

# FIRE RESISTANCE CLASSIFICATION REPORT No. 18203E

## OWNER OF THE CLASSIFICATION REPORT

KNAUF INSULATION bv  
Florijnstraat 2  
4903 RM Oosterhout  
The Netherlands

## INTRODUCTION

This classification report defines the classification assigned to a loaded concrete floor element protected with wood wool ceiling panels – (type: Heraklith Tektalan A2 – thickness: 50 mm), in accordance with the procedures given in EN 13501-2:2016: Fire classification of products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services.

This classification report consists of 9 pages and 2 annexes and may only be used or reproduced in its entirety.

## 1 Details of classified product

### 1.1 General

The element – used brand and names ceiling panels:

- Heraklith Tektalan A2;
- Heraklith Tektalan A2-035/2 [1.0mm];
- Heraklith Tektalan A2-E31-035/2;
- Heraklith Tektalan 037/2;
- Heraklith Therarock 037/2;

is defined as a loaded concrete floor element protected with wood wool ceiling panels.

### 1.2 Description

The element, Heraklith Tektalan A2, is fully described below, in support of this classification. The drawings of the test element as it was tested, are enclosed in the annex 1 of this classification report.

#### 1.2.1 Composition of the test specimen as tested

The test specimen is a loaded concrete floor element protected with wood wool ceiling panels.

Outer dimensions of the test specimen:

- width: 3000 mm;
- length: 4400 mm;
- span: 4200 mm;
- thickness slab: 120 mm.

##### 1.2.1.1 Supporting construction

[1] Slab – material: concrete – exposed length  $L_{exp}$ : 4000 mm – span  $L_{sup}$ : 4200 mm – specimen length  $L_{spec}$ : 4400 mm – exposed width  $W_{exp}$ : 2950 mm – thickness: 120 mm – production date: 20 November 2016.

[1a] Concrete – material: normal-weight concrete – type: C25/30 EE2 20mm S3 CEM I 52.5 N MF – density: 2360 kg/m<sup>3</sup> (MV) – compressive strength  $f_{ck}$ : 46.7 N/mm<sup>2</sup> (MV) – covering thickness: 20 mm.

- [1b] Lower reinforcement mesh – type: 150/150/10/10 – material: ribbed, steel reinforcement mesh – diameter bars: 10 mm – grade: BE 500 S – yield strength  $f_y$ : 500 N/mm<sup>2</sup> (NV).
- position: inside the slab, at 20 mm from the exposed bottom side.
- [1c] Upper reinforcement mesh – type: 150/150/6/6 – material: ribbed, steel reinforcement mesh – diameter bars: 6 mm – grade: BE 500 S – yield strength  $f_y$ : 500 N/mm<sup>2</sup>.
- position: inside the slab, at 20 mm from the unexposed upper side.
- [2] Release agent – brand and type: Demula Marginel® – material: emulsion of vegetable oils and animal fats in water – volume mass (by 15°C): 0.99 kg/l.

### 1.2.1.2 Fire protection ceiling panels

The test sponsor has confirmed to the laboratory that the brand and names listed below apply to identical ceiling panels as those tested.

- [3] Ceiling panel – used brand and names:
- Heraklith Tektalan A2;
  - Heraklith Tektalan A2-035/2 [1.0mm];
  - Heraklith Tektalan A2-E31-035/2;
  - Heraklith Tektalan 037/2;
  - Heraklith Therarock 037/2;
- thickness: 50 mm – dimensions: 1200 mm x 600 mm – surface mass: 11.5 kg/m<sup>2</sup> (MV) – straight edges.
- composed of:
    - 1 cover layer [3a] – thickness: 10 mm;
    - 1 insulation layer [3b] – thickness: 40 mm.
  - fixing:
    - to the bottom side of the concrete slab;
    - with screws [4];
    - number: 5 screws per full panel;
    - position: see annex 4.

[3a] Cover layer – material: mineral bounded wood wool – thickness: 10 mm (NV) – density: 700 kg/m<sup>3</sup> (MV) – fibre width: 2 mm – bevel: 5 mm.  
- fixing: glued [5] to the insulation layer [3b].

[3b] Insulation layer – material: rock wool – thickness: 40 mm – density: 150 kg/m<sup>3</sup> (MV).

For a classification time up to REI 180, RE 180, R 180:

[4] Soffit insulation screw – brand and type: EJOT DDS plus / DDS MW – material: steel, with 2 mm plastic-laminated head (DDS plus) – total length: 75 mm – threaded length: 40 mm – diameter: 5.8 mm – diameter steel head: 24 mm.

For a classification time up to REI 120, RE 120, R 120:

[4] Solid battle plug with structured cap – brand and type: Knauf Insulation MSP 75 – material plug: steel – diameter plug: 5.5 mm – material structured cap: plastic – diameter structured cap: 33 mm – total length: 75 mm.

[5] Glue – brand and type: Isolemfi 50137C – material: PU.

## 2 Test reports/EXAP reports and test results in support of the classification

### 2.1 Test reports/EXAP reports

Name of the laboratory	Report ref. no.	Name of the owner	Date of the test	Method
WFRGENT nv	18203B	KNAUF INSULATION bv	20/02/2017	EN 1365-2:2014
WFRGENT nv	16212A	KNAUF INSULATION bv	06/12/2013	EN 1365-2:1999

#### Exposure conditions during the fire resistance test:

##### **18203B:**

Temperature/time curve: standard as in EN 1363-1:2012.

In order to realize a bending moment in the concrete slab of 14.250 kN.m/m width, two line loads of 23.694 kN (P) each have been applied at 1000 mm of the supporting points.

Both longitudinal edges are free, the other edges are simply supported.

Direction of exposure: from below.

##### **16212A:**

Temperature/time curve: standard as in EN 1363-1:2012.

In order to realize a bending moment in the concrete slab of 14.250 kN.m/m width, two line loads of 23.854 kN (P) each have been applied at 1000 mm of the supporting points.

Both longitudinal edges are free, the other edges are simply supported.

Direction of exposure: from below.

Report 16212A was added for the use of the MSP 75 fixation plugs.

## 2.2 Test results

### 2.2.1 Test results 18203B

Parameters	Results
<b>Thermal insulation – I</b>	
$\Delta T_m = 140^\circ\text{C}$	215 minutes, no failure <sup>(1)</sup>
$\Delta T_M = 180^\circ\text{C}$	215 minutes, no failure <sup>(1)</sup>
<b>Integrity – E</b>	
Spontaneous and sustained flaming	215 minutes, no failure <sup>(1)</sup>
Failure with $\varnothing$ 6 mm gap gauge	215 minutes, no failure <sup>(1)</sup>
Failure with $\varnothing$ 25 mm gap gauge	215 minutes, no failure <sup>(1)</sup>
Ignition of cotton pad	215 minutes, no failure <sup>(1)</sup>
<b>Loadbearing capacity – R</b>	
Deflection $D = L^2/(400 d) = 367$ mm	184 minutes, no failure <sup>(2)</sup>
Rate of deflection $dD/dt = L^2/(9000 d) = 16.3$ mm/min	184 minutes, no failure <sup>(2)</sup>

(1) The test was discontinued after 215 minutes at the sponsor's request, the load was removed after 184 min.

(2) No failure until the moment of at the time of removal of the load.

### 2.2.2 Test results 16212A

Parameters	Results
<b>Thermal insulation – I</b>	
$\Delta T_m = 140^\circ\text{C}$	121 minutes, no failure <sup>(1)</sup>
$\Delta T_M = 180^\circ\text{C}$	121 minutes, no failure <sup>(1)</sup>
<b>Integrity – E</b>	
Spontaneous and sustained flaming	121 minutes, no failure <sup>(1)</sup>
Failure with gap gauge $\varnothing$ 6 mm	121 minutes, no failure <sup>(1)</sup>
Failure with gap gauge $\varnothing$ 25 mm	121 minutes, no failure <sup>(1)</sup>
Ignition of cotton pad	121 minutes, no failure <sup>(1)</sup>
<b>Loadbearing capacity – R</b>	
Deflection $D = 4200^2/(400*100) = 441$ mm	121 minutes, no failure <sup>(1)</sup>
Rate of deflection $dD/dt = 4200^2/(9000*100) = 19.6$ mm/min	121 minutes, no failure <sup>(1)</sup>

(1) The test was discontinued after 121 minutes at the sponsor's request.

### 3 Classification and field of application

#### 3.1 Reference of classification

This classification has been carried out in accordance with clause 7 of EN 13501-2:2016.

#### 3.2 Classification

The element – used brand and names ceiling panels:

- Heraklith Tektalan A2;
- Heraklith Tektalan A2-035/2 [1.0mm];
- Heraklith Tektalan A2-E31-035/2;
- Heraklith Tektalan 037/2;
- Heraklith Therarock 037/2;

is classified according to the following combinations of performance parameters and classes as appropriate. No other classifications are permitted.

The classifications are valid for the direction as stated in clause 2.1: The loaded concrete floor element protected with wood wool ceiling panels exposed to the fire from below.

#### Ceiling panels fixed with EJOT DDS plus / DDS MW screws (length: 75 mm)

**REI 180, REI 120, REI 90, REI 60, REI 45, REI 30, REI 20,  
REI 15**

**RE 180, RE 120, RE 90, RE 60, RE 30, RE 20**

**R 180, R 120, R 90, R 60, R 45, R 30, R 20, R 15**

**Ceiling panels fixed with Knauf Insulation MSP 75 plugs (length: 75 mm)**

**REI 120, REI 90, REI 60, REI 45, REI 30, REI 20, REI 15**

**RE 120, RE 90, RE 60, RE 30, RE 20**

**R 120, R 90, R 60, R 45, R 30, R 20, R 15**

**3.3 Field of direct application**

This classification is valid for the following end use applications according to EN 1365-2:2014.

The results of the fire test are directly applicable to similar constructions where one or more of the changes listed below are made and the construction continues to comply with the appropriate design code for its stiffness and stability:

- a) With respect to the structural building member:
  - The maximum moments and shear forces, which when calculated on the same basis as the test load, shall not be greater than those tested.
- b) With respect to the ceiling system:
  - The size of panels of the ceiling lining may be increased by a maximum of 5 % but limited to a maximum of 50 mm. Panels with dimensions 1200 mm x 600 mm and 1000 mm x 600 mm were included in the test.
- c) With respect to the cavity:
  - The height of the cavity  $h$  and the minimum distance  $d$  between the ceiling and the structural members are equal to or greater than those tested (height of cavity  $h \geq 0$  mm,  $d \geq 0$  mm).



#### 4 Limitations

This classification report does not represent type approval nor certification of the product.

According to the information mentioned by the sponsor on the technical information sheet there was no product standard for CE marking available at the time the classification report for the tested material/product was drafted.

When such a product standard is published, this report may be submitted again to the laboratory to evaluate the adequacy of the report for CE marking.

Provisions of Regulation (EU) 305/2011, commonly known as the Construction Products Regulation (CPR), prevail over any conflicting provisions in the harmonised standards and technical specifications.

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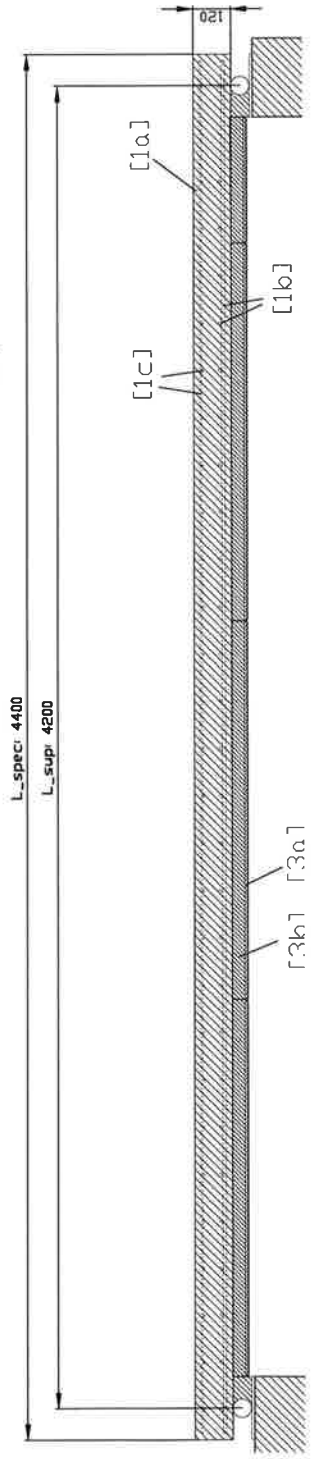
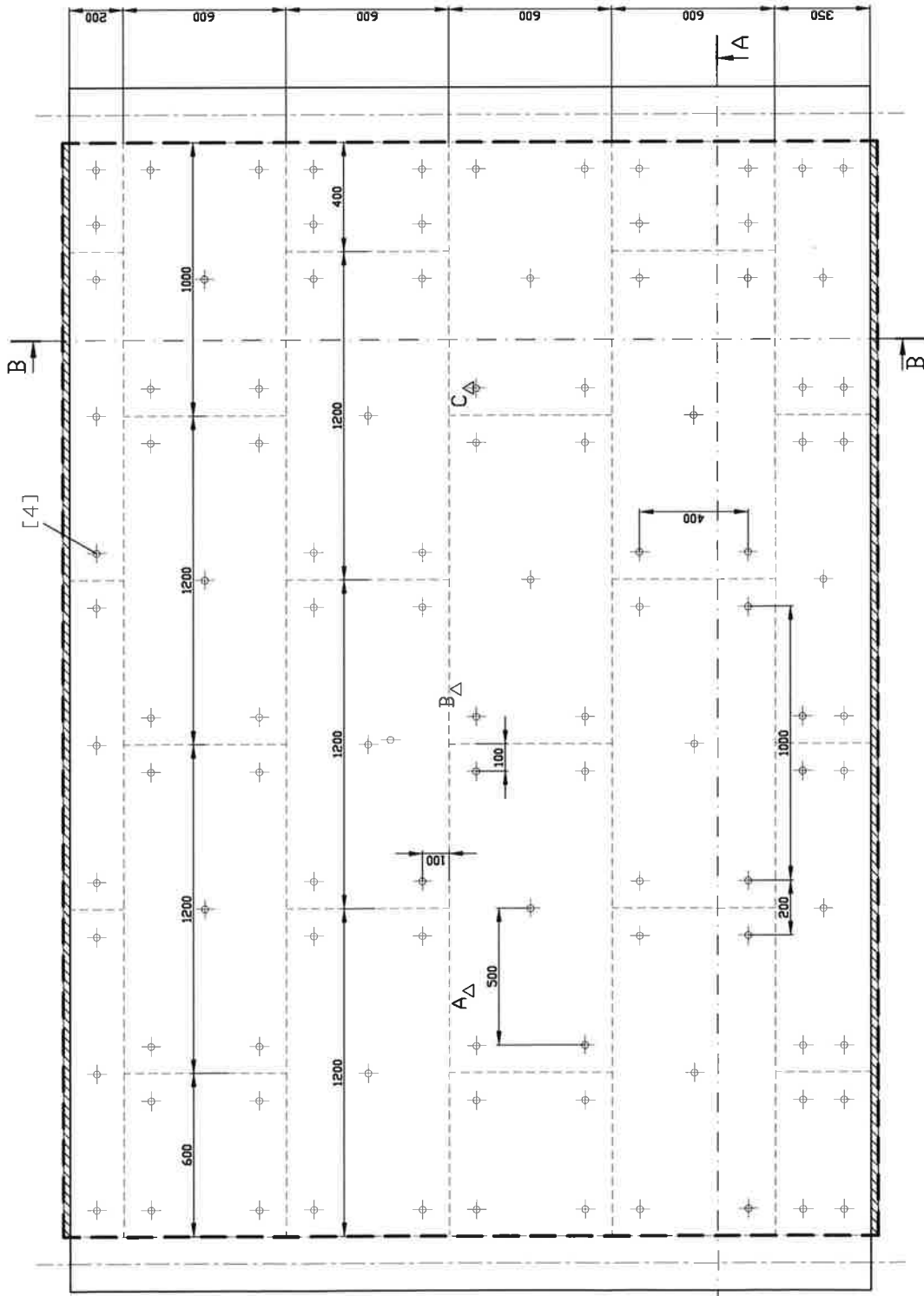
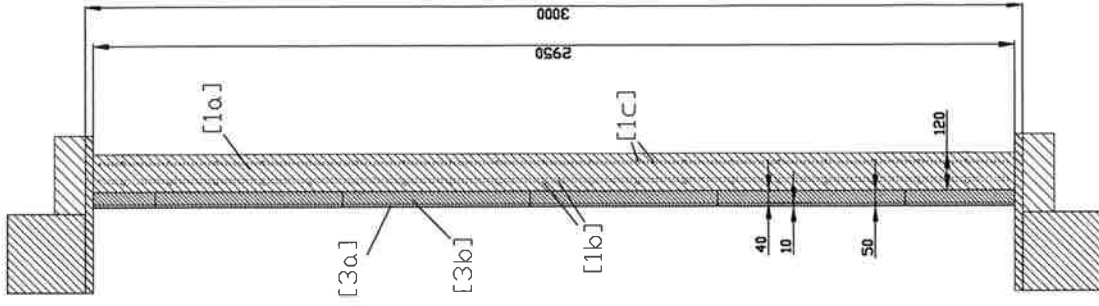
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# FIRE RESISTANCE CLASSIFICATION REPORT No. 18204E

## OWNER OF THE CLASSIFICATION REPORT

KNAUF INSULATION bv  
Florijnstraat 2  
4903 RM Oosterhout  
The Netherlands

## INTRODUCTION

This classification report defines the classification assigned to a loaded concrete floor element protected with wood wool ceiling panels – (type: Heraklith Tektalan A2 – thickness: 250 mm), in accordance with the procedures given in EN 13501-2:2016: Fire classification of products and building elements – Part 2: Classification using data from fire resistance tests, excluding ventilation services.

This classification report consists of 9 pages and 1 annexe and may only be used or reproduced in its entirety.

## 1 Details of classified product

### 1.1 General

The element – used brand and names ceiling panels:

- Heraklith Tektalan A2;
- Heraklith Tektalan A2-035/2 [1.0mm];
- Heraklith Tektalan A2-E31-035/2;
- Heraklith Tektalan 037/2;
- Heraklith Therarock 037/2;

is defined as a loaded concrete floor element protected with wood wool ceiling panels.

### 1.2 Description

The element, Heraklith Tektalan A2, is fully described below, in support of this classification. The drawings of the test element as it was tested, are enclosed in the annexe 1 of this classification report.

#### 1.2.1 Composition of the test specimen as tested

The test specimen is a loaded concrete floor element protected with wood wool ceiling panels.

Outer dimensions of the test specimen:

- width: 3000 mm;
- length: 4400 mm;
- span: 4200 mm;
- thickness slab: 120 mm.

##### 1.2.1.1 Supporting construction

[1] Slab – material: concrete – exposed length  $L_{exp}$ : 4000 mm – span  $L_{sup}$ : 4200 mm – specimen length  $L_{spec}$ : 4400 mm – exposed width  $W_{exp}$ : 2950 mm – thickness: 120 mm – production date: 20 November 2016.

[1a] Concrete – material: normal-weight concrete – type: C25/30 EE2 20mm S3 CEM I 52.5 N MF – type of aggregates: siliceous – density: 2360 kg/m<sup>3</sup> (MV) – compressive strength  $f_{ck}$ : 46.7 N/mm<sup>2</sup> (MV) – covering thickness: 20 mm.

- [1b] Lower reinforcement mesh – type: 150/150/10/10 – material: ribbed, steel reinforcement mesh – diameter bars: 10 mm – grade: BE 500 S – yield strength  $f_y$ : 500 N/mm<sup>2</sup> (NV).
- position: inside the slab, at 20 mm from the exposed bottom side.
- [1c] Upper reinforcement mesh – type: 150/150/6/6 – material: ribbed, steel reinforcement mesh – diameter bars: 6 mm – grade: BE 500 S – yield strength  $f_y$ : 500 N/mm<sup>2</sup>.
- position: inside the slab, at 20 mm from the unexposed upper side.
- [2] Release agent – brand and type: Demula Marginel® – material: emulsion of vegetable oils and animal fats in water – volume mass (by 15°C): 0.99 kg/l.

### 1.2.1.2 Fire protection ceiling panels

The test sponsor has confirmed to the laboratory that the brand and names listed below apply to identical ceiling panels as those tested.

Ceiling panel – used brand and names:

- Heraklith Tektalan A2;
  - Heraklith Tektalan A2-035/2 (1.0mm);
  - Heraklith Tektalan A2-E31-035/2;
  - Heraklith Tektalan 037/2;
  - Heraklith Therarock 037/2;
- thickness: 250 mm – dimensions: 1200 mm x 600 mm – surface mass: 37.0 kg/m<sup>2</sup> (MV) – straight edges.
- composed of:
    - 1 cover layer [3a] – thickness: 10 mm;
    - 1 insulation layer [3b] – thickness: 40 mm;
    - 1 insulation layer [3c] – thickness: 200 mm;
  - fixing:
    - to the bottom side of the concrete slab;
    - with screws [4];
    - number: 6 screws per full panel;
    - position: see annex 4.

[3a] Cover layer – material: mineral bounded wood wool – thickness: 10 mm (NV) – density: 700 kg/m<sup>3</sup> (MV) – fibre width: 2 mm – bevel: 5 mm.

- fixing: glued [5] to the insulation layer [3b].

[3b] Insulation layer – material: rock wool – thickness: 40 mm – density: 150 kg/m<sup>3</sup> (MV).

- fixing: glued [6] to the insulation layer [3c].

[3c] Insulation layer – material: rock wool – thickness: 200 mm – density: 701 kg/m<sup>3</sup> (MV).

For a classification time up to REI 180, RE 180, R 180:

[4] Soffit insulation screw – brand and type: EJOT DDS plus / DDS MW – material: steel, with 2 mm plastic-laminated head (DDS plus) – total length: 275 mm – threaded length: 40 mm – diameter: 5.8 mm – diameter head: 24 mm.

For a classification time up to REI 120, RE 120, R 120:

[4] Solid battle plug with structured cap – brand and type: Knauf Insulation MSP 275 – material plug: steel – diameter plug: 5.5 mm – material structured cap: plastic – diameter structured cap: 33 mm – total length: 275 mm.

[5] Glue – brand and type: Isolemfi 50137C – material: PU.

[6] Glue – brands and types: Isolemfi 50137C + Jowatherm 27090-18 (Hotmelt) – material: PU.

## 2 Test reports/EXAP reports and test results in support of the classification

### 2.1 Test reports/EXAP reports

Name of the laboratory	Report ref. no.	Name of the owner	Date of the test	Method
WFRGENT nv	18203B	KNAUF INSULATION bv	20/02/2017	EN 1365-2:2014
WFRGENT nv	16212A	KNAUF INSULATION bv	06/12/2013	EN 1365-2:1999

#### Exposure conditions during the fire resistance test:

##### **18204B:**

Temperature/time curve: standard as in EN 1363-1:2012.

In order to realize a bending moment in the concrete slab of 14.250 kN.m/m width, two line loads of 22.067 kN (P) each have been applied at 1000 mm of the supporting points.

Both longitudinal edges are free, the other edges are simply supported.

Direction of exposure: from below.

##### **16212A:**

Temperature/time curve: standard as in EN 1363-1:2012.

In order to realize a bending moment in the concrete slab of 14.250 kN.m/m width, two line loads of 23.854 kN (P) each have been applied at 1000 mm of the supporting points.

Both longitudinal edges are free, the other edges are simply supported.

Direction of exposure: from below.

Report 16212A was added for the use of the MSP 275 fixation plugs.

## 2.2 Test results

### 2.2.1 Test results 18204B

Parameters	Results
<b>Thermal insulation – I</b>	
$\Delta T_m = 140^\circ\text{C}$	270 minutes, no failure <sup>(1)</sup>
$\Delta T_M = 180^\circ\text{C}$	270 minutes, no failure <sup>(1)</sup>
<b>Integrity – E</b>	
Spontaneous and sustained flaming	270 minutes, no failure <sup>(1)</sup>
Failure with $\varnothing$ 6 mm gap gauge	270 minutes, no failure <sup>(1)</sup>
Failure with $\varnothing$ 25 mm gap gauge	270 minutes, no failure <sup>(1)</sup>
Ignition of cotton pad	270 minutes, no failure <sup>(1)</sup>
<b>Loadbearing capacity – R</b>	
Deflection $D = L^2/(400 d) = 367$ mm	270 minutes, no failure <sup>(2)</sup>
Rate of deflection $dD/dt = L^2/(9000 d) = 16.3$ mm/min	270 minutes, no failure <sup>(2)</sup>

<sup>(1)</sup> The test was discontinued after 270 minutes at the sponsor's request, the load was removed after 270 min.

<sup>(2)</sup> No failure until the moment of at the time of removal of the load.

### 2.2.2 Test results 16212A

Parameters	Results
<b>Thermal insulation – I</b>	
$\Delta T_m = 140^\circ\text{C}$	121 minutes, no failure <sup>(1)</sup>
$\Delta T_M = 180^\circ\text{C}$	121 minutes, no failure <sup>(1)</sup>
<b>Integrity – E</b>	
Spontaneous and sustained flaming	121 minutes, no failure <sup>(1)</sup>
Failure with gap gauge $\varnothing$ 6 mm	121 minutes, no failure <sup>(1)</sup>
Failure with gap gauge $\varnothing$ 25 mm	121 minutes, no failure <sup>(1)</sup>
Ignition of cotton pad	121 minutes, no failure <sup>(1)</sup>
<b>Loadbearing capacity – R</b>	
Deflection $D = 4200^2/(400*100) = 441$ mm	121 minutes, no failure <sup>(1)</sup>
Rate of deflection $dD/dt = 4200^2/(9000*100) = 19.6$ mm/min	121 minutes, no failure <sup>(1)</sup>

<sup>(1)</sup> The test was discontinued after 121 minutes at the sponsor's request.



### 3 Classification and field of application

#### 3.1 Reference of classification

This classification has been carried out in accordance with clause 7 of EN 13501-2:2016.

#### 3.2 Classification

The element – used brand and names ceiling panels:

- Heraklith Tektalan A2;
- Heraklith Tektalan A2-035/2 [1.0mm];
- Heraklith Tektalan A2-E31-035/2;
- Heraklith Tektalan 037/2;
- Heraklith Therarock 037/2;

is classified according to the following combinations of performance parameters and classes as appropriate. No other classifications are permitted.

The classifications are valid for the direction as stated in clause 2.1: The loaded concrete floor element protected with wood wool ceiling panels exposed to the fire from below.

#### Ceiling panels fixed with EJOT DDS plus / DDS MW screws (length: 275 mm)

**REI 240, REI 180, REI 120, REI 90, REI 60, REI 45,  
REI 30, REI 20, REI 15**

**RE 240, RE 180, RE 120, RE 90, RE 60, RE 30, RE 20**

**R 240, R 180, R 120, R 90, R 60, R 45, R 30, R 20, R 15**

**Ceiling panels fixed with Knauf Insulation MSP 75 plugs (length: 275 mm)**

**REI 120, REI 90, REI 60, REI 45, REI 30, REI 20, REI 15**

**RE 120, RE 90, RE 60, RE 30, RE 20**

**R 120, R 90, R 60, R 45, R 30, R 20, R 15**

**3.3 Field of direct application**

This classification is valid for the following end use applications according to EN 1365-2:2014.

The results of the fire test are directly applicable to similar constructions where one or more of the changes listed below are made and the construction continues to comply with the appropriate design code for its stiffness and stability:

- a) With respect to the structural building member:
  - The maximum moments and shear forces, which when calculated on the same basis as the test load, shall not be greater than those tested.
- b) With respect to the ceiling system:
  - The size of panels of the ceiling lining may be increased by a maximum of 5 % but limited to a maximum of 50 mm. Panels with dimensions 1200 mm x 600 mm and 1000 mm x 600 mm were included in the test.
- c) With respect to the cavity:
  - The height of the cavity  $h$  and the minimum distance  $d$  between the ceiling and the structural members are equal to or greater than those tested (height of cavity  $h \geq 0$  mm,  $d \geq 0$  mm).

#### 4 Limitations

This classification report does not represent type approval nor certification of the product. According to the information mentioned by the sponsor on the technical information sheet there was no product standard for CE marking available at the time the classification report for the tested material/product was drafted.

When such a product standard is published, this report may be submitted again to the laboratory to evaluate the adequacy of the report for CE marking.

Provisions of Regulation (EU) 305/2011, commonly known as the Construction Products Regulation (CPR), prevail over any conflicting provisions in the harmonised standards and technical specifications.

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