

TESTS OF VIPS IN SIMULATION, LABORATORY, AND PRACTICE

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THE KINDERGARTEN KITA „PLAPPERSNUT“ IN WISMAR



Before retrofitting

prefab concrete panels
with ceramic skin



After retrofitting

East gable facade
→ VIP 1



North
facade



West gable
facade
→ VIP 2

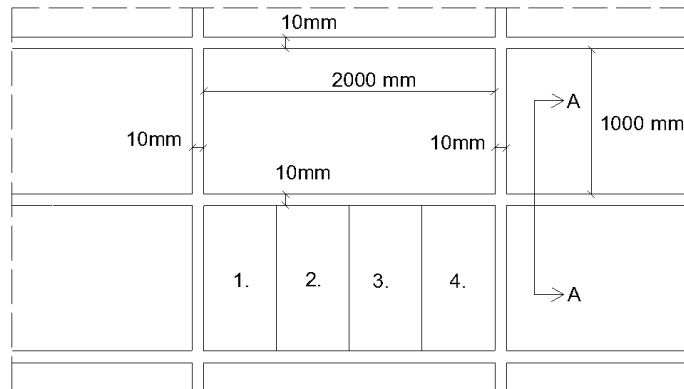


Inside

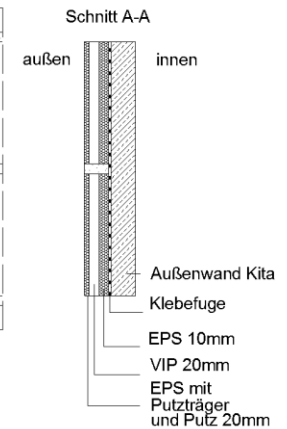
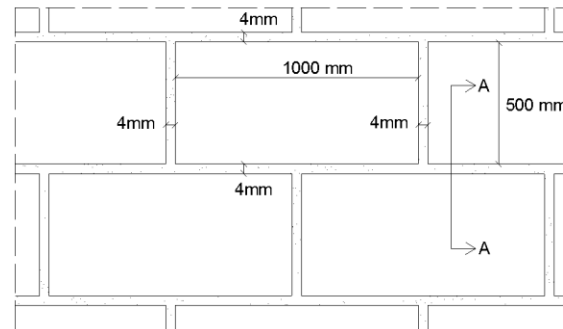
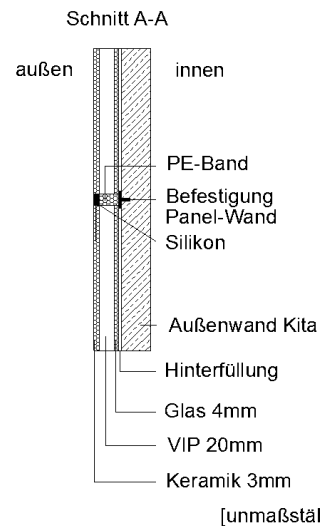
2005: Award of the
Journal „Bauphysik“

CONSTRUCTION OF VIP1 AND VIP2

VIP1: glass-ceramic-sandwich



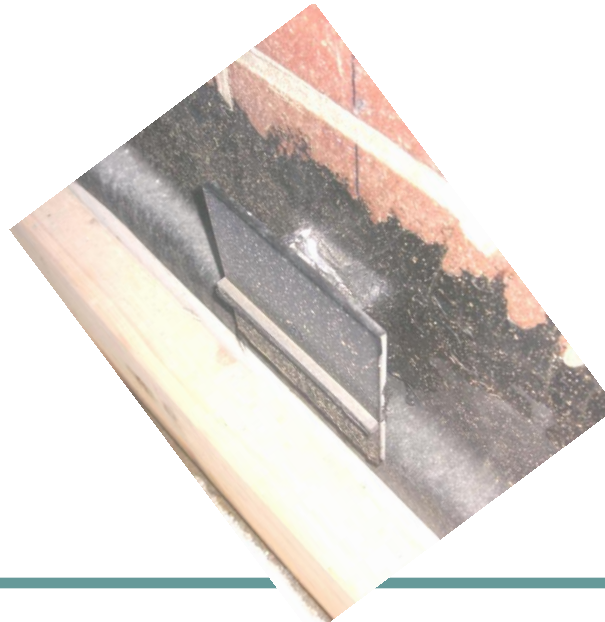
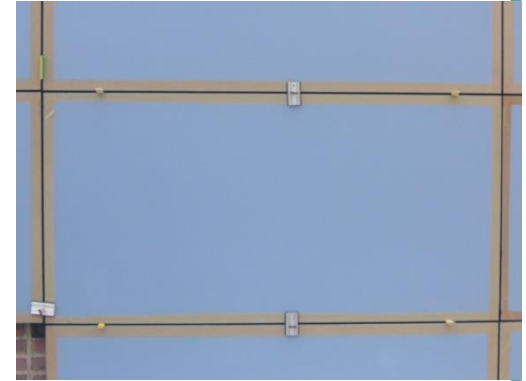
Ausschnitt aus dem Fassadenplan
2x1 m Panel besteht aus 4 VIPs



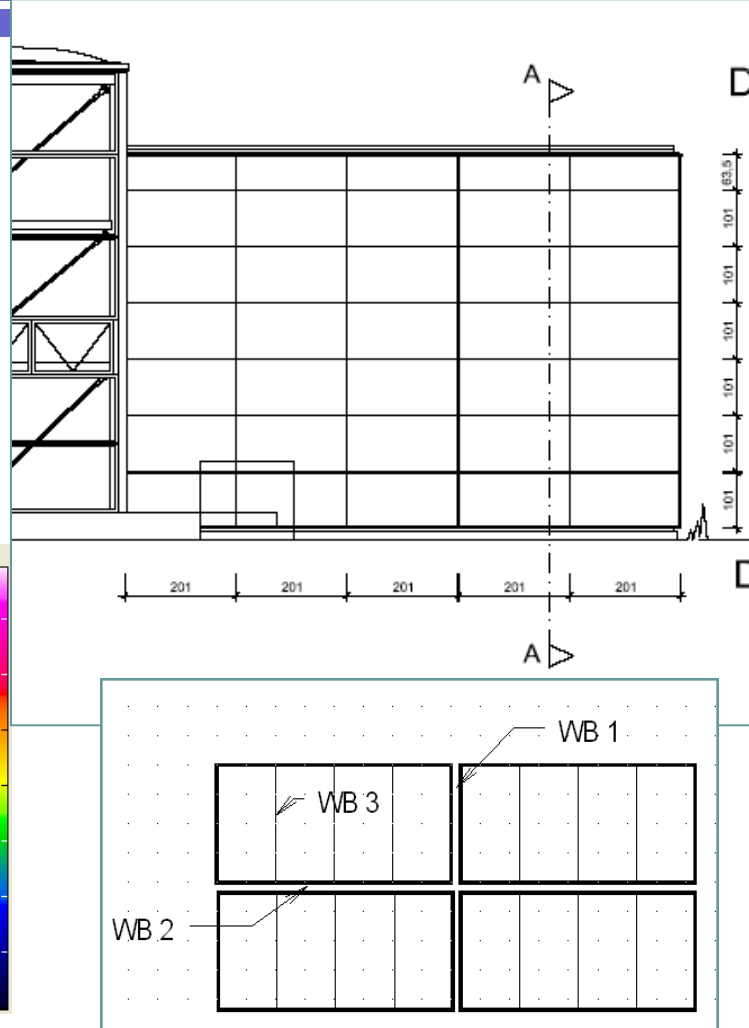
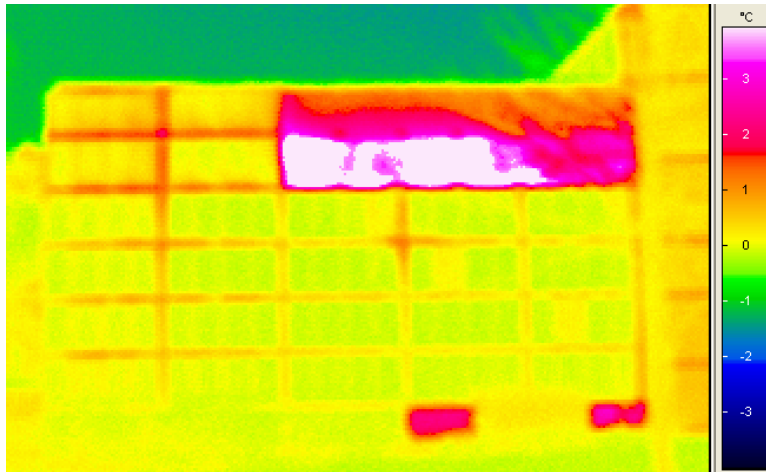
VIP2: ETICS with VIP-kernel

VIP1:

SANDWICH WITH 4 VIPs INSIDE



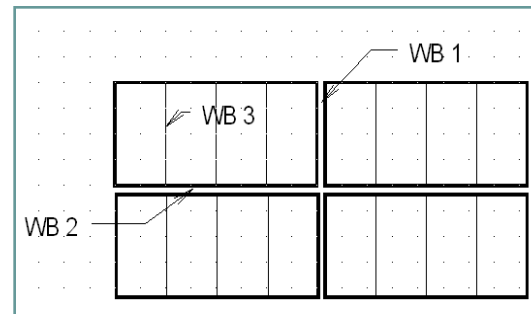
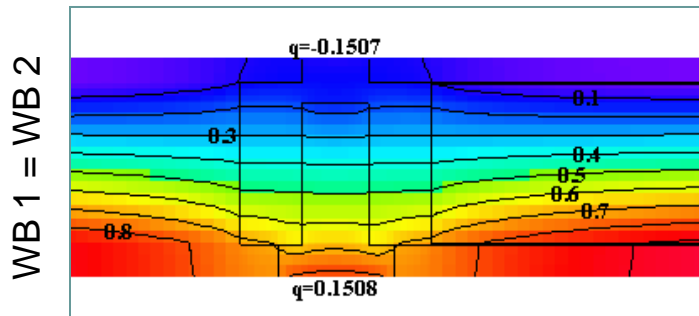
VIP1: FACADE PLAN , READY FACADE, AND THERMOGRAPHY



VIP1: INFLUENCE OF THERMAL BRIDGES

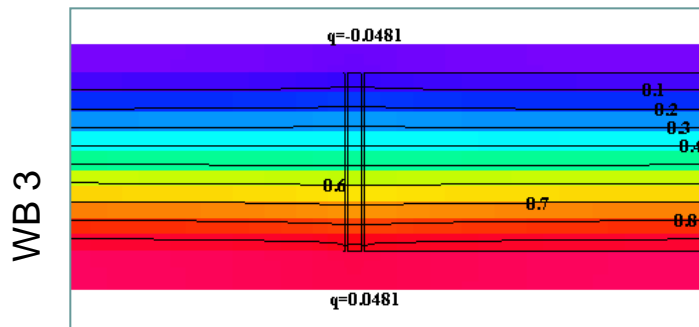
Estern facade : ca. 140 m² (2 gable walls)

Sandwich glass/ceramic with VIP-kernel (ADCO company)



$$\Phi' = U \cdot A + \sum \psi \cdot l$$

$$d = \lambda / (\Phi' \cdot A)$$



	Ψ_{WB1+2} [W/mK]	Ψ_{WB3} [W/mK]	U-value [W/m ² K]	Equival. thickness ETICS (WLG 040) d [mm]
VIP (center)	-	-	0,19	200
VIP (Sandw.)	0,091	0,0208	0,345	110

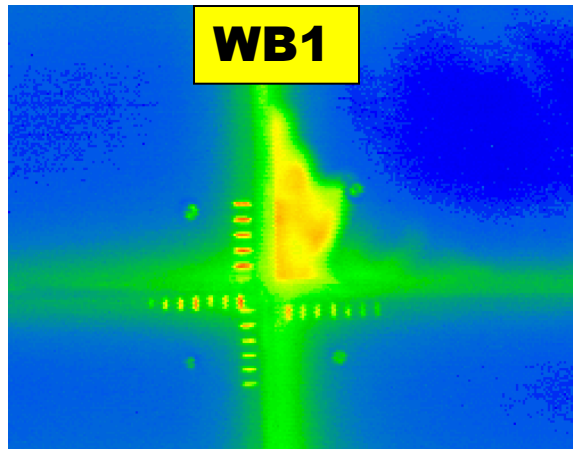
VIP1:

TEST IN THE CLIMATE CHAMBER

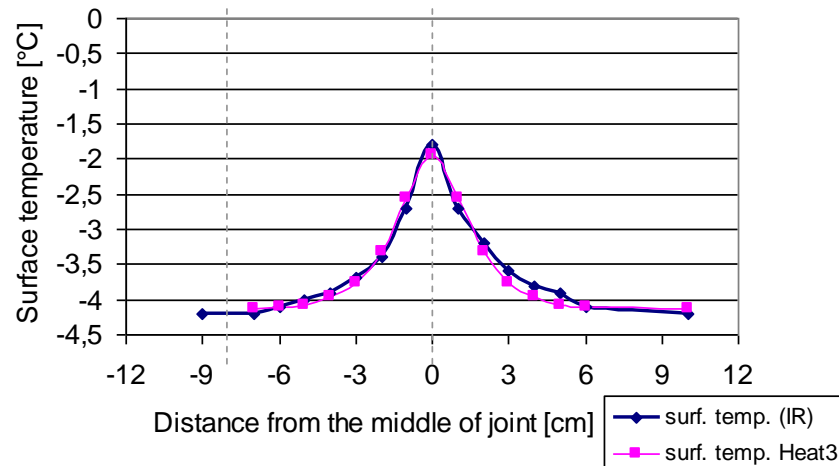
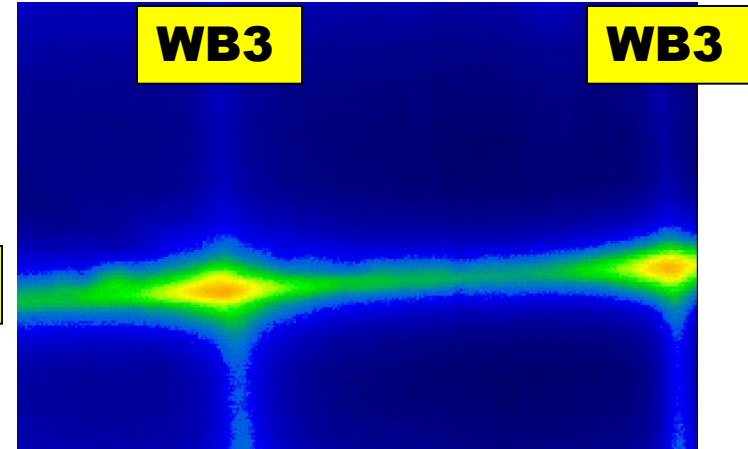


VIP 1: THERMAL BRIDGES

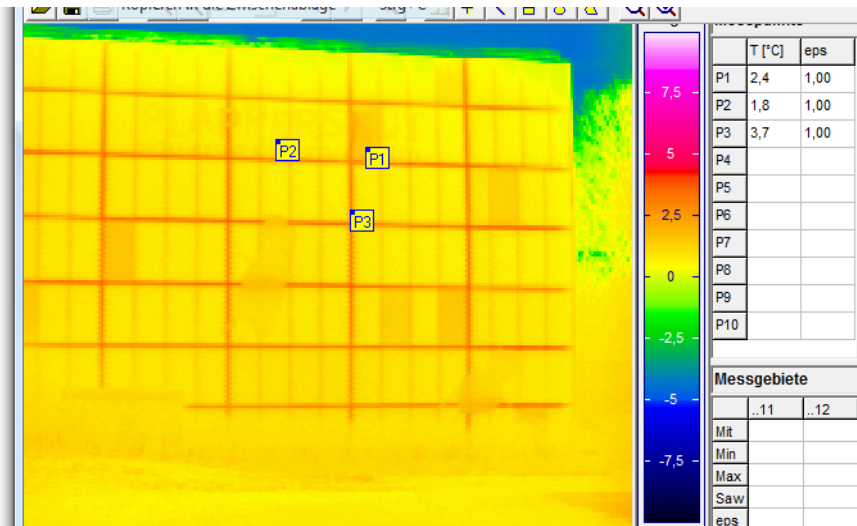
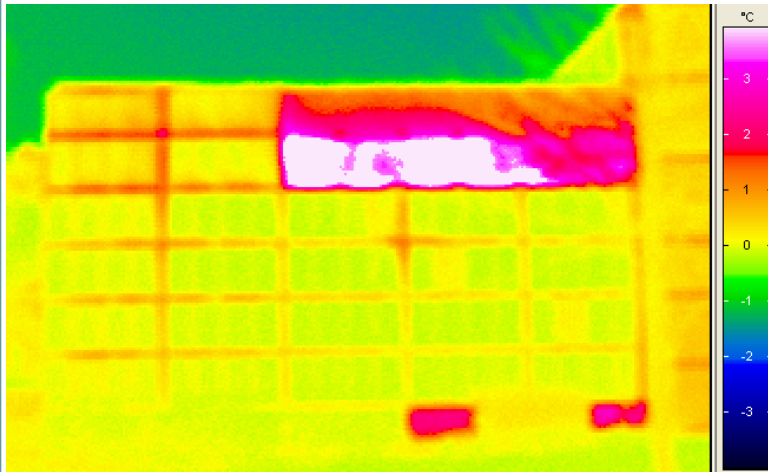
MEASUREMENT VS CALCULATION



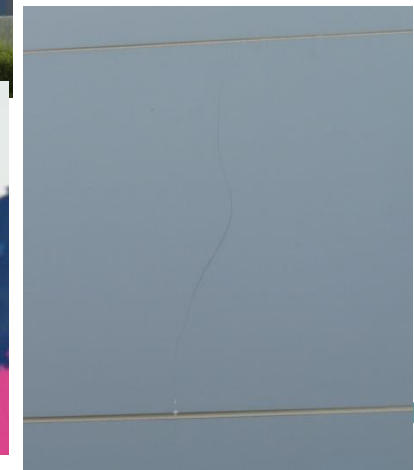
WB2



VIP1: LONG TERM BEHAVIOUR VENTILATION



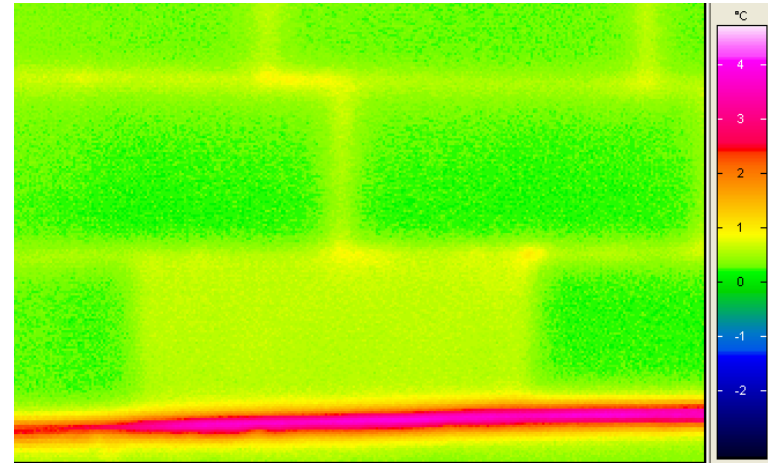
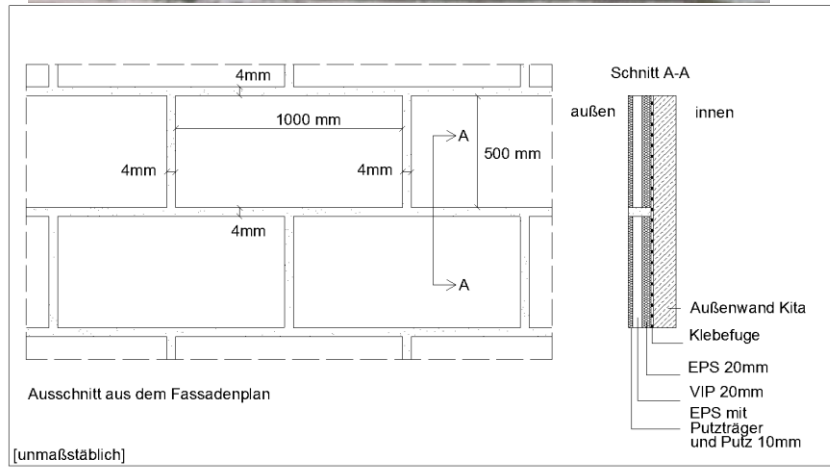
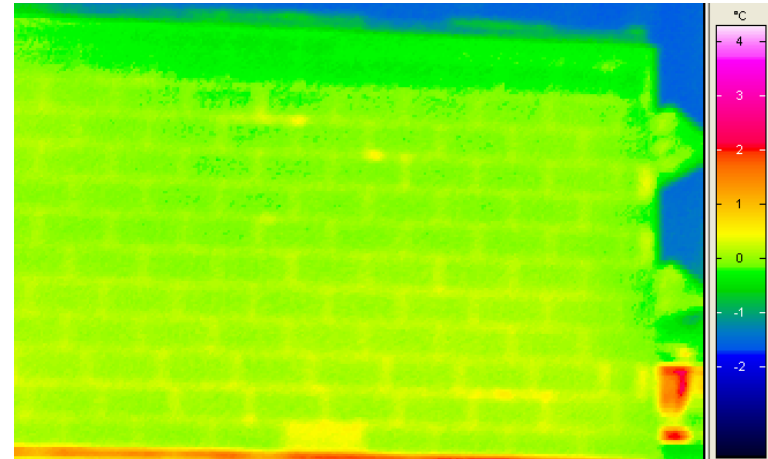
VIP1: LONG TERM BEHAVIOUR CRACKS



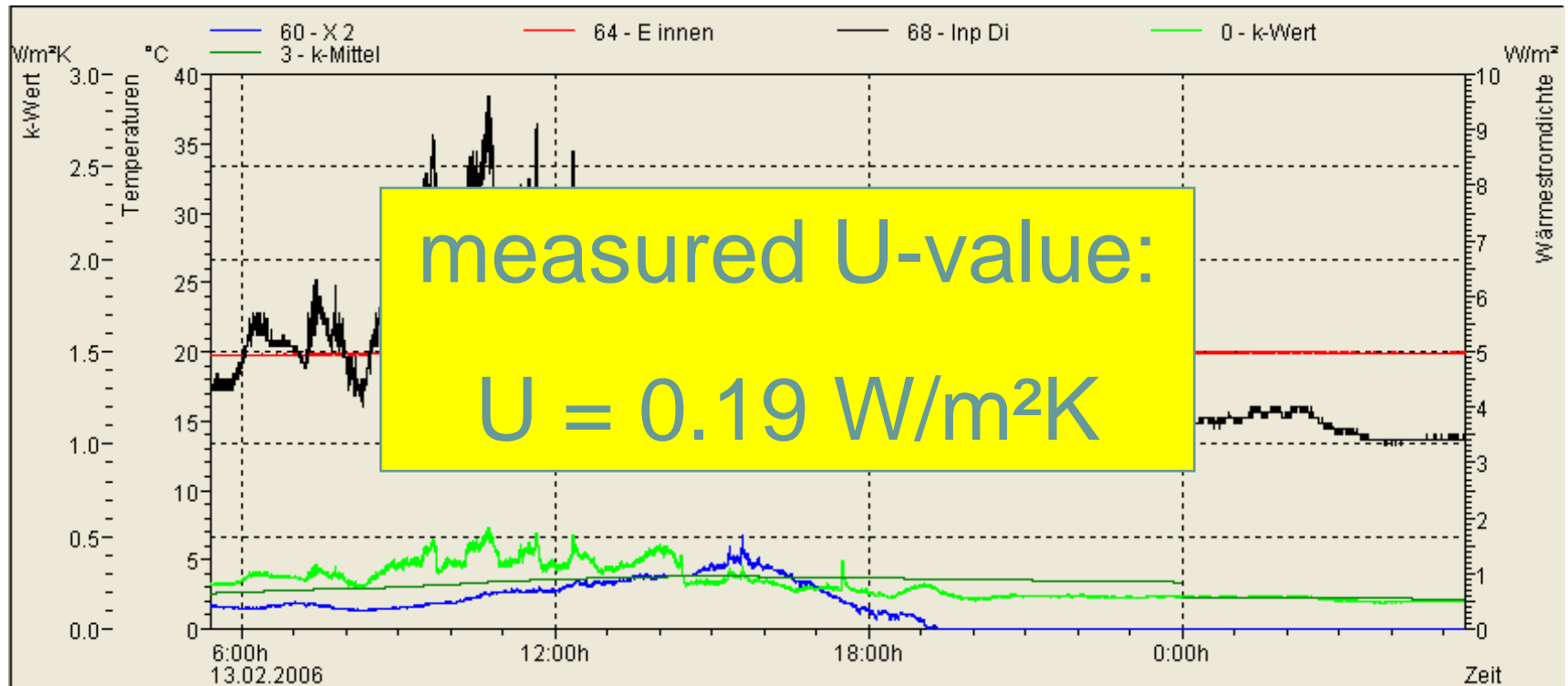
VIP2: ETICS WITH VIP-KERNEL



VIP1: FACADE PLAN , READY FACADE, AND THERMOGRAPHY

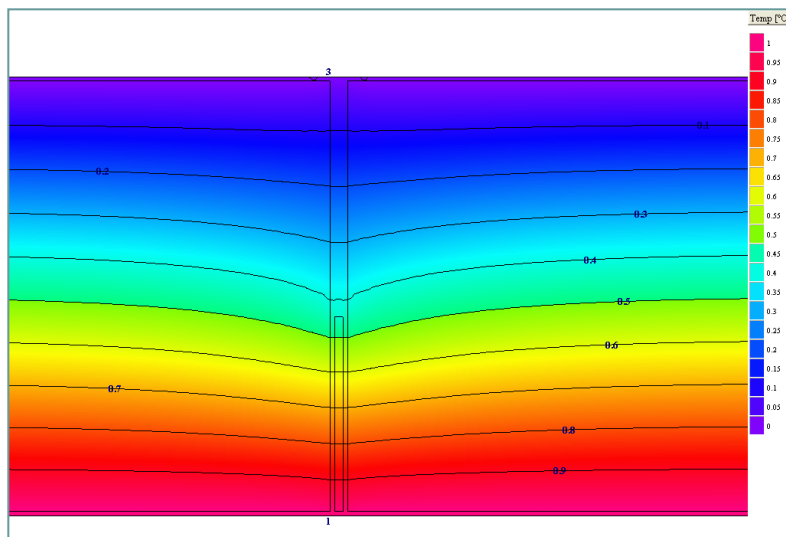
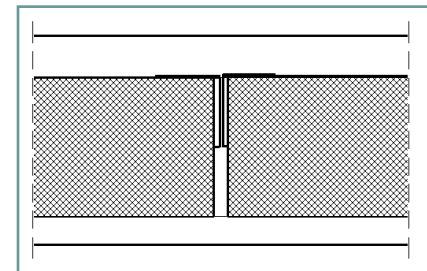


VIP2: U-VALUE



VIP2: INFLUENCE OF THERMAL BRIDGES

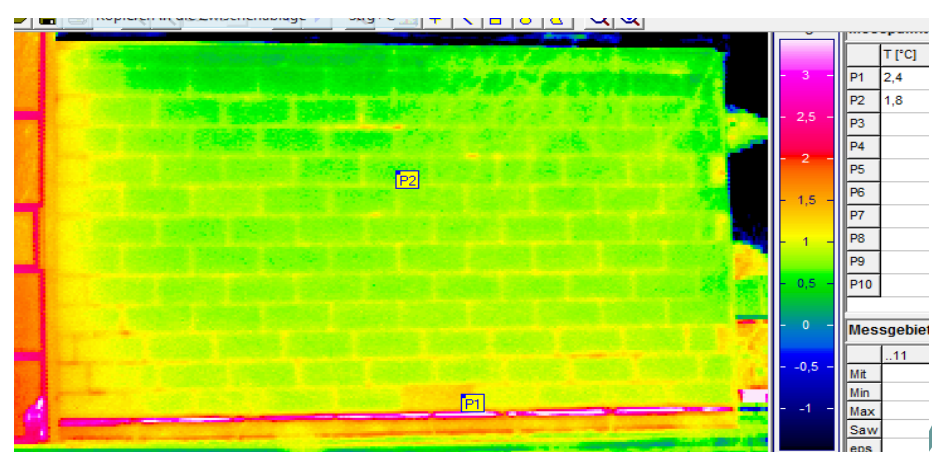
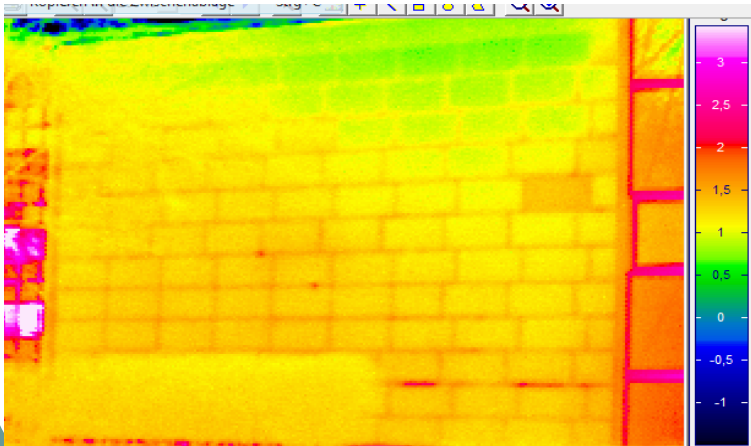
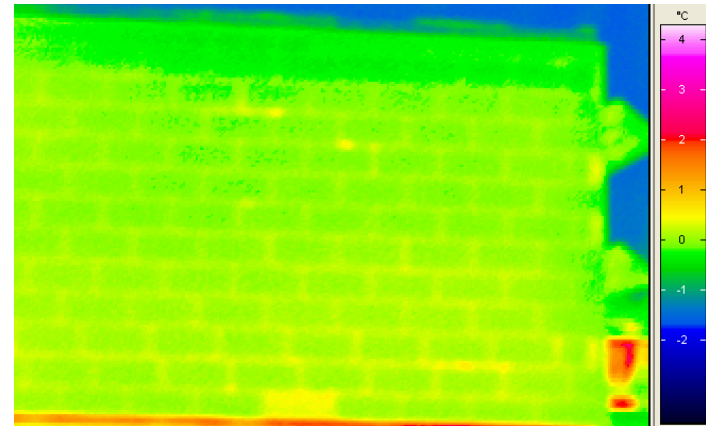
Western facade : ca. 140 m² (2 gable walls)
ETICS with VIP-kernel (Sto company)



	ψ -value [W/mK]	U-value [W/m ² K]	equival. thickness ETICS (WLG 040) d [mm]
VIP (center)	-	0,19	200
VIP (ThB)	0,00275	0,22	180

VIP2: LONG TERM BEHAVIOUR VENTILATION

2005



2009

CONCLUSION: VIP1

- + Easy to handle → structural glazing
- High performance for adjustable fixing system
- Avoid ventilation behind panels (mineral fibers)
- Reasons for cracks in ceramic plates unknown
- Surface too sensitive for impacts (Vandalism)
- Many VIPs ventilated
- Thermal bridges: extra energy loss 40%
 - not yet recommended
 - to be further developed

CONCLUSION: VIP2

- + common ETICS-technique
- + VIP protected
- + few ventilated VIPs
- + Thermal bridges: extra energy loss 10%
→ recommended

End

THANK YOU VERY MUCH
FOR YOUR ATTENTION

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