Expert’s opinion

Müpro anchors in hollow core slabs

valid for

Steel anchor
Nail anchor
Hollow-core slab ceiling anchor
(selected sizes)

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Expert´s Opinion
Tension load capacity of Müpro anchors in hollow core slabs
-
condensed version

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Date: 10.8.2015
Project number: 1008/15 _ 21533_5

Pages: 4
Annex: -
Rev. 1: 15.1.2016 ES M8 x 30 A4 and N6x25 A4 + N6x30 A4 added

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Müpro GmbH commissioned Ingenieurbüro Thiele GmbH to examine the usability of Müpro-anchors in hollow core slabs (e.g. Cobiax)

For that purpose tension tests on various anchor types have been performed in thin concrete slabs.

The evaluation of these tests and a recommendation for the praxis is substance of the expert opinion 1008/15_21529 from 16.7.2015. In this condensed version, the essential contents of the named expert opinion were summarized.

In this document the following products were considered.

- Müpro Steel Anchor M8 x 30
- Müpro Steel Anchor M10 x 30
- Nail anchor N 6 x 25 (all types)
- Nail anchor N 6 x 30 (all types)
- Hollow-core slab ceiling anchor EASY M8

In the following table the residual tension capacities of the investigated anchors were given.

A residual flange thickness of 30 mm is given for a 60 mm concrete flange between hollow core and surface of the concrete member [60 mm – 10 mm position tolerance of the hollow core - 20 mm concrete breakout caused by the drilling of the borehole = 30 mm residual flange thickness].

Table 1: Summary of the test results

anchor	approval/assessment	characteristic tension resistance for a residual flange thickness of 30 mm [kN]
Steel anchor M8 x 30/ M8 x 30 A4	ETA 05/0161 [2]	5,00
Steel anchor M10 x 30	ETA 05/0161 [2]	6,00
N 6 x 25 / N 6 x 25 A4 h_{ef}= 25 mm	ETA 11/0240 [3]	2,94 (25 mm residual flange thickness)
N 6 x 25 / N 6 x 25 A4 h_{ef}= 30 mm	ETA 11/0240 [3]	5,90
anchor	approval	approvable tension resistance for a residual flange thickness of 30 mm
Easy M8	Z-21.1-1785 [4]	1,4

Diagonal loads and shear loads are to be excluded.

The maximum grain size of the concrete ceiling must be greater than 16 mm.

The transmission of the introduced loads into the hollow core ceiling is not the subject of this report.

Because of the local principle poorer concreting situation below the hollow body and therefore poorer concrete quality the specified characteristic loads may not be increased for higher concrete strengths than C20 / 25.

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Special instruction:

Steel anchor M8 x 30 / M8 x 30 A4:

When installing the anchor it must be ensured that the anchor is located less than 3 mm below the concrete surface, otherwise uncontrolled slip can occur.

For steel anchor M8 x 30 the residual flange thickness must be ≥ 30 mm.

All other details of the approval/assessment including the partial safety factors have to be considered.

Steel anchor M10 x 30

When installing the anchor must be ensured that the anchor is located less than 3 mm below the concrete surface, otherwise uncontrolled slip can occur.

For steel anchor M10 x 30 the residual flange thickness must be ≥ 30 mm.

All other details of the approval/assessment including the partial safety factors have to be considered.

Nail anchor N / N A4 h_{ef} = 25 mm

A residual flange thickness of 25 mm is given for a 55 mm concrete flange between hollow core an surface of the concrete member [55 mm (nominal flange thickness – 10 mm position tolerance of the hollow core - 20 mm concrete breakout caused by the drilling of the borehole = 35 mm residual flange thickness].

If there are lower capacities in the assessment (e.g. hook type), these have to be used for design. All other details of the assessment including the partial safety factors have to be considered.

Nail anchor N / N A4 h_{ef} = 30 mm

If there are lower capacities in the assessment (e.g. hook type), these have to be used for design. All other details of the assessment including the partial safety factors have to be considered.

EASY M8

All other details of the approval have to be considered.

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Literature

[1] Gutachterliche Stellungnahme 1008/15 _21529 zur Zugtragfähigkeit von MKT Dübeln in Hohlkörperdecken vom 16.7.2015, Ingenieurbüro Thiele Pirmasens.

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[3] Europäisch Technische Zulassung ETA-11/0240, MKT Nagelanker N vom 7. Mai 2015.

[4] Z–21.1-1785, Allgemeine bauaufsichtliche Zulassung, MKT Easy zur Verankerung in Spannbeton-Hohldeckenplatten vom 17.8.2011