“Façade systems without heat loss”

GIP + Schöck

Dipl.-Ing. Werner Venter

Schöck Bauteile GmbH

1

Schöck Bauteile GmbH

Unconventional thinker and innovator

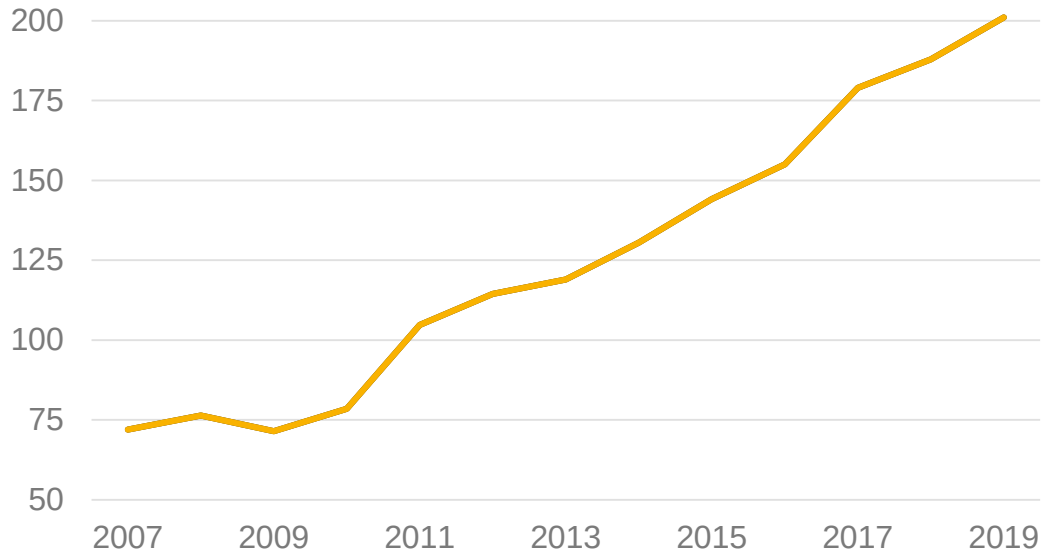
Our company founder Eberhard Schöck

„Those who want to be successful have to improve existing things or invent new things."

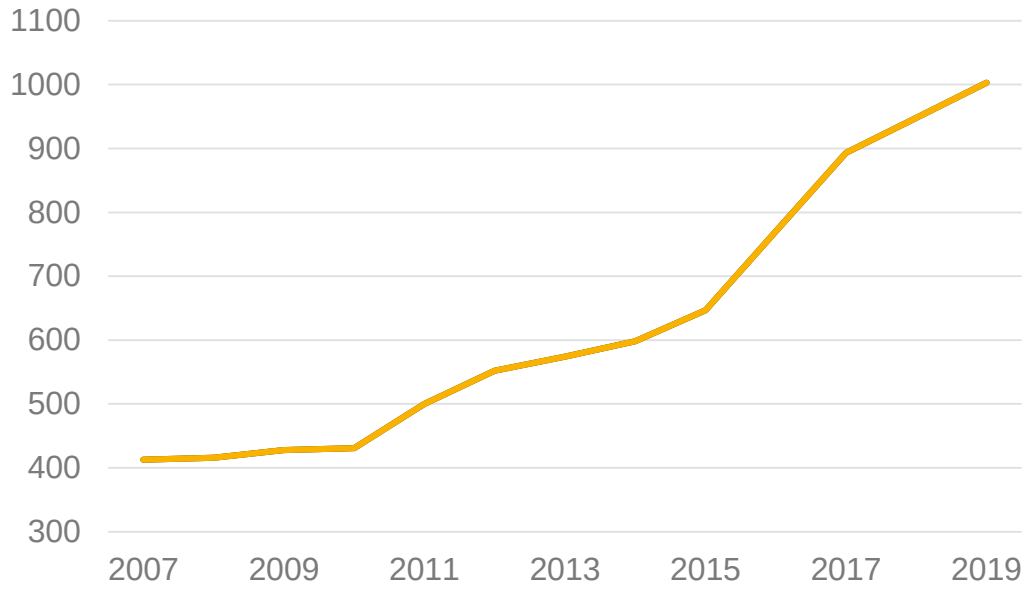
Schöck Bauteile GmbH, Baden-Baden

Healthy growth

Turnover Mio.€



Employees



Schöck Isokorb® CXT

Load-bearing thermal insulation element

Schöck Isokorb® SK

Load-bearing thermal insulation element

Schöck Isokorb® A

Insulates parapets efficiently

Schöck Isolink® TA

sandwich concrete walls

Schöck Isolink® TA-S

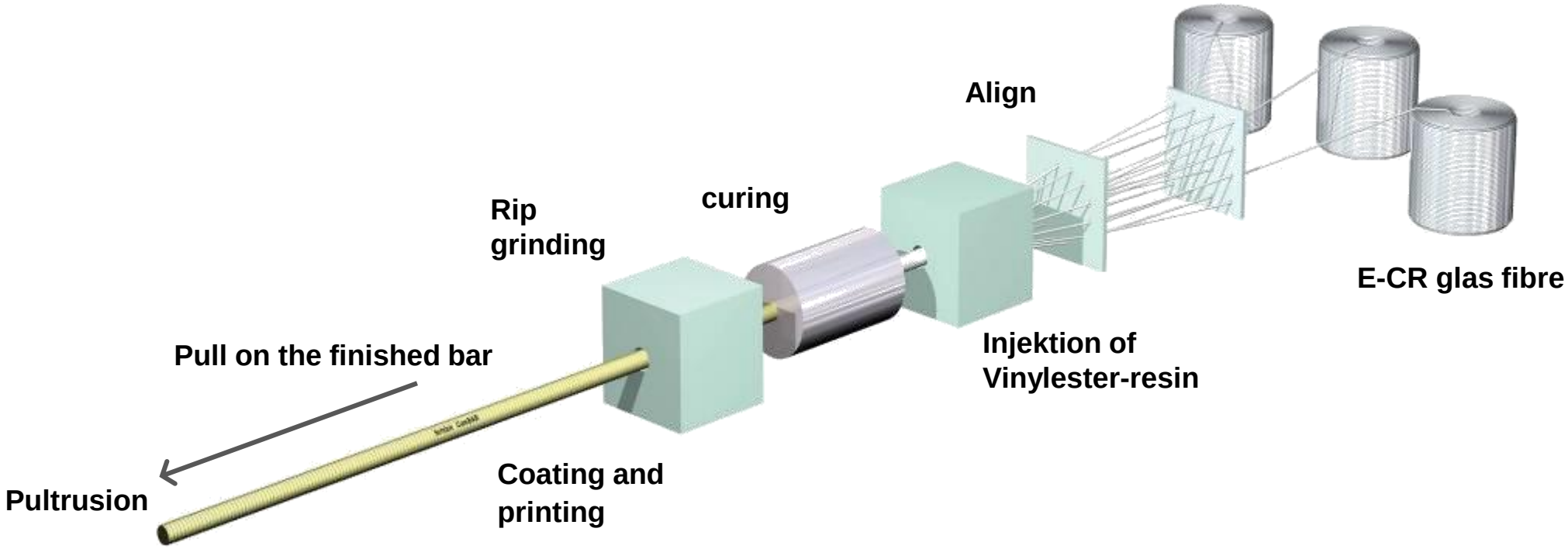
Rainscreen cladding façade

2

Schöck Combar®

Combar®

Composite Reinforcement Bar



Fibre content: 88 % weight

Combar®

Composite Rebar glas fibre reinforcement

Straight bar

Bent bar

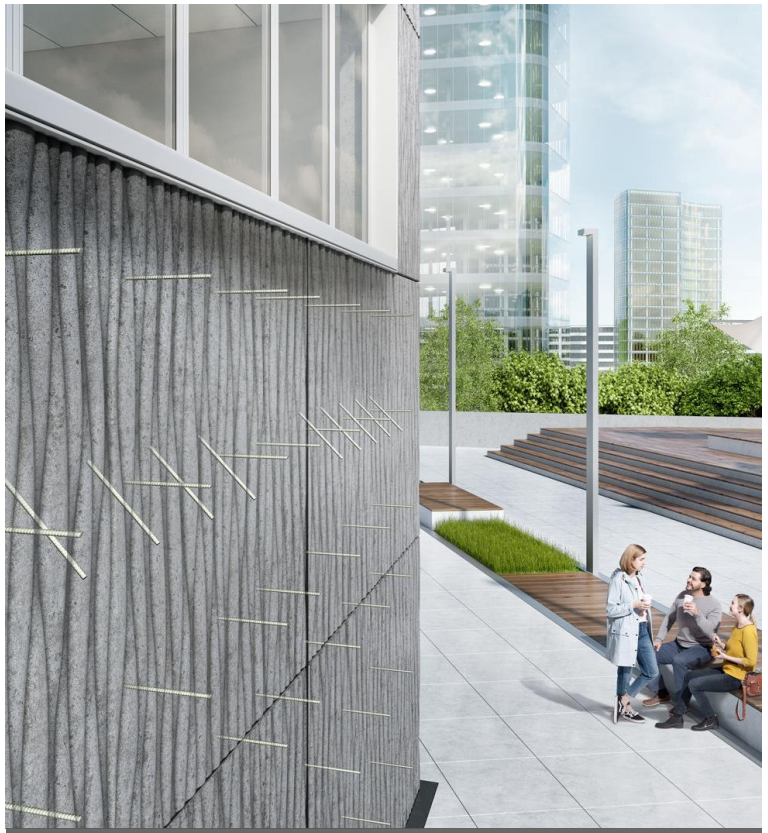
Headed bar

Combar®

Application of Combar

Reinforced concrete

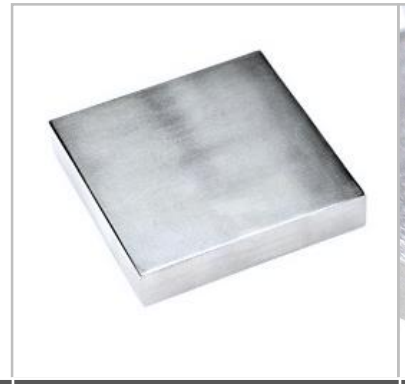
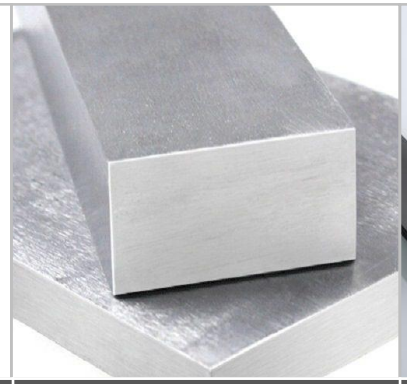
Tensile rod of Isokorb®



Concrete sandwich panel anchor

Material property

In comparison

Material properties		Unit	Stainless steel	Aluminium	composites	Schöck Combar®
Tensile strength	f_{tk}	N/mm²	460-650	215	80 (45)*	≥ 1.000
E-Modul	E_{Zug}	GPa	200	70	3.0 (1.0)*	60
Thermal conductivity	λ	W/(m·K)	13-17	160-220	0.23	0.7
Density	ρ	g/cm³	8.0	2.75	1.14	2.2
Fire class			Non-combustible	Non-combustible	Combustible	Hardly-combustible

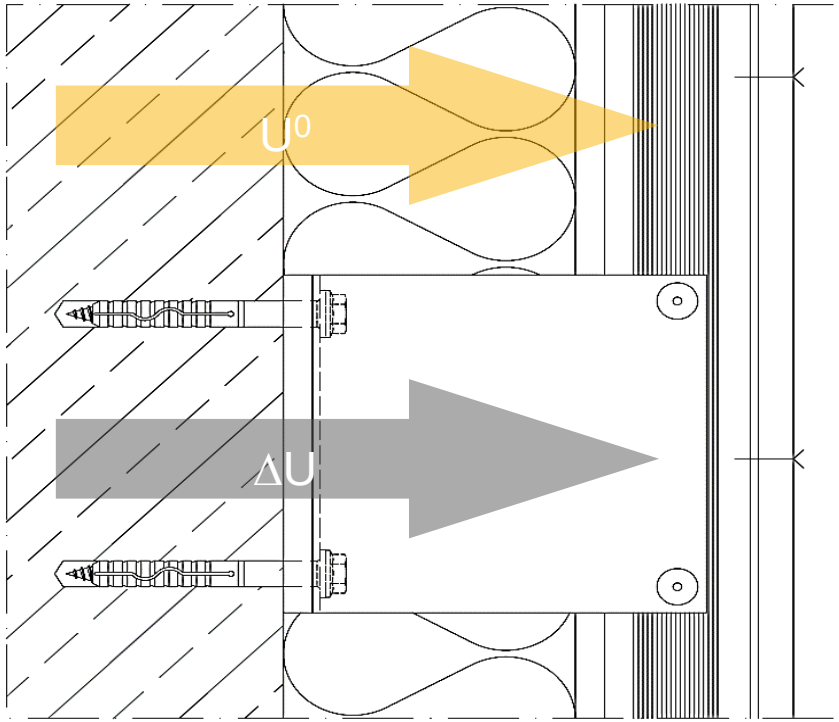
* Wet Polyamide

3

Punctual thermal bridge in rainscreen façade

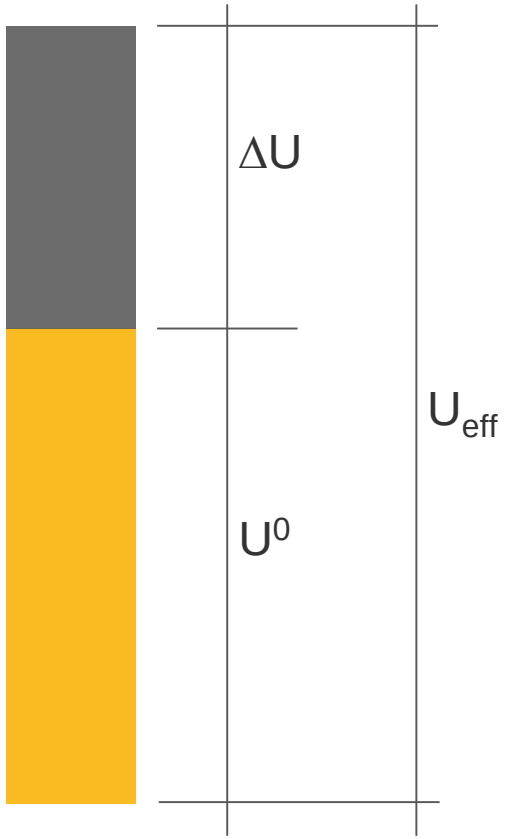
Thermal transmission coefficient U

Consideration of punctually thermal bridges according EN ISO 6949



$$U_{eff} = U^0 + \Delta U$$

$$\Delta U = n \cdot \chi$$

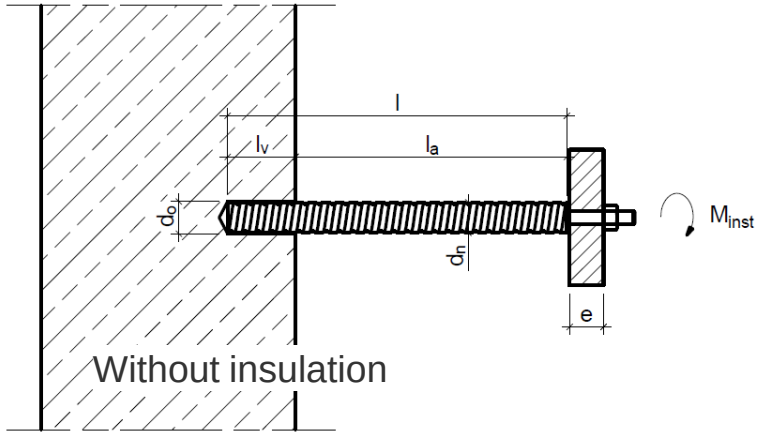


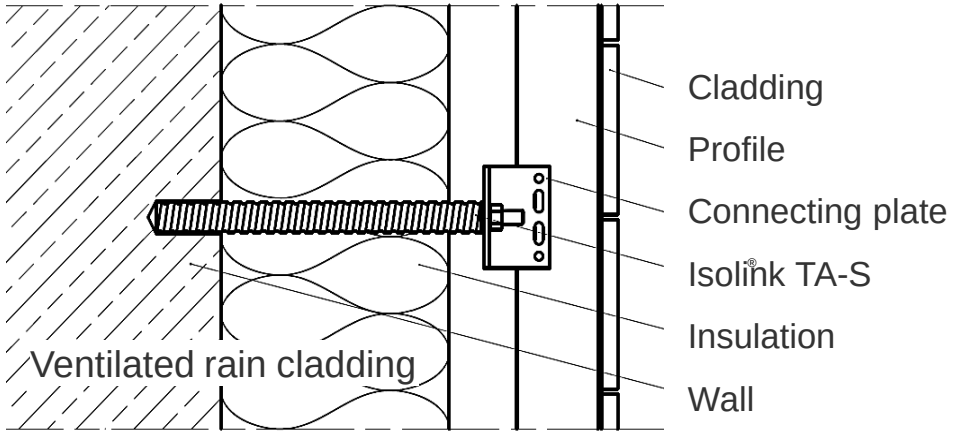
Schöck Isolink® type TA-S

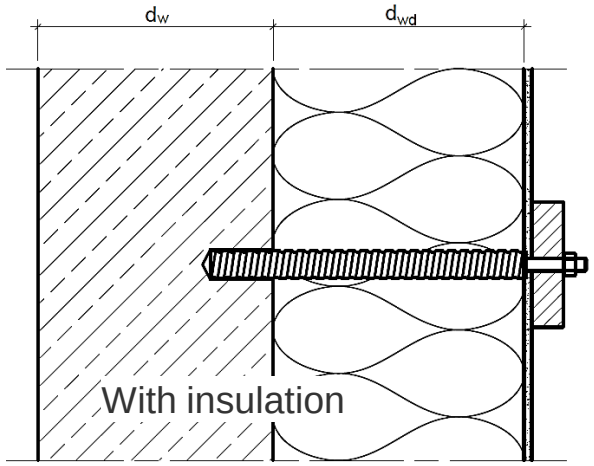
Approval: Z-21.8-2082 | Berlin, 01/10/2018

Schöck Isolink®

Application examples of the approval Z-21.8-2082







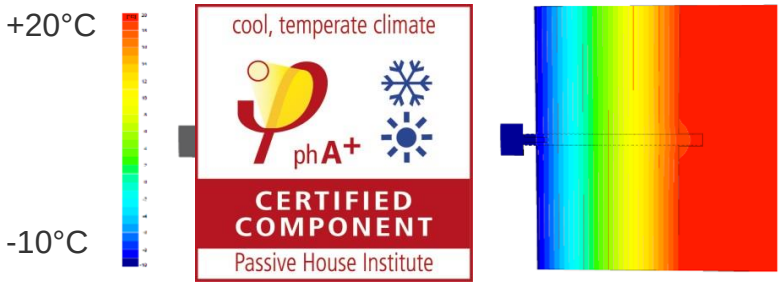
l	length Isolink® Typ TA-S
l_v	anchoring length TA-S
l_a	leverarm
d_0	drill hole diameter
d_n	Diameter
M_{inst}	installing torque moment
e	thickness of anchorplate
d_w	wall thickness
d_{wd}	insulation thicknes

Punctually thermal bridge of Schöck Isolink® type TA-S

Punctually thermal transmission coefficient as part of the approval

Insulation thickness [mm]	100	150	200	250	300
Thermal conductivity 0.030 to 0.040	χ_{100} [W/K]	χ_{150} [W/K]	χ_{200} [W/K]	χ_{250} [W/K]	χ_{300} [W/K]
TA-S 12	0.0007	0.0006	0.0004	0.0004	0.0003
TA-S 16	0.0012	0.0009	0.0007	0.0006	0.0005
TA-S 20	0.0017	0.0012	0.0010	0.0009	0.0007

Approval Z-21.8-2082: Schedule 6



Certificated component phA+

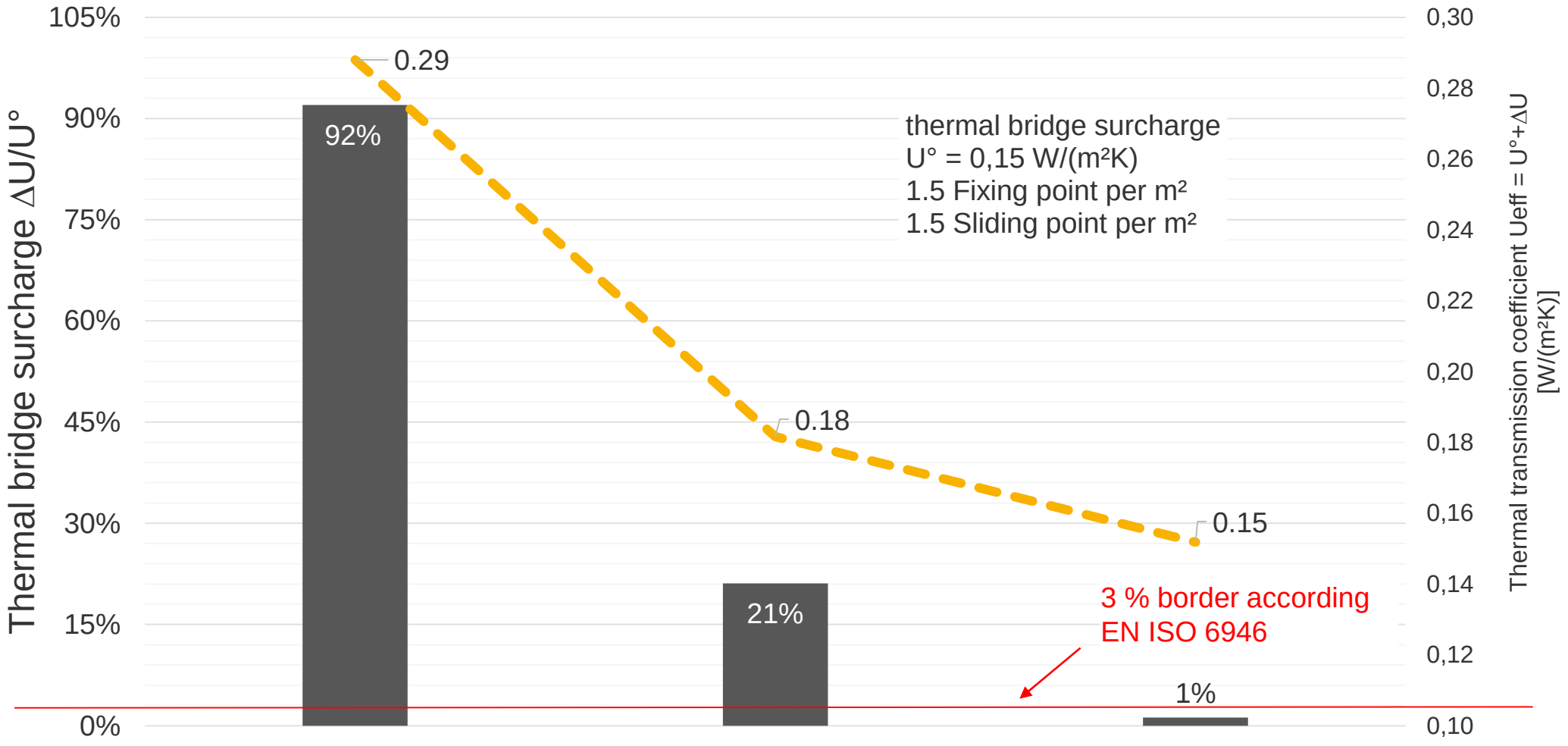
Best in all weight class

Class	Cladding	weight [kN/m²]	efficiency class
I	Aluminium panels	0.100	phA+
II	Composite panels	0.150	phA+
III	Fiber cement panels	0.200	phA+
IV	Acryl glass panels	0.250	phA+
V	Ceramic	0.300	phA+
VI	Stone	0.400	phA+

Source: Passivhausinstitut

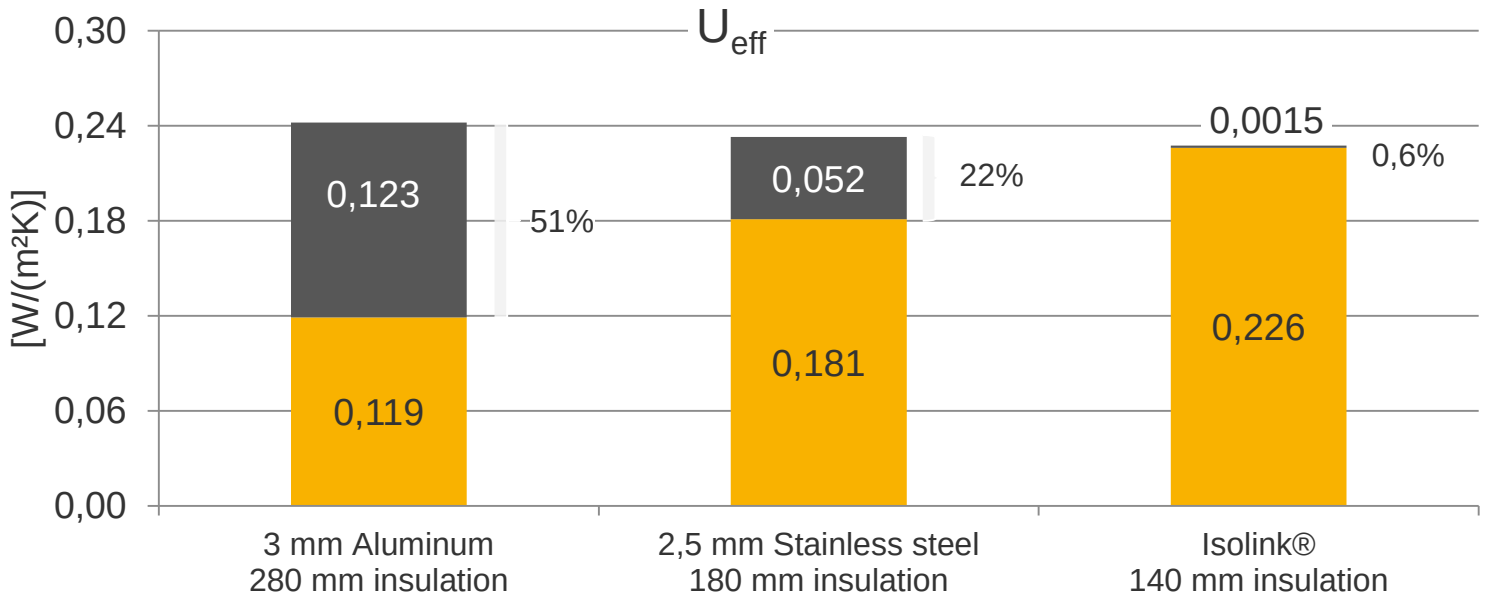
Punctually thermal bridge

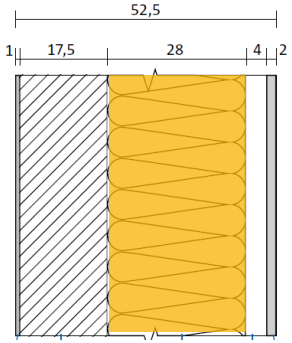
ΔU-value thermal bridge surcharge

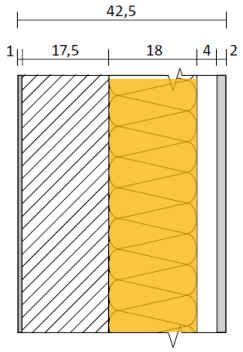


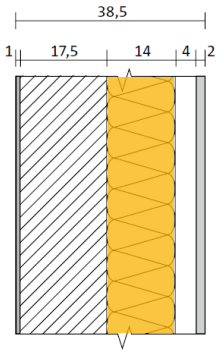
Target U-value 0.24 W/(m²K)

Determination of the required thermal insulation thickness









- ΔU – Influence of thermal bridges
- U^0 – thermal transmission coefficient undisturbed wall

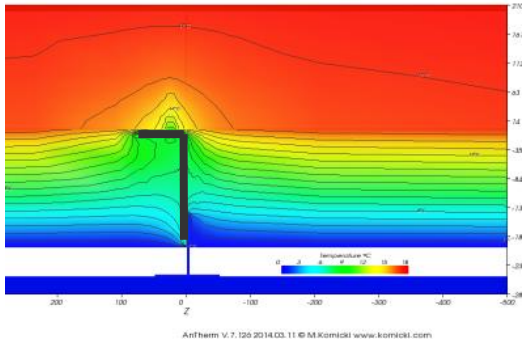
Mineral wool λ=0.035 W/(m·K), 3 brackets per m²

Number of brackets

For geometric reasons

- $U = U^0 + \Delta U \leq 0.24$ W/(m²K)
- $\chi_{,Alu} = 0.036$ W/K

- $\Delta U =$ **12** x 0.036 / 0.8
- $\Delta U = 0.54$ W/(m²K)



Amount of Isolink®

If the influence of the thermal bridge ΔU is less than 3% of the U-value of the wall, the correction value according to EN ISO 6946 need not be considered.

Maximum amount of Schöck Isolink® Typ TA-S up to 3 % limit

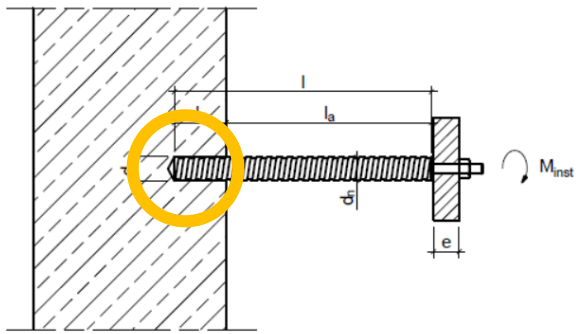
Insulation thickness	100 mm	150 mm	200 mm	250 mm	300 mm
WLG 035	n_{100} [Pieces/m²]	n_{150} [Pieces/m²]	n_{200} [Pieces/m²]	n_{250} [Pieces/m²]	n_{300} [Pieces/m²]
TA-S 12	12	12	11	11	11
TA-S 16	7	7	6	6	6
TA-S 20	5	5	4	4	4

Approval Z-21.8-2082 : Schedule 9

4

Isolink® TA-S

Schöck Isolink® Typ TA-S



Designation	Unit		TA-S 12	TA-S 16	TA-S 20
Drill hole diameter	d_0	[mm]	16	20	24
Brush diameter	D_{Br}	[mm]	18	22	26
Minimum embedment depth	$h_{ef,min}$	[mm]	40	40	40
Maximal calc. Embedment depth	$h_{ef,max}$	[mm]	96	128	160
Minimum edge distance	c_{min}	[mm]	60	80	100
Minimum anchor spacing	s_{min}	[mm]	60	80	100

Schöck Isolink®

- **400kg wood**
- **8m heigh facades**
- **Ceramic weight 43kg/m²**
- **All criteria passed**

5 Case studies

Case studies

Syllen, Stockholm

- 7.500 Isolink® TA-S
- 2.800 m² Tonelity Ceramic
- GIP Facade
- Purchase decision:
  - Avoiding punctual thermal bridges
  - Easy to post install after the insulation (PIR)
  - The preinstall of insulation save time

Case studies

Multipurpose hall Volkertshausen (Germany)

- 2.000 Isolink® Typ TA-S
- 600 m² Alucobond cladding
- GIP Facades
- S+T Fassaden GmbH
- Purchase decision:
  - Avoiding punctual thermal bridges
  - 180mm thermal insulation
  - U-value < 0,16 W/m²K
  - Rc > 6,25 m²K/W

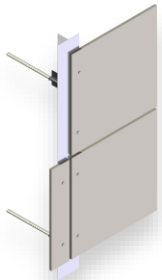
Case studies

Elisabeth school Osnabrück (Germany)

- 2.200 Isolink® TA-S
- 600 m² Eternit facade
- GIP Facade
- Installer: Holzbau Brockhaus
- Purchase decision:
  - Renovation
  - Existing ETICS Facade
  - New Rainscreen Facade
  - Easy to post install.
  - Avoiding punctual thermal bridges

Two specialists – one goal

GIP Fassade + Schöck = FAÇADE SOLUTIONS²



- Universal sub frame
- For different cladding material
- Great knowledge
- International competence

- DIBt approved
- Passivhouse certified
- Easy to use
- Renovation and new construction

- Complete frame solution
- Thermal bridge free
- Economically
- High-quality facades

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