

- Translation of the original report -

Supplementary for the Test report

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No. 3038/8141-3
(2002-01-10)

1. edition

Applicant: fischerwerke
Artur Fischer GmbH & Co. KG
Weinhalde 14 – 18
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Application of: 2001-07-31

Ref.: personal

entry: -

Content of the application:

Tests of the fire behaviour for the determination of the fire resistance duration and evaluation of the tension loaded anchors

fischer injection anchor FIS V

of the dimensions M8 – M30

designed in the tension zone of reinforced concrete slab sections of a strength class \geq B 25.

Test instruction: following DIN 4102-2: 1977-09

The supplementary document comprises 3 pages and is a precise of the test report no. 3038/8141-3 from 10/01/2002.

The supplementary document is valid like the test report mentioned above until 10/01/2004.

Summary of the test results:

Due to the inspection results achieved in the test report mentioned above, the corresponding fire resistance duration values for the fischer injection anchor FIS V subjected to the maximum tension loads can be determined according to the following table 1 and 2.

Table 1: Fire resistance duration of the fischer injection anchor FIS V with anchor rod FIS G of the dimensions M 8 - M 30 and internal thread sleeve FIS I (RG MI) of the dimensions M 8 - M 16 made of galvanized steel subjected to the maximum tension load

| Designation | fire resistance duration in minutes | | | |
|-------------|-------------------------------------|----------------------|----------------------|-----------------------|
| | 30 max. N [kN] | 60 max. N [kN] | 90 max. N [kN] | 120 max. N [kN] |
| M 8 | ≤ 1,90 | ≤ 0.80 | ≤ 0.30 | ≤ 0.15 |
| M 10 | ≤ 4.50 | ≤ 2.10 | ≤ 1.00 | ≤ 0.60 |
| M 12 | ≤ 8.50 | ≤ 3.60 | ≤ 2.10 | ≤ 1.50 |
| M 16 | ≤ 13.50 | ≤ 6.40 | ≤ 4.00 | ≤ 3.00 |
| M 20 | ≤ 21.00 | ≤ 10.00 | ≤ 6.00 | ≤ 4.50 |
| M 24 | ≤ 30.00 | ≤ 4.00 | ≤ 9.00 | ≤ 6.50 |
| M 30 | ≤ 45.00 | ≤ 22.00 | ≤ 14.00 | ≤ 10.00 |

Table 2: Fire resistance duration of the fischer injection anchor FIS V with anchor rod FIS G of the dimensions M 8 - M 30 made of stainless steel A4 and of high-corrosion resistant steel with the material-no. 1.4529 as well as the internal thread sleeve FIS I (RG MI) of the dimensions M 8 - M 16 made of stainless steel A4 subjected to the maximum tension load

| Designation | fire resistance duration in minutes | | | |
|-------------|-------------------------------------|----------------------|----------------------|-----------------------|
| | 30 max. N [kN] | 60 max. N [kN] | 90 max. N [kN] | 120 max. N [kN] |
| M 8 | ≤ 4.30 | ≤ 0.80 | ≤ 0.30 | ≤ 0.15 |
| M 10 | ≤ 7.50 | ≤ 2.10 | ≤ 1.00 | ≤ 0.60 |
| M 12 | ≤ 11.00 | ≤ 5.70 | ≤ 3.90 | ≤ 3.00 |
| M 16 | ≤ 25.00 | ≤ 10.00 | ≤ 5.80 | ≤ 4.00 |
| M 20 | ≤ 32.00 | ≤ 15.00 | ≤ 9.00 | ≤ 6.00 |
| M 24 | ≤ 45.00 | ≤ 22.00 | ≤ 13.00 | ≤ 9.00 |
| M 30 | ≤ 70.00 | ≤ 35.00 | ≤ 20.00 | ≤ 14.00 |

Special references

The evaluation mentioned above is only valid for the fischer injection anchor FIS V with anchor rod FIS G of the sizes M8 – M 30 made of galvanized steel strength class ≥ 5.8 and stainless steel grade A 4 as well as high corrosion-resistant steel with the material-no. 1.4529 and with internal thread sleeve FIS I of the sizes M 8 - M 16 made of galvanized steel strength class ≥ 5.8 and of stainless steel A4 considering the boundary conditions of the Technical data sheets of the applicant.

The evaluation of the fischer injection anchor is only valid in dependence with on one-side flamed reinforced concrete components, being classified at least with the fire resistance class according to the fire resistance duration of the anchors.

The validity of the supplementary document ends at the validity date 10/01/2004 of the test report mentioned above.

Original paper signed by

i. V.
RD Dr.-Ing. Wesche

Dipl.-Ing. Nause

Braunschweig, 10/01/2002

MPA BRAUNSCHWEIG

- Translation of the original report -

fischerwerke
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72178 Waldachtal
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Our Ref: 024/04-CM-
(3538/8534)
Customer No.: 3455
Expert: Maertins
Department: BS
Direct: -8265
Date: 05.03.2004

Validity of the investigation report

Dear Sir or Mdm,

In reference to your request on Test Report No. 3038/8141-3 dated 10 January 2002 we may inform you that validity of the determination of fire behavior of the fixing subjected to centric tension

fischer Injection Anchors FIS V

injection mortar installed with threaded rods FIS V (sizes ranged from M8 to M30) or internally threaded anchors FIS I (sizes ranged from M8 to M16) made of galvanized steel of strength class ≥ 5.8 as well as

injection mortar installed with threaded rods FIS V A4 (sizes ranged from M8 to M30), or with internally threaded anchors FIS I A4 (sizes range from M8 to M16) made of stainless steel A4 as well as

injection mortar installed with threaded rods FIS V C (sizes ranged from M8 to M30), or with internally threaded anchors FIS I C (sizes ranged from M8 to M16) made of highly corrosion-resistant steel 1.4529

in non-cracked normally-reinforced concrete (tensile and compression zone) of strength class of $\geq C20/25$ to $\leq C50/60$ in accordance with DIN 4102-2:1977-09 – fire load from the unit-temperature-time curve (ETK) has been extended till 10 January 2006.

The supplementary document comprises 3 pages and is a summary of the above mentioned test report..

The supplementary document is valid until 2006-01-10.

1 General

Based on the results achieved, the fire resistance of fischer Injection Anchors FIS V can be accessed in relation to the maximum centric tensile load tabulated in Section 2 – Table 2-1 and 2-2, and in consideration of Section 3.

2 Analysis of the test results

Table 2-1: Fire resistance of the fischer FIS V injection anchor with threaded rods FIS V (sizes ranged from M8 to M30), or with internally threaded anchor FIS I (sizes ranged from M8 to M16) made of galvanized steel of strength class ≥ 5.8 in normally reinforced, non-cracked concrete of grade $\geq C20/25$ to $\leq C50/60$.

| Anchor size | Fire Resistance (time in minutes) | | | |
|-------------|--------------------------------------|---------------------|---------------------|----------------------|
| | 30 max F [kN] | 60 max F [kN] | 90 max F [kN] | 120 max F [kN] |
| M8 | ≤ 1.90 | ≤ 0.80 | ≤ 0.30 | ≤ 0.15 |
| M10 | ≤ 4.50 | ≤ 2.10 | ≤ 1.00 | ≤ 0.60 |
| M12 | ≤ 8.50 | ≤ 3.60 | ≤ 2.10 | ≤ 1.50 |
| M16 | ≤ 13.50 | ≤ 6.40 | ≤ 4.00 | ≤ 3.00 |
| M20 | ≤ 21.00 | ≤ 10.00 | ≤ 6.00 | ≤ 4.50 |
| M24 | ≤ 30.00 | ≤ 14.00 | ≤ 9.00 | ≤ 6.50 |
| M30 | ≤ 45.00 | ≤ 22.00 | ≤ 14.00 | ≤ 10.00 |

Table 2-2: Fire resistance of the fischer FIS V injection anchor with threaded rods FIS V A4 (sizes ranged from M8 to M30), or with internally threaded anchor FIS I A4 (sizes ranged from M8 to M16) made of A4 stainless steel or of the fischer FIS V injection anchor with threaded rods FIS V C (sizes ranged from M8 to M30), or with internally threaded anchor FIS I C (sizes ranged from M8 to M16) made of highly corrosion resistant steel 1.4529 in normal or reinforced, non-cracked concrete of grade $\geq C20/25$ to $\leq C50/60$.

| Anchor size | Fire Resistance (time in minutes) | | | |
|-------------|--------------------------------------|---------------------|---------------------|----------------------|
| | 30 max F [kN] | 60 max F [kN] | 90 max F [kN] | 120 max F [kN] |
| M8 | ≤ 4.30 | ≤ 0.80 | ≤ 0.30 | ≤ 0.15 |
| M10 | ≤ 7.50 | ≤ 2.10 | ≤ 1.00 | ≤ 0.60 |
| M12 | ≤ 11.00 | ≤ 5.70 | ≤ 3.90 | ≤ 3.00 |
| M16 | ≤ 25.00 | ≤ 10.00 | ≤ 5.80 | ≤ 4.00 |
| M20 | ≤ 32.00 | ≤ 15.00 | ≤ 9.00 | ≤ 6.00 |
| M24 | ≤ 45.00 | ≤ 22.00 | ≤ 13.00 | ≤ 9.00 |
| M30 | ≤ 70.00 | ≤ 35.00 | ≤ 20.00 | ≤ 14.00 |

3 Special notes

The above mentioned assessment only applies to installation of fischer FIS V injection anchors with

- threaded rods FIS V (sizes range from M8 to M30), or internally threaded anchors FIS I, (sizes ranged from M8 to M16), made of galvanized steel of strength class ≥ 5.8 in consideration of the edge distance constraints reflected in European Technical Approval No. ETA-02/0043 dated 29 October 2002 issued by DIBt, Berlin.
- threaded rods FIS V A4 (sizes range from M8 to M30), or internally threaded anchors FIS I, (sizes ranged from M8 to M16), made of stainless steel A4 in consideration of the edge distance constraints reflected in European Technical Approval No. ETA-02/0024 dated 29 October 2002 issued by DIBt, Berlin.
- threaded rods FIS V C (sizes range from M8 to M30), or internally threaded anchors FIS I, (sizes ranged from M8 to M16), made of highly corrosion resistant steel 1.4529 in consideration of the edge distance constraints reflected in European Technical Approval No. ETA-02/0025 dated 29 October 2002 issued by DIBt, Berlin.

This assessment of the fischer FIS V injection anchor is only valid for anchors used in conjunction with reinforced structure, which fire resistance classification is at least equal to the fire resistance of the anchor.

The validity of this addendum to Test Report No. 3038/8141-3 dated 10 January 02 is extended to 10 January 2006.

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Expert