

Assessment Report

Project **22037 – condensed version**
**Assessment of resistance under fire exposure of the
VF200PRO FastCure Anchoring Adhesive**

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Table of contents

1	General	3
2	References.....	3
3	Product Description.....	3
4	Evaluation Scope	3
5	Fire Resistance	4

1. General

The Technische Universität Kaiserslautern had been authorized by Allfasteners USA LLC to evaluate the fire resistance of the VF200PRO FastCure Anchoring Adhesive. This report is based on the test reports of MPA Braunschweig [3]. The fire tests and their evaluation were executed according to DIN EN 1363-1:2012 [2] and [1].

The fire resistances (listed in Table 1) are based on the test results of a one-sided fire exposure of a non-cracked concrete slab. The evaluation in this report is based on TR 020 [1].

2. References

- [1] Evaluation of Anchorages in Concrete Concerning Resistance to fire, EOTA TR 020, Edition May 2004
- [2] Feuerwiderstandsprüfungen – Teil 1: Allgemeine Anforderungen, DIN EN 1363-1; Edition Oktober 2012
- [3] Test Report (3290/0966)-NB dd. 06/03/2008 ; iBMB Braunschweig; hinterlegt an der TU Kaiserslautern.
- [4] ESR-4632 from 9/2020, VF200PRO FastCure Anchoring Adhesive for concrete, Allfasteners USA LLC.

3. Product Description

The Product is described in [4].

4. Evaluation Scope

The fire resistance evaluation of the VF200PRO FastCure Anchoring Adhesive is based on the executed fire tests. The anchors were installed upside down to simulate the real situation of a ceiling and stressed by the uniform temperature curve fire test (UTC) according to [2]. In all tests, a fixture was used based on TR020 [1], therefore the following fire resistance evaluation applies only for anchors which are protected (in a comparable manner to the used fixture in the fire test) against the temperature increase during a fire case.

The fire tests were executed on a non-cracked concrete slab.

The evaluation was executed depending on TR020 [1].

Nut failures, fracture of the anchor rod and pull-out failures occurred in the tests.

5. Fire Resistances

The following tables show the decisive fire resistances $N_{Rk,fi}$ of a one side fire exposure in non-cracked concrete with tensile loading (minimum strength class C20/25). The given fire resistances $N_{Rk,fi}$ apply for a single anchor under tensile load with an edge distance greater than $c_{Cr} = 2 h_{ef}$ and a spacing of at least $s = 2 c_{Cr} = 4 h_{ef}$ to the adjacent anchor. By keeping the mentioned edge distances and spacing, a concrete cone failure is not relevant. The given values apply for anchor rods with a strength class of at least 5.8 (EN 1993-1-8:2005+AC:2009, $f_{ub} > 500 \text{ N/mm}^2 = 72,500 \text{ psi}$; $f_{yb} > 400 \text{ N/mm}^2 = 58,000 \text{ psi}$). The same fire resistances can be assumed for threaded rods of stainless steel (A4) and high corrosion resistant steel (HCR) with a strength class of 70 (EN ISO 3506-1:2009). If the edge distance c is chosen in a way, that steel failure / pull-out is determined in the fire design, the following load values can be also applied on anchors under shear load.

Table 1: Fire resistance $N_{Rk,fi}$ of VF200PRO FastCure Anchoring Adhesive in non-cracked concrete slab

fire resistance $N_{Rk,fi}$	size	3/8	1/2	5/8	3/4	7/8	1	1 1/4
[lbf]	minimum embedment depth $h_{ef,min}$ [inch]	≥ 3.15	≥ 4.33	≥ 5	≥ 6.70	≥ 8.27	≥ 9.84	≥ 11
fireresistance duration	30	504	823	1306	1933	2666	3498	5592
t_u [min]	60	344	635	1008	1491	2057	2699	4314
	90	181	447	709	1049	1447	1899	3035
	120	101	354	562	831	1147	1505	2405

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