R-HLX-CS

INDUCTION HARDENED CONCRETE SCREW ANCHOR

Induction hardened concrete screw anchor with countersunk head

FEATURES AND BENEFITS

The new thread geometry with additional cutting teeth ensures quick and easy installation, also in reinforced concrete C20/25 - C50/60.

R-HLX concrete screws can be used in earthquake-prone zones - seismic category C1 and C2.

Special anti-corrosion zinc flake coating for increased corrosion resistance.

Possibility of installation near the edge of concrete and at short distances from adjacent screws.

Induction hardening ensures high surface hardness and high core impact strength.

Different head types for any application.

Possibility of disassembly and repeated use after verifying thread wear with a tester.

The highest parameters in cracked and uncracked concrete C20/25 - C50/60 confirmed in the ETA.

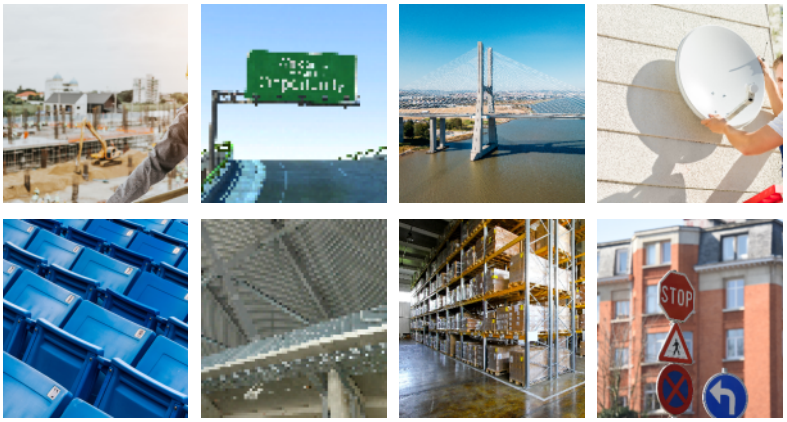
SUBSTRATES

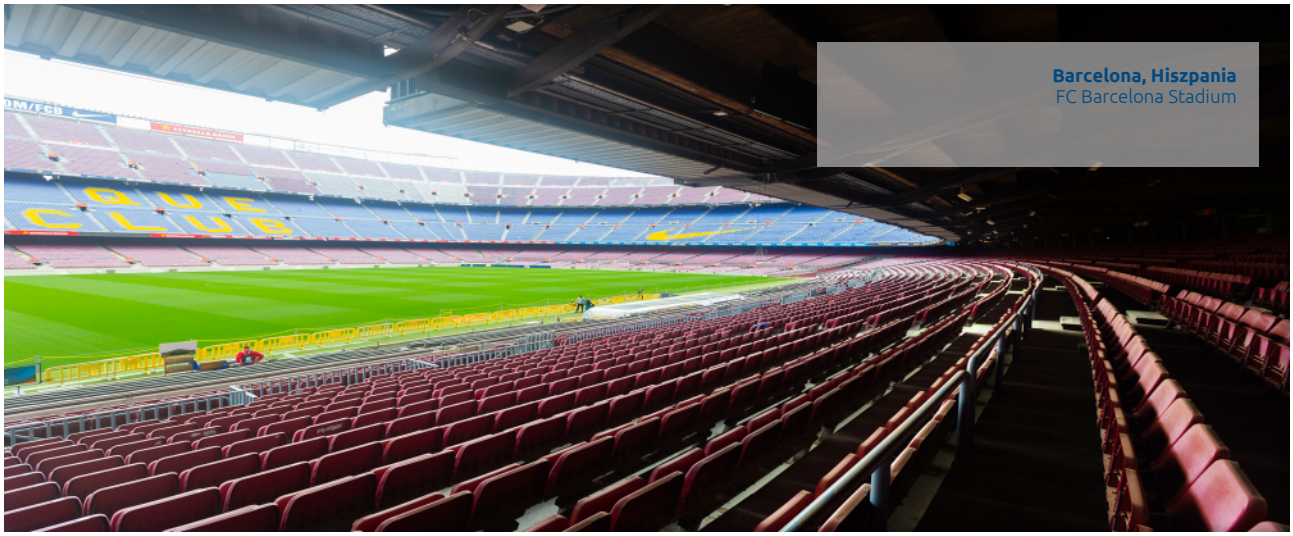
- Cracked concrete C20/25-C50/60
- Non-cracked concrete C20/25-C50/60
- Reinforced concrete
- Unreinforced concrete
- High-density natural stone

R-HLX-CS INDUCTION HARDENED CONCRETE SCREW ANCHOR

APPLICATIONS

- Construction work
- Poles and road signs
- Roads and bridges
- Satellite dishes
- Seats in public facilities
- Steel structures
- Storage racks



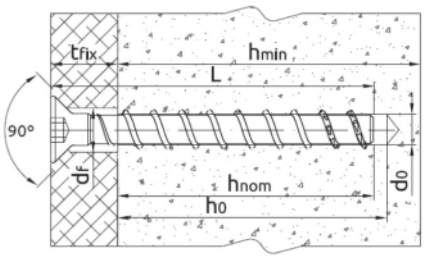


Barcelona, Hiszpania
FC Barcelona Stadium

INSTALLATION GUIDE

1. Drill the hole with a hammer drill (1a) or a dust-free drill (1b) to the required depth according to the table.
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.
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. Finish screwing when the screw head touches the fastened element/substrate. The screw head must not be damaged.
5. Possibility to unscrew the fixed anchor to a maximum height of 10mm. In the adjustment process, the permissible thickness of the fastened elements (Tfix) must be observed.
6. Adjust the element and tighten until the fixture is clamped to the substrate. Installation with any impact wrench with tangential impact.
7. Finish screwing when the anchor touches the fastened element. The adjustment operation can be performed twice.

INSTALLATION DATA



Size			6	8	10
Thread diameter	d	[mm]	7,9	10,4	12,7
Hole diameter in substrate	d_0	[mm]	6	8	10
Hole diameter in fixture	d_f	[mm]	9	12	14
Wrench size	T	[mm]	T40	T50	T50
External diameter of washer	d	[mm]	14,2	18,5	21,0
Max. torque for impact screw driver	$T_{imp,max}$	[Nm]	250	350	650
STANDARD EMBEDMENT DEPTH					
Min. hole depth in substrate	$h_{0,s}$	[mm]	65	85	95
Real hole depth in substrate	h_0	[mm]	L+10-t_{fix}	L+10-t_{fix}	L+10-t_{fix}
Min. installation depth	$h_{nom,s}$	[mm]	55	70	85
Min. substrate thickness	$h_{min,s}$	[mm]	80	110	130
Min. edge distance	c_{min}	[mm]	35	35	60
Min. spacing	s_{min}	[mm]	35	35	60
REDUCED EMBEDMENT DEPTH					
Min. hole depth in substrate	$h_{0,r}$	[mm]	50	70	85
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]	40	60	75
Min. substrate thickness	$h_{min,r}$	[mm]	80	110	120
Min. edge distance	c_{min}	[mm]	35	35	60
Min. spacing	s_{min}	[mm]	35	35	60
MINIMUM EMBEDMENT DEPTH					
Min. hole depth in substrate	$h_{0,r}$	[mm]	45	60	65
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]	35	50	55
Min. substrate thickness	$h_{min,r}$	[mm]	80	110	100
Min. edge distance	c_{min}	[mm]	35	35	60
Min. spacing	s_{min}	[mm]	35	35	60

MECHANICAL PROPERTIES

Size			6	8	10
Nominal ultimate tensile strength - tension	f_{uk}	[N/mm²]	800	800	800
Nominal yield strength	f_{yk}	[N/mm²]	640	640	640
Cross sectional area	A_s	[mm²]	24,6	44,2	67,9
Elastic section modulus	W_{el}	[mm³]	17,24	41,42	75,97
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	16,6	39,8	75,8
Design bending resistance	M	[Nm]	13,2	31,8	60,6

BASIC PERFORMANCE DATA

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

Size			6	8	10
Standard embedment depth	h_{nom}	[mm]	55	70	85
Reduced embedment depth	h_{nom}	[mm]	40	60	75
Minimum embedment depth	h_{nom}	[mm]	35	50	55
MEAN ULTIMATE RESISTANCE					
TENSION LOAD $N_{Ru,m}$					
UNCRACKED CONCRETE					
Standard embedment depth	-	[kN]	18,99	26,34	37,85
Reduced embedment depth	-	[kN]	11,09	19,03	30,59
Minimum embedment depth	-	[kN]	8,32	16,44	18,37
CRACKED CONCRETE					
Standard embedment depth	-	[kN]	10,88	12,24	26,64
Reduced embedment depth	-	[kN]	7,11	11,59	21,53
Minimum embedment depth	-	[kN]	4,02	9,86	12,93
SHEAR LOAD $V_{Ru,m}$					
UNCRACKED CONCRETE					
Standard embedment depth	-	[kN]	10,67	19,47	29,92
Reduced embedment depth	-	[kN]	10,67	19,47	29,92
Minimum embedment depth	-	[kN]	8,95	16,44	18,37
CRACKED CONCRETE					
Standard embedment depth	-	[kN]	10,67	19,47	29,92
Reduced embedment depth	-	[kN]	7,81	19,47	29,92
Minimum embedment depth	-	[kN]	6,30	11,57	12,93
CHARACTERISTIC RESISTANCE					
TENSION LOAD N_{Rk}					
UNCRACKED CONCRETE					
Standard embedment depth	-	[kN]	13,80	20,60	27,58
Reduced embedment depth	-	[kN]	8,00	13,87	22,29
Minimum embedment depth	-	[kN]	4,50	11,90	13,39
CRACKED CONCRETE					
Standard embedment depth	-	[kN]	3,50	11,00	19,30
Reduced embedment depth	-	[kN]	2,00	9,00	15,60
Minimum embedment depth	-	[kN]	2,00	8,00	9,37
SHEAR LOAD V_{Rk}					
UNCRACKED CONCRETE					
Standard embedment depth	-	[kN]	9,70	17,70	27,20
Reduced embedment depth	-	[kN]	8,08	17,70	27,20
Minimum embedment depth	-	[kN]	6,52	11,98	13,39
CRACKED CONCRETE					
Standard embedment depth	-	[kN]	9,70	17,70	27,20
Reduced embedment depth	-	[kN]	5,66	17,70	27,20
Minimum embedment depth	-	[kN]	4,57	8,39	9,37
DESIGN RESISTANCE					
TENSION LOAD N_{Rd}					
UNCRACKED CONCRETE					
Standard embedment depth	-	[kN]	9,20	13,73	18,39
Reduced embedment depth	-	[kN]	5,33	9,25	14,86
Minimum embedment depth	-	[kN]	3,00	7,93	8,93
CRACKED CONCRETE					
Standard embedment depth	-	[kN]	2,33	7,33	12,87
Reduced embedment depth	-	[kN]	1,33	6,00	10,40
Minimum embedment depth	-	[kN]	1,33	5,33	6,25
SHEAR LOAD V_{Rd}					
UNCRACKED CONCRETE					
Standard embedment depth	-	[kN]	7,76	14,16	21,76
Reduced embedment depth	-	[kN]	5,39	14,16	21,76

R-HLX-CS INDUCTION HARDENED CONCRETE SCREW ANCHOR

Size			6	8	10
Minimum embedment depth	-	[kN]	4,35	7,99	8,93
CRACKED CONCRETE					
Standard embedment depth	-	[kN]	6,47	14,16	21,76
Reduced embedment depth	-	[kN]	3,77	12,95	20,81
Minimum embedment depth	-	[kN]	3,04	5,59	6,25
RECOMMENDED LOAD					
TENSION LOAD N_{rec}					
UNCRACKED CONCRETE					
Standard embedment depth	-	[kN]	6,57	9,81	13,14
Reduced embedment depth	-	[kN]	3,81	6,61	10,62
Minimum embedment depth	-	[kN]	2,14	5,67	6,38
CRACKED CONCRETE					
Standard embedment depth	-	[kN]	1,67	5,24	9,19
Reduced embedment depth	-	[kN]	0,95	4,29	7,43
Minimum embedment depth	-	[kN]	0,95	3,81	4,46
SHEAR LOAD V_{rec}					
UNCRACKED CONCRETE					
Standard embedment depth	-	[kN]	5,54	10,11	15,54
Reduced embedment depth	-	[kN]	3,85	10,11	15,54
Minimum embedment depth	-	[kN]	3,11	5,71	6,38
CRACKED CONCRETE					
Standard embedment depth	-	[kN]	4,62	10,11	15,54
Reduced embedment depth	-	[kN]	2,69	9,25	14,86
Minimum embedment depth	-	[kN]	2,17	3,99	4,46

DESIGN PERFORMANCE DATA

Static loads

Size			6	6	6	8	8	8	10	10	10
Nominal embedment depth	h_{nom}	[mm]	35	40	55	50	60	70	55	75	85
Effective embedment depth	h_{ef}	[mm]	26	30	43	39	43	56	42	59	68
TENSION LOAD											
STEEL FAILURE											
Characteristic resistance	$N_{Rk,s}$	[kN]	19,4	19,4	19,4	35,4	35,4	35,4	54,3	54,3	54,3
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											
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p,ucr}$	[kN]	4,5	8,0	13,8	11,9	16,3	20,6	13,4	22,3	27,6
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p,cr}$	[kN]	2,0	2,0	3,5	8,0	9,0	11,0	9,4	15,6	19,3
Installation safety factor	γ_{inst}	[-]	1,0[1)]	1,0[1)]	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Increasing factors for concrete C30/37	Ψ_c	[-]	1,17	1,17	1,17	1,17	1,17	1,17	1,22	1,22	1,22
Increasing factors for concrete C40/50	Ψ_c	[-]	1,32	1,32	1,32	1,32	1,32	1,32	1,41	1,41	1,41
Increasing factors for concrete C50/60	Ψ_c	[-]	1,42	1,42	1,42	1,42	1,42	1,42	1,55	1,55	1,55
CONCRETE CONE FAILURE											
Installation safety factor	γ_{inst}	[-]	1,0[1)]	1,0[1)]	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	7,7	7,7	7,7	7,7	7,7
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11,0	11,0	11,0	11,0	11,0	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
Edge distance	$c_{cr,N}$	[mm]	39,0	45,0	64,5	58,5	64,5	84,0	63,0	88,5	102,0
CONCRETE SPLITTING FAILURE											
Installation safety factor	γ_{inst}	[-]	1,0[1)]	1,0[1)]	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
Edge distance	$c_{cr,sp}$	[mm]	40,0	45,0	65,0	60,0	75,0	85,0	60,0	90,0	100,0
SHEAR LOAD											
STEEL FAILURE											
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	9,7	9,7	9,7	17,7	17,7	17,7	27,2	27,2	27,2
Ductility factor	k_7	[-]	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	16,1	16,1	16,1	39,8	39,8	39,8	75,8	75,8	75,8
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	[-]	1,0	1,0	1,0	1,0	2,0	2,0	1,0	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
CONCRETE EDGE FAILURE											
Effective length of anchor	ℓ_f	[mm]	35	40	55	50	60	70	55	75	85
Anchor diameter	d_{nom}	[mm]	6	6	6	8	8	8	10	10	10
Installation safety factor	γ_{inst}	[-]	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0

[1)] Holes without cleaning γ_{inst} = 1,2

Resistance to tension and shear loads under fire exposure

Size			6	6	6	8	8	8	10	10	10
R (for EI) = 30 min											
Nominal embedment depth	h_{nom}	[mm]	35	40	55	50	60	70	55	75	85
TENSION LOAD											
STEEL FAILURE											
Characteristic resistance	$N_{Rk,s}$	[kN]	1,8	1,8	1,8	3,8	3,8	3,8	6,6	6,6	6,6
PULL-OUT FAILURE											
Characteristic resistance	$N_{Rk,p}$	[kN]	0,5	0,5	0,8	2,0	2,2	2,7	2,3	3,9	4,8
SHEAR LOAD											
STEEL FAILURE											
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	1,8	1,8	1,8	3,8	3,8	3,8	6,6	6,6	6,6
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	1,5	1,5	1,5	4,3	4,3	4,3	9,3	9,3	9,3
R (for EI) = 60 min											
Nominal embedment depth	h_{nom}	[mm]	35	40	55	50	60	70	55	75	85
TENSION LOAD											
STEEL FAILURE											
Characteristic resistance	$N_{Rk,s}$	[kN]	1,4	1,4	1,4	2,9	2,9	2,9	5,0	5,0	5,0
PULL-OUT FAILURE											
Characteristic resistance	$N_{Rk,p}$	[kN]	0,5	0,5	0,8	2,0	2,2	2,7	2,3	3,9	4,8
SHEAR LOAD											
STEEL FAILURE											
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	1,4	1,4	1,4	2,9	2,9	2,9	5,0	5,0	5,0
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	1,2	1,2	1,2	3,3	3,3	3,3	7,0	7,0	7,0
R (for EI) = 90 min											
Nominal embedment depth	h_{nom}	[mm]	35	40	55	50	60	70	55	75	85
TENSION LOAD											
STEEL FAILURE											
Characteristic resistance	$N_{Rk,s}$	[kN]	1,0	1,0	1,0	2,0	2,0	2,0	3,4	3,4	3,4
PULL-OUT FAILURE											
Characteristic resistance	$N_{Rk,p}$	[kN]	0,5	0,5	0,8	2,0	2,2	2,7	2,3	3,9	4,8
SHEAR LOAD											
STEEL FAILURE											
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	1,0	1,0	1,0	2,0	2,0	2,0	3,4	3,4	3,4
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0,8	0,8	0,8	2,3	2,3	2,3	4,8	4,8	4,8
R (for EI) = 120 min											
Nominal embedment depth	h_{nom}	[mm]	35	40	55	50	60	70	55	75	85
TENSION LOAD											
STEEL FAILURE											
Characteristic resistance	$N_{Rk,s}$	[kN]	0,8	0,8	0,8	1,6	1,6	1,6	2,6	2,6	2,6
PULL-OUT FAILURE											
Characteristic resistance	$N_{Rk,p}$	[kN]	0,4	0,4	0,7	1,6	1,8	2,2	1,8	3,1	3,8
SHEAR LOAD											
STEEL FAILURE											
Characteristic resistance without lever arm	$V_{Rk,s}$	[kN]	0,8	0,8	0,8	1,6	1,6	1,6	2,6	2,6	2,6
Characteristic resistance with lever arm	$M_{Rk,s}$	[Nm]	0,7	0,7	0,7	1,8	1,8	1,8	3,7	3,7	3,7

Allowable values for resistance in case of Seismic performance category C1 & C2

Size			6	6	6	8	8	8	10	10
Nominal embedment depth	h_{nom}	[mm]	40	55	50	60	70	55	75	85
SEISMIC CATEGORY C1										
TENSION LOAD, STEEL FAILURE										
Characteristic resistance	$N_{Rk,s,C1}$	[kN]	19,4	19,4	35,4	35,4	35,4	54,3	54,3	54,3
TENSION LOAD, PULL-OUT FAILURE										
Characteristic resistance seismic C1	$N_{Rk,p,C1}$	[kN]	2,0	3,5	7,6	8,6	10,5	8,6	14,4	17,8
SHEAR LOAD, STEEL FAILURE										
Characteristic resistance without lever arm	$V_{Rk,s,C1}$	[kN]	4,7	4,7	10,6	10,6	10,6	18,7	18,7	18,7
SEISMIC CATEGORY C2										
TENSION LOAD, STEEL FAILURE										
Characteristic resistance	$N_{Rk,s,C2}$	[kN]	-	-	-	-	35,4	-	-	54,3
TENSION LOAD, PULL-OUT FAILURE										
Characteristic resistance seismic C2	$N_{Rk,p,C2}$	[kN]	-	-	-	-	2,0	-	-	8,5
SHEAR LOAD, STEEL FAILURE										
Characteristic resistance without lever arm	$V_{Rk,s,C2}$	[kN]	-	-	-	-	3,6	-	-	8,0

R-HLX-CS INDUCTION HARDENED CONCRETE SCREW ANCHOR

LOGISTICAL DATA

SKU	Base-sales unit	Unit pack	Bulk pack	Pallet	Single Package - Gross Weight	Bulk Package - Gross Weight	Palette - Gross Weight	Barcode
R-HLX-06X050-CS-ZF	pcs.	100.0	100.0	38400.0	1.5	1.5	560.6	5906675556475
R-HLX-06X060-CS-ZF	pcs.	100.0	100.0	38400.0	1.7	1.7	637.4	5906675556482
R-HLX-06X075-CS-ZF	pcs.	100.0	100.0	38400.0	2.0	2.0	768.0	5906675556499
R-HLX-06X090-CS-ZF	pcs.	100.0	100.0	25600.0	2.3	2.3	596.5	5906675556505
R-HLX-06X100-CS-ZF	pcs.	100.0	100.0	25600.0	2.5	2.5	650.2	5906675556512
R-HLX-06X120-CS-ZF	pcs.	100.0	100.0	25600.0	3.0	3.0	762.9	5906675556529
R-HLX-06X130-CS-ZF	pcs.	100.0	100.0	25600.0	3.2	3.2	821.8	5906675556536
R-HLX-08X075-CS-ZF	pcs.	100.0	100.0	25600.0	3.8	3.8	960.0	5906675556543
R-HLX-08X090-CS-ZF	pcs.	100.0	100.0	19200.0	4.3	4.3	821.8	5906675556550
R-HLX-08X100-CS-ZF	pcs.	100.0	100.0	19200.0	4.7	4.7	894.7	5906675556567
R-HLX-08X120-CS-ZF	pcs.	50.0	50.0	12800.0	2.8	2.8	704.0	5906675556574
R-HLX-08X130-CS-ZF	pcs.	50.0	50.0	12800.0	2.9	2.9	750.1	5906675556581
R-HLX-08X150-CS-ZF	pcs.	50.0	50.0	12800.0	3.1	3.1	796.2	5906675556598
R-HLX-10X070-CS-ZF	pcs.	50.0	50.0	12800.0	2.4	2.4	603.6	5906675534039
R-HLX-10X090-CS-ZF	pcs.	50.0	50.0	12800.0	3.0	3.0	758.3	5906675534046
R-HLX-10X100-CS-ZF	pcs.	50.0	50.0	12800.0	3.3	3.3	835.8	5906675534053
R-HLX-10X120-CS-ZF	pcs.	25.0	25.0	6400.0	2.0	2.0	512.0	5906675534060
R-HLX-10X140-CS-ZF	pcs.	25.0	25.0	6400.0	2.2	2.2	574.7	5906675534077
R-HLX-10X160-CS-ZF	pcs.	20.0	20.0	6000.0	2.3	2.3	684.0	5906675640914

RELATED PRODUCTS

SAFETY

Protective gloves for power tools
R-PGL

DRILLING

Rotary Hammer Drill SDS plus; 850W; 26mm; 2.5J
R-PRH-26850

Cordless Hammer 18V SDS plus
R-PRH18

Drill bits Aggressor SDS plus
RT-SDSA

Drill bits Rebardrill SDS plus
RT-SDSR

CLEANING

Blow Pump
R-BLOWPUMP

ANCHORING

Cordless RawlWrench 18V 315 Nm, in a transport case
R-PID18-315

Cordless RawlWrench 18V 1000Nm bare tool, in a transport case
R-PIW18-S

T type screwdriver bits
RT-BIT-TORX T