



Standard Fire Resistant Ceiling Systems
EN 13501 – the European Standard and
BS 476 – the British Standard
OWA UK 2018/2019

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.



The British Standards

The British National Standard BS 476 is still valid in the UK. OWA tested unique loadbearing structures which are usually applied in the UK according to this standard. Building regulations and guidance regarding fire performance are contained in Approved Document B and in other guidance documents for specific applications.

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 a / ASTM E 1264	Class I / class A
UK	(Former standard)	Class 0

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 reaction to fire classification is always given separately.

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 °K above ambient as an average measurement and no more than 180 °K 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.

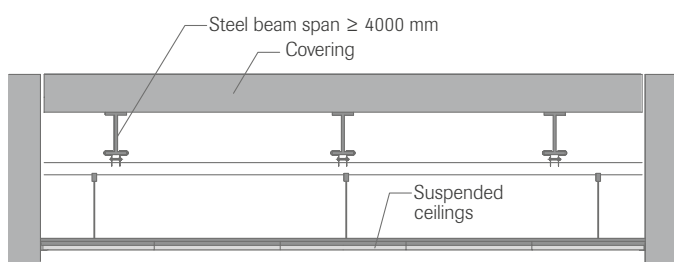


Fig. 1: steel beam floor

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

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.

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

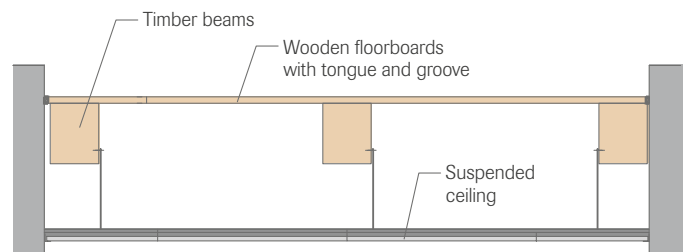


Fig. 2: timber floor

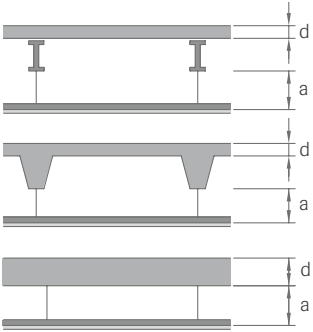




Where an OWAcooustic® ceiling is used to provide structural fire resistance it is important that the ceiling is constructed in the same manner as that used in the test. Failure to use the same components and layout may invalidate any certification and prevent us issuing a KIT declaration.



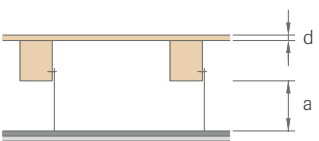


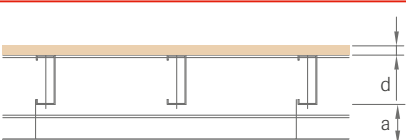

The harmonised European Standard EN13964 (suspended ceilings requirements and test methods), covers a number of essential requirements including:

- 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 concrete slab (d)	Min. cavity height (a)	Type of suspended ceiling
				OWAconstruct® premium systems
	Steel beam floor/ concrete floor KIT-11-01/2008	≥ 90 mm	≥ 200 mm	 S 3  S 3a
	Steel beam floor/ concrete floor KIT-28-01/2015 - S 3	≥ 90 mm	≥ 250 mm	 S 3
	Steel beam floor/ concrete floor KIT-19-01/2011 - S 6a	≥ 100 mm	≥ 200 mm	 S 6a

Resistance to fire (BS 476)

Loadbearing construction		Min. thickness floor boards (d)	Min. cavity height (a)	Type of suspended ceiling
				OWAconstruct® premium systems
	Timber floor	19 mm	≥ 200 mm	 S 3  S 3a
	Mezzanine floor	38 mm	≥ 150 mm	 S 3

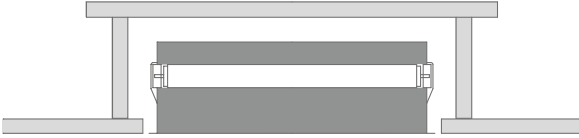
OWAcoustic® tiles *			Resistance to fire		Tested hanger (max. distance)			Suspension details
Module	Thickness	Products	Classification min.	Test report no.	Centre of main tee	Centre of hangers	Hanger OWA-no.	
600 x 600 mm	15 mm	Steel pro Cosmos/ Needled	REI 60	PB 3686/137/10-CR	1200 mm	1200 mm	Pre-stressed 2 mm wire	OWAconstruct® 45G/46G perimeter 51/32G
600 x 600 mm	15 mm	Steel pro Sinfonia	REI 60	PB 3.2/14-338-1, PB 3.2/15-411-1 ... and further reports	1200 mm	1200 mm	Pre-stressed 2 mm wire	OWAconstruct® 45G/46G perimeter 51/32G
≤ 2000 (tile length) x 300 mm	15 mm	Corridor pro Cosmos/ Needled Corridor pro Sinfonia	REI 90	No. 285879/6380/CPD ... and further reports	-	-	-	C profile no. 36/70 perimeter 51/25

OWAcoustic® tiles			Resistance to fire		Tested hanger (max. distance)			Suspension details
Module	Thickness	Products	Classification min.	Test report no.	Centre of main tee	Centre of hangers	Hanger OWA-no.	
600 x 600 mm	20 mm	Timber pro Sinfonia	60	WARRES no. 132741 ... and further reports/ assessments	600 mm	1200 mm	Pre-stressed 2 mm wire	OWAconstruct® 45G/46G perimeter 51/32G
600 x 600 mm	15 mm	Mezz Pro	60	WF test report no. 106961 ... and further reports/ assessments	1200 mm	1200 mm	Pre-stressed 2 mm wire	OWAconstruct® 45G/46G/47G perimeter 51/32G

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 15 mm thick MINOWA® Firebox.

For details, see OWA Installation Guide no. 9801 e.

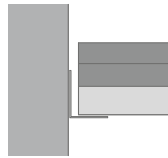
When using 20 mm thick OWAacoustic® premium tiles, 21 mm thick MINOWA® tiles should be used.

Also see information sheet on Fire Protection Enclosure no. 9905 e.

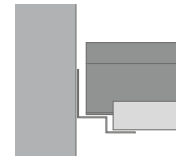
Thickness OWAacoustic® tiles	Thickness firebox
15 mm	15 mm
20 mm	21 mm

Perimeter trims

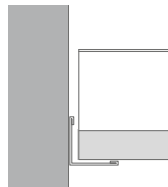
For Fire Resistant Ceilings the perimeter trims should be installed in accordance with corresponding test report. Only approved fire resistant wall fixings should be used (ETA – European Technical Approval). Fixing centre ≤ 250 mm.



Standard wall perimeter
for all standard ceilings



Wall perimeter
for Contura ceilings S 3a



Wall perimeter
for S 6a

Hangers and suspensions



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

Top fixings

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

Verification

For fire resistance requirements relating to OWAacoustic® ceilings, it is recommended that you clarify the design for the relevant requirement prior to ordering and installing the ceiling.

When placing an order, please request the documents from your dealer by providing a completed checklist (download right). This is required in order to provide the correct documents (DoP, CE-KIT declaration).

OWA fire protection documents are only valid if OWAacoustic®-tiles and original OWAconstruct® system components (as tested) are used.

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.

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Product warranties

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