The EASIE Project Conclusions

EPAQ Congress 2011 in Rome

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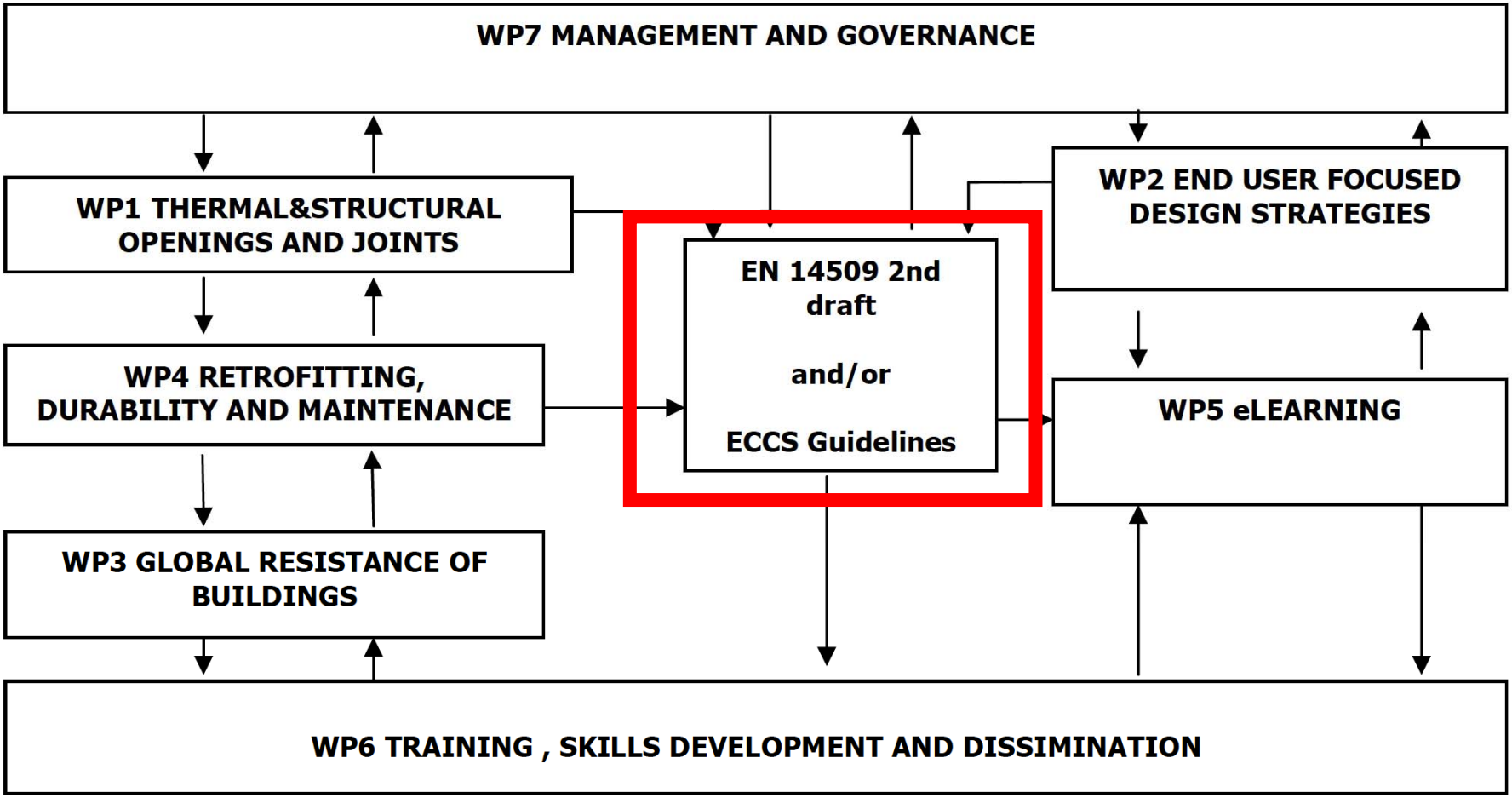
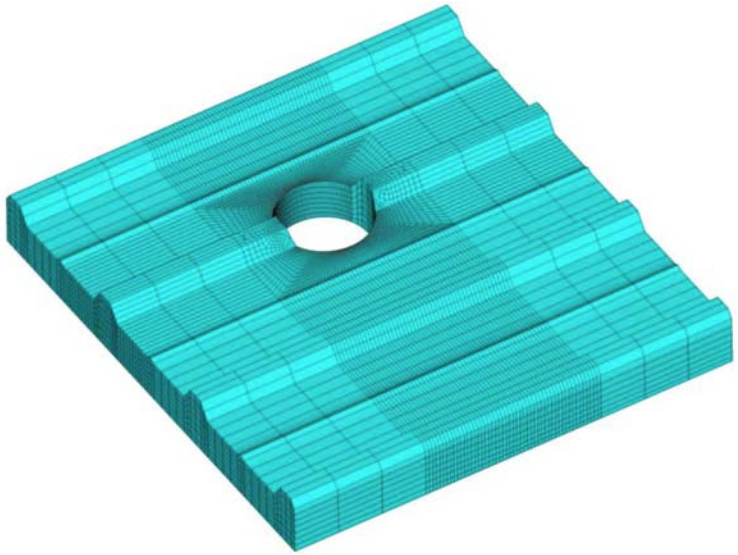
Input to Codification



Openings



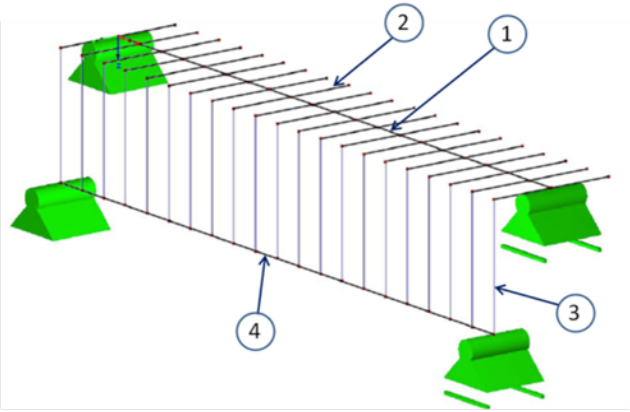
Small openings without frames:

Easy Equations for the design!

$$M_{od}(x) \leq \left(1 - 0{,}5 \cdot \frac{b}{B}\right) \cdot M_{ud}$$

$$V_{od}(x) \leq 0{,}85 \cdot \left(1 - \frac{A_{öffnung}}{A_c}\right) \cdot V_{ud}$$

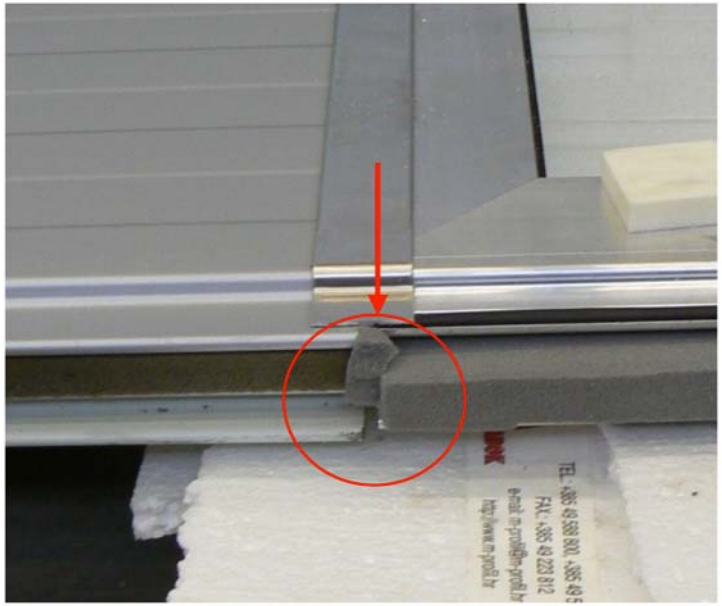
Openings



Calculation Models for different types of large openings

ECCS Recommendations

Openings



Design Guidelines for Joints and Openings

Design by Testing/Calculation

Practical Guidance for both methods
Draft for Annex F of EN 14509

CE

01234

AnyCo Ltd, PO Box 21, B-1050

XYZ Co

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01234-CPD-00234

EN 14509

Metal faced insulating panel for use in buildings.

Reference: KS1000. Insulation: PUR Density: 35 kg/m^3 Thickness: 80mm. Facings: Steel 0,5 mm external: 0,4 mm internal (EN 10326). Coating: PVC. Mass: 12 kg/m^2.

Span table

for: **Arcelor 1001 TS-roof-100** D = 140,69 mm $t_{nom,1}$ = 0,474 mm $t_{nom,2}$ = 0,47 mm

The stated values are only valid together with the input datas and safety factors according to clause A and B

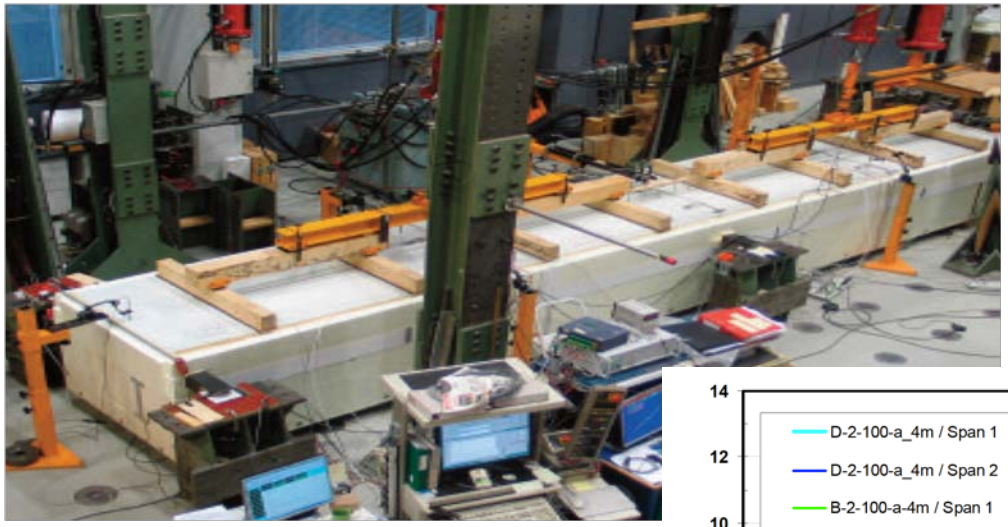
for: **One span panel**

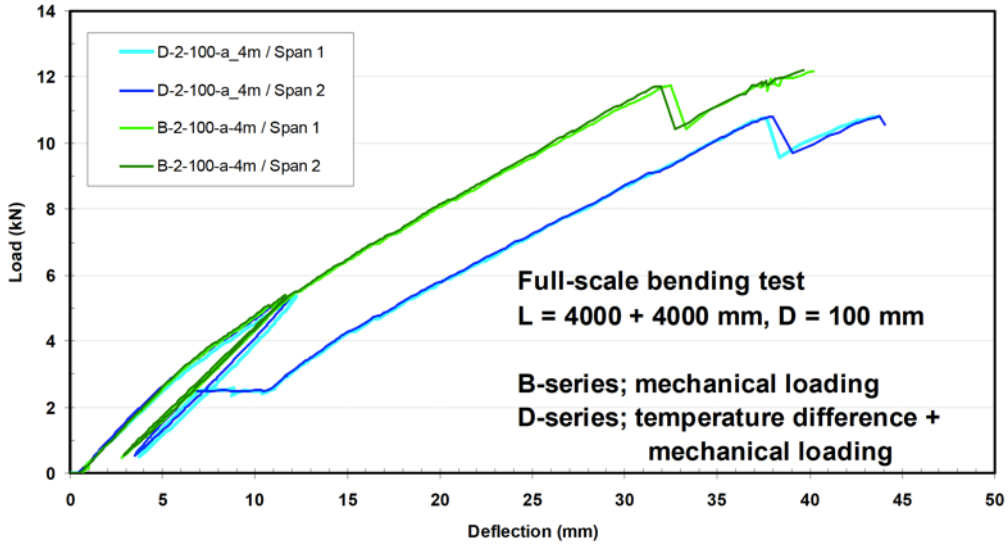
Colour group	Characteristical snow load [kN/m^2]													
	0,00	0,25	0,50	0,75	1,00	1,25	1,50	1,75	2,00	2,25	2,50	2,75		5,00
I	7,01	7,01	6,00	5,35	4,88	4,52	4,20	3,91	3,67	3,46	3,28	3,08		1,67
II	7,01	7,01	6,00	5,35	4,88	4,52	4,20	3,91	3,67	3,46	3,28	3,08		1,67
III	7,01	7,01	6,00	5,35	4,88	4,52	4,20	3,91	3,67	3,46	3,28	3,08	...	1,67

Colour group	Characteristical wind suction load [kN/m^2]													
	0,00	-0,25	-0,50	-0,75	-1,00	-1,25	-1,50	-1,75	-2,00	-2,25	-2,50	-2,75		-5,00
I	7,01	7,01	7,01	6,44	5,60	5,01	4,56	4,21	3,92	3,68	3,47	3,29		2,30
II	7,01	7,01	7,01	6,12	5,41	4,91	4,53	4,21	3,92	3,68	3,47	3,29		2,30
III	7,01	7,01	5,99	5,39	4,97	4,61	4,27	4,00	3,77	3,58	3,41	3,26	...	2,30

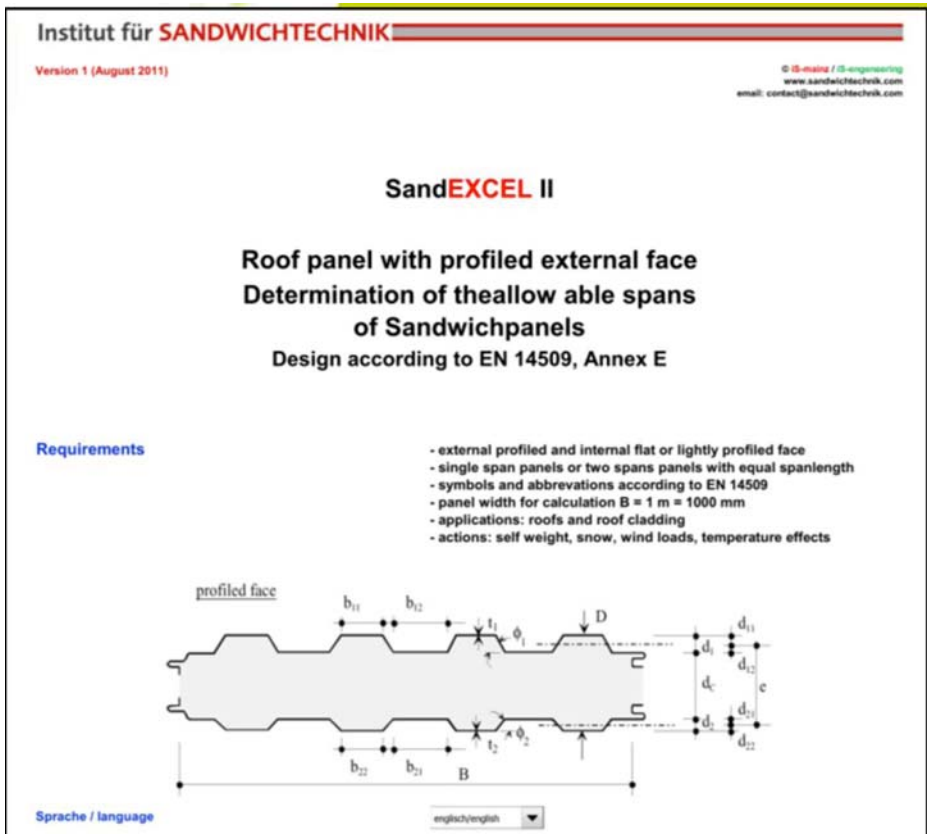
Design by Testing/Calculation

Test Method for Thermal Tests





Design by Testing/Calculation


Institut für SANDWICHTECHNIK

Version 1 (August 2011)

SandEXCEL II

Roof panel with profiled external face
Determination of theallow able spans
of Sandwichpanels
Design according to EN 14509, Annex E

Requirements

- external profiled and internal flat or lightly profiled face
- single span panels or two spans panels with equal spanlength
- symbols and abbrevations according to EN 14509
- panel width for calculation B = 1 m = 1000 mm
- applications: roofs and roof cladding
- actions: self weight, snow, wind loads, temperature effects

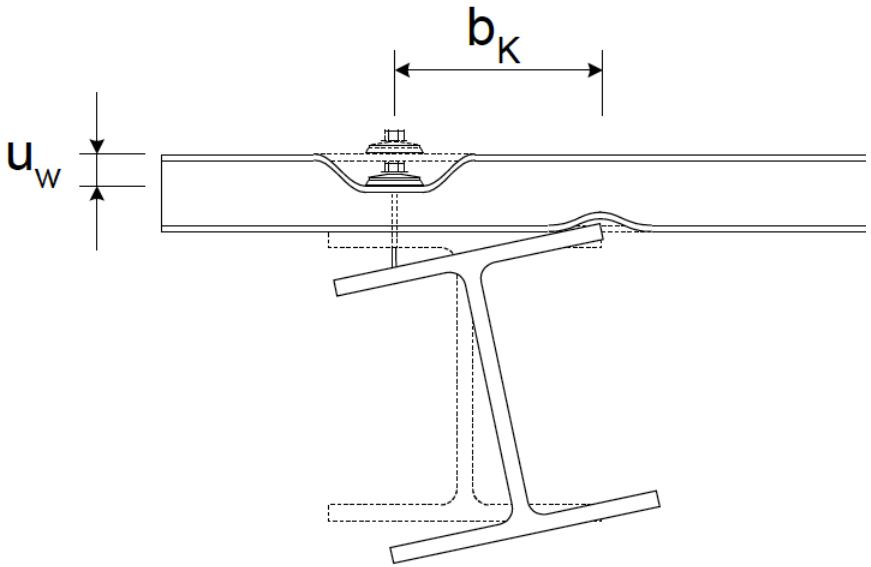
Sprache / language

Software for SME:

Excel Programme
for 1-span, 2-span Elements
with flat or profiled outer face

Global resistance

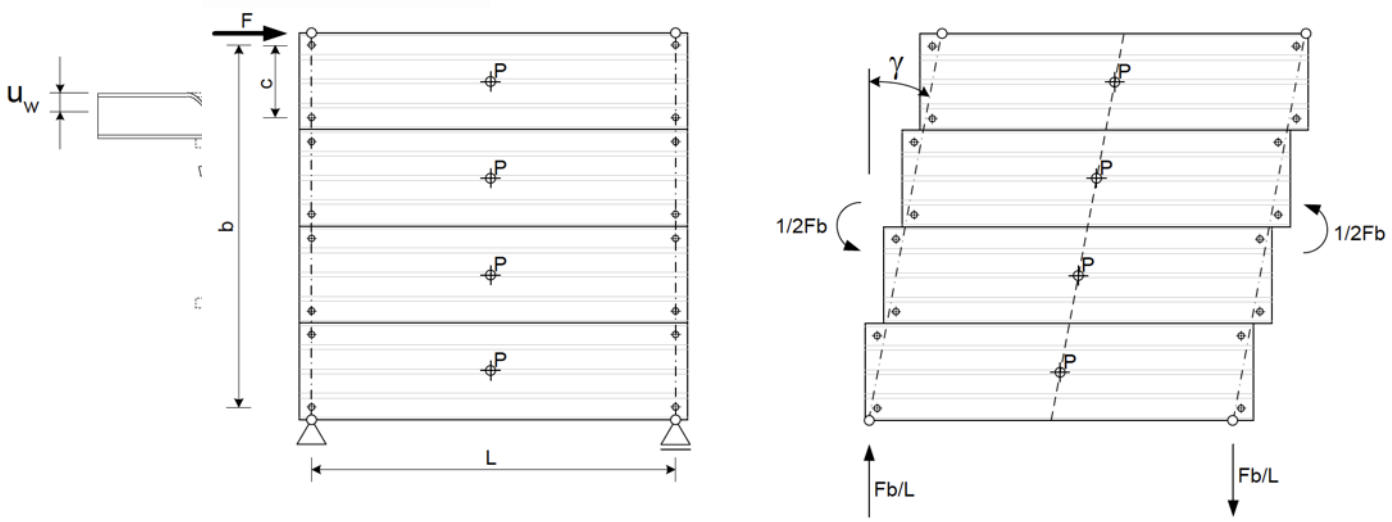
Stabilization of purlins



Updated values for torsional restraint
Modified calculation model

Global resistance

Calculation model for
In-plane shear resistance of Sandwich Elements



- For stabilization of purlins and columns
- Transfer of horizontal loads

Global resistance

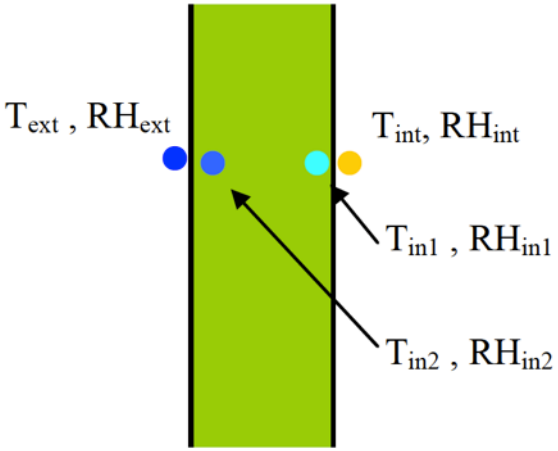
Axially loaded Sandwich Panels:

Calculation Model
including the influence of creeping and imperfection

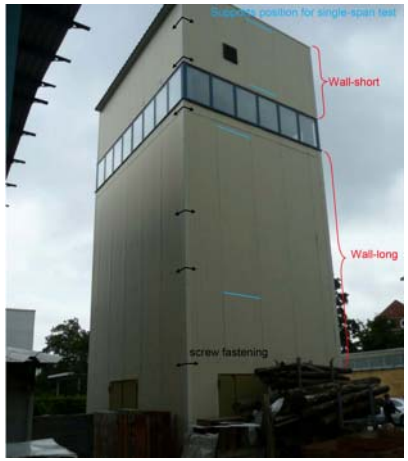
Recommendation for load introduction

Durability/Retrofitting

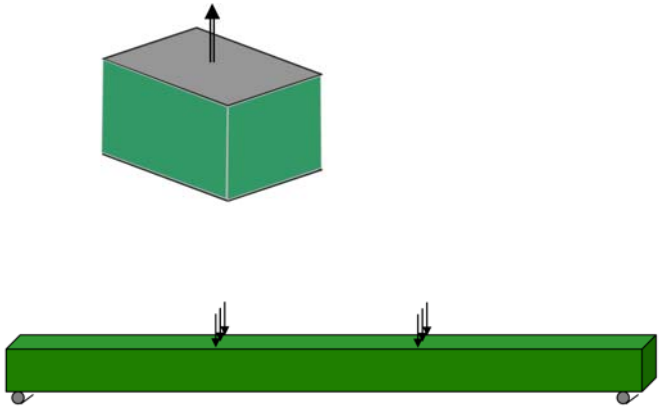
Based on extensive test series:



Monitoring of installed elements



Testing of used panels



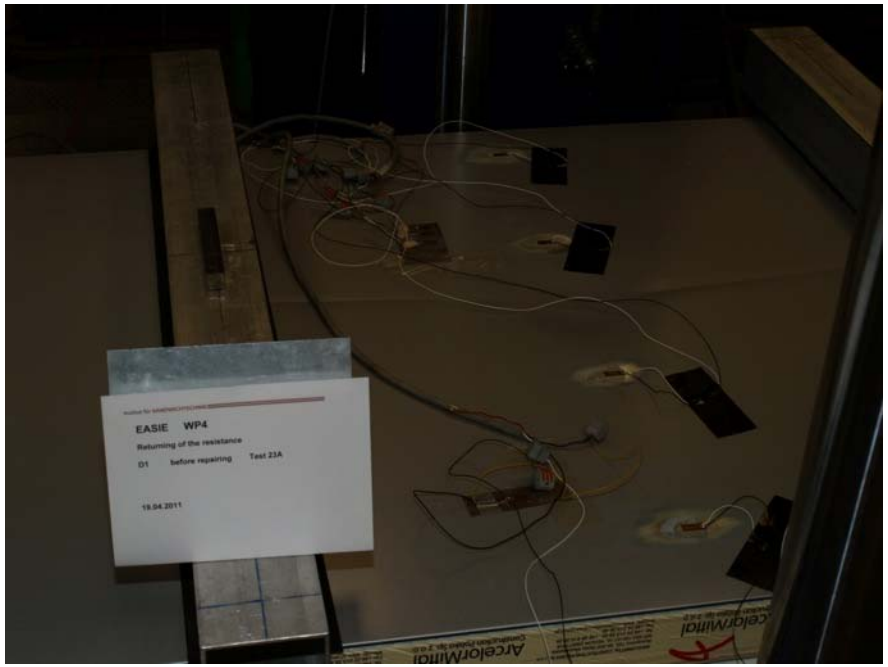
Artificial ageing of each kind of test specimen up to complete elements

Durability/Retrofitting

Based on extensive test series:

Recommendations for:
- Model to describe the effect of ageing
- Improved design expressions
- Evaluation of the remaining service life

Durability/Retrofitting



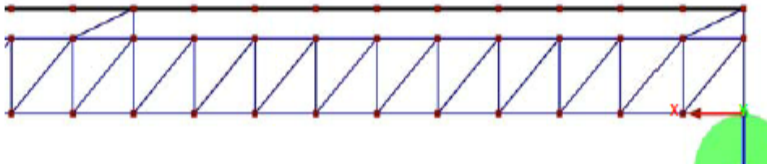
Recommendation for the reduction of wrinkling strength caused by defects

Guideline for Retrofitting

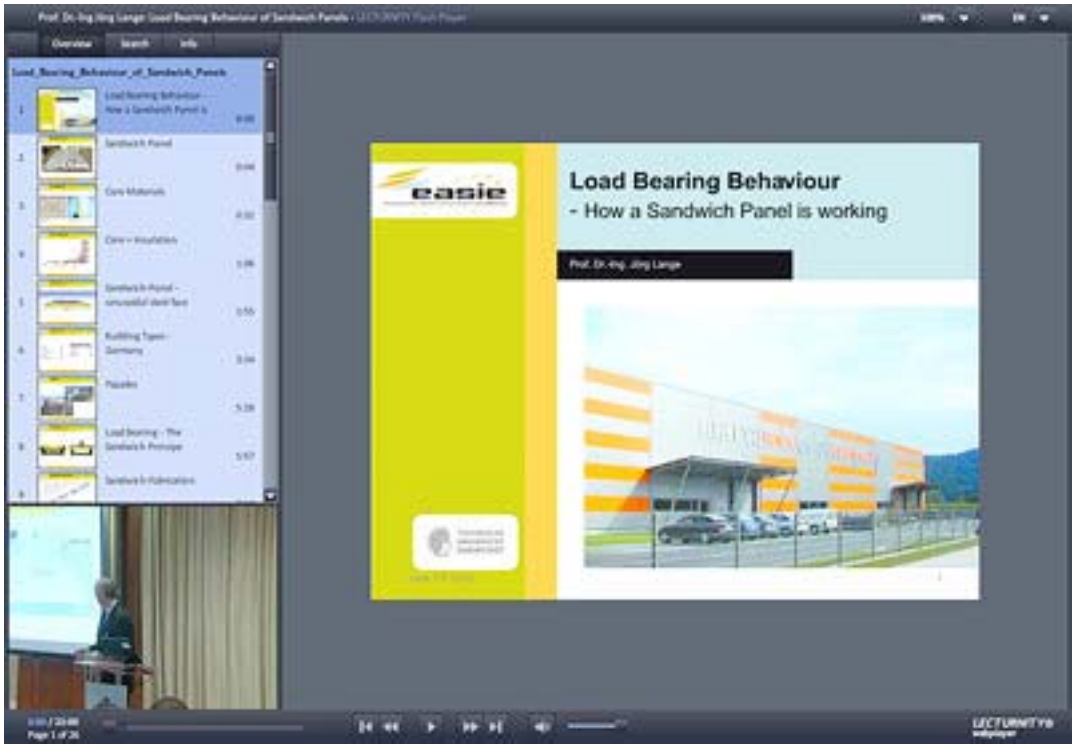
Durability/Retrofitting

New to Old Concept:

Calculation model and recommendations for
- stiffness of connection
- influence of temperature



E-Learning and Dissemination



www.easie.eu
E-learning based education on sandwich panels

EASIE Partners

Thanks to our partners!

Universities:
iS-mainz
KIT
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TU Darmstadt

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