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21-06-2013

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Assessment report for Conlit 300/300P mounted with welding pins

Executive summary

DBI – Danish Institute of Fire and Security Technology has been requested by Rockwool A/S to assess Conlit 300/300P mineral wool boards used as passive fire protection for load bearing steel profiles.

It is the opinion of DBI that Conlit 300/300P mineral wool boards with thickness 10 – 40 mm, fixed to the steel profiles with 2.7 mm welding pins and 28 mm washers, with a pin distance of max. 320 mm and placed max. 50 mm from the edges, may be used as passive fire protection for load bearing steel profiles (R30 – R210) according to table 1.1 – 1.6 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 300/300P mineral wool boards used as passive fire protection for load bearing steel profiles.

Product

Conlit 300/300P is a mineral wool board with nominal density of 300 kg/m³. The thickness is between 10 and 40 mm.

Conlit 300 has a layer of fiberglass cloth glued to one side. Conlit 300P does not.

Basis for the assessment:

- 1) Test report PGA10202, dated 2012-12-20: fire test according to EN13381-4:2002 and prEN13381-4:2010 of two loaded beams and two unloaded references.
- 2) Test report PGA10203, dated 2012-12-20: fire test according to EN13381-4:2002 and prEN13381-4:2010 of 13 unloaded short columns.

- 3) Assessment report PHA10303, dated 2012-12-21: Analysis (Numerical Regression Analysis) according to prEN13381-4:2010 of test results gained in PGA10202 and PGA10203.

Fire protection of steel constructions:

The fire tests were made according to EN13381-4:2002 and prEN13381-4:2010.

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.

13 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 13 unloaded columns and the stickability from the two loaded beams are used in a numerical regression analysis as defined in EN13381-4 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 300/300P depending on critical steel temperature and section factor.

Assessment:

It is the opinion of DBI that Conlit 300/300P mineral wool boards with thickness 10 – 40 mm, fixed to the steel profiles with 2.7 mm welding pins and 28 mm washers, with a pin distance of max. 320 mm and placed max. 50 mm from the edges, may be used as passive fire protection for load bearing steel profiles (R30 – R210) according to table 1.1 – 1.6 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 – 1.6 enclosed this assessment shows thicknesses equal to or larger than the corresponding tables given in assessment report PHA10303.
- The mounting and fixing guide enclosed this assessment is following the description given in test reports PGA10202 and PGA10203.

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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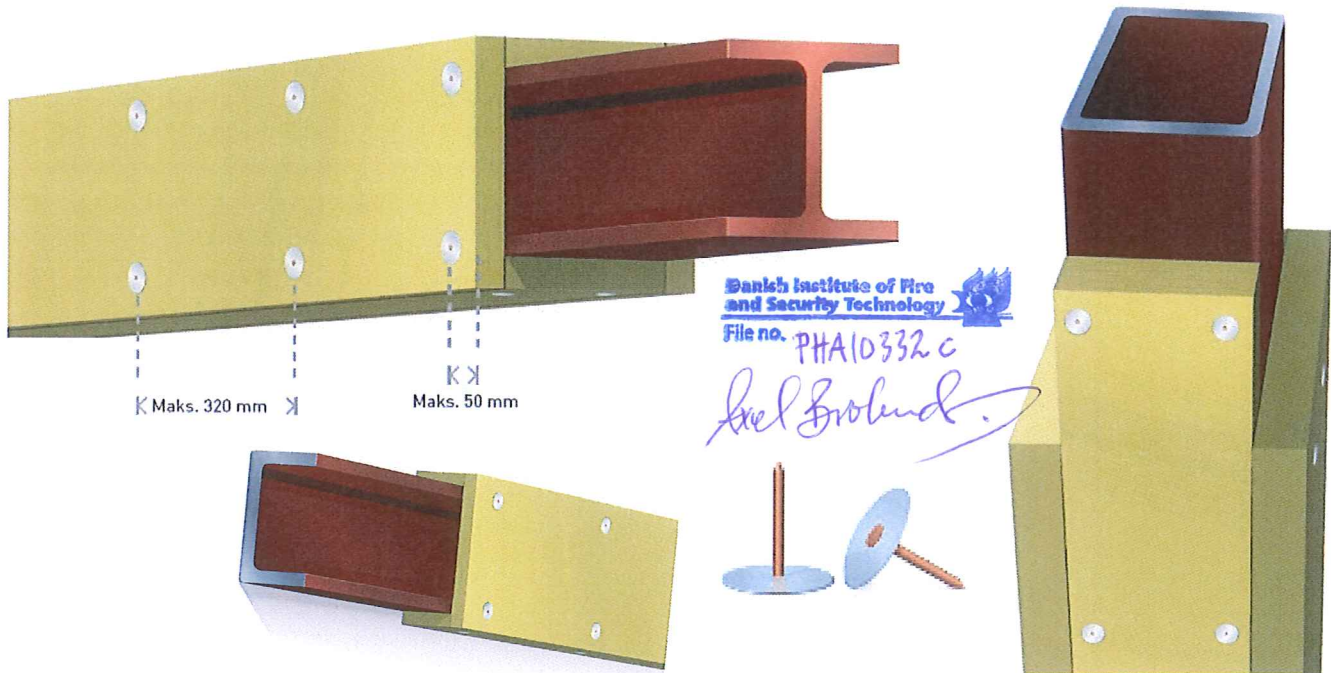
Enclosure:

- Mounting and fixing guide (stamped and signed by DBI)
- Table 1.1 – 1.6 (R30 – R210) (stamped and signed by DBI)

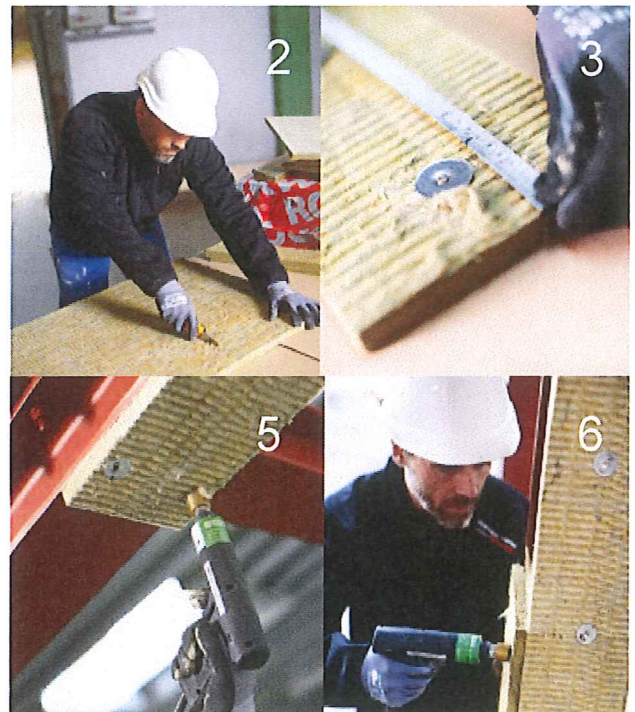
R 30 – R 120

Mounting and fixing guide

Fire protection of steel beams with Conlit 300 fixed with welding pins



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. The welding pins are placed maximum 50mm from the edge and maximum 320mm between each other.
4. The welding pins must have a minimum diameter of 2,7mm and the head has to have a minimum diameter of 28mm. The length has to be 2-3mm longer than the Conlit board thickness.
5. The Conlit board is fixed to the steel using welding pins. Make sure the fixing is stable and secure.
6. The boards have to be fixed tightly together to ensure a close-fitting protection.
7. If the Conlit fire protection is penetrated by other installations, these also have to be protected to maintain the fire protection



Tabel 1.1

Produkt: Conlit 300

Brannmotstand: R 30

F/A	Kritisk ståltemperatur									
	350	400	450	500	550	600	650	700	750	800
50	10	10	10	10	10	10	10	10	10	10
60	10	10	10	10	10	10	10	10	10	10
70	10	10	10	10	10	10	10	10	10	10
80	10	10	10	10	10	10	10	10	10	10
90	10	10	10	10	10	10	10	10	10	10
100	10	10	10	10	10	10	10	10	10	10
110	10	10	10	10	10	10	10	10	10	10
120	10	10	10	10	10	10	10	10	10	10
130	10	10	10	10	10	10	10	10	10	10
140	15	10	10	10	10	10	10	10	10	10
150	15	10	10	10	10	10	10	10	10	10
160	15	10	10	10	10	10	10	10	10	10
170	15	10	10	10	10	10	10	10	10	10
180	15	10	10	10	10	10	10	10	10	10
190	20	10	10	10	10	10	10	10	10	10
200	20	15	10	10	10	10	10	10	10	10
210	20	15	10	10	10	10	10	10	10	10
220	20	15	10	10	10	10	10	10	10	10
230	20	15	10	10	10	10	10	10	10	10
240	20	15	10	10	10	10	10	10	10	10
250	25	15	10	10	10	10	10	10	10	10
260	25	15	10	10	10	10	10	10	10	10
270	25	15	10	10	10	10	10	10	10	10
280	25	15	10	10	10	10	10	10	10	10
290	25	20	10	10	10	10	10	10	10	10
300	25	20	10	10	10	10	10	10	10	10
310	25	20	15	10	10	10	10	10	10	10
320	25	20	15	10	10	10	10	10	10	10
330	30	20	15	10	10	10	10	10	10	10
340	30	20	15	10	10	10	10	10	10	10
350	30	20	15	10	10	10	10	10	10	10
360	30	20	15	10	10	10	10	10	10	10
370	30	20	15	10	10	10	10	10	10	10
380	30	20	15	10	10	10	10	10	10	10
390	30	25	15	10	10	10	10	10	10	10

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Tabel 1.2

Produkt: Conlit 300

Brannmotstand: R 60

F/A	Kritisk ståltemperatur									
	350	400	450	500	550	600	650	700	750	800
50	10	10	10	10	10	10	10	10	10	10
60	15	10	10	10	10	10	10	10	10	10
70	15	15	10	10	10	10	10	10	10	10
80	20	15	10	10	10	10	10	10	10	10
90	25	15	15	10	10	10	10	10	10	10
100	25	20	15	10	10	10	10	10	10	10
110	30	20	15	15	10	10	10	10	10	10
120	30	25	20	15	10	10	10	10	10	10
130	40	25	20	15	10	10	10	10	10	10
140	40	25	20	15	15	10	10	10	10	10
150	40	30	25	20	15	10	10	10	10	10
160	40	30	25	20	15	10	10	10	10	10
170	40	40	25	20	15	15	10	10	10	10
180		40	25	20	15	15	10	10	10	10
190		40	30	25	20	15	10	10	10	10
200		40	30	25	20	15	10	10	10	10
210		40	30	25	20	15	10	10	10	10
220		40	30	25	20	15	15	10	10	10
230		40	40	25	20	15	15	10	10	10
240			40	30	25	20	15	10	10	10
250			40	30	25	20	15	10	10	10
260			40	30	25	20	15	10	10	10
270			40	30	25	20	15	10	10	10
280			40	30	25	20	15	15	10	10
290			40	40	25	20	15	15	10	10
300			40	40	30	20	20	15	10	10
310				40	30	25	20	15	10	10
320				40	30	25	20	15	10	10
330				40	30	25	20	15	10	10
340				40	30	25	20	15	10	10
350				40	30	25	20	15	10	10
360				40	30	25	20	15	15	10
370				40	40	25	20	15	15	10
380				40	40	30	20	20	15	10
390				40	40	30	25	20	15	10

Tabel 1.3

Produkt: Conlit 300

Brannmotstand: R 90

F/A	Kritisk ståltemperatur									
	350	400	450	500	550	600	650	700	750	800
50	20	15	10	10	10	10	10	10	10	10
60	25	20	15	10	10	10	10	10	10	10
70	30	25	20	15	10	10	10	10	10	10
80	40	25	20	15	15	10	10	10	10	10
90	40	30	25	20	15	15	10	10	10	10
100	40	40	25	20	20	15	15	10	10	10
110		40	30	25	20	15	15	10	10	10
120		40	40	25	20	20	15	15	10	10
130			40	30	25	20	15	15	10	10
140			40	30	25	20	20	15	15	10
150			40	40	30	25	20	15	15	10
160				40	30	25	20	20	15	15
170				40	30	25	25	20	15	15
180				40	40	30	25	20	15	15
190				40	40	30	25	20	20	15
200					40	30	25	25	20	15
210					40	40	30	25	20	15
220					40	40	30	25	20	20
230					40	40	30	25	20	20
240						40	30	25	25	20
250						40	40	30	25	20
260						40	40	30	25	20
270						40	40	30	25	20
280							40	30	25	25
290							40	40	30	25
300							40	40	30	25
310							40	40	30	25
320							40	40	30	25
330							40	40	30	25
340								40	30	30
350								40	40	30
360								40	40	30
370								40	40	30
380								40	40	30
390								40	40	30

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Tabel 1.4

Produkt: Conlit 300

Brannmotstand: R 120

F/A	Kritisk ståltemperatur									
	350	400	450	500	550	600	650	700	750	800
50	30	25	20	15	15	10	10	10	10	10
60	40	30	25	20	15	15	10	10	10	10
70	40	40	30	25	20	15	15	10	10	10
80		40	30	25	20	20	15	15	10	10
90			40	30	25	20	20	15	15	10
100			40	40	30	25	20	20	15	15
110				40	30	25	25	20	15	15
120				40	40	30	25	20	20	15
130					40	30	30	25	20	20
140					40	40	30	25	25	20
150					40	40	30	30	25	20
160						40	40	30	25	25
170						40	40	30	30	25
180							40	40	30	25
190							40	40	30	25
200							40	40	30	30
210								40	40	30
220								40	40	30
230								40	40	40
240									40	40
250									40	40
260									40	40
270										40
280										40
290										40
300										40

Tabel 1.5

Produkt: Conlit 300

Brannmotstand: R 180

F/A	Kritisk ståltemperatur									
	350	400	450	500	550	600	650	700	750	800
50		40	30	25	25	20	15	15	15	10
60			40	40	30	25	20	20	15	15
70				40	40	30	25	25	20	20
80					40	40	30	25	25	20
90						40	40	30	25	25
100						40	40	40	30	25
110							40	40	40	30
120								40	40	30
130									40	40
140									40	40
150										40

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Tabel 1.6

Produkt: Conlit 300

Brannmotstand: R 210

F/A	Kritisk ståltemperatur									
	350	400	450	500	550	600	650	700	750	800
50			40	40	30	25	20	20	15	15
60				40	40	30	25	25	20	20
70					40	40	30	30	25	20
80						40	40	30	30	25
90							40	40	40	30
100								40	40	40
110									40	40
120										40

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