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CLASSIFICATION

CLASSIFICATION OF FIRE RESISTANCE ACCORDING TO EN 13501-2: 2007+A1:2009 OF A LOAD BEARING THERMAL INSULATED CONCRETE FLOOR; REPPEL OP-DECK®

Classification no.	2016-Efectis-R001560
Sponsor	Kingspan BV P.O. Box 6565 4000 HN TIEL THE NETHERLANDS
Product name	Reppel OP-Deck®
Prepared by	Efectis Nederland BV
Notified body no.	1234
Authors	P.G.R. Scholten B.Sc. R.D. Scheepe B. Sc.
Project number	ENL-15-000104 / 2015757
Test date	04 December 2015
Test report no.	2015-Efectis-R001559
Date of issue	February 2016
Issue	1
Number of pages	8

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1. INTRODUCTION

This classification report defines the resistance to fire classification assigned to a Reppel OP-Deck®, in accordance with the procedures given in EN 13501-2:2007+A1:2009.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

For the dimensions and specifications of the materials and components of the examined construction, also see the figures in chapter 8. Details of the assembly of the construction are given in the paragraphs below.
The density and moisture content of the relevant used building materials defined by the sponsor and measured by Efectis are mentioned in the table in paragraph 4.3 if applicable.

2.2 TEST SPECIMEN

The test specimen was a load bearing thermal insulated concrete floor, type: Reppel OP-deck®.

2.2.1 Free edges

Two free edges were left unrestrained by a gap of 25 mm to 50 mm between the edges of the test specimen and the test furnace.

2.2.2 Test specimen

The test specimen was constructed from different elements. The Kingspan XD/OP® panels acted during the casting of the concrete as a mould. After curing of the concrete the panel acts as a thermal insulation and fire protection of the constructive concrete slab. EPS was put into the specimen to reduce the weight and to optimize the design of the structure of the concrete slab.
At the supporting ends of the specimen an extra steel reinforcement cage was present to make the lifting of the specimen possible.

Specifications	
Overall dimensions specimen	5400 x 3950 x 284 mm, l x w x h $L_{specimen}$ = 5400 mm $L_{support}$ = 5000 mm $L_{exposed}$ = 5000 mm
Constructional cross section as in practice for the benefit of the fire test	T-beam with ribs c.t.c 333 mm, 80 mm wide, 158 mm high with a rebar of 1 x ∅ 16 mm and a flange of 60mm height with a wire mesh ∅ 8-150 mm
Cross section for the benefit of the transport	At the supporting ends: 200 mm wide, 284 mm high, rebar 2 x ∅ 16 mm on the lower end and 2 x ∅ 8 mm at the upper end with strirrups R6-166. At every supporting end two lifting points with a capacity of 5 kN each.
Rebar	∅ 16 mm at 20 mm from the Kingspan panel
Wire mesh	∅ 8-150 mm at 30 mm from the EPS

Specifications	
EPS	5000 x 253 x 158 mm, w x h EPS was connected to the Kingspan panel with 160 x 6 mm screws with a disc under the screw head to hold in place during the pouring of the concrete.
Kingspan XD/Op-Deck® panel	5 panels were used along the width of the specimen, 3 with a width of 1000 mm and 2 with a width of 450 mm Because of the transport from the production location to the test facility, a 160 x 6 mm screw was used to connect the Kingspan panel to the concrete.
Concrete	C30/37 with the following composition per m^3 Sand: 739 kg Grind/Gravel: 874 kg Kalksteenmeel/Limestone flour:188 kg Cement: 380 kg (CEMIIIA 52,5N) HR70: 2.8 kg (superplastifier) LR7500 1 kg (superplastifier) Water: 171 l 28 day strength was 73.3 N/mm^2

2.3 METHOD OF CONSTRUCTION

The test specimen was built in the following order:

- Placing the Kingspan XD/OP® panels in the casting mould;
- Connecting the Kingspan XD/OP® panels to each other at their top with screws;
- Placing the EPS over the top of the Kingspan XD/OP® panels;
- Placing the concrete reinforcement;
- Casting the concrete over the Kingspan XD/OP® panels.

3. MANUFACTURING OF THE CONSTRUCTION

Bestcon B.V.	Assembly of construction

4. TEST REPORT & TEST RESULTS IN SUPPORT OF CLASSIFICATION

4.1 TEST REPORT

Name of laboratory	Name of sponsor	Test report no.	Test method
Efectis Nederland BV THE NETHERLANDS	Kingspan BV P.O. Box 6565 4000 HN TIEL THE NETHERLANDS	2015-Efectis-R001559	EN 1365-2: 2014

4.2 TEST RESULTS

Criterion	Time (min.)	Result
Load bearing capacity (R)	97	No failure
Integrity (E)		
▪ Cotton pad	97	No failure
▪ Gap Gauge:		
Ø 6 mm	97	No failure
Ø 25 mm	97	No failure
▪ Sustained flaming > 10 seconds	97	No Failure
Insulation (I)		
▪ Average temperature	97	No failure
▪ Maximum temperature	97	No failure
The heating was terminated after 97 minutes in concurrence with the client.		

5. CLASSIFICATION

5.1 REFERENCE OF CLASSIFICATION

This classification has been prepared in accordance with clause 7 of EN13501-2:2007+A1:2009.

5.2 CLASSIFICATION

The Reppel OP-Deck® is classified according to the criteria and classes:

REI 90

6. FIELD OF APPLICATION

This report details the method of construction, the test conditions and the results obtained when the specific element of construction described herein was tested following the procedure outlined in EN 1363-1, and where appropriate EN 1363-2. Any significant deviation with respect to size, constructional details, loads, stresses, and edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.
The test results are directly applicable to a similar untested floor or roof construction provided the following is true:

With respect to the structural building member:
- The maximum moments and shear forces which, when calculated on the same basis as the test load, 3.5 kN/m^2, shall not be greater than those tested.

With respect to the inclination of roof constructions:
- Valid for installation in practice 0° up to 15°.

7. LIMITATIONS

This classification report does not represent any type approval or certification of the product.

P.G.R. Scholten B.Sc.
Project leader resistance to fire

R.D. Scheepe B.Sc.
Manager testing

8. FIGURES

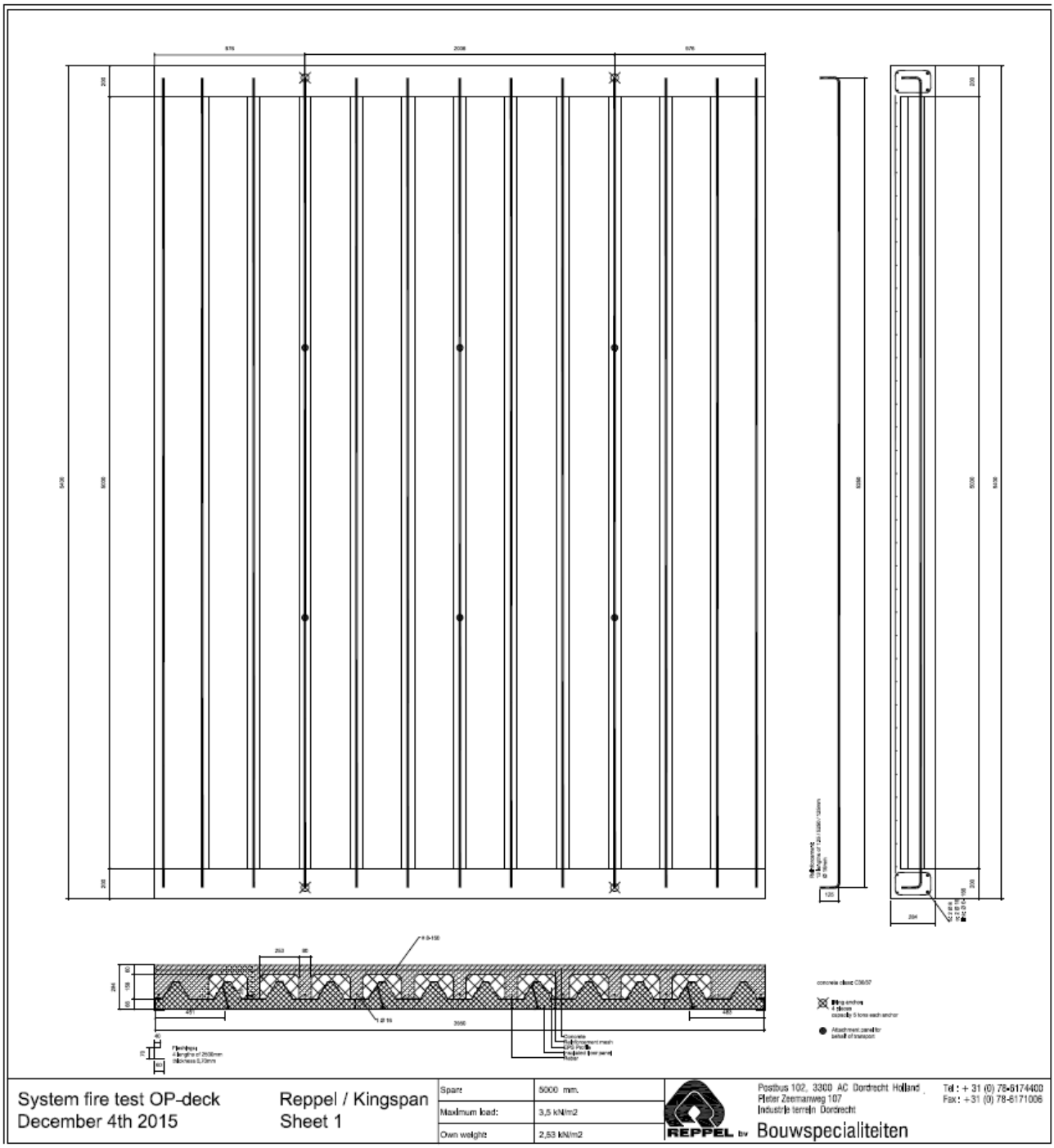

Figure 1 Overview

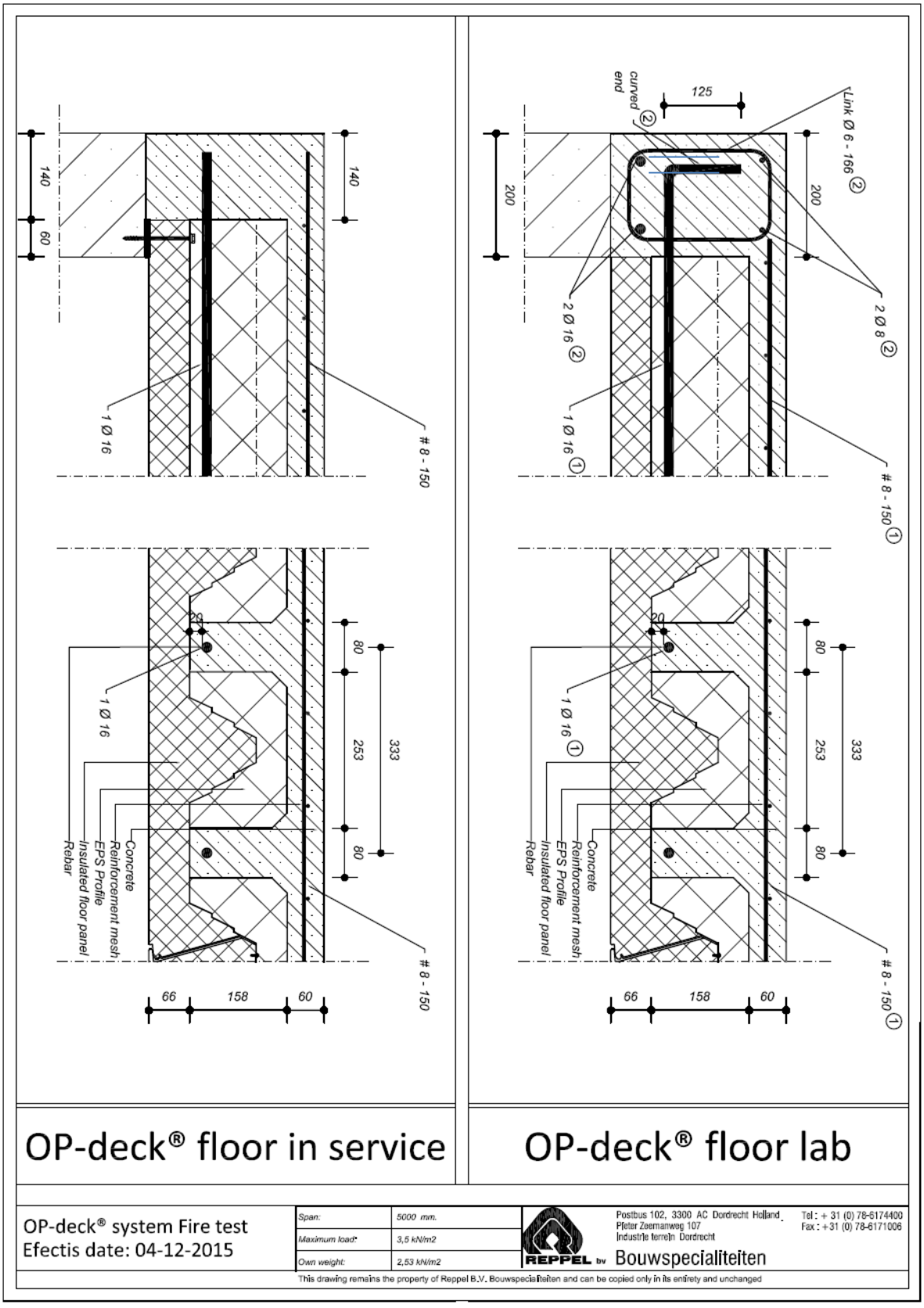

Figure 2 Differences of the test in the lab and practical end configuration of the OP-deck® floor