FixING
Solutions GmbH
Schoellstraße 7, 70599 Stuttgart
www.fixing-solutions.de
info@fixing-solutions.de

Independent Technical Assessment for fischer HybridPower 10x90 under fire exposure based on EAD 330232-02-0601 and EAD 330284-00-0604-v01

Report no.: 25-005-2(1)

Technical Report

Name of product:
fischer HybridPower 10x90

Type of product:
Plastic anchor with metal power wedge

Manufacturer:
fischerwerke GmbH & Co. KG

Validity:
5 years

Technical Assessment is based on:
EAD 330232-02-0601, EAD 330284-00-0604-v01, 25-005-1(0), 25-005-2(0)

09/03/2026

1 Task and Aim

The characteristic fire resistance of the fischer HybridPower in concrete under pure tension load, inclined load and shear load is assessed in this report in accordance with EAD 330284-00-0604-v01 and EAD 330232-02-0601. In addition, fire resistance in solid calcium silicate brick (KS) and solid lightweight concrete block (Vbl) is assessed by transferring the characteristic fire resistance derived from fire test results in concrete.

For this purpose, fire tests were conducted in concrete. The anchors were subjected to pure tensile loading (0°), inclined loading (45°), and shear loading (90°). Screws with a hexagon head and an integrally formed washer were used as inserts. The fire tests were performed at the MPA of the University of Stuttgart using the fischer HybridPower in size 10 with a screw diameter of d = 7 mm. The anchors were exposed to a standard fire defined by the standard temperature curve according to EN1363-1:2020-05.

The characteristic fire resistance in concrete is evaluated for a shear load and a 45° inclined tensile load according to EAD 330284-00-0604-v01 and under tension load according to EAD 330232-02-0601. The evaluation is based on detailed results summarised in the test report Fi 638/01-25/07 dated 05.05.2025 and on the assessment report 25-005-1(0) dated 25.06.2025. The transfer of the fire resistance to masonry units is assessed in 25-005-2(0) dated 12.02.2026.

The characteristic fire resistance is valid for the following conditions:

- all material versions
- head type FUS and type T
- uncracked and cracked concrete (note, that uncracked concrete is generally not present in case of fire)
- solid calcium silicate brick and solid lightweight concrete block

According to EN 1992-4:2018, $\gamma_{M,fi}$ = 1,0 applies to steel failure and concrete failure modes under shear loading. For concrete failure modes under tension loading, $\gamma_{M,fi} = 1,0 \cdot \gamma_{inst}$ (with γ_{inst} = 1,0) applies.

2 Description of the product

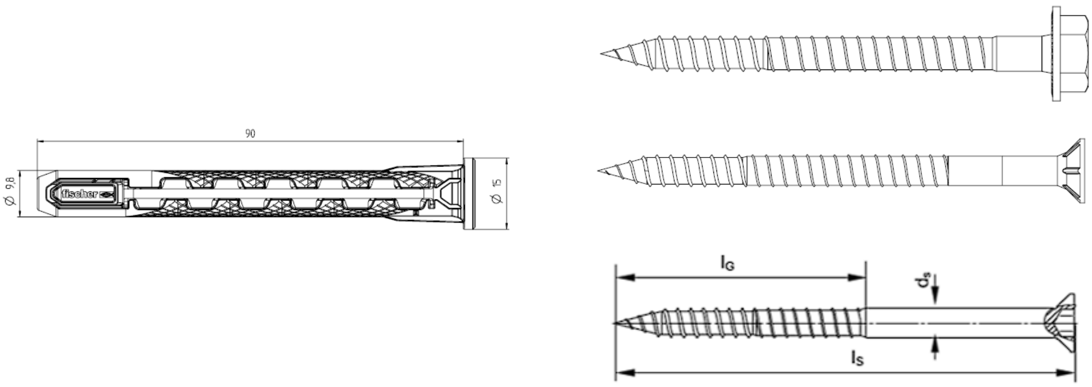
2.1 General description

The fischer HybridPower is a plastic anchor consisting of a plug sleeve made of polyamide PA6 combined with a metal skeleton (power wedge) and a special screw made of either galvanised steel, galvanised steel with an additional organic coating, or stainless steel (see Figure 2.1). The anchor sleeve expands when the special screw is screwed in, pressing the sleeve against the borehole wall. The power wedges interlock with the base material, ensuring secure anchorage. The screw is available with two different head types, a hexagon head with formed washer (type FUS) and a countersunk head (type T). In the fire tests galvanised screws with hexagon head with formed washer were used. An installed anchor is shown in Figure 2.3. A technical drawing of the anchor and the screws is shown in Figure 2.2.

a) HybridPower 10x90 FUS

b) HybridPower 10x90 T

Figure 2.1: HybridPower (sleeve: size 10, screw: size 7)



a) Sleeve

b) Screws FUS and T

Figure 2.2: Technical drawings of the sleeve and the screws of HybridPower

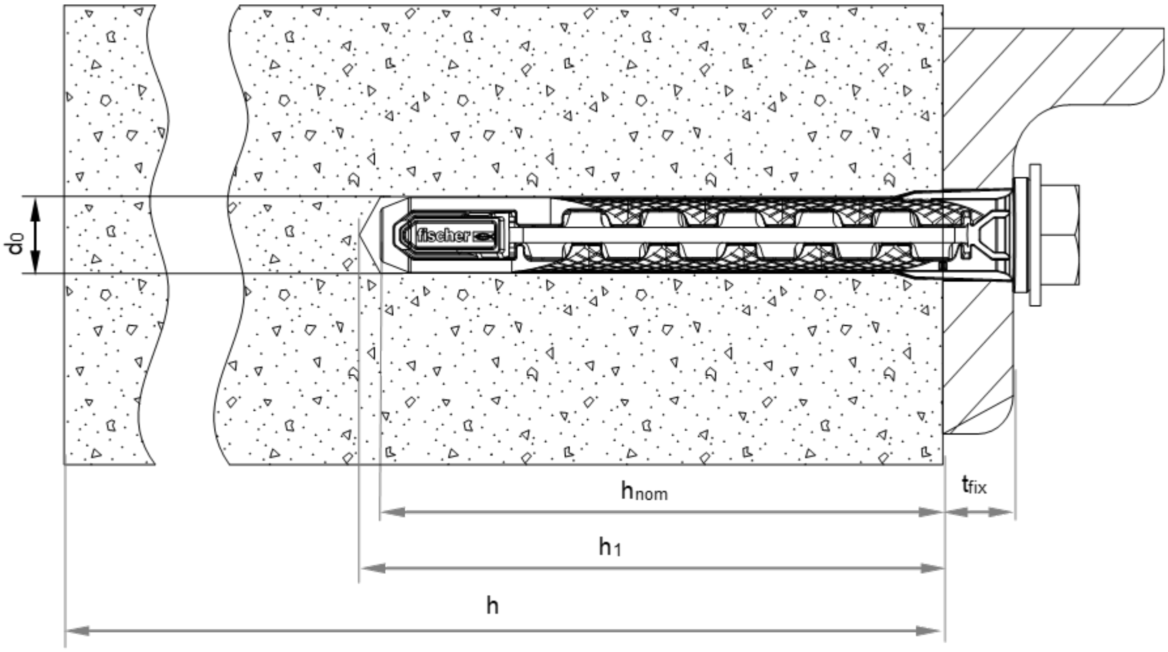


Figure 2.3: Installed anchor HybridPower (10x90 FUS, push-through installation).

Screw

The screws are made of either galvanised steel, galvanised steel with an additional organic coating, or stainless steel. The material of the screws used in the tests is marked in bold (see Table 2.1). The range of validity for all steel grades can be justified by the fact that the assessments are based on test results with carbon steel anchors. According to EAD 330232-02-0601, it can be assumed that the carbon steel version represents the less favorable case compared to the stainless steel version as it results in a shorter fire resistance duration. Therefore, the results summarised in this report are applicable to all material versions.

Table 2.1: Materials of screws 10x90 FUS and T (material used in tests is marked in bold).

Anchor	Screw			Material
	d_s [mm]	l_G [mm]	l_s [mm]	
HybridPower	7,0	≥ 77	≥ l_G+10	• **Galvanised steel gvz with Zn5/Ag or Zn5/An according to EN ISO 4042:2022** • Electro galvanised steel gvz with Zn5/Ag or Zn5/An according to EN ISO 4042:2022 with additional organic coating (Zn5/Ag/T7 or Zn5/An/T7) in three layers (total layer thickness ≥ 6 µm) • Stainless steel "A2" of corrosion resistance class CRC II according to EN 1993-1-4:2006 + A1:2015 • stainless steel "A4" or "R" of corrosion resistance class CRC III according to EN 1993-1-4:2006 + A1:2015

Plastic sleeve

The plastic sleeve consists of Polyamid PA6. The drawing is shown in Figure 2.2.

2.2 Base material

The anchors are intended for use in cracked and uncracked concrete of strength classes ranging from C20/25 to C50/60 as well as in solid calcium silicate brick and solid lightweight concrete block. The different types of bricks are summarised in Table 2.2.

Table 2.2: Masonry base material for the HybridPower.

No.	**Base material; density ρ [kg/dm³]; mean compressive strength f_b [N/mm²]** [manufacturer, designation, country], geometry, DF or nominal size (LxWxH) [mm], and drilling method
1	**Solid calcium silicate brick KS; ρ ≥ 2.0; f_b ≥ 25 according to EN 771-2** e.g. KS Wemding, DE, NF (240x115x71), hammer drilling
2	**Solid calcium silicate brick KS; ρ ≥ 1.8; f_b ≥ 20 according to EN 771-2** e.g. KS Wemding, DE, 2 DF (≥240x115x113), hammer drilling
3	**Solid lightweight concrete block Vbl; ρ ≥ 1.2; f_b ≥ 5 according to EN 771-3** e.g. Vbl KLB, DE, 2 DF (240x115x113), rotary drilling

2.3 Head forms

As noted above, two different head types are available for the screw with a hexagonal head with formed washer (type FUS) and countersunk head (type T). In the tests, only the hexagonal head with formed washer was used. However, the same screw types (FUS and T) are also used for the fischer DuoXpand, which already holds a valid ETA under fire exposure. The assessment with this anchor concluded that both screw head types show the same behavior under fire exposure. Therefore, the characteristic fire resistance values assessed in this report are valid for both head types.

2.4 Installation of the product

The installation instruction is shown in Figure 2.4. The essential installation parameters are listed in Table 2.3.

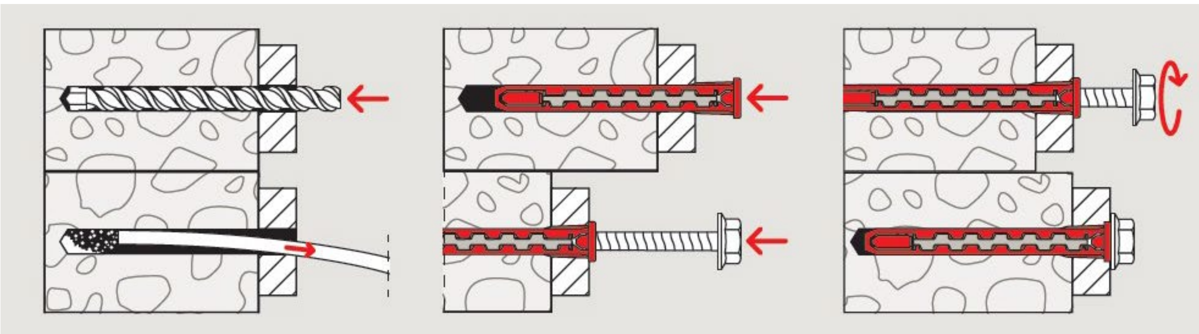


Figure 2.4: Installation instruction of HybridPower, type FUS (type T is analogous).

Table 2.3: Installation parameters of HybridPower.

Drill hole diameter	Anchor length	Minimum drill hole depth	Screw dimension	Nominal anchorage depth	Maximum thickness of fixture	Setting tool
d_0	l	h_1	d_s x l_s	h_{nom}	$t_{fix,max}$	
[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[-]
10	90	90	7,0 x 89 (FUS) 7,0 x 87 (T)	≥ 80	10	SW17 (FUS) TX40 (FUS+T)

3 Performance of the product under fire exposure

3.1 Fire resistance for concrete according to EAD 330232-02-0601

3.1.1 Tension loading (0°) (steel failure and pull-out failure)

The characteristic fire resistance to steel and pull-out failure for the HybridPower in concrete are listed in Table 3.1.

Table 3.1: Fire resistance to steel and pull-out failure in concrete for HybridPower.

Fire resistance class	Load direction	$N_{Rk,s,fi}$ and $N_{Rk,p,fi}$
[-]	[-]	[kN]
R30	0°	0,45
R60		0,35
R90		0,25
R120		0,20

3.1.2 Concrete cone failure

The fire resistance to concrete cone failure of HybridPower is listed in Table 3.2.

Table 3.2: Fire resistance to concrete cone failure for HybridPower.

Screw diameter	h_{ef}	A_s	$N^0_{Rk,c,C20/25}$	$N^0_{Rk,c,fi(90)}$	$N^0_{Rk,c,fi(120)}$
[-]	[mm]	[mm²]	[kN]	[kN]	[kN]
7	35	38,5	7,1	1,2	1,0

3.1.3 Steel failure under shear load

Shear tests under fire exposure were conducted in accordance with EAD 330284-00-0604. Since the assessment methodology is identical for both EADs, the results obtained according to EAD 330284-00-0604 are also applicable to EAD 330232-02-0601. The corresponding values are listed in Table 3.3.

Table 3.3: Fire resistance to steel failure under shear load with and without lever arm for HybridPower.

Fire resistance class	$\tau_{Rk,s,fi}$	$V_{Rk,s,fi}$	W_{el}	$M^0_{Rk,s,fi}$
[-]	[N/mm²]	[kN]	[mm³]	[Nm]
R30	99,17	2,0	33,7	2,09
R60	76,64	1,5		1,62
R90	50,90	1,0		1,07
R120	38,03	0,8		0,80

3.1.4 Concrete pryout failure

The fire resistance to concrete pry-out failure is listed in Table 3.4.

Table 3.4: Fire resistance to concrete pryout failure for HybridPower.

Screw diameter	h_{ef}	A_s	$N^0_{Rk,c,C20/25}$	$N^0_{Rk,c,fi(90)}$	$N^0_{Rk,c,fi(120)}$	k_8	$V_{Rk,cp,fi(90)}$	$V_{Rk,cp,fi(120)}$
[-]	[mm]	[mm²]	[kN]	[kN]	[kN]	[-]	[kN]	[kN]
7	35	38,5	20,2	7,1	5,6	1,0	1,2	1,0

3.1.5 Concrete edge failure

The fire resistance to concrete edge failure is listed in Table 3.5.

Table 3.5: Fire resistance to concrete edge failure for HybridPower.

Screw diameter	d_{nom}	$h_{ef} = l_f$	$c_{cr,fi}$	k_9	α	β	f_{ck}	$V^0_{Rk,c}$	$V^0_{Rk,c,fi(90)}$	$V^0_{Rk,c,fi(120)}$
[-]	[mm]	[mm]	[mm]	[-]	[-]	[-]	[N/mm²]	[kN]	[kN]	[kN]
7	7	80	160	1,7	0,07	0,05	20	22,3	5,6	4,5

3.2 Fire resistance for concrete according to EAD 330284-00-0604-v01

3.2.1 Tests under inclined loading (45°)

The characteristic fire resistance to steel and pull-out failure for the HybridPower in concrete is listed in Table 3.6.

Table 3.6: Fire resistance to steel and pull-out failure in concrete for HybridPower.

Fire resistance class	Load direction	$F_{Rk,s,fi}$ and $F_{Rk,p,fi}$
[-]	[-]	[kN]
R30	45°	1,58
R60		1,10
R90		0,62
R120		0,37

3.2.2 Tests under shear loading (90°)

The characteristic fire resistance to steel and pull-out failure for the HybridPower in concrete under shear load is listed in Table 3.7.

Table 3.7: Fire resistance to steel and pull-out failure in concrete for HybridPower.

Fire resistance class	Load direction	$V_{Rk,s,fi}$ and $V_{Rk,p,fi}$
[-]	[-]	[kN]
R30	90°	1,99
R60		1,54
R90		1,02
R120		0,76

3.2.3 Characteristic fire resistance for shear load with lever arm

The characteristic fire resistance for shear load with lever arm is listed in Table 3.8.

Table 3.8: Fire resistance to steel failure for shear load with lever arm for HybridPower.

Fire resistance class	$F_{Rk,s,fi}$	$\sigma_{Rk,s,fi}$	W_{el}	$M^0_{Rk.s,fi}$
[-]	[kN]	[N/mm²]	[mm³]	[Nm]
R30	0,45	11,6	33,7	0,47
R60	0,35	9,0		0,37
R90	0,25	6,5		0,26
R120	0,20	5,2		0,21

3.2.4 Interaction of fire resistance for load directions between 45° and 90°

For the HybridPower the characteristic fire resistance for load directions between 45° and 90° is listed in Table 3.9.

According to EAD 330284-00-0604-v01, for fastening of facade systems, the load bearing behaviour of the specific screwed-in plastic anchor with a diameter ≥ 10mm and a metal screw with a diameter ≥ 7mm and a h_{nom} of ≥ 50mm and a plastic sleeve made of polyamide PA6 with no permanent centric tension load and only for shear load without lever arm $F_{Rk,fi,90}$ = 0,8 kN applies. The fire resistance $F_{Rk,fi,90}$ = 0,8 kN is justified for a load direction of α ≥ 57° with a constant tensile load of 1,1 kN.

Table 3.9: Characteristic fire resistances to steel and pull-out failure in concrete as a function of load direction.

Load direction [°]	**Characteristic fire resistance $F_{Rk,s/p,fi}$ [kN]**			
	R30	**R60**	**R90**	**R120**
0	-[1)]	-[1)]	-[1)]	-[1)]
≥45	1,58	1,10	0,62	0,37
≥60	1,99	1,54	0,87	0,53
≥75	1,99	1,54	1,02	0,76
90	1,99	1,54	1,02	0,76

1) Pure tension loading is not allowed according to EAD 330284. Pure tension loading is covered by EAD 330232 (see Section 3.1).

3.3 Fire resistance for masonry units according to EAD 330284-00-0604-v01

3.3.1 General

The conditions according to EAD 330284-00-0604-v01 for omitting fire tests in masonry units under 45° and 90° loading are fulfilled according to 25-005-2(0). Therefore, no additional fire tests in masonry units are required and the characteristic fire resistance determined from fire tests in cracked concrete can be transferred to the masonry unit types solid calcium silicate brick and solid lightweight concrete block.

3.3.2 Fire resistance under 45° loading

The characteristic fire resistance under 45° loading is summarized in Table 3.10.

Table 3.10: Fire resistance to steel and pull-out failure in masonry units HybridPower (45°).

Fire resistance class	Load direction	Bricks	min $F_{Rk,s/p,fi}$
[-]	[-]	[-]	[kN]
R30	45°	• solid calcium silicate brick (Table 2.2, No. 1)	0,62
R60			0,62
R90			0,62
R120			0,37
R30	45°	• solid calcium silicate brick (Table 2.2, No. 2)	1,10
R60			1,10
R90			0,62
R120			0,37
R30	45°	• solid lightweight concrete block (Table 2.2, No. 3)	1,10
R60			1,10
R90			0,62
R120			0,37

3.3.3 Fire resistance under 90° loading

The characteristic fire resistance under 90° loading is summarized in Table 3.11.

Table 3.11: Fire resistance to steel and pull-out failure in masonry units HybridPower (90°).

Fire resistance class	Load direction	Bricks	min $V_{Rk,s/p,fi}$
[-]	[-]	[-]	[kN]
R30	90°	• solid calcium silicate brick (Table 2.2, No. 1)	1,54
R60			1,54
R90			1,02
R120			0,76
R30	90°	• solid calcium silicate brick (Table 2.2, No. 2)	1,02
R60			1,02
R90			1,02
R120			0,76
R30	90°	• solid lightweight concrete block (Table 2.2, No. 3)	1,02
R60			1,02
R90			1,02
R120			0,76

3.3.4 Interaction of fire resistance for load directions between 45° and 90°

The characteristic fire resistance for load directions between 45° and 90° is listed for solid calcium bricks KS (No. 1) in Table 3.12 and KS (No. 2) in Table 3.13 and for solid lightweight concrete block Vbl (No. 3) in Table 3.14.

Table 3.12: Characteristic fire resistances to steel failure and pull-out in solid calcium bricks KS (No. 1) as a function of load direction.

Load direction [°]	Characteristic fire resistance $F_{Rk,s/p,fi}$ [kN]			
	R30	R60	R90	R120
≥45	0,62	0,62	0,62	0,37
≥60	0,88	0,88	0,88	0,53
≥75	1,54	1,54	1,02	0,76
≥90	1,54	1,54	1,02	0,76

Table 3.13: Characteristic fire resistances to steel failure and pull-out in solid calcium bricks KS (No. 2) as a function of load direction.

Load direction [°]	Characteristic fire resistance $F_{Rk,s/p,fi}$ [kN]			
	R30	R60	R90	R120
≥45	1,10	1,10	0,62	0,37
≥60	1,02	1,02	0,88	0,53
≥75	1,02	1,02	1,02	0,76
≥90	1,02	1,02	1,02	0,76

Table 3.14: Characteristic fire resistances to steel failure and pull-out in solid lightweight concrete block Vbl (No. 3) as a function of load direction.

Load direction [°]	Characteristic fire resistance $F_{Rk,s/p,fi}$ [kN]			
	R30	R60	R90	R120
≥45	1,10	1,10	0,62	0,37
≥60	1,02	1,02	0,88	0,53
≥75	1,02	1,02	1,02	0,76
≥90	1,02	1,02	1,02	0,76

4 Summary

The characteristic fire resistance assessed according to both standards EAD 330232-02-0601 (concrete) and EAD 330284-00-0604v01 (concrete and masonry units) are given in the following tables. According to EN 1992-4:2018, $\gamma_{M,fi}$ = 1,0 applies to steel failure and concrete failure modes under shear loading. For concrete failure modes under tension loading, $\gamma_{M,fi} = 1{,}0 \cdot \gamma_{inst}$ (with γ_{inst} = 1,0) applies.

4.1 Fire resistance in concrete

Table 4.1: Fire resistance for different failure modes for HybridPower according to EAD 330232-02-0601.

Failure mode		Characteristic fire resistance [kN]			
		R30	R60	R90	R120
Tension loading					
Steel failure or pull-out	$N_{Rk,s,fi}$ and $N_{Rk,p,fi}$	0,45	0,35	0,25	0,20
Concrete cone failure	$N^0_{Rk,c,fi}$	1,2	1,2	1,2	1,0
Shear loading					
Steel failure	$V_{Rk,s,fi}$	1,99	1,54	1,02	0,76
Pryout failure	$V_{Rk,cp,fi}$	1,2	1,2	1,2	1,0
Concrete edge failure	$V^0_{Rk,c,fi}$	5,6	5,6	5,6	4,5

Table 4.2: Fire resistance for different failure modes for HybridPower according to EAD 330284-00-0604v01.

Failure mode		Load direction [°]	Characteristic fire resistance [kN]			
			R30	R60	R90	R120
Steel failure or pull-out	$F_{Rk,s,fi}$ and $F_{Rk,p,fi}$	0	-1)	-1)	-1)	-1)
		≥45	1,58	1,10	0,62	0,37
		≥60	1,99	1,54	0,87	0,53
		≥75	1,99	1,54	1,02	0,76
		90	1,99	1,54	1,02	0,76

1) Pure tension loading is not allowed according to EAD 330284. Pure tension loading is covered by EAD 330232 (see Table 4.1).

4.2 Fire resistance in masonry units

Table 4.3: Characteristic fire resistances for different failure modes in solid calcium bricks KS (No. 1).

Failure mode		Load direction [°]	Characteristic fire resistance [kN]			
			R30	R60	R90	R120
Steel failure and pull-out (solid calcium brick No. 1)	$F_{Rk,s,fi}$ and $F_{Rk,p,fi}$	0	-	-	-	-
		≥45	0,62	0,62	0,62	0,37
		≥60	0,88	0,88	0,88	0,53
		≥75	1,54	1,54	1,02	0,76
		90	1,54	1,54	1,02	0,76

Table 4.4: Characteristic fire resistances for different failure modes in solid calcium bricks KS (No. 2).

Failure mode		Load direction [°]	Characteristic fire resistance [kN]			
			R30	R60	R90	R120
Steel failure and pull-out (solid calcium brick No. 2)	$F_{Rk,s,fi}$ and $F_{Rk,p,fi}$	0	-	-	-	-
		≥45	1,10	1,10	0,62	0,37
		≥60	1,02	1,02	0,88	0,53
		≥75	1,02	1,02	1,02	0,76
		90	1,02	1,02	1,02	0,76

Table 4.5: Characteristic fire resistances for different failure modes in solid lightweight concrete block Vbl (No. 3).

Failure mode		Load direction [°]	Characteristic fire resistance [kN]			
			R30	R60	R90	R120
Steel failure and pull-out (solid lightweight concrete block Vbl No. 3)	$F_{Rk,s,fi}$ and $F_{Rk,p,fi}$	0	-	-	-	-
		≥45	1,10	1,10	0,62	0,37
		≥60	1,02	1,02	0,88	0,53
		≥75	1,02	1,02	1,02	0,76
		90	1,02	1,02	1,02	0,76

K. Schmid

FixING Solutions GmbH
Dr.-Ing. K. Schmid

J. Rex

FixING Solutions GmbH
Dipl.-Ing. J. Rex

Independent Technical Assessment for fischer HybridPower 10x90 under fire exposure based on EAD 330232-02-0601 andEAD 330284-00-0604-v01

Final Audit Report 2026-03-09

Created:	2026-03-09
By:	Klaus Schmid (schmid@fixing-solutions.de)
Status:	Signed
Transaction ID:	CBJCHBCAABAAH2JxjThytPB-oQDi-NhEg7FB6ij9dY9A

"Independent Technical Assessment for fischer HybridPower 10 x90 under fire exposure based on EAD 330232-02-0601 andEA D 330284-00-0604-v01" History

Document created by Klaus Schmid (schmid@fixing-solutions.de)
2026-03-09 - 8:04:46 AM GMT

Document emailed to Justus Rex (rex@fixing-solutions.de) for signature
2026-03-09 - 8:04:52 AM GMT

Email viewed by Justus Rex (rex@fixing-solutions.de)
2026-03-09 - 8:58:34 AM GMT

Document e-signed by Justus Rex (rex@fixing-solutions.de)
Signature Date: 2026-03-09 - 8:58:48 AM GMT - Time Source: server

Agreement completed.
2026-03-09 - 8:58:48 AM GMT