Declaration of Performance
DoP-17/0783-R-LX

1. Unique identification code of the product-type:

R-LX

The photo depicts an example of a product of the given type of goods

2. Intended use/es:	
general type	Concrete screw
to be applied in	Screw anchor made of galvanized steel for multiple use for applications in concrete
option / category	
Loading	subject to static or quasi-static
material	The R-LX are concrete screw anchors. The anchors are made of zinc plated (ZP) or zinc flaked (ZF) steel.

3. Manufacturer:

Rawlplug S.A.
ul. Kwidzyńska 6, 51-416 Wrocław, PL
www.rawlplug.com

4. System/s of AVCP:

System 2+

5. European Assessment Document:

EAD-330747-00-0601 Metal anchors for use in concrete for multiple use for non-structural applications.
Utilization category:

6. European Technical Assessment:

ETA-17/0783 edition of 2019-08-22

7. Technical Assessment Body:

Instytut Techniki Budowlanej w Warszawie

8. Notified body/ies:

1488 on the basis of:

- initial inspection of the manufacturing plant and of factory production control
- continuing surveillance, assessment and evaluation of factory production control

issued a certificate **1488-CPR-0515/Z**

9. Declared performance/s:

Essential Characteristics:

Technical Specification	**Basic requirements according to CPR**		**Remarks:**
ETA-17/0783	[1]	Mechanical resistance and stability	Declared values on the page 2
	[4]	Operational safety	Such criteria as those significant for [1]

Characteristic values in concrete– standard embedment depth

Anchor			R-LX				
size			R-LX-05	R-LX-06	R-LX-08	R-LX-10	R-LX-14
Any load directions							
Characteristic resistance in concrete C20/25	F^0_{Rk}	[kN]	5	9	12	20	30
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,2	1,0			
Increasing factors for F^0_{Rk}	ψ_c	C30/37	1,08				
		C40/50	1,15				
		C50/60	1,19				
Effective embedment depth	h_{ef}	[mm]	30	42	53	65	92
Spacing	s_{cr}	[mm]	90	126	160	196	276
Edge distance	c_{cr}	[mm]	45	63	80	98	138
Shear load with lever arm							
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	19,0	31,8	72,4	123,6	329,6
Partial safety factor	$\gamma_{m,s}$	[-]	1,5				

Characteristic values in concrete– reduced embedment depth

Anchor			R-LX				
size			R-LX-05	R-LX-06	R-LX-08	R-LX-10	R-LX-14
Any load directions							
Characteristic resistance in concrete C20/25	F^0_{Rk}	[kN]	3	6	7,5	9	12
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,2	1,0			
Increasing factors for F^0_{Rk}	ψ_c	C30/37	1,08				
		C40/50	1,15				
		C50/60	1,19				
Effective embedment depth	h_{ef}	[mm]	17,5	30	37	40	55
Spacing	s_{cr}	[mm]	70	90	120	120	180
Edge distance	c_{cr}	[mm]	35	45	60	60	90
Shear load with lever arm							
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	19,0	31,8	72,4	123,6	329,6
Partial safety factor	$\gamma_{m,s}$	[-]	1,5				

Characteristic values in concrete reduced embedment depth

Anchor size			R-LX-06
Any load directions			
Characteristic resistance in hollow concrete slabs C20/25 to C50/60	F^0_{Rk}	[kN]	3
Installation safety factor	$\gamma_2 = \gamma_{inst}$	[-]	1,0
Effective embedment depth	h_{ef}	[mm]	24,7
Spacing	s_{cr}	[mm]	100
Edge distance	c_{cr}	[mm]	50
Shear load with lever arm			
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	31,8
Partial safety factor	$\gamma_{m,s}$	[-]	1,5

Characteristic values in hollow concrete slabs

Anchor size			R-LX-06
Any load directions			
Bottom flange thickness	d_b	[mm]	≥ 35
Characteristic resistance in hollow concrete slabs C40/50 to C50/60	F^0_{Rk}	[kN]	5
Installation safety factor	F^0_{Rk}	[kN]	6
Effective embedment depth	$\gamma_2 = \gamma_{inst}$	[-]	1,0
Spacing	h_{ef}	[mm]	24,7
Edge distance	s_{cr}	[mm]	100
Bottom flange thickness	c_{cr}	[mm]	50
Shear load with lever arm			
Characteristic bending moment	$M^0_{Rk,s}$	[Nm]	31,8
Partial safety factor	$\gamma_{m,s}$	[-]	1,5

Characteristic resistance under fire exposure in concrete C20/25 to C50/60 - – standard embedment depth

Anchor			R-LX				
Size			R-LX-05	R-LX-06	R-LX-08	R-LX-10	R-LX-14
Effective embedment depth		[mm]	30	42	53	65	92
All load directions							
Characteristic resistance $F_{Rk,fi1)}$	R30	[kN]	0,20	0,28	0,75	1,57	3,08
	R60	[kN]	0,18	0,25	0,65	1,18	2,31
	R90	[kN]	0,14	0,20	0,50	1,02	2,00
	R120	[kN]	0,10	0,14	0,40	0,79	1,54
Spacing	$s_{cr,fi}$	[mm]	4 x h_{ef}				
Edge distance	$c_{cr,fi}$	[mm]	2 x h_{ef}				
The design method covers anchors with a fire attack from one side only. In case of fire attack from more than one side, the edge distance shall be ≥ 300 mm.							

Characteristic resistance under fire exposure in concrete – reduced embedment depth

Anchor			R-LX				
Size			R-LX-05	R-LX-06	R-LX-08	R-LX-10	R-LX-14
Effective embedment depth		[mm]	17,5	30	37	40	55
All load directions							
Characteristic resistance $F_{Rk,fi1)}$	R30	[kN]	-	0,28	0,75	1,57	3,00
	R60	[kN]	-	0,25	0,65	1,18	2,31
	R90	[kN]	-	0,20	0,50	1,02	2,00
	R120	[kN]	-	0,14	0,40	0,79	1,54
Spacing	$s_{cr,fi}$	[mm]	4 x h_{ef}				
Edge distance	$c_{cr,fi}$	[mm]	2 x h_{ef}				
The design method covers anchors with a fire attack from one side only. In case of fire attack from more than one side, the edge distance shall be ≥ 300 mm.							

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of manufacturer:

Sławomir Jagła
Proxy of the Quality Management System
Wrocław, 27.11.2019.

PEŁNOMOCNIK SYSTEMU
ZARZĄDZANIA JAKOŚCIĄ
mgr Sławomir Jagła

Declaration of Performance
DoP-17/0806-R-LX

1. Unique identification code of the product-type:

R-LX

The photo depicts an example of a product of the given type of goods

2. Intended use/es:

general type	Concrete screw
to be applied in	Concrete Screw for use in cracked and non cracked concrete
option / category	
Loading	subject to static or quasi-static
material	The R-LX are concrete screw anchors. The anchors are made of zinc plated (ZP) or zinc flaked (ZF) steel.

3. Manufacturer:

Rawlplug S.A.
ul. Kwidzyńska 6, 51-416 Wrocław, PL
www.rawlplug.com

4. System/s of AVCP:

System 1

5. European Assessment Document:

EAD-330232-00-0601 Mechanical anchors for use in concrete.
Utilization category:

6. European Technical Assessment:

ETA-17/0806 edition of 2017-12-29

7. Technical Assessment Body:

Instytut Techniki Budowlanej

8. Notified body/ies:

Instytut Techniki Budowlanej on the basis of:

- an assessment of the performance of the construction product carried out on the basis of testing (including sampling), calculation, tabulated values or descriptive documentation of the product
- initial inspection of the manufacturing plant and of factory production control
- continuing surveillance, assessment and evaluation of factory production control

issued a certificate **1488-CPR-0658/W**

9. Declared performance/s:

Essential Characteristics:

Technical Specification	**Basic requirements according to CPR**		**Remarks:**
ETA-17/0806	[1]	Mechanical resistance and stability	Declared values on the page 2
	[4]	Operational safety	Such criteria as those significant for [1]

Characteristic resistance in cracked and non-cracked concrete C20/25 to C50/60, design method A											
Anchor size			**R-LX-05**	**R-LX-06**		**R-LX-08**		**R-LX-10**		**R-LX-14**	
Nominal embedment depth	h_{nom}	[mm]	43	43	55	50	70	55	85	75	120
Adjustment											
Total max. thickness of adjustment layers	t_{adj}	[mm]	10	-	10	-	10	-	10	-	10
Max. number of adjustments	n_s	[-]	2	-	2	-	2	-	2	-	2
Steel failure											
Characteristic resistance	$N_{Rk,s}$	[kN]	25,5	35,4		60,4		82,4		157,0	
Partial safety factor	γ_{Ms} [1]	[-]	1,4	1,4		1,4		1,4		1,5	
Pull-out failure											
Characteristic resistance in non-cracked concrete C20/25	$N_{Rk,p}$	[kN]	7,0	-) [5]	12	-) [5]	-) [5]	-) [5]	-) [5]	-) [5]	-) [5]
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	4,5	-) [5]	7,0	7,5	13,0	8,0	-) [5]	13,0	-) [5]
Installation safety factor	γ_2 [2] = γ_{inst} [3][4]	[-]	1,2	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Increasing factor C40/50 — concrete C30/37	ψc	[-]	1,08	1,08	1,08	1,08	1,08	1,08	1,08	1,08	1,08
Increasing factor C40/50 — concrete	ψc	[-]	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15
Increasing factor C40/50 — concrete C50/60	ψc	[-]	1,19	1,19	1,19	1,19	1,19	1,19	1,19	1,19	1,19
Concrete cone failure and splitting failure											
Effective embedment depth	h_{ef}	[mm]	32	32	42	36	53	40	65	54	92
Factor for non cracked concrete	k_1 [2] = k_{ucr} [3]	[-]	10,1	10,1	10,1	10,1	10,1	10,1	10,1	10,1	10,1
	$k_{ucr,N}$ [4]	[-]	11,0	11,0	11,0	11,0	11,0	11,0	11,0	11,0	11,0
Factor for cracked concrete	k_1 [2] = k_{cr} [3]	[-]	7,2	7,2	7,2	7,2	7,2	7,2	7,2	7,2	7,2
	$k_{cr,N}$ [4]	[-]	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,7	7,7
Installation safety factor	γ_2 [2] = γ_{inst} [3][4]	[-]	1,2	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Increasing factor C40/50 — concrete C30/37	ψc	[-]	1,08	1,08	1,08	1,08	1,08	1,08	1,08	1,08	1,08
Increasing factor C40/50 — concrete	ψc	[-]	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15	1,15
Increasing factor C40/50 — concrete C50/60	ψc	[-]	1,19	1,19	1,19	1,19	1,19	1,19	1,19	1,19	1,19
Characteristic resistance for splitting in non-cracked concrete	$N^0_{Rk,sp}$	[kN]	7,0	8,0	12,0	11,0	24,0	13,0	30,0	20,0	50,0
Characteristic resistance for splitting in cracked concrete	$N^0_{Rk,sp}$	[kN]	4,5	5,5	7,0	7,5	13,0	8,0	19,0	13,0	34,0
Characteristic spacing — concrete cone failure	$s_{cr,N}$	[mm]	90	90	126	112	160	120	196	165	276
Characteristic spacing — splitting failure	$s_{cr,sp}$	[mm]	90	90	126	112	160	136	222	188	312
Characteristic edge distance — concrete cone failure	$s_{cr,N}$	[mm]	45	45	63	56	80	60	98	83	138
Characteristic edge distance — splitting failure	$s_{cr,sp}$	[mm]	45	45	63	56	80	68	111	94	156

Characteristic resistance in cracked and non-cracked concrete C20/25 to C50/60, design method A											
Anchor size			**R-LX-05**	**R-LX-06**		**R-LX-08**		**R-LX-10**		**R-LX-14**	
Nominal embedment depth	h_{nom}	[mm]	43	43	55	50	70	55	85	75	120
Steel failure without lever arm											
Characteristic resistance	$V_{Rk,s}$	[kN]	12,7	17,7		30,2		41,2		78,5	
Factor considering ductility	k [2] = k2 [3] = k_7 [4]	[-]	0,8	0,8		0,8		0,8		0,8	
Partial safety factor	γ_{Ms} [1]	[-]	1,5	1,5		1,5		1,5		1,5	
Steel failure with lever arm											
Characteristic bending resistance	$M^0_{Rk,s}$	[Nm]	19,0	31,8		72,4		123,6		329,6	
Partial safety factor	γ_{Ms} [1]	[-]	1,5	1,5		1,5		1,5		1,5	
Concrete pry-out failure											

Factor	$k = k_3$ [2] [3] $= k_8$ [4]	[-]	1,0	1,0		1,0		1,0	2,0	1,0	2,0
Partial safety factor	γ_{Ms} [1]	[-]	1,5	1,5		1,5		1,5		1,5	
Concrete edge failure											
Outside diameter on anchor	d_{nom}	[mm]	6	6		8		10		14	
Effective length of anchor under shear loads	l_f	[mm]	32	32	42	36	53	40	65	54	92
Partial safety factor	γ_{Ms} [1]	[-]	1,5	1,5		1,5		1,5		1,5	
Minimum member thickness	h_{min}	[mm]	100	100	100	100	110	100	130	110	190
Displacements											
Tension load in non-cracked concrete C20/25 to C50/60											
Tension load	N	[kN]	2,9	5,6		11,0		14,9		23,1	
Short term tension displacement	δ_{N0}	[mm]	0,3	0,3		0,4		0,4		0,5	
Long term tension displacement	$\delta_{N\infty}$	[mm]	0,85	0,9		1,0		1,0		1,25	
Tension load in cracked concrete C20/25 to C50/60											
Tension load	N	[kN]	2,3	4,4		6,7		10,2		17,7	
Short term tension displacement	δ_{N0}	[mm]	0,4	0,4		0,5		0,5		0,7	
Long term tension displacement	$\delta_{N\infty}$	[mm]	2,0	2,0		2,0		2,0		2,0	
Shear load in non cracked concrete C20/25 to C50/60											
Shear load	V	[kN]	5,6	8,1		11,9		18,7		35,2	
Short term shear displacement	δ_{V0}	[mm]	1,4	1,5		2,5		2,5		2,5	
Long term shear displacement	$\delta_{V\infty}$	[mm]	2,1	2,25		3,75		3,75		3,75	

1) In the absence of other national regulations
2) Parameter for design acc. to ETAG 001 Annex C
3) Parameter for design acc. to CEN/TS 1992-4-4:2009
4) Parameter for design acc. to EN 1992-4
5) Pull-out failure is not decisive

Characteristic resistance under fire exposure in cracked and non-cracked concrete C20/25 to C50/60												
Anchor size				R-LX-05	R-LX-06		R-LX-08		R-LX-10		R-LX-14	
Nominal embedment depth		h_{nom}	[mm]	43	43	55	50	70	55	85	75	120
Steel failure for tension and shear load $F_{Rk,s,fi}$ = $N_{Rk,s,fi}$ = $V_{Rk,s,fi}$												
Characteristic resistance	R30	$F_{Rk,s,fi}$	[kN]	0,20	0,28	0,28	0,75	0,75	1,57	1,57	3,08	3,08
	R60	$F_{Rk,s,fi}$	[kN]	0,18	0,25	0,25	0,65	0,65	1,18	1,18	2,31	2,31
	R90	$F_{Rk,s,fi}$	[kN]	0,14	0,20	0,20	0,50	0,50	1,02	1,02	2,00	2,00
	R120	$F_{Rk,s,fi}$	[kN]	0,10	0,14	0,14	0,40	0,40	0,79	0,79	1,54	1,54
	R30	$M^0_{Rk,s,fi}$	[kNm]	0,15	0,25	0,25	0,90	0,90	2,36	2,36	6,47	6,47
	R60	$M^0_{Rk,s,fi}$	[kNm]	0,13	0,23	0,23	0,78	0,78	1,77	1,77	4,85	4,85
	R90	$M^0_{Rk,s,fi}$	[kNm]	0,10	0,18	0,18	0,60	0,60	1,53	1,53	4,20	4,20
	R120	$M^0_{Rk,s,fi}$	[kNm]	0,07	0,13	0,13	0,48	0,48	1,18	1,18	3,23	3,23
Pull-out failure												
Characteristic resistance	R30	$N_{Rk,p,fi}$	[kN]	1,13	1,38	1,75	1,88	3,25	2,00	4,75	3,25	8,50
	R60	$N_{Rk,p,fi}$	[kN]	1,13	1,38	1,75	1,88	3,25	2,00	4,75	3,25	8,50
	R90	$N_{Rk,p,fi}$	[kN]	1,13	1,38	1,75	1,88	3,25	2,00	4,75	3,25	8,50
	R120	$N_{Rk,p,fi}$	[kN]	0,90	1,10	1,40	1,50	2,60	1,60	3,80	2,60	6,80
Concrete cone failure												
Characteristic resistance	R30	$N_{Rk,c,fi}$	[kN]	0,89	0,89	2,06	1,50	3,68	1,82	6,13	4,04	14,61
	R60	$N_{Rk,c,fi}$	[kN]	0,89	0,89	2,06	1,50	3,68	1,82	6,13	4,04	14,61
	R90	$N_{Rk,c,fi}$	[kN]	0,89	0,89	2,06	1,50	3,68	1,82	6,13	4,04	14,61
	R120	$N_{Rk,c,fi}$	[kN]	0,71	0,71	1,65	1,20	2,94	1,46	4,91	3,23	11,69
Edge distance												
R30 do R120		$c_{cr,fi}$	[mm]	$2h_{ef}$								
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm.												

Anchor spacing											
R30 do R120	$s_{cr,fi}$	[mm]	$4h_{ef}$								
Concrete pry-out failure											
R30 do R120	k	[-]	1,0	1,0	1,0	1,0	1,0	1,0	2,0	1,0	2,0

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of manufacturer:

Sławomir Jagła
Proxy of the Quality Management System
Wrocław, 16.04.2018.

PEŁNOMOCNIK SYSTEMU
ZARZĄDZANIA JAKOŚCIĄ
mgr Sławomir Jagła