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Assessment report for Conlit 150/150P mounted with Conlit adhesive

Executive summary

DBI – Danish Institute of Fire and Security Technology has been requested by Rockwool A/S to assess Conlit 150/150P mineral wool boards used as passive fire protection for load bearing steel profiles.

It is the opinion of DBI that Conlit 150/150P mineral wool boards with thickness 20 – 100 mm, fixed to the steel profiles with Conlit adhesive as well as 4 mm steel nails per 300 mm, may be used as passive fire protection for load bearing steel profiles (R30 – R120) according to table 1.1 – 1.4 and the mounting and fixing guide enclosed with this assessment.

DBI refers to the subsequent text which gives insight into the underlying reasons for this assessment.

Full text assessment

DBI – Danish Institute of Fire and Security Technology has been requested by Rockwool A/S to assess Conlit 150/150P mineral wool boards used as passive fire protection for load bearing steel profiles.

Product

Conlit 150/150P is a mineral wool board with nominal density of 165 kg/m³ and a minimum of 150 kg/m³. The thickness is between 20 and 100 mm.

Conlit 150 has a layer of fiberglass cloth glued to one side. Conlit 150P does not.

Conlit 150/150P has the classification A1 according to EN13501-1 and non-combustible according to DS 1057.1.

Basis for the assessment:

- 1) Test report 2002-CVB-R05785, dated November 2002: Two fire tests according to ENV 13381-4:2002 of two loaded beams, two unloaded references and ten unloaded short columns.

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- 2) Assessment report 2010-Efectis-R0216 [Rev.1], dated September 2012: Analysis (Numerical Regression Analysis) according to ENV 13381-4:2002 of test results gained in 2002-CVB-R05785.

Fire protection of steel constructions:

The fire tests were made according to ENV 13381-4:2002.

The minimum and maximum thicknesses of the passive fire protection boards are each tested on loaded beams to define the stickability – a measure of how well the passive fire protection performs when the profile deflects. This value is used to modify the results gained from the test of the unloaded columns.

10 unloaded columns with varying section factors to cover a wide range are mounted with the passive fire protection in different thicknesses ranging between the minimum and maximum.

The temperature results from the 10 unloaded columns and the stickability from the two loaded beams are used in a numerical regression analysis as defined in EN 13381-4 Annex E. The values for the steel are taken from Eurocode 3 – Design of steel structures.

The results of this analysis are tables with information on the required thickness for Conlit 150/150P depending on critical steel temperature and section factor.

Assessment:

It is the opinion of DBI that Conlit 150/150P mineral wool boards with thickness 20 – 100 mm, fixed to the steel profiles with Conlit adhesive and steel nails with a distance of max. 300 mm, may be used as passive fire protection for load bearing steel profiles (R30 – R120) according to table 1.1 – 1.4 and the mounting and fixing guide enclosed with this assessment.

DBI specifies the following conditions which are preconditions for the expressed opinion.

- Table 1.1 – 1.4 enclosed this assessment are calculated based on the coefficients a_0 – a_7 given in assessment report 2010-Efectis-R0216 [Rev.1] and adjusted for product thicknesses.
- The mounting and fixing guide enclosed this assessment is following the description given in test report 2002-CVB-R05785.

Remarks:

This is an expressed opinion based on the above mentioned reports.

Any changes in the product or the mounting will invalidate this assessment.

DBI - Danish Institute of Fire and Security Technology



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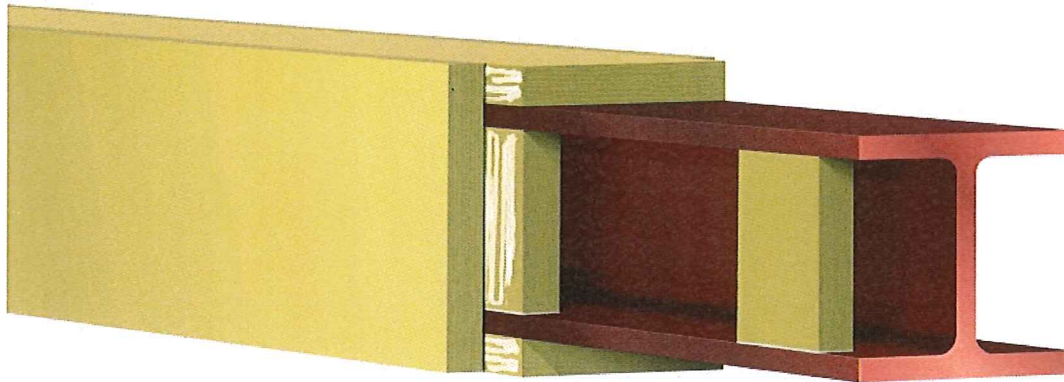
Enclosure:

- Mounting and fixing guide (stamped and signed by DBI)
- Table 1.1 – 1.4 (R30 – R120) (stamped and signed by DBI)

R 30 – R 120

Mounting and fixing guide

Fire protection of steel beams with Conlit 150/150P fixed with Conlit glue



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1. The thickness of the Conlit board has to be dimensioned after table 1 or according to the Conlit calculation program at www.rockwool.dk.
2. The Conlit board is cut with accuracy to fit the steel profile.
3. Small Conlit 150, 20mm boards are placed tightly in between the flange. The small Conlit boards are glue to the flange using Conlit glue. The small Conlit boards are placed with a maximum distanced of 1000mm and have to be placed underneath all joints of the outer board (1).
4. The Conlit boards are glue to the steel profile and the small underlying Conlit boards using Conlit glue(2+3).
5. All joints are glued with Conlit glue (4). It will take approximately 3 days to dry. Use approximately 1kg/m².
6. The boards have to be fixed tightly together to ensure a close-fitting protection.
7. Fix the boards with nails or by other alternative fixing methods while the Conlit glue is drying.
1. If the Conlit fire protection is penetrated by other installations, these also have to be protected to maintain the fire protection



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Tabel 1.1

Product:

Conlit 150/150P glued

Fire resistance:

R 30

U/A	Critical steel temperature								
	350	400	450	500	550	600	650	700	750
50	20	20	20	20	20	20	20	20	20
55	20	20	20	20	20	20	20	20	20
60	20	20	20	20	20	20	20	20	20
65	20	20	20	20	20	20	20	20	20
70	20	20	20	20	20	20	20	20	20
75	20	20	20	20	20	20	20	20	20
80	20	20	20	20	20	20	20	20	20
85	20	20	20	20	20	20	20	20	20
90	20	20	20	20	20	20	20	20	20
95	20	20	20	20	20	20	20	20	20
100	20	20	20	20	20	20	20	20	20
105	20	20	20	20	20	20	20	20	20
110	20	20	20	20	20	20	20	20	20
115	20	20	20	20	20	20	20	20	20
120	20	20	20	20	20	20	20	20	20
125	20	20	20	20	20	20	20	20	20
130	20	20	20	20	20	20	20	20	20
135	20	20	20	20	20	20	20	20	20
140	20	20	20	20	20	20	20	20	20
145	20	20	20	20	20	20	20	20	20
150	20	20	20	20	20	20	20	20	20
155	20	20	20	20	20	20	20	20	20
160	20	20	20	20	20	20	20	20	20
165	20	20	20	20	20	20	20	20	20
170	20	20	20	20	20	20	20	20	20
175	20	20	20	20	20	20	20	20	20
180	20	20	20	20	20	20	20	20	20
185	20	20	20	20	20	20	20	20	20
190	20	20	20	20	20	20	20	20	20
195	20	20	20	20	20	20	20	20	20
200	20	20	20	20	20	20	20	20	20
205	20	20	20	20	20	20	20	20	20
210	20	20	20	20	20	20	20	20	20
215	20	20	20	20	20	20	20	20	20
220	20	20	20	20	20	20	20	20	20
225	20	20	20	20	20	20	20	20	20
230	20	20	20	20	20	20	20	20	20

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Tabel 1.2

Product:

Conlit 150/150P glued

Fire resistance:

R 60

U/A	Critical steel temperature								
	350	400	450	500	550	600	650	700	750
50	20	20	20	20	20	20	20	20	20
55	20	20	20	20	20	20	20	20	20
60	20	20	20	20	20	20	20	20	20
65	20	20	20	20	20	20	20	20	20
70	20	20	20	20	20	20	20	20	20
75	25	20	20	20	20	20	20	20	20
80	25	20	20	20	20	20	20	20	20
85	25	20	20	20	20	20	20	20	20
90	30	20	20	20	20	20	20	20	20
95	30	20	20	20	20	20	20	20	20
100	30	25	20	20	20	20	20	20	20
105	30	25	20	20	20	20	20	20	20
110	40	25	20	20	20	20	20	20	20
115	40	25	20	20	20	20	20	20	20
120	40	30	20	20	20	20	20	20	20
125	40	30	20	20	20	20	20	20	20
130	40	30	20	20	20	20	20	20	20
135	40	30	25	20	20	20	20	20	20
140	40	30	25	20	20	20	20	20	20
145	40	30	25	20	20	20	20	20	20
150	40	40	25	20	20	20	20	20	20
155	40	40	25	20	20	20	20	20	20
160	40	40	25	20	20	20	20	20	20
165	50	40	25	20	20	20	20	20	20
170	50	40	30	20	20	20	20	20	20
175	50	40	30	20	20	20	20	20	20
180	50	40	30	20	20	20	20	20	20
185	50	40	30	20	20	20	20	20	20
190	50	40	30	20	20	20	20	20	20
195	50	40	30	20	20	20	20	20	20
200	50	40	30	25	20	20	20	20	20
205	50	40	30	25	20	20	20	20	20
210	50	40	30	25	20	20	20	20	20
215	50	40	30	25	20	20	20	20	20
220	50	40	30	25	20	20	20	20	20
225	50	40	40	25	20	20	20	20	20
230	50	40	40	25	20	20	20	20	20

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Kiel Brønd

Tabel 1.3

Product: Conlit 150/150P glued

Fire resistance: R 90

U/A	Critical steel temperature								
	350	400	450	500	550	600	650	700	750
50	30	25	20	20	20	20	20	20	20
55	40	25	20	20	20	20	20	20	20
60	40	30	20	20	20	20	20	20	20
65	40	40	25	20	20	20	20	20	20
70	50	40	30	20	20	20	20	20	20
75	50	40	30	25	20	20	20	20	20
80	50	40	30	25	20	20	20	20	20
85	50	50	40	25	20	20	20	20	20
90	50	50	40	30	20	20	20	20	20
95	60	50	40	30	25	20	20	20	20
100	60	50	40	30	25	20	20	20	20
105	60	50	40	40	25	20	20	20	20
110	60	50	50	40	30	20	20	20	20
115	60	50	50	40	30	20	20	20	20
120	60	60	50	40	30	25	20	20	20
125	70	60	50	40	30	25	20	20	20
130	70	60	50	40	40	25	20	20	20
135	70	60	50	40	40	25	20	20	20
140	70	60	50	50	40	30	20	20	20
145	70	60	50	50	40	30	20	20	20
150	70	60	60	50	40	30	20	20	20
155	70	60	60	50	40	30	25	20	20
160	70	60	60	50	40	30	25	20	20
165	70	70	60	50	40	30	25	20	20
170	70	70	60	50	40	40	25	20	20
175	80	70	60	50	40	40	25	20	20
180	80	70	60	50	40	40	25	20	20
185	80	70	60	50	50	40	30	20	20
190	80	70	60	50	50	40	30	20	20
195	80	70	60	50	50	40	30	20	20
200	80	70	60	60	50	40	30	20	20
205	80	70	60	60	50	40	30	25	20
210	80	70	60	60	50	40	30	25	20
215	80	70	60	60	50	40	30	25	20
220	80	70	70	60	50	40	30	25	20
225	80	70	70	60	50	40	30	25	20
230	80	70	70	60	50	40	40	25	20

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Tabel 1.4

Product: Conlit 150/150P glued

Fire resistance: R 120

U/A	Critical steel temperature								
	350	400	450	500	550	600	650	700	750
50	50	40	40	25	20	20	20	20	20
55	60	50	40	30	25	20	20	20	20
60	60	50	40	40	25	20	20	20	20
65	60	60	50	40	30	25	20	20	20
70	70	60	50	40	40	25	20	20	20
75	70	60	50	50	40	30	20	20	20
80	70	70	60	50	40	30	25	20	20
85	80	70	60	50	40	40	25	20	20
90	80	70	60	50	50	40	30	20	20
95	80	70	60	60	50	40	30	25	20
100	80	80	70	60	50	40	40	25	20
105	90	80	70	60	50	50	40	30	20
110	90	80	70	60	60	50	40	30	25
115	90	80	70	60	60	50	40	30	25
120	90	80	70	70	60	50	40	40	25
125	90	80	80	70	60	50	40	40	30
130	90	90	80	70	60	50	50	40	30
135	100	90	80	70	60	60	50	40	30
140	100	90	80	70	60	60	50	40	30
145	100	90	80	70	70	60	50	40	40
150	100	90	80	80	70	60	50	40	40
155	100	90	80	80	70	60	50	50	40
160	100	90	100	80	70	60	50	50	40
165	100	90	100	80	70	60	60	50	40
170	100	100	100	80	70	60	60	50	40
175	100	100	100	80	70	70	60	50	40
180		100	100	80	70	70	60	50	40
185		100	100	80	70	70	60	50	40
190		100	100	80	80	70	60	50	40
195		100	100	80	80	70	60	50	50
200		100	100	100	80	70	60	50	50
205		100	100	100	80	70	60	50	50
210		100	100	100	80	70	60	60	50
215		100	100	100	80	70	60	60	50
220		100	100	100	80	70	60	60	50
225			100	100	80	70	70	60	50
230			100	100	80	70	70	60	50

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