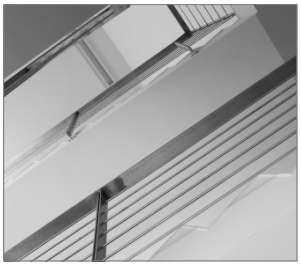
R-HLX-HF-ZF Self-tapping, induction-hardened concrete screw with a hexagonal head in a flake zinc coating.

Self-tapping induction hardened concrete screw



Approvals and Reports

- ETA-23/0707

Product information

Features and benefits

- R-HLX screws are coated with ZF flake zinc coating, which guarantees increased corrosion resistance.
- High parameters in cracked and uncracked concrete C20/25 – C50/60.
- Three anchoring depths
- Polish production
- Thanks to the use of thread to the end of the anchor length, we ensure better cooperation with the substrate, thereby achieving higher load capacities.
- Additional ribbing of the washer ensures better pressing of the fastened element to the surface of the substrate.
- Reliable and simple installation.
- Coated with flake zinc coating - corrosion class C1-C4.
- Induction hardening ensures high surface hardness and high core impact strength
- The new thread shape ensures quick and easy installation
- The optimized tip shape ensures efficient anchoring from the beginning of the thread.

Applications

- Through-fixing
- Temporary anchorages
- Formwork support systems
- Balustrading & handrails
- Fencing & gates manufacturing and installation
- Racking systems
- Public seating
- Scaffolding

Base materials

Approved for use in:

- Cracked concrete C20/25-C50/60
- Non-cracked concrete C20/25-C50/60
- Reinforced concrete
- Unreinforced concrete

Also suitable for use in:

- Natural Stone (after site testing)

Product information

Size	Product Code	Approval type	Anchor		Fixture			
			Diameter	Length	Max. thickness t_{fix} for:			Hole diameter
			d	L	$h_{nom,red}$	$h_{nom,med}$	$h_{nom,std}$	d_F
		-	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
10	R-HLX-10X060-HF-ZF	ETA-23/0707	12.7	60	5	-	-	14
	R-HLX-10X070-HF-ZF	ETA-23/0707	12.7	70	15	-	-	14
	R-HLX-10X080-HF-ZF	ETA-23/0707	12.7	80	25	5	-	14
	R-HLX-10X090-HF-ZF	ETA-23/0707	12.7	90	35	15	5	14
	R-HLX-10X100-HF-ZF	ETA-23/0707	12.7	100	45	25	15	14
	R-HLX-10X120-HF-ZF	ETA-23/0707	12.7	120	65	45	35	14
	R-HLX-10X140-HF-ZF	ETA-23/0707	12.7	140	85	65	55	14
	R-HLX-10X180-HF-ZF	ETA-23/0707	12.7	180	125	105	95	14
	R-HLX-10X200-HF-ZF	ETA-23/0707	12.7	200	145	125	115	14
12	R-HLX-12X070-HF-ZF	ETA-23/0707	14.9	70	10	-	-	16
	R-HLX-12X090-HF-ZF	ETA-23/0707	14.9	90	30	10	-	16
	R-HLX-12X110-HF-ZF	ETA-23/0707	14.9	110	50	30	10	16
	R-HLX-12X130-HF-ZF	ETA-23/0707	14.9	130	70	50	30	16
	R-HLX-12X150-HF-ZF	ETA-23/0707	14.9	150	90	70	50	16
14	R-HLX-14X075-HF-ZF	ETA-17/0783	16.9	75	10	-	-	18
	R-HLX-14X100-HF-ZF	ETA-23/0707	16.9	100	35	15	-	18
	R-HLX-14X130-HF-ZF	ETA-23/0707	16.9	130	65	45	15	18
	R-HLX-14X150-HF-ZF	ETA-23/0707	16.9	150	85	65	35	18
	R-HLX-14X180-HF-ZF	ETA-23/0707	16.9	180	115	95	65	18

Installation data

Size			10	12	14
Thread diameter	d	[mm]	12.7	14.9	16.9
Hole diameter in substrate	d_0	[mm]	10	12	14
Wrench size	Sw	[mm]	15	17	21
External diameter of washer		[mm]	22	27	32
Max. torque for impact screw driver	$T_{imp,max}$	[Nm]	1000	1000	1000
STANDARD EMBEDMENT DEPTH					
Min. hole depth in substrate	$h_{0,s}$	[mm]	95	110	125
Real hole depth in substrate	h_0	[mm]	L + 10 - t_{fix}	L + 10 - t_{fix}	L + 10 - t_{fix}
Min. installation depth	$h_{nom,s}$	[mm]	85	100	115
Min. substrate thickness	$h_{min,s}$	[mm]	130	155	190
Min. spacing	$s_{min,s}$	[mm]	60	80	100
Min. edge distance	$c_{min,s}$	[mm]	60	80	100
REDUCED EMBEDMENT DEPTH					
Min. hole depth in substrate	$h_{0,r}$	[mm]	85	90	95
Real hole depth in substrate	h_0	[mm]	L + 10 - t_{fix}	L + 10 - t_{fix}	L + 10 - t_{fix}
Min. installation depth	$h_{nom,r}$	[mm]	65	80	85
Min. substrate thickness	$h_{min,r}$	[mm]	120	130	130
Min. spacing	$s_{min,r}$	[mm]	60	80	100
Min. edge distance	$c_{min,r}$	[mm]	60	80	100
MINIMUM EMBEDMENT DEPTH					
Min. hole depth in substrate	$h_{0,min}$	[mm]	65	70	75
Real hole depth in substrate	h_0	[mm]	L + 10 - t_{fix}	L + 10 - t_{fix}	L + 10 - t_{fix}
Min. installation depth	$h_{nom,min}$	[mm]	55	60	65
Min. substrate thickness	$h_{min,min}$	[mm]	100	110	110
Min. spacing	$s_{min,min}$	[mm]	60	80	100
Min. edge distance	$c_{min,min}$	[mm]	60	80	100

Mechanical properties

Size			10	12	14
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm²]	800	800	800
Nominal yield strength - tension	f_{yk}	[N/mm²]	640	640	640
Cross sectional area - tension	A_s	[mm²]	67.9	100.3	138.9
Elastic section modulus	W_{el}	[mm³]	91.2	110.9	130.5
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	75.8	143.4	221.7
Design bending resistance	M	[Nm]	60.64	114.72	177.36

Basic performance data

Performance data for single anchor without influence of edge distance and spacing

Size		10	12	14
NON-CRACKED CONCRETE C20/25				
Standard embedment depth h_{nom}	[mm]	85.00	100.00	115.00
Reduced embedment depth h_{nom}	[mm]	75.00	80.00	85.00
Minimum embedment depth h_{nom}	[mm]	55.00	60.00	65.00
CRACKED CONCRETE C20/25				
Standard embedment depth h_{nom}	[mm]	85.00	100.00	115.00
Reduced embedment depth h_{nom}	[mm]	75.00	80.00	85.00
Minimum embedment depth h_{nom}	[mm]	55.00	60.00	65.00
MEAN ULTIMATE LOAD				
TENSION LOAD $N_{Ru,m}$				
NON-CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	37.85	48.30	59.56
Reduced embedment depth	[kN]	30.59	33.75	36.19
Minimum embedment depth	[kN]	18.37	21.06	23.15
CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	26.64	33.99	41.92
Reduced embedment depth	[kN]	21.53	23.75	23.75
Minimum embedment depth	[kN]	12.93	14.82	16.29
SHEAR LOAD $V_{Ru,m}$				
NON-CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	29.92	45.76	61.16
Reduced embedment depth	[kN]	29.92	45.76	61.16
Minimum embedment depth	[kN]	18.37	42.12	46.31
CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	29.92	45.76	61.16
Reduced embedment depth	[kN]	29.92	45.76	45.76
Minimum embedment depth	[kN]	12.93	29.64	32.59

Basic performance data

Size		10	12	14
CHARACTERISTIC LOAD				
TENSION LOAD N_{Rk}				
NON-CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	27.58	35.20	43.41
Reduced embedment depth	[kN]	22.29	24.60	26.38
Minimum embedment depth	[kN]	13.39	15.35	16.87
CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	19.31	24.64	30.39
Reduced embedment depth	[kN]	15.61	17.22	17.22
Minimum embedment depth	[kN]	9.37	10.74	11.81
SHEAR LOAD V_{Rk}				
NON-CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	27.20	41.60	55.60
Reduced embedment depth	[kN]	27.20	41.60	52.75
Minimum embedment depth	[kN]	13.39	30.70	33.75
CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	27.20	41.60	55.60
Reduced embedment depth	[kN]	27.20	34.44	34.44
Minimum embedment depth	[kN]	9.37	21.49	23.62
DESIGN LOAD				
TENSION LOAD N_{Rd}				
NON-CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	18.39	23.47	24.12
Reduced embedment depth	[kN]	14.86	16.40	14.65
Minimum embedment depth	[kN]	7.44	8.53	9.37
CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	12.87	16.43	16.88
Reduced embedment depth	[kN]	10.40	11.48	11.48
Minimum embedment depth	[kN]	5.21	5.97	6.56
SHEAR LOAD V_{Rd}				
NON-CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	21.76	33.28	44.48
Reduced embedment depth	[kN]	21.76	32.80	35.17
Minimum embedment depth	[kN]	8.93	20.46	22.50
CRACKED CONCRETE C20/25				
Standard embedment depth	[kN]	21.76	32.85	40.52
Reduced embedment depth	[kN]	20.81	22.96	22.96
Minimum embedment depth	[kN]	6.25	14.32	15.75

Design performance data

Size			10			12			14		
Min. installation depth	h_{nom}	[mm]	55.00	75.00	85.00	60.00	80.00	100.0	65.00	85.00	115.0
Effective embedment depth	h_{ef}	[mm]	42.00	59.00	68.00	46.00	63.00	80.00	49.00	66.00	92.00
TENSION LOAD											
STEEL FAILURE											
Characteristic resistance	$N_{Rk,s}$	[kN]	54.30	54.30	54.30	83.10	83.10	83.10	111.1	111.1	111.1
Partial safety factor	γ_{Ms}	-	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
PULL-OUT FAILURE; NON-CRACKED CONCRETE C20/25											
Characteristic resistance	$N_{Rk,p}$	[kN]	13.40	22.30	27.60	15.40	24.60	35.20	16.90	26.40	43.40
PULL-OUT FAILURE; CRACKED CONCRETE C20/25											
Characteristic resistance	$N_{Rk,p}$	[kN]	9.40	15.60	19.30	10.70	17.20	24.60	11.80	18.50	30.40
PULL-OUT FAILURE											
Installation safety factor	γ_{inst}	-	1.20	1.00	1.00	1.20	1.00	1.00	1.20	1.20	1.20
Increasing factors for $N_{Rd,p}$ - C30/37	Ψ_c	-	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Increasing factors for $N_{Rd,p}$ - C40/50	Ψ_c	-	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41	1.41
Increasing factors for $N_{Rd,p}$ - C50/60	Ψ_c	-	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55
CONCRETE CONE FAILURE											
Installation safety factor	γ_{inst}	-	1.20	1.00	1.00	1.20	1.00	1.00	1.20	1.20	1.20
Factor for cracked concrete	$k_{cr,N}$	-	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70	7.70
Factor for non-cracked concrete	$k_{ucr,N}$	-	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00	11.00
Spacing	$s_{cr,N}$	[mm]	126.0	177.0	204.0	138.0	189.0	240.0	147.0	189.0	276.0
Edge distance	$c_{cr,N}$	[mm]	63.00	89.00	102.0	69.00	95.00	120.0	74.00	95.00	138.0
CONCRETE SPLITTING FAILURE											
Installation safety factor	γ_{inst}	-	1.20	1.00	1.00	1.20	1.00	1.00	1.20	1.20	1.20
Spacing	$s_{cr,sp}$	[mm]	120.0	180.0	200.0	140.0	200.0	240.0	150.0	200.0	280.0
Edge distance	$c_{cr,sp}$	[mm]	60.00	90.00	100.0	70.00	100.0	120.0	75.00	100.0	140.0
SHEAR LOAD											
STEEL FAILURE											
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	27.20	27.20	27.20	41.60	41.60	41.60	55.60	55.60	55.60
Ductility factor	k_7	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	45.80	75.80	75.80	143.4	143.4	143.4	221.7	221.7	221.7
Partial safety factor	γ_{Ms}	-	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25
CONCRETE PRY-OUT FAILURE											
Factor	k	-	1.00	2.00	2.00	1.00	2.00	2.00	2.00	2.00	2.00
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CONCRETE EDGE FAILURE											
Effective length of anchor	ℓ_f	[mm]	55.00	75.00	85.00	60.00	80.00	100.0	65.00	85.00	115.0
Anchor diameter	d_{nom}	[mm]	10.00	10.00	10.00	12.00	12.00	12.00	14.00	14.00	14.00
Installation safety factor	γ_{inst}	-	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Product commercial data

Product Code	Anchor	Quantity [pcs]			Weight [kg]			Bar Codes
	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
R-HLX-10X060-HF-ZF [1)]	60	50	50	14400	2.8	2.8	820.6	5906675505442
R-HLX-10X070-HF-ZF [1)]	70	50	50	12800	3.1	3.1	833.8	5906675533810
R-HLX-10X080-HF-ZF [1)]	80	50	50	12800	3.2	3.2	859.4	5906675533827
R-HLX-10X090-HF-ZF [1)]	90	50	50	12800	3.7	3.7	972.1	5906675533834
R-HLX-10X100-HF-ZF [1)]	100	50	50	12800	3.9	3.9	1033.5	5906675533841
R-HLX-10X120-HF-ZF [1)]	120							

Product commercial data

Product Code	Anchor	Quantity [pcs]			Weight [kg]			Bar Codes
	Length [mm]	Box	Outer	Pallet	Box	Outer	Pallet	
R-HLX-10X140-HF-ZF [1]	140	25	25	7200	2.5	2.5	761.5	5906675533865
R-HLX-10X180-HF-ZF [1]	180	20	20	6000	2.5	2.5	774.0	5906675533872
R-HLX-10X200-HF-ZF [1]	200	20	20	6000	2.9	2.9	891.0	5906675533889
R-HLX-12X070-HF-ZF [1]	70	50	50	9600	4.6	4.6	917.0	5906675533896
R-HLX-12X090-HF-ZF [1]	90	50	50	9600	7.1	7.1	1393.2	5906675533902
R-HLX-12X110-HF-ZF [1]	110	50	50	6400	8.2	8.2	1082.8	5906675533919
R-HLX-12X130-HF-ZF [1]	130	50	50	6400	8.9	8.9	1171.8	5906675533926
R-HLX-12X150-HF-ZF [1]	150	50	50	6400	9.6	9.6	1252.4	5906675533933
R-HLX-14X075-HF-ZF [1]	75	20	20	5120	2.7	2.7	726.3	5906675533940
R-HLX-14X100-HF-ZF [1]	100	20	20	5120	3.4	3.4	910.6	5906675533957
R-HLX-14X130-HF-ZF [1]	130	20	20	5120	4.1	4.1	1079.6	5906675533964
R-HLX-14X150-HF-ZF [1]	150	15	15	5120	4.8	4.8	1651.0	5906675533971
R-HLX-14X180-HF-ZF [1]	180	10	10	5120	4.1	4.1	2147.1	5906675533988

1) ETA-23/0707