\theta_i = 20^\circ C$ ψ -value: $R_{se} = 0,04 (m^2K)/W$; $f_e = 0$; $R_{si} = 0,13 (m^2K)/W$; $f_i = 1$



Notes:

The number of nodes in this calculation amounts to 168700.

- a) The roller shutter cavity is assumed non-ventilated. The air cells inside the box sections are non-ventilated cavities and acc. to DIN ISO 10077-2 are calculated separately. The λ -value of the roller shutter cavity is $0,674 (W/mK)$.
- b) The emission grade for the surface has been considered 0,9.