W-HLX-H Concrete Screws

superior performance concrete screws for anchoring in cracked and non-cracked concrete

Anchor types

W-HLX-H 6x40 6x60 8x60 8x75 8x100 10x70 10x90 10x100 12x110

- **W-HLX-H** concrete screw with hexagon head and a pre-pressed washer with zinc flake coating for improved corrosion resistance
- Ø10 suits installation with Walraven RapidStrut®

W-HLX-P 6x40

- **W-HLX-P** concrete screw with a ø14.6 mm pan head and torx T30 drive with zinc flake coating for improved corrosion resistance
- suits installation with Walraven RapidRail® Light-Duty Channel

W-HLX-PX 6x40 6x60

- **W-HLX-PX** concrete screw with a ø17.0 mm pan head and torx T30 drive with zinc flake coating for improved corrosion resistance
- suits installation with Walraven RapidStrut® Channel

W-HLX-N 6x35 6x55

- **W-HLX-N** unibody zinc-plated concrete screw with an internal socket: M8, M10 or M8/M10 thread

Features and benefits

- European Technical Assessment according to EAD 330232-01-0601 for use in cracked and non-cracked concrete (Option 1)
- The advanced thread geometry ensures fast and simple installation
- Induction hardened technology ensures very high load capacity
- Zinc flake coating rated up to corrosivity category C4 for demanding environments
- Seismic performance categories C1 and C2 for design of anchorages under seismic action
- Compliance with VdS CEA 4001:2024-01 (08) for applications with sprinkler systems in concrete elements
- Up to three embedment depths per size for maximum design and installation flexibility
- Installation possible without drill hole cleaning for faster workflow on site
- Reduced minimum edge and anchor spacing distances for use in confined areas
- Fire resistance class R30-R120 for design of anchorages under exposure to fire

Suitable base materials

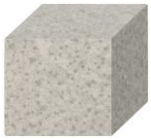
- Non-cracked concrete, C20/25 to C50/60
- Cracked concrete, C20/25 to C50/60
- Reinforced and unreinforced concrete
- Stone (after site testing)

Typical applications

- Structural steel
- Barriers and safety systems
- Heavy plant machinery
- Facade systems

Concrete (non-cracked)

Concrete (cracked)



Stone

Approvals and certificates

■ European Technical Assessment	ETA-25/1137	
■ Fire Test Report	ETA-25/1137	
■ Compliance with VdS requirements for applications with sprinkler systems in concrete elements	VdS CEA 4001:2024-01 (08)	

1. Product details

Article	Description	Size	Length	Thread diameter	Max. Fixture Thickness*			Drive System
					$t_{fix,max}$ [mm]			
			L [mm]	d_s [mm]	h_{nom} = STD	h_{nom} = MED	h_{nom} = MIN	
62510304	W-HLX-H 6x40	6	40	7.9	-	-	Δ/5	SW10
62510306	W-HLX-H 6x60	6	60	7.9	5	20	Δ/25	SW10
62510406	W-HLX-H 8x60	8	60	10.4	-	-	10	SW13
62510408	W-HLX-H 8x75	8	75	10.4	5	15	25	SW13
62510410	W-HLX-H 8x100	8	100	10.4	30	40	50	SW13
62510507	W-HLX-H 10x70	10	70	12.7	-	-	15	SW15
62510509	W-HLX-H 10x90	10	90	12.7	5	15	35	SW15
62510510	W-HLX-H 10x100	10	100	12.7	15	25	45	SW15
62510611	W-HLX-H 12x110	12	110	14.9	10	30	40	SW17
62511304	W-HLX-P 6x40	6	40	7.9	-	-	Δ/5	T30
62512304	W-HLX-PX 6x40	6	40	7.9	-	-	Δ/5	T30
62512306	W-HLX-PX 6x60	6	60	7.9	5	20	Δ/25	T30
62533304	W-HLX-N 6x35 M8/M10	6	35	7.9	-	-	□	SW13
62533314	W-HLX-N 6x35 M8	6	35	7.9	-	-	□	SW13
62533324	W-HLX-N 6x35 M10	6	35	7.9	-	-	□	SW13
62533305	W-HLX-N 6x55 M8/M10	6	55	7.9	□	□	□	SW13
62533315	W-HLX-N 6x55 M8	6	55	7.9	□	□	□	SW13
62533325	W-HLX-N 6x55 M10	6	55	7.9	□	□	□	SW13

*Articles without a valid fixture thickness cannot be designed and used according to ETA-25/1137

Δ use restricted to anchoring statically indeterminate structural components

□ product not intended for application with fixture plate

2. Packaging details

Article	Description	Dimension	Pack 1					
			[pcs]	EAN13	length [mm]	width [mm]	height [mm]	weight [kg]
62510304	W-HLX-H	6x40	100	8719942184755	186	140	72	1.44
62510306	W-HLX-H	6x60	100	8719942184786	186	140	72	1.86
62510406	W-HLX-H	8x60	100	8719942184816	186	140	108	3.28
62510408	W-HLX-H	8x75	100	8719942184847	186	140	108	4.06
62510410	W-HLX-H	8x100	100	8719942184878	286	122	108	5.03
62510507	W-HLX-H	10x70	50	8719942184908	286	122	108	2.93
62510509	W-HLX-H	10x90	50	8719942184939	186	140	108	3.51
62510510	W-HLX-H	10x100	50	8719942184960	186	140	108	3.80
62510611	W-HLX-H	12x110	50	8719942184991	379	140	108	6.28
62511304	W-HLX-P	6x40	100	8719942185028	186	140	72	1.36
62512304	W-HLX-PX	6x40	100	8719942185059	186	140	72	1.41
62512306	W-HLX-PX	6x60	100	8719942185080	186	140	72	1.87
62533304	W-HLX-N M8/M10	6x35	100	8719942185257	186	140	72	2.73
62533314	W-HLX-N M8	6x35	100	8719942185271	186	140	72	2.18
62533324	W-HLX-N M10	6x35	100	8719942185295	186	140	72	1.95
62533305	W-HLX-N M8/M10	6x55	100	8719942185127	186	140	108	3.19
62533315	W-HLX-N M8	6x55	100	8719942185165	186	140	108	2.66
62533325	W-HLX-N M10	6x55	100	8719942185202	186	140	108	2.43

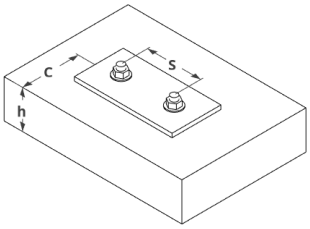
3. Mechanical properties

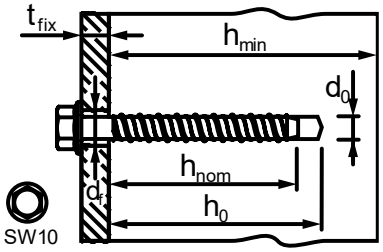
Property			ETA-25/1137
			W-HLX-H, W-HLX-P, W-HLX-PX, W-HLX-N
Material			Carbon Steel; rupture elongation $A_5 \geq 12\%$
Coating			Zinc flake ≥ 5µm ISO 10683 or Zinc plated ≥ 5µm

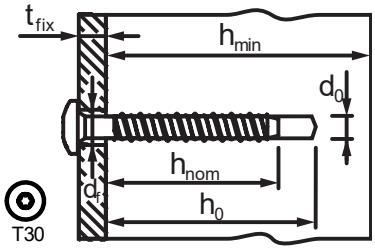
3. Installation data

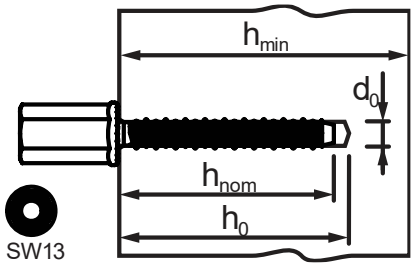
3.1 Installation parameters for cracked and non-cracked concrete

Anchor Type			W-HLX											
Anchor Size			6	6	6	8	8	8	10	10	10	12	12	12
Embedment depth			MIN	MED	STD	MIN	MED	STD	MIN	MED	STD	MIN	MED	STD
Nominal embedment depth	h_{nom}	[mm]	35	40	55	50	60	70	55	75	85	60	80	100
Effective embedment depth	h_{ef}	[mm]	26	30	43	39	43	56	42	59	68	46	63	80
Drill hole diameter	d_0	[mm]	6			8			10			12		
Max cutting diameter	$d_{cut,max}$	[mm]	6.40	6.40	6.40	8.45	8.45	8.45	10.45	10.45	10.45	12.45	12.45	12.45
Min. depth of drill hole	$h_0 \geq$	[mm]	45	50	65	60	70	85	65	85	95	70	90	110
Diameter of clearing hole in the fixture	d_f	[mm]	9			12			14			16		
Max fixture thickness	$t_{fix,max}$	[mm]	$L - h_{nom}$											
Minimum concrete member thickness	h_{min}	[mm]	80	80	80	110	110	110	100	120	130	110	130	155
Minimum edge distance	c_{min}	[mm]	35			35			60			80		
Minimum anchor spacing	s_{min}	[mm]	35			35			60			80		
Max. impact screw driver torque	$T_{imp,max}$	[Nm]	250			350			650			1000		



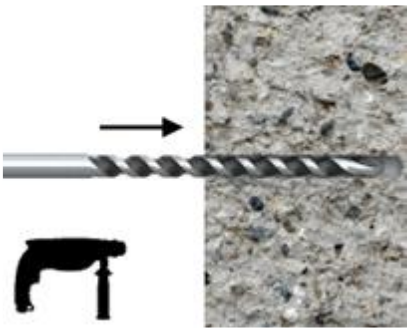




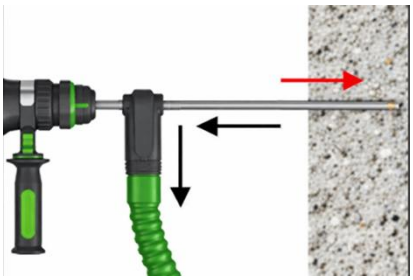


3.2 Installation procedure for concrete – with cleaning

1a

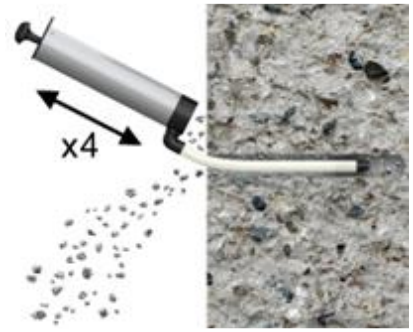


1b



1. Drill the hole with a hammer drill (1a) or a dust-free drill (1b) to the required depth.
   Drill hole depth: $h_1 \geq L - t_{fix} + 10$ mm

2.



2. Clean the hole (blow dust at least 4 times with the hand pump). When using a dust-free drill bit (1b), it is not necessary to clean the hole by pump.

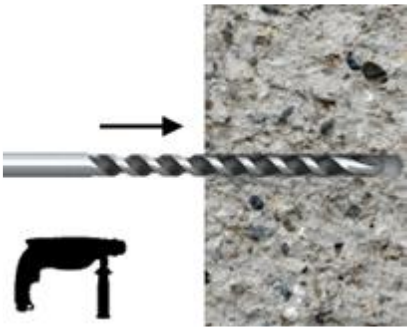
3.

3. Screw the concrete screw into the hole with an impact wrench and a suitable impact socket. Tighten until the fixture is clamped to the substrate.
   Installation with any tangential impact wrench.

4.

4. Finish screwing when the screw head presses the fastened element/substrate. The screw head must not be damaged.

3.3 Installation procedure for concrete – without cleaning

1. 

1. Drill the hole with a hammer drill to the required depth and 3x ventilation after drilling is executed (moving the drill bit in and out drill hole 3 times after the recommended drilling depth is achieved).
   Drill hole depth: $h_1 \geq L - t_{fix} + 25$ mm

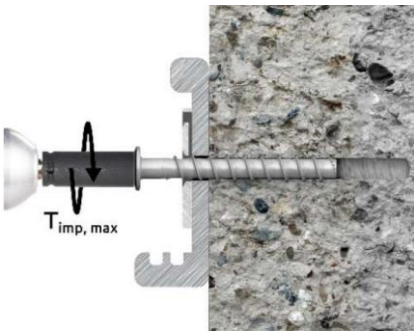
2. 

2. Screw the concrete screw into the hole with an impact wrench and a suitable impact socket. Tighten until the fixture is clamped to the substrate.
   Installation with any tangential impact wrench ($T_{imp,max}$).

3. 

3. After installation a further turning of the screw must not be possible. The head of the screw must be in contact with the fixture / substrate and it must not be damaged.

3.4 Installation procedure– filling of the annular gap

1. 

1. Place the sealing ring on the fixture. Screw the concrete screw into the hole using an impact wrench and an appropriate impact socket. Tighten until the element is pressed to the surface. Installation using any impact wrench with a tangential impact.

2. 

2. Finish screwing in when the screw head and the ring presses with the fastened element/substrate. The screw head must not be damaged.

3. 

3. Place the dispensing nozzle in the opening of the sealing ring. Fill the annular gap with resin.

4. 

4. Correctly installed screw with a sealing ring filled with resin.

4. Performance information

4.1 Loading information for cracked and non-cracked concrete C20/25 for single anchors[1)]

Anchor Type			W-HLX											
Anchor Size			6	6	6	8	8	8	10	10	10	12	12	12
Nominal embedment depth	h_{nom}	[mm]	35[3)]	40	55	50	60	70	55	75	85	60	80	100
Non-cracked concrete														
Characteristic tension load	N_{Rk}	[kN]	4.50	8.00	13.80	11.90	13.87	20.60	13.39	22.29	27.58	15.35	24.60	35.20
Characteristic shear load	V_{Rk}	[kN]	6.52	8.08	9.70	11.98	17.70	17.70	13.39	27.20	27.20	30.70	41.60	41.60
Design tension load	N_{Rd}	[kN]	3.00	5.33	9.20	7.93	9.25	13.73	8.93	14.86	18.39	10.23	16.40	23.47
Design shear load	V_{Rd}	[kN]	4.35	5.39	7.76	7.99	14.16	14.16	8.93	21.76	21.76	20.46	32.80	33.28
Recommended tension load	N_{Rec}	[kN]	2.14	3.81	6.57	5.67	6.61	9.81	6.38	10.62	13.14	7.31	11.71	16.76
Recommended shear load	V_{Rec}	[kN]	3.11	3.85	5.54	5.71	10.11	10.11	6.38	15.54	15.54	14.62	23.43	23.77
Cracked concrete														
Characteristic tension load	N_{Rk}	[kN]	2.00	2.00	3.50	8.00	9.00	11.00	9.37	15.6	19.3	10.70	17.20	24.60
Characteristic shear load	V_{Rk}	[kN]	4.57	5.66	9.70	8.39	17.70	17.70	9.37	27.20	27.20	21.49	34.44	41.60
Design tension load	N_{Rd}	[kN]	1.33	1.33	2.33	5.33	6.00	7.33	6.25	10.40	12.87	7.13	11.47	16.40
Design shear load	V_{Rd}	[kN]	3.04	3.77	6.47	5.59	12.95	14.16	6.25	20.81	21.76	14.32	22.96	32.85
Recommended tension load	N_{Rec}	[kN]	0.95	0.95	1.67	3.81	4.29	5.24	4.46	7.43	9.19	5.10	8.19	11.71
Recommended shear load	V_{Rec}	[kN]	2.17	2.69	4.62	3.99	9.25	10.11	4.46	14.86	15.54	10.23	16.40	23.47

1) Single anchors are anchors not affected by concrete edge and anchor spacing influence.
2) Recommended load includes partial safety factor and an overall partial safety factor for action of 1.4. Recommended load based on cleaned holes. The partial safety factor for action depends on the type of loading and shall be taken from national regulations. All anchor failure modes and the entire relevant product European Technical Assessment must be considered for anchor design.
3) Use restricted to anchoring statically indeterminate structural components

4.2 Performance data for cracked and non-cracked concrete for single anchors[1)]

Anchor Type			W-HLX											
Anchor Size			6	6	6	8	8	8	10	10	10	12	12	12
Nominal embedment depth	h_{nom}	[mm]	35	40	55	50	60	70	55	75	85	60	80	100
Tension load														
Steel failure														
Characteristic resistance	$N_{Rk,s}$	[kN]	19.40			35.40			54.30			83.10		
Partial safety factor	γ_{Ms}		1.5			1.5			1.5			1.5		
Pullout failure, non-cracked concrete														
Characteristic resistance	$N_{Rk,p}$	[kN]	4.5	8.0	13.8	11.9	16.3	20.6	13.4	22.3	27.6	15.4	24.6	35.2
Pullout failure, cracked concrete														
Characteristic resistance	$N_{Rk,p}$	[kN]	2.0	2.0	3.5	8.0	9.0	11.0	9.4	15.6	19.3	10.7	17.2	24.6
Pullout failure														
Installation safety factor	γ_{inst}	-	1.0[2)]	1.0[2]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Increasing factor for C30/37	Ψ_C	-	1.17	1.17	1.17	1.17	1.17	1.17	1.22	1.22	1.22	1.22	1.22	1.22
Increasing factor for C40/50	Ψ_C	-	1.32	1.32	1.32	1.32	1.32	1.32	1.41	1.41	1.41	1.41	1.41	1.41
Increasing factor for C50/60	Ψ_C	-	1.42	1.42	1.42	1.42	1.42	1.42	1.55	1.55	1.55	1.55	1.55	1.55
Concrete cone failure														
Installation safety factor	γ_{inst}	-	1.0[2)]	1.0[2)]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Factor for cracked concrete	$k_{cr,N}$	-	7.7			7.7			7.7			7.7		
Factor for non-cracked concrete	$k_{ucr,N}$	-	11.0			11.0			11.0			11.0		
Spacing	$S_{cr,N}$	[mm]	78.0	90.0	129.0	117.0	129.0	168.0	126.0	177.0	204.0	138.0	189.0	240.0
Edge distance	$C_{cr,N}$	[mm]	39.0	45.0	64.5	58.5	64.5	84.0	63.0	88.5	102.0	69.0	94.5	120.0
Concrete splitting failure														
Installation safety factor	γ_{inst}	-	1.0[2)]	1.0[2]	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Spacing	$S_{cr,sp}$	[mm]	80.0	90.0	130.0	120.0	150.0	170.0	120.0	180.0	200.0	140.0	200.0	240.0
Edge distance	$C_{cr,sp}$	[mm]	40.0	45.0	65.0	60.0	75.0	85.0	60.0	90.0	100.0	70.0	100.0	120.0
Shear load														
Steel failure														
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	9.7			17.7			27.2			41.6		
Ductility factor	k_7	-	1.0			1.0			1.0			1.0		
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	16.1			39.8			75.8			143.4		
Partial safety factor for steel	γ_{Ms}	-	1.25			1.25			1.25			1.25		
Concrete pry-out failure														
Factor	k	-	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0
Installation safety factor	γ_{inst}	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Concrete edge failure														
Effective length of anchor	ℓ_f	[mm]	35	40	55	50	60	70	55	75	85	60	80	100
Anchor diameter	d_{nom}	[mm]	6	6	6	8	8	8	10	10	10	12	12	12
Installation safety factor	γ_{inst}	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

1) Single anchors are anchors not affected by concrete edge and anchor spacing influence.
2) Holes without cleaning γinst = 1.2

4.3 Characteristic values for seismic performance category C1

Anchor Type			W-HLX										
Anchor Size			6		8			10			12		
Nominal embedment depth	h_{nom}	[mm]	40	55	50	60	70	55	75	85	60	80	100
Tension load													
Characteristic resistance for steel failure	$N_{Rk,s,C1}$	[kN]	19.4		35.4			54.3			83.1		
Characteristic resistance for pull-out failure	$N_{Rk,p,C1}$	[kN]	2.0	3.5	7.6	8.6	10.5	8.6	14.4	17.8	7.6	12.2	17.5
Shear load													
Characteristic resistance without lever arm for steel failure	$V_{Rk,s,C1}$	[kN]	4.7		10.6			18.7			28.7		
Reduction factor without gap filling	α_{gap}		0.5										
Reduction factor with gap filling	α_{gap}		1.0										

4.4 Characteristic values for seismic performance category C2

Anchor Type			W-HLX		
Anchor Size			8	10	12
Nominal embedment depth	h_{nom}	[mm]	70	85	100
Tension load					
Characteristic resistance for steel failure	$N_{Rk,s,C2}$	[kN]	35.4	54.3	83.1
Characteristic resistance for pull-out failure	$N_{Rk,p,C2}$	[kN]	2.0	8.5	13.3
Shear load					
Characteristic resistance without lever arm for steel failure	$V_{Rk,s,C2}$	[kN]	3.6	8.0	22.3
Reduction factor without gap filling	α_{gap}		0.5		
Reduction factor with gap filling	α_{gap}		1.0		
Displacements					
Displacements under tension load					
Displacements DLS	$\boldsymbol{\delta_{N,C2}}$	[mm]	0.50	0.36	0.44
Displacements ULS	$\boldsymbol{\delta_{N,C2}}$	[mm]	1.19	1.29	1.65
Displacements under shear load					
Displacements DLS	$\boldsymbol{\delta_{V,C2}}$	[mm]	1.98	5.59	5.00
Displacements ULS	$\boldsymbol{\delta_{V,C2}}$	[mm]	6.24	7.10	7.90

4.5 Characteristic values of resistance to fire exposure[1)]

Anchor Type			W-HLX											
Anchor Size			6	6	6	8	8	8	10	10	10	12	12	12
Nominal embedment depth	h_{nom}	[mm]	35[2)]	40	55	50	60	70	55	75	85	60	80	100
Characteristic values under tension load														
Steel failure														
R30	$N_{Rk,s,fi}$	[kN]	1.8			3.8			6.6			11.4		
R60	$N_{Rk,s,fi}$	[kN]	1.4			2.9			5.0			8.5		
R90	$N_{Rk,s,fi}$	[kN]	1.0			2.0			3.4			5.7		
R120	$N_{Rk,s,fi}$	[kN]	0.8			1.6			2.6			4.3		
Pull-out failure														
R30	$N_{Rk,p,fi}$	[kN]	0.5	0.5	0.8	2.0	2.2	2.7	2.3	3.9	4.8	2.6	4.3	6.1
R60	$N_{Rk,p,fi}$	[kN]	0.5	0.5	0.8	2.0	2.2	2.7	2.3	3.9	4.8	2.6	4.3	6.1
R90	$N_{Rk,p,fi}$	[kN]	0.5	0.5	0.8	2.0	2.2	2.7	2.3	3.9	4.8	2.6	4.3	6.1
R120	$N_{Rk,p,fi}$	[kN]	0.4	0.4	0.7	1.6	1.8	2.2	1.8	3.1	3.8	2.1	3.4	4.9
Characteristic values under shear load														
Characteristic resistance														
R30	$V_{Rk,s,fi}$	[kN]	1.8			3.8			6.6			11.4		
R60	$V_{Rk,s,fi}$	[kN]	1.4			2.9			5.0			8.5		
R90	$V_{Rk,s,fi}$	[kN]	1.0			2.0			3.4			5.7		
R120	$V_{Rk,s,fi}$	[kN]	0.8			1.6			2.6			4.3		
Characteristic bending resistance														
R30	$M^0_{Rk,s,fi}$	[Nm]	1.5			4.3			9.3			19.7		
R60	$M^0_{Rk,s,fi}$	[Nm]	1.2			3.3			7.0			14.8		
R90	$M^0_{Rk,s,fi}$	[Nm]	0.8			2.3			4.8			9.9		
R120	$M^0_{Rk,s,fi}$	[Nm]	0.7			1.8			3.7			7.4		
Edge distance														
R30 to R120	$C_{cr,fi}$	[mm]	2 x h_{ef}											
In case of fire attack from more than one side, the edge distance of the anchor has to be ≥ 300 mm and ≥ 2 hef														
Anchor spacing														
R30 to R120	$S_{cr,fi}$	[mm]	4 x h_{ef}											
Concrete pry-out failure														
R30 to R120	k	-	1.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0	2.0	2.0	2.0

1) In absence of other national regulations, the partial safety factor for resistance under fire exposure is recommended $\gamma_{M,fi} = 1.0$ for steel failure and concrete related failure modes under shear loading. For concrete related failure under tension $\gamma_{M,fi} = 1.0$ γ_{inst}

2) Use restricted to anchoring statically indeterminate structural components