

# The EPAQ Quality Label for panels and profiles



EN 14509, rev. 1  
The revision of the fire clauses  
of the sandwichpanel-standard

# [ EN 14509, revision of the fire clauses ]

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# [ EN 14509, revision of the fire clauses ]

Johan Schedin

- Graduated in 1977 as chemical engineer
- Worked at ISOCAB N.V. Belgium since then, till 2009
- ISOCAB became a part of the ThyssenKrupp group in the '90's
- Member of working groups in the old Panama Intl (Eureg 1 and Eureg 2)
- Member of ECCS-CIB during the preparation of the European recommendations for design of sandwichpanels
- Member since the start of CEN TC 128 SC11 as leader of the Belgian delegation, convenor of Working Group 3 „fire“
- Member of CEN TC 127 WG1 (resistance to fire) and WG4 (reaction to fire)

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# [ EN 14509, revision of the fire clauses ]

Johan Schedin

- President of EPAQ since the start in 2003
- Independent consultant since 01.12.2009  
CHEMACH bvba

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# [ EN 14509, revision of the fire clauses ]

## REVISION OF EN 14509, WHY ?

- many small mistakes were found in the standard
  - Different results in testing as usual (e.g. due to speed in compression of tensile properties)
  - Unclear explanations
- Some explanations in the standard leave space for different interpretations
- Some things can be simplified (e.g. no complete repetition of ITT for partial modifications)
- To work out the design by testing
- Several subjects could be part of the scope in the future
  - Curved panels
  - Perforated panels

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# [ EN 14509, revision of the fire clauses ]

## REVISION OF EN 14509,

The revision will take place in different phases :

- Urgent modifications, which may pass under UAP procedure for fast application, this may be applicable end of 2011

- Large modifications, which will need an enquiry and vote, not time schedule fixed yet.

Revision of the fire clauses will be mostly in the first phase.

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# [ EN 14509, revision of the fire clauses ]

## REVISION OF THE FIRE CLAUSES, WHY ?

Already in the first phase because a revision was promised to the European Commission in 2008, during a discussion whether or not to publish EN14509 in the OJEU

- Compromise offered by our industry,
  - Improve the safety
  - Take away doubts about correlation between SBI results and RCT, by changing prescriptions for the small flame test EN 11925-2
- 
- Other modifications now proposed to adapt to current situations and to improve the standard.

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# EN 14509, revision of the fire clauses

|  | SBI RR   | BRE   | Nordt est-(SP+ Eurima a) | Nordt est (SP+ Eurima)  | Nordt est (S P+Eurima)  | Nordt est (SP+Eurima)   | CPIF (VTT) | Panama (SP)                         | Eurima |
|--|--|-------|--------------------------|---|---|---|------------|-------------------------------------|--------|
| Core material                              | EPS  | XPS   | Stone wool               | polystyrene   | PIR   | PUR   | PUR        | XPS                                 | PIR    |
| Ignitability ISO 11925                     | ?  | ?     | -                        | Not done  | Not done  | Not done  | ok         | ?                                   | ?      |
| Conformity of the specimen at the EN 14509 | No (rr dated 1998). SBI carried out without vertical joint | ?     | -                        | SBI Carried out without vertical joint. New test on new (other) panel | SBI Carried out without vertical joint. New test on new (other) panel | SBI Carried out without vertical joint. New test on new (other) panel | ok         | No (see mail Van Hees 4 march 2006) | ?      |
| SBI (3 tests)                              | Bs2d0, E   | Bs1d0 | Bs1d0 or better          | Bs2d0, E,d0   | Bs3d0, E  | Bs2d0, Ds3d0  | Bs2d0      | E,d0                                | B,s2d0 |
| ISO 9705 (only one test)                   | C  | C     | B or better              | D   | B   | C   | B          | -                                   | C      |
| ISO 13784-1 (only one test)                | -  | -     |                          | C (some question about the mounti                                     | C(some question about the   | D(some question about the mountin g of the                            | B          | C(so me question about the          | C      |



# EN 14509, revision of the fire clauses

|                          | CPIF (VTT) | Nordtest (SP)   | Final report for sector Group C – sandwich panels 2003 -- BRE | Final report for sector Group C – sandwich panels 2003 -- BRE | Final report for sector Group C – sandwich panels 2003 -- BRE | Final report for sector Group C – sandwich panels 2003 -- BRE | SNPPA/ISOPA SP test |
|--------------------------|------------|-----------------|---|---|---|---|---------------------|
| Core material            | PUR        | Stone wool      | Modified phenolic   | PIR   | PUR   | Rock fibre  | PU                  |
| Ignitability ISO 11925-2 | made       | -               | done  | done  | done  | done  | done                |
| SBI                      | Bs2d0      | Bs1d0 or better | Bs1d0   | Bs2/s3 d0   | Bs2/s3d0  | Bs1 d0  | Bs3d0               |
| ISO 9705                 | B          | B               | -   | -   | -   | -   | -                   |
| ISO 13784-1 (SP)         | B          | -               | B   | B   | B   | B   | B                   |
| Conclusion               | Correlated | Correlated      | Correlated  | Correlated  | Correlated  | Correlated  | Correlated          |

# [ EN 14509, revision of the fire clauses ]

## REVISION OF THE FIRE CLAUSES, WHY ?

- Correlation proven when small flame test was passed on the naked core material,
- Correlation not yet proven when small flame test not passed on the naked core material,
- The Eurima tests based though, on partially wrongly mounted SBI tests without joint, and no flamability test on the core material

In order to avoid further discussion:

- Small flame test on naked core material
- The test is not end use condition, but for the product „as put on the market“

# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING THE GENERAL CLAUSES OF THE STANDARD

### Fire characteristics

#### **General**

~~Sandwich panels shall be tested in end use application as far as possible. This means the performance of an assembly shall be assessed i.e. the assembly that is to be installed in a building, including the product and its coatings, factory applied seals, standard joints, representative flashings, and a method of fixing as appropriate to the test.~~

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# EN 14509, revision of the fire clauses

## CHANGES CONCERNING THE GENERAL CLAUSES OF THE STANDARD

### Fire resistance

Where required, the fire resistance classification of the product shall be determined according to EN 13501-2.

The test methods for sandwich panels shall be in accordance with the following standards:

EN 1364-1 (non-loadbearing walls) together with the additions set out **in C.2.12 and C.2.3**;

EN 1364-2 (ceilings) together with the additions set out in **C.2.12**;

CEN/TS 13381-1 (ceilings – horizontal protection) **together with the additions set out in C.2.1**;

**CEN/TS 13381-2 (walls)**

EN 1365-2 (loadbearing roofs) together with the additions set out in **C.2.12 and C.2.24**;

EN 14135 (fire protection ability).

# EN 14509, revision of the fire clauses

## CHANGES CONCERNING THE GENERAL CLAUSES OF THE STANDARD

### External fire performance – roofs

Where the manufacturer wishes to declare external fire performance (e.g. when subject to regulatory requirements), the product shall be tested and classified in accordance with EN 13501-5.

Sandwich panels that satisfy the criteria set out in C.3.1 shall be considered to satisfy the requirements for the characteristic external fire performance without the need for further testing in accordance with Decision 2006/600/EC. These products shall be given a B<sub>ROOF</sub> **classification in all the test methods 1, 2 and 3**. Test arrangements for external fire performance tests shall be in accordance **ENV-TS 1187** together with the additions set out in C.3.2 to C.3.5.

Test arrangements for external fire performance tests shall be in accordance **ENV TS 1187** together with the additions set out in C.3.2 to C.3.5.

# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

**Reaction to Fire**  
**Resistance to Fire**  
**External Fire (Roofs)**

**The modifications discussed so far :**

**There may be changes again, after the WG 1 meeting which is foreseen 3 & 4 november in London.**

# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Fire test EN 13823 (SBI) – specimens and mounting and fixing

#### General

...

For internal end use applications, where both faces may be exposed to the internal fire, the following shall apply: products with similar facings (e.g. same metal type, profile and coating – see Table C.1) **and with symmetrical geometry of the panel to panel joint** shall be tested on one side only;

products with asymmetrical or dissimilar facings (e.g. different types of material, profile geometry, or coating – see Table C.1) shall be tested **at on** both sides. **In this case two options are possible for the declaration:**

# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Fire test EN 13823 (SBI) – specimens and mounting and fixing

#### General

...

either the worse test result shall be used to declare the reaction to fire class of the panel (valid for both faces exposed);

or a declaration of the reaction to fire class of each face shall be made, provided that the identification of the faces is clearly visible in the marking and labeling of the panel

In the case of a Euroclass F declaration for one of the faces, no test needs to be performed on that face.

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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Fire test EN 13823 (SBI) – specimens and mounting and fixing

...

### Mounting and fixing

### General configuration

### General

Sandwich panels shall **either** be installed and fixed as described in EN 13823 in the configuration shown in Figure C.1 and in accordance with C.1.1.3.1 and C.1.1.3.2. ~~, or installed in a manner representative of their end use application(s).~~

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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### **Reaction to fire**

### **Fire test EN 13823 (SBI) – specimens and mounting and fixing**

...

Panels used without corner flashings in end use shall be tested in accordance with EN 13823 without **corner** flashings. This shall be recorded on the test report.

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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Fire test EN 13823 (SBI) – specimens and mounting and fixing

...

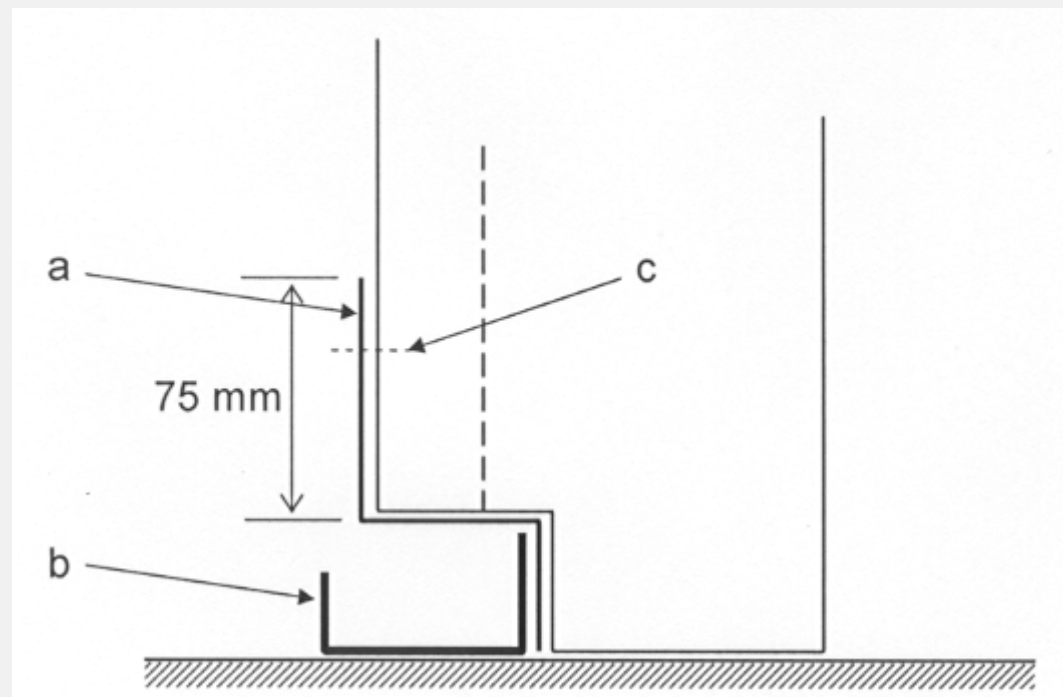
Non-flat products shall be reshaped (cut-back) to partly extend over the U-profile to the side of the burner to fulfil this requirement (see Figure C.2). A product shall not extend over the burner (i.e. maximum extension over the U-profile is 40 mm).

The cut section shall be covered with a flashing (Figure C.2 key a) manufactured from the same material as the face to be tested. **The bottom edge of the panel behind this flashing shall not be covered (see Figure C.2).**

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## [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C



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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Fire test EN 13823 (SBI) – specimens and mounting and fixing

...

Sandwich panels that are normally held together with an internal locking system, i.e. ~~some cold store panels wall panels in controlled environmental chambers~~, shall be fixed together using the locking method. ~~Panels shall be cut so that the locking system is positioned symmetrically between the top and bottom of the test sample.~~

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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Fire test EN ISO 11925-2 (ignitability test)

### Specimen

...

~~For applications where the cut edges are protected in end use, metal flashings may be used in the test to cover the cut edge and shall be prepared to suit the thickness of the specimen (see C.1.2.2 b)).~~

~~In certain end use applications the cut edges are protected by flashings manufactured from other materials, e.g. plastics, that are different to the metal facings of the sandwich panel. For these applications specimens shall be prepared with the end use flashing covering the cut edge to be tested (see C.1.2.2 b)).~~

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[ EN 14509, revision of the fire clauses ]

CHANGES CONCERNING IN ANNEX C

**Reaction to fire**

**Fire test EN ISO 11925-2 (ignitability test)**

**Specimen**

...

**Method**

Testing shall be in accordance with EN ISO 11925-2. ~~end use conditions, where the insulating core may be unprotected or protected by flashings.~~

~~Method for unprotected applications without flashings: The flame shall be applied both to the end (cut edge) representing all applications and to the surface of the specimen.~~

~~The surface flame attack shall be as described in EN ISO 11925-2.~~

[ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Fire test EN ISO 11925-2 (ignitability test)

#### Specimen

...

#### Method

...

In the edge exposure part of the test the flame shall be applied directly to the insulating core of the sandwich panel without any facing, flashing or covering and ~~The cut-edge flame attack~~ shall be carried out on the middle of the thickness of the insulating core (specimen turned 90° (see Figure C.3). For this European Standard, other layers i.e. adhesive shall be considered non-substantial and shall not be tested individually.



# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### **Reaction to fire**

### **Fire test EN ISO 11925-2 (ignitability test)**

### **Specimen**

...

### **Method**

...

In the case of panels that are designed and manufactured where the core material is covered by the facings on all sides and will not be cut or perforated in end use application, only the surface flame attack shall be carried out

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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Fire test EN ISO 11925-2 (ignitability test)

### Specimen

### Method

...

In the case of panels that are designed and manufactured where the core material is covered by the facings on all sides and will not be cut or perforated in end use application, only the surface flame attack shall be carried out.

~~Method for applications with protective flashings:~~

~~The flame shall be applied both to the surface of the specimen and to the protected cut edge of the specimen.~~

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# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Fire test EN ISO 11925-2 (ignitability test)

### Specimen

### Results

The results shall be recorded for both surface and edge flame attack test methods.

The results shall be valid **for all applications whether the edge of the sandwich panels is either unprotected or protected by a metal facing or separate edge flashing. as follows:**

**In the case of panels that are designed and manufactured where the core material is covered by the facings on all sides, the result shall be valid only for that end use application.**

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# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Fire test EN ISO 11925-2 (ignitability test)

### Specimen

### Results

...

~~for tests where the edge flame attack is on the unprotected edge, the classification shall be valid for all end use applications;~~

~~for tests where the edge flame attack is on an edge protected by steel flashings, the classification shall be valid for all steel protective flashings;~~

~~for tests where the edge flame attack is on an edge protected by other types of flashings e.g. plastic, aluminium, the classification shall be valid for the type of flashing tested and also for steel protective flashings.~~

~~NOTE 1 — The manufacturer may declare any number of alternative classification values with associated definitions.~~

~~The classification shall be accompanied by a note describing the materials tested:~~

~~in case a) above — ‘Classification result’ (all end use applications);~~

~~in case b) above — ‘Classification result’ (with steel protective flashings);~~

~~in case c) above — ‘Classification result’ (with (e.g. plastic PVC 2 mm) protective flashings.~~

~~NOTE 2 — Protected edge flashings should be of the same material as the corner flashings, where they are used in EN 13823.~~

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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Direct field of application of reaction to fire test results

#### Joint design

Similar types of joint of the tested face with facings of the same profile  
– see ‘Facings’ above and Fig C.4.

Butt joint (Types 1 and 2).Worst case scenario

Joint Types 4, 5 and 6

~~Valid within normal tolerances (see 5.2.5). Not valid for changes of shape or configuration~~

Valid for all types of joint

Valid for similar types of overlapping joint where the metal overlapping tongue is  $\geq 15$  mm

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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

#### Direct field of application of reaction to fire test results

Adhesive (where relevant)

~~Amount and type of adhesive~~

Change of tested quantity and/or type:

a) Quantity only

b) Type only <sup>a</sup>

c) Quantity and Type <sup>a</sup>

~~Valid for same amount of adhesive (same PCS in) or lower~~

~~Valid for PCS values lower than the tested adhesive within manufacturing tolerances~~

Valid for lower quantity of tested adhesive (expressed as g/m<sup>2</sup>)

Valid for an alternative adhesive with calorific value  $\leq$  to that tested (expressed as PCS in MJ/kg)

Valid for an alternative adhesive and different quantity, with calorific value  $\leq$  to that tested (expressed as PCS in MJ/m<sup>2</sup>)

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[ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

#### Direct field of application of reaction to fire test results

...

b) panels  $\geq 100$  mm thickness

The results from **any** specimens **in the range**  $100 \leq D \leq 150$  mm in thickness shall be valid **for any all** panels greater than 100 mm in thickness

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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Reaction to fire

### Direct field of application of reaction to fire test results

...

~~Protection over cut edges (C.1.2)~~

~~a) no flashings in EN ISO 11925-2~~

~~Valid for all end use applications~~

~~b) plastic or other flashings~~

~~Only valid for the same material as that tested~~

...

<sup>a</sup> PCS values expressed as PCS in MJ/m<sup>2</sup> shall be calculated using the maximum application rate, as stated in the manufacturing specification.

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# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### **C.2.3 Fire resistance test EN 1364-1 – Walls. Supplementary requirements for testing non-loadbearing, self-supporting sandwich panels as external or internal walls supported by vertical structural elements**

##### **C.2.3.1 General**

The following comments and mounting and fixing rules give supplementary guidance specific to sandwich panels to the specifications described in EN 1364-1 Annex B

##### **C.2.3.2 Size of specimen**

The dimensions of the specimen/panel assembly shall be at least 3 m x 3 m and be sufficient fill the opening in the test frame.

##### **C.2.3.3 Supporting structure**

The supporting structure shall have an r-value classification equal to or greater than the E-value of the panels.

# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### C.2.3.4 Mounting and fixing rules

##### C.2.3.4.1 Exposed face

The exposed face to be tested for sandwich panels used in external and internal roof and wall applications shall depend on the end use conditions and the regulatory requirements in the Member State of use. There may be a requirement to test both faces. However if the faces are symmetrical and have the same composition the test for one side shall be sufficient for classification.

Where one face is the external face of the building, this face ~~can~~ shall be tested as the exposed face using the time-temperature curve for external applications [EN 1362-2].

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# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### C.2.3.4.2 General Fixing rules

The number of fixings shall not be greater than those used in end use applications. The diameter of the fixings used shall not be larger than fixings used in end use applications.

Fixings may be used independently to secure both the exposed and non-exposed facings (typically for partitions). Alternatively a 'through-fixing' can be used to secure both faces as for external claddings. The through-fixing method represents the worst case and results are valid for the independently secured method.

Fixing between panels (stitching) may be used as in end use conditions but shall be declared in the classification report.

Fixings shall only be protected inside the furnace if the same method is applied in end use.

**NOTE** It may be necessary to use a method of fire protection for both flashings and fixings to obtain classes of fire resistance greater than 2 h.

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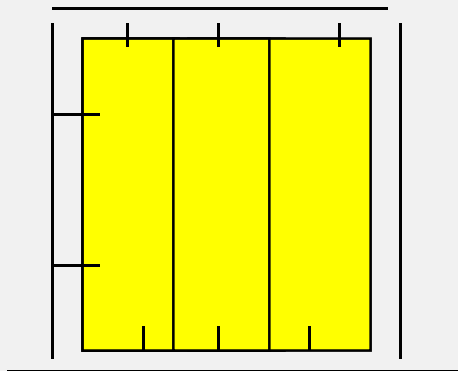
# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### C.2.3.4.3 Wall panels in vertical orientation

The specimen shall be mounted with one fixed and one free vertical side-edge (see figure C.5). This covers the majority of end use applications. However both sides-edges can be unrestrained where this conforms to the end use application.



Free side-edge

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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### **C.2.3.4.3.1 Fixing at the top of the specimen – vertical orientation**

The method of fixation at the top of the specimen shall be to an angle profile or between angle profiles e.g. where the wall is a partition between a floor and a ceiling. Any gap above the panels shall be firestopped (as in practice in the case of partitions). The method of fixing the angle profile(s) to the concrete test frame shall simulate a rigid supporting structure.

**NOTE** The gap above the panels does not provide a means for expansion because the movement of the panel is restrained by the fixings and any expansion results in bowing of the panel.

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# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### **C.2.3.4.3.2 Closure of the vertical free edge – vertical orientation**

The vertical free edge is shown in Fig.C.5. The free edge (min. 30 mm gap between specimen and frame) shall be filled with a non-combustible insulating material class A2 (e.g. mineral wool). This material shall be held in place with profiles that are fixed to the sandwich panel, not fixed to the concrete test-frame. Alternatively two layers of MW with one side of aluminium foil to provide less friction etc may be used.

(NOTE The free edge is NOT a part of the test- specimen.

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# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### **C.2.3.4.3.3 Fixing at the bottom of the specimen – vertical orientation**

Panels shall be fixed to the bottom of the concrete test frame using at least one angle profile on the exposed side of the panels and using either through-fixings or fixings on the exposed side only. The angle profile shall be sufficient to simulate a rigid construction element of the supporting structure and shall be installed with the horizontal leg under the panel. For partitions, this is the most practical way and represents a worst-case scenario regarding thermal bridging.

Angle profiles on the exterior side or a U-profile can also be used. A U-profile covers all methods of fixation. Panels representing external applications are generally fixed at the bottom with the angle profile turned away from the panel (exposed side). However this is not the worst-case condition if both applications are considered in the test.

**NOTE** A filling with a non-combustible insulating material class A2 may be used under the panels

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# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### **C.2.3.4.3.4 Fixing along the fixed vertical edge of the specimen – vertical orientation**

At the fixed vertical edge angle profile(s) shall be fixed to the concrete test-frame to restrain the movement of the panel in the horizontal direction. The panel shall be fixed to the angle profile(s) as in end use condition. This method of fixing of the panel is considered to be equally valid for partition or external wall applications. The angle profile(s) shall not cover the panel facing more than they would in end use conditions.

If a panel has to be cut in width to fit the assembly into the test-frame, the cut panel shall be mounted on the restrained vertical side

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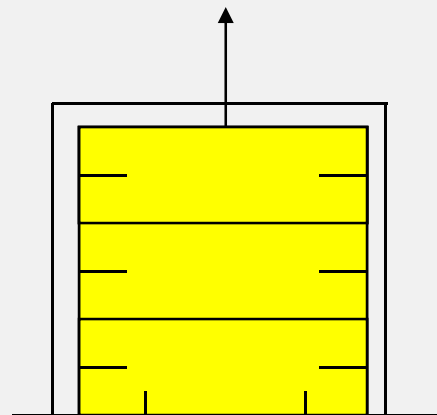
# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C Resistance to fire

### . C.2.3.4.4 Wall panels in horizontal orientation

The specimen shall be mounted with one fixed (bottom) and one free (top) horizontal edge (see figure C.6). This covers the majority of end use applications. However both sides edges can be unrestrained where this conforms to end use application.

Free sideedge



**Fig C.6 Mounting and fixing of wall panels with horizontally orientated joints**

# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### **. C.2.3.4.4.1 Fixing along the fixed vertical side of the specimen – horizontal orientation**

At the fixed vertical edge angle profile(s) shall be fixed to the concrete test-frame to restrain the movement of the panel in horizontal direction. The panel shall be fixed to the angle profile(s) as in end use condition. This method of fixing of the panel is considered to be equally valid for both partition or external wall applications. The angle profile(s) shall not cover the panel facing more than they would in end use conditions

**NOTE 1** The fixing of both the exposed and non-exposed side either independently or using a through-fixing are expected to have the same effect. The first method is used more often in partitions, the second one in external applications.

**NOTE 2** Expansion movement in the panels can be expected at both ends between the concrete frame and the panel edge

# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### C.2.3.4.4.2 Closure at the free top edge of the specimen – horizontal orientation

The top panel shall be either the smallest width panel or the panel with the cut edge. This corresponds with end use applications where the full panel width is always at the bottom. The gap between the top panel and the frame shall be at least 30 mm and shall be filled with a non-combustible insulating material class A2 (e.g. mineral wool). This material shall be held in place with profiles that are fixed to the sandwich panel, not fixed to the concrete test-frame.

**NOTE** Expansion movement can be expected between the panel and the frame as experienced in the end use applications (in case of internal partitions against a ceiling or horizontal construction).

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# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C Resistance to fire

### C.2.3.4.4.3 Fixing at the bottom of the specimen – horizontal orientation

Panels shall be fixed to the bottom of the concrete test frame using at least one angle profile on the exposed side of the panels and using either through-fixings or fixings on the exposed side only. The angle profile shall be sufficient to simulate a rigid construction element of the supporting structure and shall be installed with the horizontal leg under the panel. For partitions, this is the most practical way and represents a worst-case scenario regarding thermal bridging.

Angle profiles on the exterior side or a U-profile can also be used. A U-profile covers all methods of fixation. Panels representing external applications are generally fixed at the bottom with the angle profile turned away from the panel (exposed side). However this is not the worst-case condition if both applications are considered in the test.

**NOTE** A filling with a non-combustible insulating material class A2 may be used under the panels. If in end-use conditions the panel is not fixed to the floor, the filling can be held in place at the bottom by profiles that are not fixed to the concrete test frame.

# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### **C.2.4 Fire resistance test EN 1365-2 – Roofs**

##### **C.2.4.1 General**

Sandwich panel roofs may be subject to ~~superimposed~~ loads. Only in exceptional designs (e.g. acting as diaphragms) do they carry part of the primary load of the building structure.

~~Loading in accordance with the EN 1363-1 and EN 1365-2 test refers to superimposed loads only.~~

##### **C.2.4.2 Apparatus**

The framework shall be designed to support the panel assembly as in end use. ~~Panels shall be fixed to the framework on two sides at either end of the panel. The other two sides shall be unrestrained~~

The specimen shall be tested in the horizontal position.

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# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### Field of application of fire resistance test results

##### C.2.5.1 Wall panels

The field of application of the fire resistance test results for sandwich panels used for wall applications shall be in accordance with EN 15254-5 together with the additional in field of application in Table C.2.

#### Table C.2 – Fire resistance: Additional direct field of application of test results – wall panels

##### Parameter

##### Factors

##### Validity of test

##### Metal facings

##### Surface coating – tested side

##### Valid for all coatings

##### a) colour of coating

##### Valid for all colours

##### b) un-coated facings

##### Tests on coated facings are not valid for un-coated facings

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# EN 14509, revision of the fire clauses

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### Field of application of fire resistance test results

##### C.2.5.2 Ceiling panels

The field of application of the fire resistance test results for sandwich panels used for ceiling applications for the standard parameters for sandwich panels described in Table C.2-3 shall apply.

#### Parameter Factors Validity of test

Joint design Valid within normal tolerances (see 5.2.5)

Not valid for changes of shape or configuration

~~Orientation of panels Vertical or horizontal joints between sandwich panels Valid for both orientations (EN1364-1:1999, 13.1 i))~~

~~Fixing distance and spans a) External applications Valid for fixing centres and spans less than those tested~~

~~b) Internal applications Panels tested at 3 m are valid for applications up to 4 m spans providing the conditions in EN 1364-1 are satisfied~~

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[ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C

### Resistance to fire

#### C.2.5.3 Roof panels

This standard does not provide rules for direct field of application of fire resistance test results for roof panels, which are considered loadbearing.

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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C Fire tests ~~EN~~ TS 1187 - external fire performance for roofs

...

~~a return overlap extending 15 mm minimum down the opposite face of the crown (sidelap – longitudinal joint);~~

~~————— or a metal cover cap completely covering the joint crowns at the longitudinal joint;~~

~~————— or a raised standing seam at the longitudinal joint;~~

~~where applicable, an end overlap greater than or equal to 75 mm;~~

~~a minimum nominal thickness for the external facing of 0,4 mm (steel and stainless steel) and 0,9 mm (aluminium) in accordance with 5.1.2.1, 5.1.2.2 and 5.1.2.3;~~

minimum thickness 0,4 mm for facings of steel and stainless steel;

minimum thickness 0,9 mm for facings of aluminium;

at each longitudinal joint between two panels an overlap of the external metal facing extending across the crown and a minimum 15 mm down the opposite face of the crown,

or a metal cover cap completely covering the joint crown,

or a raised standing metal seam along the joint;

at each transverse joint between two panels an overlap of the external metal facing of at least 75 mm;

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# [ EN 14509, revision of the fire clauses ]

## CHANGES CONCERNING IN ANNEX C Fire tests ~~EN~~ TS 1187 - external fire performance for roofs

...

~~a return overlap extending 15 mm minimum down the opposite face of the crown (sidelap – longitudinal joint);~~

~~————— or a metal cover cap completely covering the joint crowns at the longitudinal joint;~~

~~————— or a raised standing seam at the longitudinal joint;~~

~~where applicable, an end overlap greater than or equal to 75 mm;~~

~~a minimum nominal thickness for the external facing of 0,4 mm (steel and stainless steel) and 0,9 mm (aluminium) in accordance with 5.1.2.1, 5.1.2.2 and 5.1.2.3;~~

minimum thickness 0,4 mm for facings of steel and stainless steel;

minimum thickness 0,9 mm for facings of aluminium;

at each longitudinal joint between two panels an overlap of the external metal facing extending across the crown and a minimum 15 mm down the opposite face of the crown,

or a metal cover cap completely covering the joint crown,

or a raised standing metal seam along the joint;

at each transverse joint between two panels an overlap of the external metal facing of at least 75 mm;

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## [ EN 14509, revision of the fire clauses ]

AoC Level for reaction to fire : 1(+) or 3 ?

-Discussion still going on in WG3 and WG1

-Concern of the laboratories : they do not necessarily agree with the choice of the Producer. (N491 of the FSG)

-A note has been circulated by which the Notified Bodies take decision = not legal

-Better produce guideline in the product standard

-NOT CLEAR where it will lead :

-Can the producer affect the fire performance , working with preformulated PU system

-How important is the glue layer in MIWO panels

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[ EN 14509, revision of the fire clauses ]

END of this presentation,

**Thank you all for your attention,**

Johan Schedin

Please feel free to ask questions or discuss

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