

CLASSIFICATION REPORT

2014-A-033 – Rev. 4

in relation to the fire resistance
leading to a specific field of application

SPONSOR

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SUBJECT

Evaluation of the stability in case of fire according to the Belgian standard NBN 713.020 (edition 1968) of a suspended ceiling and the fire resistance according to the European standard EN 13501-2:2007+A1:2009 of a floor/ceiling construction.
Self-supporting straight ceiling tiles of the A type (thickness: 22 mm; maximum dimensions: 1200 x 600 mm).

This document has been drawn up in the framework of an analysis of test results as described in § 2.1-2° -a) 4) of the RD of 13/06/2007.

1. TEST REPORTS

1.1. Reports

Name of the laboratory	Number of the test report	Date of the test report	Owner of the test report	Test standard
WFRGENT nv	16007A	13/09/2013	Saint-Gobain Eurocoustic	NBN 713.020 (1968)
WFRGENT nv	16007B	13/09/2013	Saint-Gobain Eurocoustic	EN 1363-1:1999 EN 1365-2:1999
ISTITUTO GIORDANO	307589/3551FR	16/07/2013	Saint-Gobain Eurocoustic	EN 1363-1:2012 EN 1365-2:1999
Efectis France	12-U-348	15/10/2012	Saint-Gobain Eurocoustic	EN 1363-1:2012 prCEN/TS 13381-1:2005
Efectis France	13-U-202	20/06/2013	Saint-Gobain Eurocoustic	EN 1363-1:2012 prCEN/TS 13381-1:2005

1.2. Description of the tested elements

Test report No. 16007A gives the description and the results of an orientating fire resistance test carried out according to the Belgian standard NBN 713.020 (edition 1968), on a suspended ceiling (dimensions: 6000 x 3000 mm), composed of a metal framework (trade name according to your declarations: **Quick Lock Hook-On**; c/c distance main supporting profiles: 1200 mm; c/c distance transversal profiles: 600 mm) and self-supporting straight ceiling tiles of the **Eurocoustic Tonga A – Athena** type (thickness: 22 mm; nominal dimensions: 1200 x 600 mm; density: approx. 105 kg/m³). The suspended ceiling has been applied underneath an non loadbearing aerated concrete floor (thickness: 150 mm).

Test report No. 16007B gives the description and the results of a fire resistance test carried out according to the European standards EN 1363-1:1999 and EN 1365-2:1999 on a non-loadbearing aerated concrete floor (dimensions: 6000 x 3300 mm; thickness: 150 mm; density: approx. 650 kg/m³; span: 3000 mm), protected from below by means of a suspended ceiling, composed as described in test report No. 16007A.

Test report No. 307589/3551FR gives the description and the results of a fire resistance test carried according to the European standards EN 1363-1:2012 and EN 1365-2:1999 on a loadbearing reinforced gravel concrete floor (dimensions: 4500 x 3000 mm; thickness: 200 mm; density: approx. 1750 kg/m³; span: 4200 mm), protected from below by a suspended ceiling (dimensions: 4000 x 3000 mm). The suspended ceiling was composed of a metal framework of the **Quick Lock Clip-On** type (c/c distance main supporting profiles: 1200 mm; c/c distance primary transversal profiles: 600 mm) and self-supporting straight ceiling tiles of the **Eurocoustic Tonga A** type (thickness: 22 mm; nominal dimensions: 600 x 600 mm; density: approx. 110 kg/m³). During the test, a supplementary load was applied on the floor to obtain a maximal bending moment of approx. 52 kNm.

Test report No. 12-U-348 gives the description and the results of a fire resistance test carried out according to the European standards EN 1363-1:2012 and prCEN/TS 13381-1:2005 on a loadbearing floor (dimensions: 5100 x 3100 mm), composed of aerated concrete slabs (thickness: 125 mm) placed on steel supporting beams (IPE 160; c/c distance: 600 mm; span: 4900 mm), protected from below by a suspended ceiling (dimensions: 4100 x 3100 mm). The suspended ceiling was composed of a metal framework (trade name according to your declarations: **Quick Lock Hook-On**; c/c distance main supporting profiles: 600 mm; c/c distance transversal profiles: 600 mm) and self-supporting straight ceiling tiles of the **Eurocoustic Tonga A** type (thickness: 22 mm; nominal dimensions: 600 x 600 mm; density: approx. 105 kg/m³). At the ceiling tiles, anti-lift clips, composed of pins, were applied. A layer of rock wool insulation of the type Eurocoustic EUROLENE 603 (thickness: 160 mm; density: approx. 34 kg/m³) was applied perpendicularly onto the main supporting profiles. During the test a load was applied on the floor to obtain a maximal bending moment corresponding to 60 % of the plastic moment of the steel supporting beams.

Test report No. 13-U-202 gives the description and the results of a fire resistance test carried out according to the European standards EN 1363-1:2012 and prCEN/TS 13381-1:2005 on a loadbearing floor (dimensions: 5400 x 3100 mm), composed of aerated concrete slabs (thickness: 125 mm), placed on steel supporting beams (IPE 160; c/c distance: 600 mm; span: 5100 mm), protected from below by a suspended ceiling (dimensions: 4800 x 3100 mm). The suspended ceiling was composed of a metal framework of the **Quick Lock Clip-On** type (c/c distance main supporting profiles: 600 mm; c/c distance transversal profiles: 600 mm) and self-supporting straight ceiling tiles of the **Eurocoustic Tonga A** type (thickness: 22 mm; nominal dimensions: 600 x 600 mm; density: approx. 105 kg/m³). At the ceiling tiles, anti-lift clips, composed of pins, were applied. During the test a load was applied on the floor to obtain a maximal bending moment corresponding to 60 % of the plastic moment of the steel supporting beams.

2. RESULTS

The results obtained for the suspended ceiling and the floor/ceiling construction during the above-mentioned tests are given in the table below:

Test report No.	16007A	307589/3551FR	12-U-348	13-U-202
Type of framework Quick Lock	Hook-On	Clip-On	Hook-On	Clip-On
C/c distance main supporting profiles	1200 mm	1200 mm	600 mm	600 mm
Dimensions ceiling tiles	1200 x 600 mm	600 x 600 mm	600 x 600 mm	600 x 600 mm
Rock wool insulation	-	-	160 mm	-
Plenum height	378 mm	300 mm	300 mm	300 mm
Floor composition	aerated concrete	gravel concrete	aerated concrete	aerated concrete
Characteristic temperature in the plenum after 30 minutes	approx. 285 °C	not measured	approx. 145 °C	approx. 310 °C
Characteristic temperature in the plenum after 60 minutes	-	not measured	approx. 225 °C	-
Characteristic temperature in the plenum after 120 minutes	-	not measured	approx. 385 °C	-
Criteria	Time in minutes			
Suspended ceiling (according to the criteria of the Belgian standard NBN 713.020 (edition 1968))				
Falling of the 1 st ceiling element	≥ 30	≥ 186	18	44
Stability of the ceiling	CONFORM	CONFORM	CONFORM ^(*)	CONFORM
Floor/ceiling construction (according to the criteria of the European standard EN 13501-2:2007+A1:2009)				
Thermal insulation (I)	≥ 30	≥ 186	159	≥ 55
Integrity (E)	≥ 30	≥ 186	159	≥ 55
Loadbearing capacity (R)	≥ 30	≥ 186	159	≥ 55
Test duration	30	186	159	55
(*) The dimensions (and the surface weight) of the falling pieces are inferior to the allowed dimensions (and surface weight) according to section 4 of the document 1392 SN "Stability in case of fire of lowered ceilings", approved by the Hoge Raad voor Beveiliging tegen Brand en Ontploffing during their meeting on 15 September 2011.				

The plenum height is defined as the distance between the bottom side of the floor and the upper side of the ceiling tiles.

3. REFERENCE DOCUMENTS

NBN 713.020 (edition 1968).

Document 1392 SN “Stabiliteit bij brand van verlaagde plafonds”, approved by the Hoge Raad voor Beveiliging tegen Brand en Ontploffing during their meeting on 15 September 2011. This document interprets the specific criteria for the stability in case of fire of a suspended ceiling where these are open to interpretation in the Belgian standard NBN 713.020 (edition 1968).

4. FIELD OF APPLICATION

4.1. Stability in case of fire of a suspended ceiling

Based on the above-mentioned results and the reference documents described in § 3 we are of the opinion that **the stability in case of fire** of a suspended ceiling, composed as described below, will not be inferior to **30 minutes** according to the Belgian standard NBN 713.020 (edition 1968).

4.1.1. Floor construction

The suspended ceiling is applied underneath one of the following floor types, placed or not on the supporting beams mentioned in the table below. The plenum height, i.e. the distance between the bottom side of the floor and the upper side of the ceiling tiles or the insulation, if applied, is at least 300 mm.

Type of supporting beams	Type of floor				
	Aerated concrete	Gravel concrete	Steel/concrete composite	Timber	Steeldeck
Gravel concrete	X	X	X	-	X**
Hot rolled steel	X	X	X	-	X**
Cold formed steel	X	X	X	-	X**
Timber	-	-	-	X*	-
No supporting beams	X	X	X	-	X**

* Only allowed if one of the following conditions is satisfied:

- the plenum height is increased to at least 378 mm;
- a rock wool insulation of the EUROLENE type (thickness: 160 mm; density: approx. 34 kg/m³) is applied on the metal framework of the suspended ceiling, taking into account the restrictions stated in § 4.1.2.4.2.

* Only allowed if a rock wool insulation of the EUROLENE type (thickness: 160 mm; density: approx. 34 kg/m³) is applied on the metal framework of the suspended ceiling, taking into account the restrictions stated in § 4.1.2.4.2

Important remark:

The stability in case of fire does not evaluate the fire resistance of the floor/ceiling construction.

4.1.2. Suspended ceiling construction

4.1.2.1. Metal framework

4.1.2.1.1. Metal framework of the Quick Lock Hook-On type

- edge profiles of one of the following types, applied around the full perimeter of the ceiling and fixed every 300 mm at the most by means of nail plugs of the Fischer FDN type (min. \varnothing 6 x 35 mm) to a supporting construction out of stony materials (e.g. concrete, aerated concrete, masonry...):
 - steel L-profile of the 87924 type (dimensions: 24 x 24 mm; steel thickness: 0.5 mm);
 - steel U-profile of the 87926 type (dimensions: 19 x 40 x 19 mm; steel thickness: 0.5 mm);
- a metal framework of the Quick Lock Hook-On type, composed as follows:
 - main supporting profiles of the 86282 type (T-profile; dimensions: 38 x 24 mm; steel thickness: 0.35 mm; c/c distance: max. 1200 mm), equipped with a firebreak and suspended as described in § 4.1.2.2.1. The distance between the main supporting profiles and the edge of the ceiling is 350 mm at the most. The extremities of the main supporting profiles rest on/in the edge profiles;
 - primary transversal profiles of the 86281 type (steel T-profile; dimensions: 32 x 24 mm; steel thickness: 0.35 mm; length: 1200 mm; c/c distance: max. 600 mm), applied perpendicularly between the main supporting profiles. The distance between the primary transversal profiles and the edge of the ceiling is 350 mm at the most. The extremities of the primary transversal profiles at the edge of the ceiling rest on/in the edge profiles;
 - secondary transversal profiles of the 87835 type (steel T-profile; dimensions: 32 x 24 mm; steel thickness: 0.35 mm; length: 600 mm), applied perpendicularly between the primary transversal profiles in case of self-supporting straight ceiling tiles with dimensions 600 x 600 mm. The extremities of the secondary transversal profiles at the edge of the ceiling rest on/in the edge profiles.

4.1.2.1.2. Metal framework of the Quick Lock Clip-On type

- edge profiles as described in § 4.1.2.1.1;
- a metal framework of the Quick Lock Clip-On type, composed as follows:
 - main supporting profiles of the 66413 type (steel T-profile; dimensions: 38 x 24 mm; steel thickness: 0.35 mm; c/c distance: max. 1200 mm), equipped with a firebreak and suspended as described in § 4.1.2.2.2. The distance between the main supporting profiles and the edge of the ceiling is 350 mm at the most. The extremities of the main supporting profiles rest on/in the edge profiles;
 - primary transversal profiles of the 66415 type (steel T-profile; dimensions: 32 x 24 mm; steel thickness: 0.35 mm; length: 1200 mm; c/c distance: max. 600 mm), applied perpendicularly between the main supporting profiles. The distance between the primary transversal profiles and the edge of the ceiling is 540 mm at the most. The extremities of the primary transversal profiles at the edge of the ceiling rest on/in the edge profiles;

- secondary transversal profiles of the 66414 type (steel T-profile; dimensions: 25 x 24 mm; steel thickness: 0.3 mm; length: 600 mm), applied perpendicularly between the primary transversal profiles in case of self-supporting straight ceiling tiles with dimensions 600 x 600 mm. The extremities of the secondary transversal profiles at the edge of the ceiling rest on/in the edge profiles.

4.1.2.2. Suspension

4.1.2.2.1. Suspension of the metal framework of the Quick Lock Hook-On type

- the main supporting profiles of the 86282 type, described in § 4.1.2.1.1, are suspended every 900 mm at the most by means of quick suspension hangers of the 87559 type ($\varnothing_{\text{wire}}$: 3.8 mm) or the 87560 type ($\varnothing_{\text{wire}}$: 4.0 mm);
- the distance between the suspension hangers and the edge of the ceiling is 400 mm at the most;
- the stability in case of fire of the fixing of the suspended ceiling to the overlying floor construction has to be at least 30 minutes.

4.1.2.2.2. Suspension of the metal framework of the Quick Lock Clip-On type

- the main supporting profiles of the 66413 type, described in § 4.1.2.1.2 are suspended every 900 mm at the most by means of quick suspension hangers of the 87565 type ($\varnothing_{\text{wire}}$: 4.0 mm);
- the distance between the suspension hangers and the edge of the ceiling is 300 mm at the most;
- the stability in case of fire of the fixing of the suspended ceiling to the overlying floor construction has to be at least 30 minutes.

4.1.2.3. Ceiling tiles

The self-supporting straight ceiling tiles of the A type mentioned below (manufacturer: Eurocoustic; nominal dimensions: 1200 x 600 mm or 600 x 600 mm; thickness: 22 mm; density: approx. 105 kg/m³) are applied in one of the metal frameworks described in § 4.1.2.1:

- Acoustichoc[®];
- Altés[®];
- Athena;
- Clini'Clean[®];
- Clini'Care[®];
- Clini'Safe[®] A;
- Minerval A 22;
- Tonga[®] A
- Tonga[®] Ultra Clean A 22;
- Tonga[®] Ultra Clean HP.

The ceiling tiles may be finished on the visible side with a white, decorative or coloured finishing layer.

4.1.2.4. Insulation

4.1.2.4.1. Insulation type

A layer of rock wool or glass wool insulation (surface weight: max. 5.44 kg/m²) may be applied or not on the metal framework of the suspended ceiling.

4.1.2.4.2. Restrictions

The layer of insulation may only be applied provided that the c/c distance between the main supporting profiles is 600 mm at the most and that the nominal dimensions of the self-supporting straight ceiling tiles, mentioned in § 4.1.2.3, are limited to 600 x 600 mm at the most. In this case, the primary transversal profiles are omitted and the secondary transversal profiles are applied perpendicularly between the main supporting profiles.

4.1.2.5. Accessories in the suspended ceiling

It is possible to apply accessories in the suspended ceiling, provided that these have no negative influence on the obtained classification of the above-mentioned suspended ceiling and that this can be demonstrated by means of additional fire resistance tests.

4.1.2.6. Accessories above the suspended ceiling

It is possible to apply accessories above the suspended ceiling, provided the prescriptions mentioned below are respected:

- the accessories are installed independently from the suspended ceiling, i.e. the accessories are not a part of the suspended ceiling;
- the stability in case of fire of the accessories and the fixing of these accessories to the overlying construction is at least 30 minutes.

4.2. Fire resistance of a floor/ceiling construction

4.2.1. Fire resistance 30 minutes

Based on the above-mentioned results, we are of the opinion that **the fire resistance** of a floor/ceiling construction, composed as described below, will not be inferior to **REI 30** according to the European standard EN 13501-2:2007+A1:2009.

4.2.1.1. Floor construction

The floor is chosen from the following floor types, placed or not on the supporting beams mentioned in the table below. The plenum height, i.e. the distance between the bottom side of the floor and the upper side of the ceiling tiles or the insulation, if applied, is 300 mm at the least.

Type of supporting beams	Type of floor			
	Aerated concrete ¹	Gravel concrete ²	Steel/concrete composite ³	Timber ⁴
Gravel concrete	X	X	X	-
Hot rolled steel	X	X	X	-
Cold formed steel	X	X	X	-
Timber	-	-	-	X*
No supporting beams	X	X	X	-

¹ thickness: min. 100 mm; density: min. 650 kg/m³
² thickness: min. 60 mm; density: min. 2300 kg/m³
³ composed of profiled steel plates (thickness: min. 0.75 mm) and concrete (density: min. 2300 kg/m³; concrete cover: min. 20 mm) with a thickness superior to 60 mm at the least on top of the upper steel waves
⁴ composed of wood particle boards (thickness: min. 21 mm; density: min. 600 kg/m³; with tongue and groove), fixed perpendicularly to the supporting beams

* Only allowed if one of the following conditions is satisfied:

- the plenum height is increased to at least 378 mm;
- a rock wool insulation of the EUROLENE type (thickness: 160 mm; density: approx. 34 kg/m³) is applied on the metal framework of the suspended ceiling, taking into account the restrictions stated in § 4.1.2.4.2.

4.2.1.2. Suspended ceiling

The suspended ceiling is composed as described in § 4.1.2.

4.2.2. Fire resistance 60 minutes

Based on the above-mentioned results, we are of the opinion that **the fire resistance** of a floor/ceiling construction, composed as described below, will not be inferior to **REI 60** according to the European standard EN 13501-2:2007+A1:2009.

4.2.2.1. Floor construction

The floor is chosen from the following floor types, placed or not on the supporting beams mentioned in the table below. The plenum height, i.e. the distance between the bottom side of the floor and the upper side of the ceiling tiles or the insulation, if applied, is 300 mm at the least.

Type of supporting beams	Type of floor			
	Aerated concrete ¹	Gravel concrete ²	Steel/concrete composite ³	Timber ⁴
Gravel concrete	X*	X	X*	-
Hot rolled steel	X*	X*	X*	-
Cold formed steel	X*	X*	X*	-
Timber	-	-	-	X*
No supporting beams	X*	X	X*	-

¹ thickness: min. 100 mm; density: min. 650 kg/m³
² thickness: min. 80 mm; density: min. 2300 kg/m³, concrete cover : 20 mm
³ composed of profiled steel plates (thickness: min. 0.75 mm) and concrete (density: min. 2300 kg/m³; concrete cover: min. 20 mm) with a thickness superior to 60 mm at the least on top of the upper steel waves
⁴ composed of wood particle boards (thickness: min. 21 mm; density: min. 600 kg/m³; with tongue and groove), fixed perpendicularly to the supporting beams

* Only allowed if a rock wool insulation of the EUROLENE type (thickness: 160 mm; density: approx. 34 kg/m³) is applied on the metal framework of the suspended ceiling, taking into account the restrictions stated in § 4.1.2.4.2.

4.2.2.2. Suspended ceiling

The suspended ceiling is composed as described in § 4.1.2, with the exception of the nominal dimensions of the self-supporting straight ceiling tiles mentioned in § 4.1.2.3. These are limited to 600 x 600 mm at the most. The stability in case of fire of the fixing of the suspended ceiling to the overlying floor construction is at least 60 minutes.

4.2.3. Fire resistance 120 minutes

Based on the above-mentioned results, we are of the opinion that **the fire resistance** of a floor/ceiling construction, composed as described below, will not be inferior to **REI 120** according to the European standard EN 13501-2:2007+A1:2009.

4.2.3.1. Floor construction

The floor is chosen from the following floor types, placed or not on the supporting beams mentioned in the table below. The plenum height, i.e. the distance between the bottom side of the floor and the upper side of the ceiling tiles or the insulation, if applied, is 300 mm at the least.

Type of supporting beams	Type of floor		
	Aerated concrete ¹	Gravel concrete ²	Steel/concrete composite ³
Gravel concrete	X*	X	X*
Hot rolled steel	X*	X*	X*
No supporting beams	X*	X	X*
¹ thickness: min. 100 mm; density: min. 650 kg/m ³ ² thickness: min. 120 mm; density: min. 2300 kg/m ³ , concrete cover : 40 mm (only 20 mm if a rock wool insulation is applied on the metal framework of the suspended ceiling as mentioned below) ³ composed of profiled steel plates (thickness: min. 0.75 mm) and concrete (density: min. 2300 kg/m ³ ; concrete cover: min. 20 mm) with a thickness superior to 60 mm at the least on top of upper the steel waves			
* Only allowed if a rock wool insulation of the EUROLENE type (thickness: 160 mm; density: approx. 34 kg/m ³) is applied on the metal framework of the suspended ceiling, taking into account the restrictions stated in § 4.1.2.4.2.			

4.2.3.2. Suspended ceiling

The suspended ceiling is composed as described in § 4.1.2, with the exception of the nominal dimensions of the self-supporting straight ceiling tiles mentioned in § 4.1.2.3. These are limited to 600 x 600 mm at the most. The stability in case of fire of the fixing of the suspended ceiling to the overlying floor construction is at least 120 minutes.

5. CONDITIONS FOR THE USE OF THE PRESENT CLASSIFICATION REPORT

The present classification report is only valid insofar as the stability of the constructions, composed as described in § 4, is guaranteed under normal conditions according to the standards in force.

This classification report is only valid in case of a closed suspended ceiling, i.e. there are no openings in the ceiling.

This classification report is only valid insofar as the composition of the ceiling components is identical to that of the components subjected to the above-referenced tests.

This classification report is only valid when accompanied by the above-referenced test reports.

This classification report cannot be combined with another classification report, except when mentioned explicitly.

This classification report is issued on the basis of test data and information handed over at the time of the demand by the sponsor. If contradictory evidence becomes available afterwards, the assessment will be unconditionally withdrawn and the sponsor will be notified on this.

The duration of validity of the present classification report is limited to 5 years starting from the issuing date of this classification report and may be extended after a favourable exam.

The sponsor has the right to use the above-referenced test reports and has also confirmed that he has not been informed about any non-public information which could influence this classification report, and in consequence the obtained conclusions.

If the sponsor is informed afterwards about such information, he agrees to withdraw the classification report above and its use for regulated purposes – if applicable.

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