

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 core insulation and brick frontage

I. Details concerning the roller shutter box

- | | |
|--|---|
| 1. Specification: | CBR 245x255 I |
| 2. Report number: | 15 624-18-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: $\lambda = 0,032 \text{ W/(mK)}$
Aluminium (insect protection): $\lambda = 160,0 \text{ W/(mK)}$ |

II. Calculation results

The roller shutter box complies with the proof of equivalency corresponding to image 63 DIN 4108 Bbl 2: 2006-03 in accordance with the conditions and construction materials mentioned on page 2

Temperature factor:

$$f_{RSI} = 0,74 \geq 0,70$$

Psi-value:

$$\psi = 0,16 \text{ W/(mK)} \leq 0,25 \text{ W/(mK)}$$

III. Signature

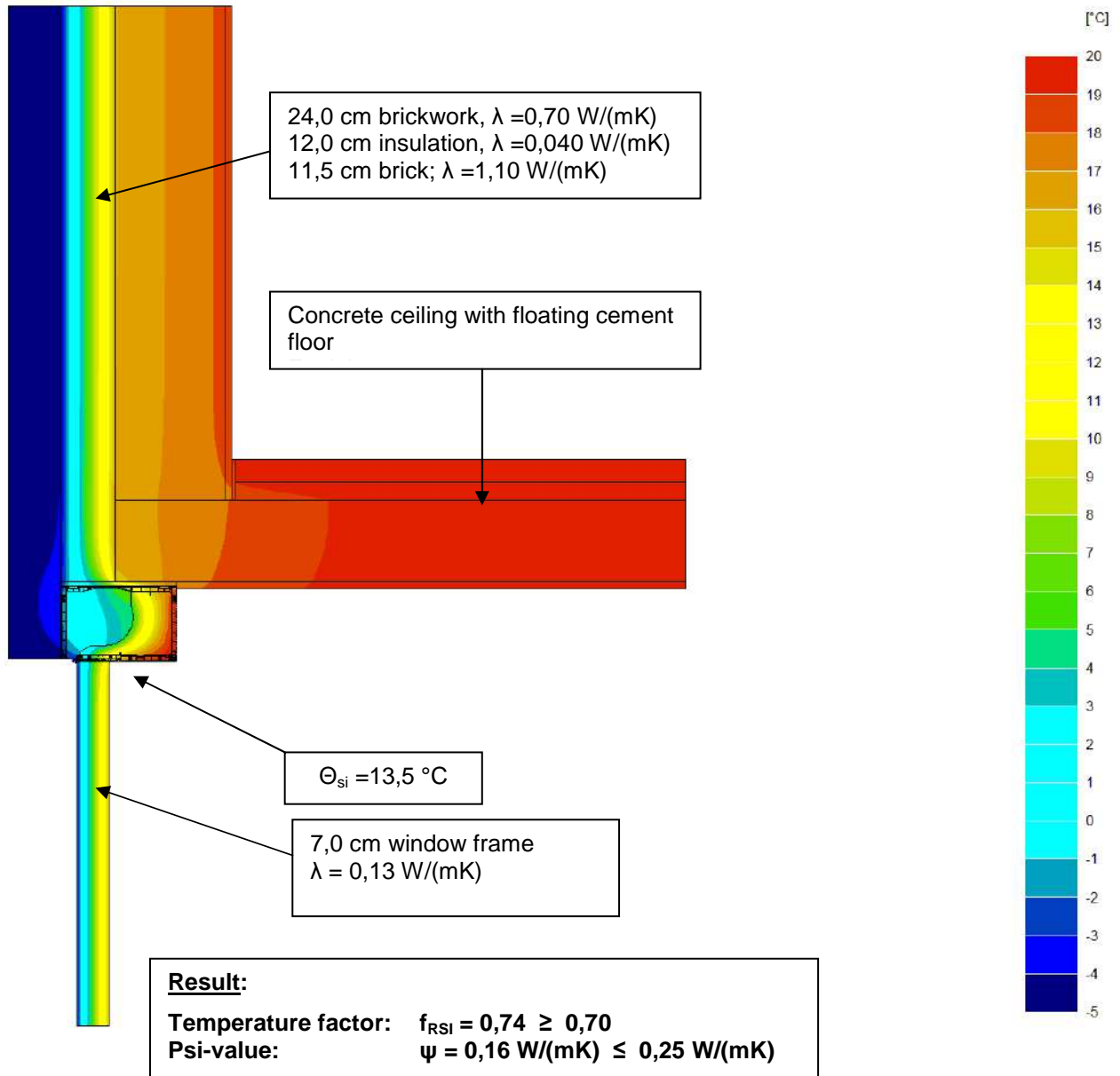
Unna, 22.09.16



(Stamp and signature of the officially recognized appraiser)

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

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



Notes:

The number of nodes in this calculation amounts to 201222.

- 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 $0,851 \text{ (W/mK)}$.
- b) The emission grade for the surface has been considered 0,9.