



# FIRE: EN 13501 – THE EUROPEAN STANDARD

## The european standards

The harmonized European Fire Standards are a set of test standards that have been accepted by all countries within the European Economic Community. This allows manufacturers to produce or import products that have been tested to a common standard without the need to test in each member state. Testing to these standards is now accepted in all EEC countries.

Compliance with the European standards and regulations is mandatory.

All certified European test laboratories (“Notified Bodies”) who are listed with EOTA (European Organisation for Technical Approval) may perform these tests and issue the corresponding test reports

(ITT – Initial Type Testing). In addition there may be national test or building regulation requirements that may need to be observed.

The Declaration of Performance (DoP) and the “KIT” CE label are the two main documents that will normally be required by local authority officers to show that the intended ceiling system will meet the specified performance level. The use of components other than those supplied by OWA will prevent the issuing of a KIT label.



## Reaction to fire

If a fire is able to find sufficient flammable materials it will quickly spread through an area. It is therefore crucial to use materials of limited combustibility on key surfaces within a room, such as ceilings and walls. The use of such materials can dramatically reduce the speed flames spread through an area as well as minimise their contribution to the fire.

The European standard EN 13501-1: Reaction to Fire provides a number of performance criteria to measure the fire characteristics of building products. These cover spread of flame and contribution to fire as well the generation of smoke and the production of burning droplets.

The table below provides an overview of the available classifications.

Additional requirements		European class according to EN 13501-1
No smoke	No burning droplets falling/dripping	
✓	✓	A1
✓	✓	A2-s1,d0
✓	✓	B-s1,d0   C-s1,d0
	✓	A2-s2,d0   A2-s3,d0 B, C-s2,d0   B, C-s3,d0
✓		A2-s1,d1   A2-s1,d2 B, C-s1,d1   B, C-s1,d2
		A2-s3,d2   B-s3,d2
✓	✓	D-s1,d0
	✓	D-s2,d0   D-s3,d0
		E   E-d2   F
✓		D-s1,d2   D-s2,d2   D-s3,d2

The additional designations are:

**Smoke** | s1, s2, s3

s1 = little or no smoke generation | s2 = medium smoke generation

s3 = heavy smoke generation

**Burning droplets** | d0, d1, d2

d0 = no droplets within 600 seconds | d1 = droplet form within

600 seconds but do not burn for more than 10 seconds | d2 = not as d0 or d1

Country	Test standard	Classification
EC member states	EN 13501-1	A2-s1,d0   B-s1,d0
Switzerland	Guide to fire regulations, 1976	VI q,3 virtually non-combustible, smoke level low
USA	ASTM E 84-97 a	class I

## Resistance to fire

Resistance to fire class EN 13501-2	Resistance to fire duration in minutes
REI 30	≥ 30
REI 60	≥ 60
REI 90	≥ 90
REI 120	≥ 120
REI 180	≥ 180

For European categorisation, a building material classification is always given separately.

Structural elements based on EN 13501-2 encompass the whole structural element and not just the suspended ceiling. This may consist of the roof and the suspended ceiling or the structural floor and suspended ceiling. The entire element should resist the impact of fire on its structural ability for as long as possible. The length of time this can be maintained is the fire resistance duration and will classify it in one of the classes shown.

## Test criteria

During the fire resistance test the laboratory will look out for adverse reaction as well as reporting on the following key criteria.

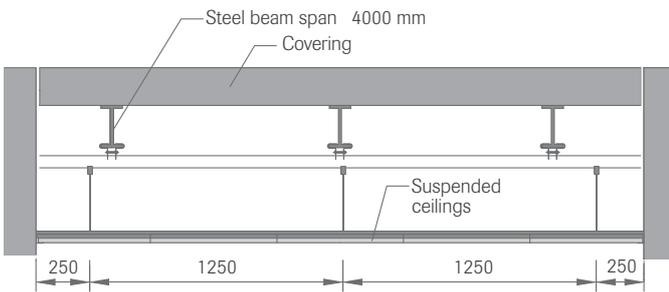
- R.** The structural element should not collapse or deflect beyond the permitted levels when subjected to the applied load.
- E.** The integrity of the room must be maintained. No breakthrough of flames is permitted.
- I.** The temperature on the non-exposed side of the structural element must not rise more than 140° C above ambient as an average measurement and no more than 180° C at any one location.

If one of the above criteria is exceeded the test is terminated and the duration achieved prior to failure will dictate the appropriate fire resistance classification.

Due to the diversity of the various structural elements currently available it is impossible to test each individually. We therefore endeavor to test the worst case scenario in each generic construction type.

The following examples show constructions within a test furnace.

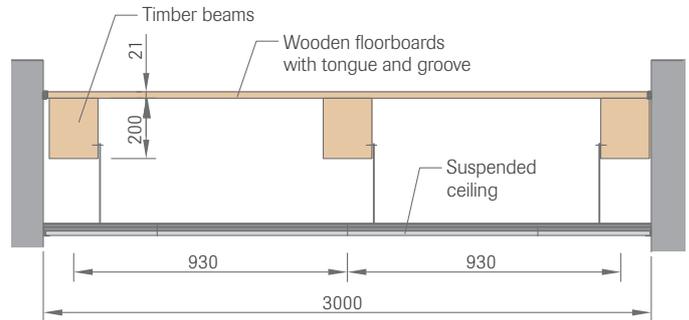
The illustration below (fig. 1) shows an example of a typical steel beam construction with the OWA ceiling below.



**Fig. 1: Steel beam floor**

OWA Suspended ceilings can also be used to provide fire resistance to timber constructions.

The example below (fig 2) shows a timber floor construction with the OWA ceiling below



**Fig. 2: Timber floor**

OWA have tested most standard floor and roof constructions with OWAAcoustic® Ceilings to EN 13501-2 and have achieved up to REI 180 as shown in the following table.

Where an OWAAcoustic® ceiling is used to provide structural fire resistance it is important that the ceiling is constructed in the same manner as that used in the test. Failure to use the same components and layout may invalidate any certification and prevent us issuing a KIT declaration.

Escape and rescue routes often have services containing combustible materials installed below the structural slabs. For this reason we recommend the use of OWAAcoustic® self contained fire resistant ceilings (see table on page 6 and 7). With this type of ceiling it is possible to provide fire resistance of EI 30 to the services in the void as well as to the area below. The use of this system can help provide protected escape routes both from fire and smoke.



On the 1st of July 2013 the new European Construction Products Regulation (CPR) No. 305/2011 came into force and replaced the existing Construction Products Directive (CPD) 89/106/EU.

Part of the new regulation is the use of CE labelling for construction products that are regulated by a harmonised European Standard (hEN) or a European Assessment Document (EAD, formerly known as “ETAG”).

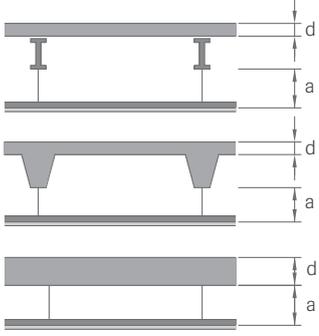
In addition a “Declaration of Performance” (DoP) will be issued for all CE labelled construction products. This declaration will show a number of key performance criteria as well as a unique identification code of the product type. This replaces the existing document known as a European Declaration of Conformity

The harmonised European standard EN13964 (Suspended Ceilings Requirements and test Methods), covers a number of essential requirements including:

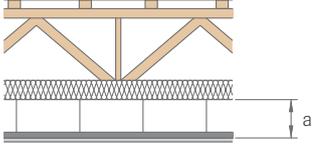
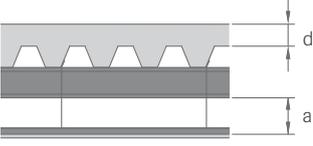
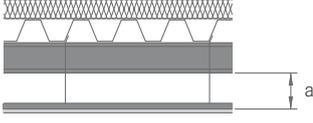
- Reaction to fire
- Mechanical safety
- Acoustics
- Others
- Resistance to fire
- Hygiene, health and environmental
- Corrosion

**Important: In case of resistance to fire a CE label and DoP for the whole kit (ceiling tiles + subconstruction) is mandatory according to EN 13964 ZA 1.1**

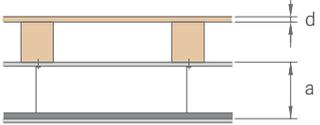
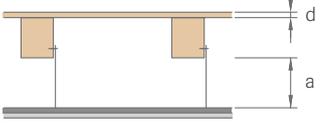
## Loadbearing construction

		min. Thickness of slab (d)	min. cavity height (a)	Type of suspended ceiling OWAconstruct® premium Systems
	<b>1. Steel beam floor</b> <b>KIT-16-01/2012 - S 3</b> <b>KIT-16-01/2012 - S 3a</b>	≥ 120 mm	≥ 200 mm	 S 3  S 3a
	<b>2. Steel beam floor</b> <b>KIT-17-01/2013 - S 15 cliq</b>	≥ 90 mm	≥ 230 mm	 S 15 cliq
	<b>3. Steel beam floor</b> <b>KIT-18-01/2011 - S 15a cliq</b>	≥ 100 mm	≥ 200 mm	 S 15a cliq
	<b>4. Steel beam floor</b> <b>KIT-19-01/2011 - S 18p</b>	≥ 100 mm	≥ 200 mm	 S 18p
	<b>5. Steel beam floor</b> <b>KIT-20-01/2013 - S 1</b>	≥ 90 mm	≥ 185 mm	 S 1
	<b>6. Steel beam floor</b> <b>KIT-15-01/2012 - S 9a</b>	≥ 90 mm	≥ 285 mm	 S 9a
	<b>7. Steel beam floor</b> <b>KIT-08-01/2008 - S 7</b>	≥ 90 mm	≥ 250 mm	 S 7 OWAplan

OWAcoustic® tiles			Resistance to fire		Tested hanger (max. distance)			Special characteristics
Module	Thickness	Product range	Classification min.	Test report no.	Centre of main tee	Centre of hangers	Hanger OWA-no.	
625 x 625 mm 600 x 600 mm	14 mm nom. 15 mm	smart premium	<b>REI 120</b>	N. 297270/7130/CPD ... and further reports	1250 mm 1200 mm	1250 mm 1200 mm	see Page 11	
625 x 625 mm 600 x 600 mm	15 mm	premium	<b>REI 90</b>	PB 3.2/13-169-1 ... and further reports	625 mm 600 mm	1250 mm 1200 mm	see Page 11	
625 x 625 mm 600 x 600 mm	14 mm nom. 15 mm	smart premium	<b>REI 90</b>	N. 285878/6379/CPD ... and further reports	625 mm 600 mm	1250 mm 1200 mm	see Page 11	
2130 x 312.5 mm	15 mm	premium	<b>REI 90</b>	N. 285879/6379/CPD ... and further reports	2130 mm	750 mm	see Page 11	
625 x 625 mm 600 x 600 mm	15 mm	premium	<b>REI 90</b>	PB 3.2/13-018-1 ... and further reports	1250 mm 1200 mm	1250 mm 1200 mm	see Page 11	
625 x 625 mm 600 x 600 mm	20 mm	premium	<b>REI 90</b>	PB 3.2/13-142-1 ... and further reports	1250 mm 1200 mm	1250 mm 1200 mm	see Page 11	
2400 x 1200 mm 1200 x 800 mm	20 mm	premium	<b>REI 120</b>	PB 3243/496/07 ... and further reports	750 mm 750 mm	750 mm 750 mm	see Page 11	

Loadbearing construction		min. Thickness of slab (d)	min. cavity height (a)	Type of suspended ceiling
	<b>8. Reinforced block floor</b> <b>KIT-21-01/2013 - S 3</b> <b>KIT-21-01/2013 - S 3a</b>	≥ 200 mm	≥ 250 mm	<b>OWAconstruct® premium Systems</b>  S 3  S 3a
	<b>9. Reinforced concrete hollow slab</b> <b>KIT-10-01/2007 - S 3</b> <b>KIT-10-01/2007 - S 3a</b>	≥ 250 mm	≥ 250 mm	 S 3  S 3a
	<b>10. Timber roof construction</b> <b>KIT-01-01/2005 - S 3</b> <b>KIT-01-01/2005 - S 3a</b>	-	≥ 250 mm	 S 3  S 3a
	<b>11. Composite floor</b> <b>KIT-22-01/2009 - S 3</b> <b>KIT-22-01/2009 - S 3a</b>	≥ 70 mm	≥ 200 mm	 S 3  S 3a
	<b>12. Steel roof construction with corrugated steel sheets insulation (Foamglas)</b> <b>KIT-13-01/2007 - S 3</b>	-	≥ 570 mm	 S 3
	<b>13. Steel roof construction with corrugated steel sheets insulation (Foamglas)</b> <b>KIT-05-01/2005 - S 3</b>	-	≥ 540 mm	 S 3

OWAcoustic® tiles			Resistance to fire		Tested hanger (max. distance)			Special characteristics
Module	Thickness	Product range	Classification min.	Test report no.	Centre of main tee	Centre of hangers	Hanger OWA-no.	
625 x 625 mm 600 x 600 mm	14 mm nom. 15 mm	smart premium	<b>REI 120</b>	N. 311867/8160/CPR ... and further reports	1200 mm	900 mm	see Page 11	
625 x 625 mm 600 x 600 mm	14 mm nom. 15 mm	smart premium	<b>REI 180</b>	N.234562/2488/CPD ... and further reports	1250 mm 1200 mm	1250 mm 1200 mm	see Page 11	
625 x 625 mm 600 x 600 mm	14 mm nom. 15 mm	smart premium	<b>REI 30</b>	PB 3222/3473-CR ... and further reports	1250 mm 1200 mm	1250 mm 1200 mm	see Page 11	
625 x 625 mm 600 x 600 mm	14 mm nom. 15 mm	smart premium	<b>REI 120</b>	N.281196/6048/CPD ... and further reports	1250 mm 1200 mm	1250 mm 1200 mm	see Page 11	
625 x 625 mm 600 x 600 mm	14 mm nom.	smart	<b>REI 90</b>	PB 3611/427/07-CR ... and further reports	625 mm 600 mm	1250 mm 1200 mm	see Page 11	
1250 x 625 mm 1200 x 600 mm	15 mm	premium	<b>REI 30</b>	PB 3691/3845-CR ... and further reports	625 mm 600 mm	1250 mm 1200 mm	see Page 11	

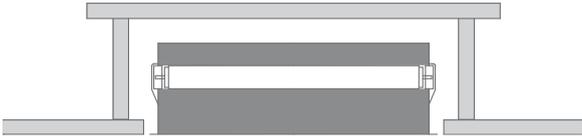
Loadbearing construction			Type of suspended ceiling	
		min. Thickness of slab (d)	min. cavity height (a)	OWAconstruct® premium Systems
	<b>14. Timber floor</b> <b>KIT-04-01/2005 - S 3</b>	timber beam  wooden floor board 21 mm	$\geq 248$ mm	 S 3
	<b>15. Timber floor</b> <b>KIT-07-01/2008 - S 3</b>	timber beam  wooden particle board 18 mm  Fermacell gypsum fireboard 12.5 mm	$\geq 245$ mm	 S 3
	<b>16. Self containing fire protection unit barriere B</b> <b>KIT-101-01/2002 - barriere B</b>	clear span, concealed grid, demountable	-	F 30 barriere B

OWAcoustic® tiles			Resistance to fire		Tested hanger (max. distance)			Special characteristics
Module	Thickness	Product range	Classification min.	Test report no.	Centre of main tee	Centre of hangers	Hanger OWA-no.	
625 x 625 mm 600 x 600 mm  + MINOWA® raw board	15 mm	premium	<b>REI 90</b>	PB 900955 2000-Re/Ei MPA Stuttgart ... and further reports	625 mm 600 mm	930 mm	17/45	
625 x 625 mm 600 x 600 mm	15 mm	premium	<b>REI 30</b>	2007 - Efectis RO 574 (E) ... and further reports	1250 mm 1200 mm	1250 mm 1200 mm	see Page 11	
width 312.5 mm length 2100 mm, 2250 mm	44 mm	premium	<b>EI 30</b>	PB 3617/3831 PB 3619/3851 MPA Braunschweig ... and further reports	clear span and band- raster ≤ 2300 mm	625 mm	79/50	perimeter trim no. 51/25 Further details see system leaflet

## Light fittings

When installing recessed luminaires in an OWAacoustic® fire resistant ceiling an OWAacoustic® fire box should be installed to ensure continuity of fire resistance. It is important to ensure that the performance of the fire box matches that of the installed OWAacoustic® ceiling.

### Recessed light fittings



OWAcoustic® **standard** ceilings  
(steelbeam floor, timber roof construction, steel roof construction, timber floor)

OWAcoustic® ceilings with recessed light fittings offer the same fire resistance as closed OWAacoustic® ceilings, if the recessed light fittings are encased in a 16 mm thick MINOWA® Firebox.

For details, see OWA installation guide no. 801.

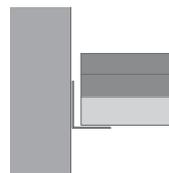
When using 40 mm thick OWAacoustic® premium tiles, 40 mm thick MINOWA® tiles should be used and for 20 mm thick OWAacoustic® premium tiles, 21mm thick MINOWA® tiles should be used.

Also see information sheet on Fire Protection Enclosure.

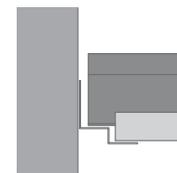
Thickness OWAacoustic® tiles	Thickness Firebox
14 mm	14.5 mm
15 mm	16 mm
20 mm	21 mm
≥ 40 mm	40 mm

## Perimeter trims

For fire resistant ceilings the perimeter trims should be installed in accordance with corresponding test report. Only approved fire resistant wall fixings should be used (ETA – European Technical Approval). Fixing centre ≤ 250 mm.



Standard perimeter trims  
for all standard ceilings



Perimeter trims  
for Contura ceilings S 3a

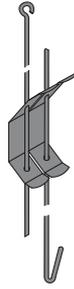
## Hangers and suspensions



no. 17/10  
Nonius hangers for  
**concealed** systems



no. 11  
Hangers for  
**exposed** systems



no. 12/.../...\*  
Double-adjustable hangers  
**exposed** systems



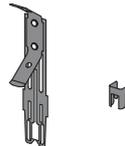
Pre-stressed wire  
 $\varnothing \geq 2.0$  mm; Fixing ends are  
bound at least 3 times



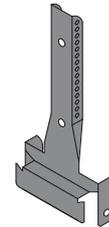
no. 17/45  
Nonius hangers for  
**exposed** systems



no. 90  
Hanger clips, adjustable  
for steel beams



no. 12/44\*  
"Click", adjustable hangers



no. 2001  
OWApplan

\* **Adjustable hangers** are **not** to be used with Timber constructions REI 90.

## Top fixings

Only approved fire resistant top fixings suitable for the substrate should be used (ETA – European Technical Approval).

## Technical assistance

This brochure provides a very brief outline of European Standard EN 13501 and how OWAacoustic® Ceilings can help meet your fire resistance requirements.

If you require further information or assistance on any aspect of your proposed ceiling installation please contact us or visit our website.

### OWAconsult® information service:

#### Germany

tel +49 93 73.2 01-0

info@owaconsult.de

www.owa-ceilings.com

## Product Warranties

The information provided in this leaflet is based on the standards and data available at the time of publication. Any performance, warranties or guarantees provided, expressed or implied, are subject to the exclusive use of OWA components and the installation of those components in accordance with our recommendations. Failure to adhere to these conditions will result in the invalidation of any performance claims, warranties or guarantees and rejection of any liability. OWA reserves the right to make any technical improvements to the products, systems or services without prior notice. **All goods and services are supplied in accordance with our current Terms and Conditions of Sale.** Errors excepted!



Mistakes and printing errors are not excluded. With the publication of this issue, all previous brochures no. 500 eu/e are invalid.

# OWA

### Odenwald Faserplattenwerk GmbH

Dr.-F.-A.-Freundt-Straße 3 | 63916 Amorbach

tel +49 93 73.2 01-0 | info@owa.de

www.owa-ceilings.com

Brochure 9500 eu/e  
051400