Designated according to The Construction Products (Amendment etc.) (EU Exit) Regulations 2020

UK Technical Assessment	UKTA-0836-22/6101 of 22/06/2022
Technical Assessment Body issuing the UK Technical Assessment:	British Board of Agrément
Trade name of the construction product:	SafetyPlus
Product family to which the construction product belongs:	Product Area Code 33 Torque controlled expansion fastener of sizes M8, M10, M12, M16 and M20 for use in uncracked concrete
Manufacturer:	RAWLPLUG S.A. ul. Kwidzyńska 6 PL 51-416 Wrocław Poland
Manufacturing plant(s):	Manufacturing Plant No. 2 Manufacturing Plant No. 3
This UK Technical Assessment contains:	14 pages including 3 annexes which form an integral part of this assessment
This UK Technical Assessment is issued in accordance with The Construction Products (Amendment etc.) (EU Exit) Regulations 2020 on the basis of:	UKAD 330232-01-0601 *Mechanical fasteners for use in concrete*

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1 Technical description of the product

The SafetyPlus are a range of fastener types: R-SPL, R-SPL-C and R-SPL-BP in sizes M8, M10, M12, M16 and M20(1). The fasteners are manufactured from galvanized steel for insertion into a drill hole and fastened by torque-controlled expansion.

(1) M20 for R-SPL and R-SPL-BP fastener types only

An illustration and the description of the product are given in Annex A.

2 Specification of the intended use(s) in accordance with the applicable UK Assessment Document (hereinafter UKAD)

The performances given in Annex C are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The provisions made in this UK Technical Assessment are based on an assumed working life of the fastener of 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer or Technical Assessment Body but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential Characteristic	Performance
Characteristic resistance for tension loads, displacements	Annex C1
Characteristic resistance for shear loads, displacements	Annex C2

3.2 Safety in case of fire (BWR 2)

Characteristic	Performance
Reaction to fire	Fasteners satisfy requirements for Class A1
Resistance to fire	No performance determined

3.3 Health, hygiene and the environment (BWR 3)

Not relevant.

3.4 Safety and accessibility in use (BWR 4)

Not relevant.

3.5 Protection against noise (BWR 5)

Not relevant.

3.6 Energy economy and heat retention (BWR 6)

Not relevant.

3.7 Sustainable use of natural resources (BWR 7)

No performance assessed.

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied

4.1 System of assessment and verification of constancy of performance

According to UKAD No. 330232-01-0601 and Annex V of the Construction Products

Regulation (Regulation (EU) 305/2011 as brought into UK law and amended, the system of assessment and verification of constancy of performance (AVCP) 1 applies.

Product	Intended use	Level or class	System
Metal anchors for use in concrete	For fixing and/or supporting to concrete structural elements (which contributes to the stability of the works) or heavy units	-	1

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable UKAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with the British Board of Agrément and made available to the UK Approved Bodies involved in the conformity attestation process.

5.1 UKCA marking for the product/ system must contain the following information:

- Identification number of the Approved Body
- Name/address of the manufacturer of the product/ system
- Marking with intention of clarification of intended use
- Date of marking
- Number of certificate of constancy of performance
- UKTA number.

On behalf of the British Board of Agrément 	
Date of Issue: 22/06/2022	**Hardy Giesler** Chief Executive

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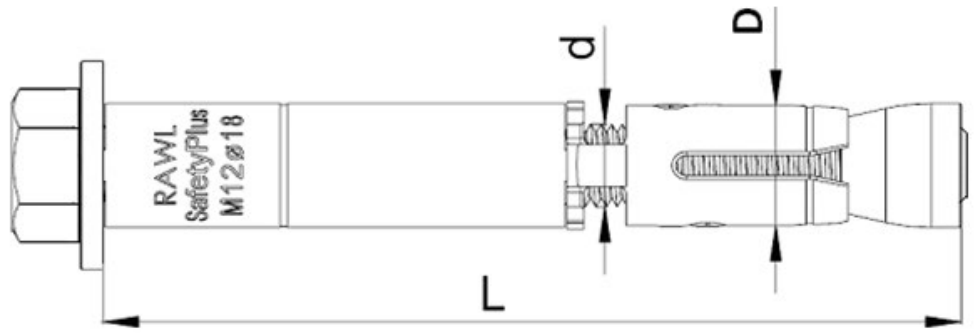
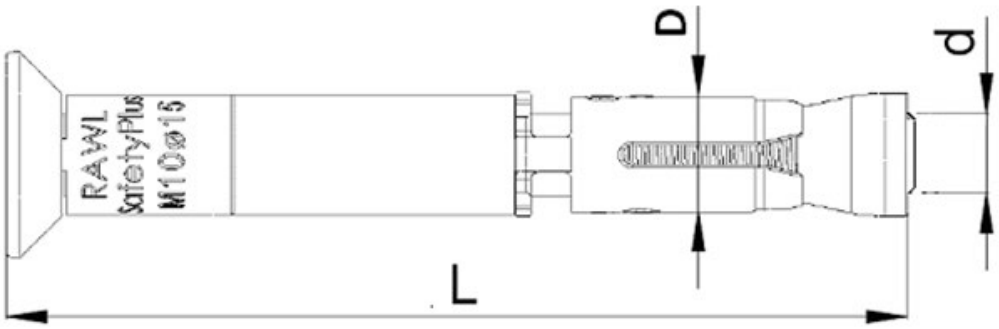
ANNEX A : SafetyPlus – product specification

This annex applies to the product described in the main body of the UK Technical Assessment.

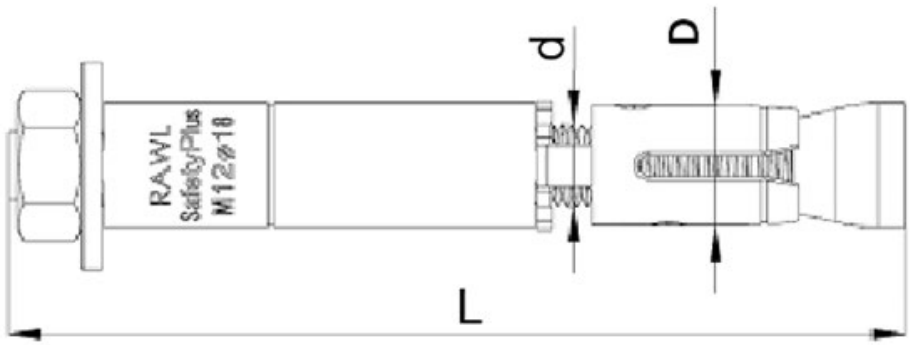
Figure A1 Characteristic of the product



R-SPL



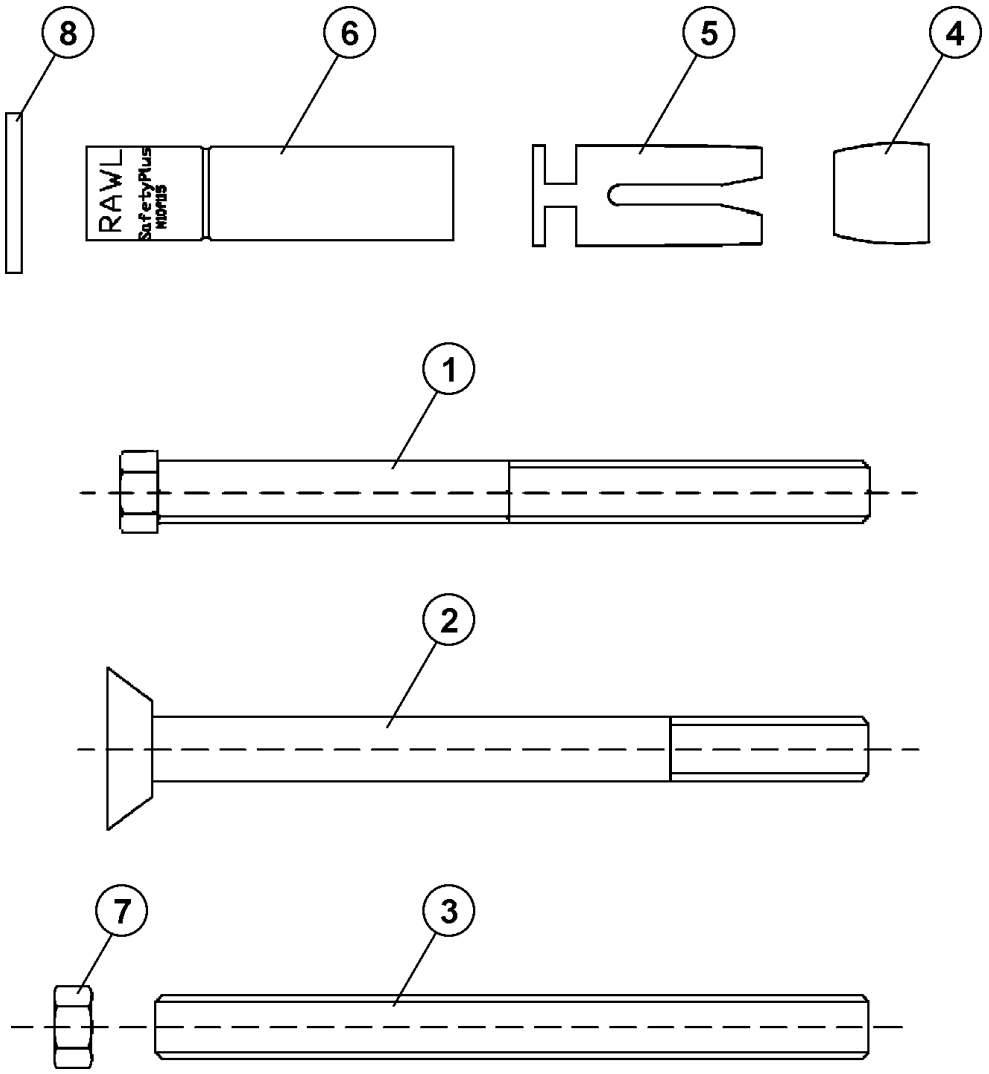
R-SPL-C



R-SPL-BP

SafetyPlus	Annex A 1
Product description Anchor	

Figure A2 Fastener components



1 – hexagonal screw
2 – countersunk screw
3 – threaded bolt
4 – conical nut
5 – expansion sleeve
6 – spacer sleeve
7 – hexagonal nut
8 – washer

SafetyPlus	Annex A 2
Product description Different parts of the anchor	

ANNEX A : SafetyPlus – product specification (continued)

Table A1: SafetyPlus anchor type R-SPL, dimensions

Type of anchor				d [mm]	dc [mm]	L [mm]	SW [mm]
Size	Marking	M x L	t_{fix} (1) [mm]				
M8	R-SPL-08090/15	M8 x 90	15	8	12	90	13
	R-SPL-08110/40	M8 x110	40			110	
M10	R-SPL-10105/20	M10 x 105	20	10	15	105	17
	R-SPL-10120/40	M10 x 120	40			120	
	R-SPL-10140/60	M10 x 140	60			140	
M12	R-SPL-12120/25	M12 x 120	25	12	18	120	19
	R-SPL-12150/50	M12 x 150	50			150	
M16	R-SPL-16145/25	M16 x 145	25	16	24	145	24
	R-SPL-16170/50	M16 x 170	50			170	
M20	R-SPL-20175/30	M20 x 175	30	20	28	175	30

1) – thickness of the fixed element

Table A2: SafetyPlus anchor type R-SPL-C, dimensions

Type of anchor				d [mm]	d_c [mm]	L [mm]	HEX [mm]
Size	Marking	M x L	t_{fix} (1) [mm]				
M8	R-SPL-C-08090/20	M8x90	20	8	12	90	6
M10	R-SPL-C-10105/25	M10 x 105	25	10	15	105	8
M12	R-SPL-C-10125/30	M12 x 125	30	12	18	125	10
M16	R-SPL-C-16145/30	M16 x 145	30	16	24	145	12

1) – thickness of the fixed element

Table A3: SafetyPlus anchor type R-SPL-BP, dimensions

Type of anchor				d [mm]	dc [mm]	L [mm]	SW [mm]
Size	Marking	M x L	t_{fix} 1) [mm]				
M8	R-SPL-BP-08095/15	M8 x 95	15	8	12	95	13
M10	R-SPL-BP-10110/20	M10 x 110	20	10	15	110	17
M12	R-SPL-BP-12135/25	M12 x 135	25	12	18	135	19
	R-SPL-BP-12160/50	M12 x 160	50			160	
M16	R-SPL-BP-16160/25	M16 x 160	25	16	24	160	24
	R-SPL-BP-16185/50	M16 x 185	50			185	
M20	R-SPL-BP-20190/30	M20 x 190	30	20	28	190	30

1) – thickness of the fixed element

SafetyPlus	Annex A 3
Product description Dimensions	

ANNEX A : SafetyPlus – product specification (continued)

Table A4: Materials

Part	Designation	Material	Protection
1	Hexagonal screw	Carbon steel class 8.8 EN ISO 898-1	Zinc plated ≥ 5 µm EN ISO 4042
2	Countersunk screw	Carbon steel class 8.8 EN ISO 898-1	Zinc plated ≥ 5 µm EN ISO 4042
3	Threaded bolt	Carbon steel class 8.8 EN ISO 898-1	Zinc plated ≥ 5 µm EN ISO 4042
4	Conical nut	Carbon steel EN 10263-2 (M8 – M12) EN 10087 (M16 – M20)	Zinc plated ≥ 5 µm EN ISO 4042
5	Expansion sleeve	Carbon steel EN 10139	Zinc plated ≥ 5 µm EN ISO 4042
6	Spacer sleeve	Carbon steel EN 10139	Zinc plated ≥ 5 µm EN ISO 4042
7	Hexagonal nut	Carbon steel class 8 EN ISO 898-1	Zinc plated ≥ 5 µm EN ISO 4042
8	Washer	Carbon steel class 8 EN ISO 898-1	Zinc plated ≥ 5 µm EN ISO 4042

SafetyPlus	Annex A 4
Product description Materials	

ANNEX B : Specification of intended use

B1 Intended use - specifications

Anchorages subject to:

- Static and quasi-static loads.

Base material:

- Reinforced or unreinforced normal weight concrete of strength classes C20/25 at minimum and C50/60 at maximum according to EN 206.
- Uncracked concrete.

Use conditions (environmental conditions):

- Structures subject to dry internal conditions.

Design:

- The anchorages under static loads and quasi-static loads are designed in accordance with methods mentioned in EOTA Technical Report TR 055.
- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- The position of the anchor is indicated on the design drawings.
- Verifiable calculation notes and drawings are taking account of the loads to be transmitted.

Installation of anchors:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Use of the anchor only as supplied by the manufacturer without exchanging any component of the anchor.
- Anchor installation in accordance with the manufacturer's specification and drawings and using the appropriate tools.
- Checks before placing the anchor to ensure that the strength class of the concrete in which the anchor is to be placed is in the range given and is not lower than that of the concrete to which the characteristic loads apply.
- Check of concrete being well compacted, e.g. without significant voids.
- Effective anchorage depth, edge distances and spacings not less than the specified values without minus tolerances.
- Positioning of the drill holes without damaging the reinforcement.
- Hole drilling by hammer drill.
- Cleaning of the hole of drilling dust.
- Application of the torque moment using a calibrated torque wrench.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance it the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load if is not in the direction of load application.

SafetyPlus	Annex B 1
Intended use Specifications	

ANNEX B : Specification of intended use (continued)

Figure B1 Installation parameters

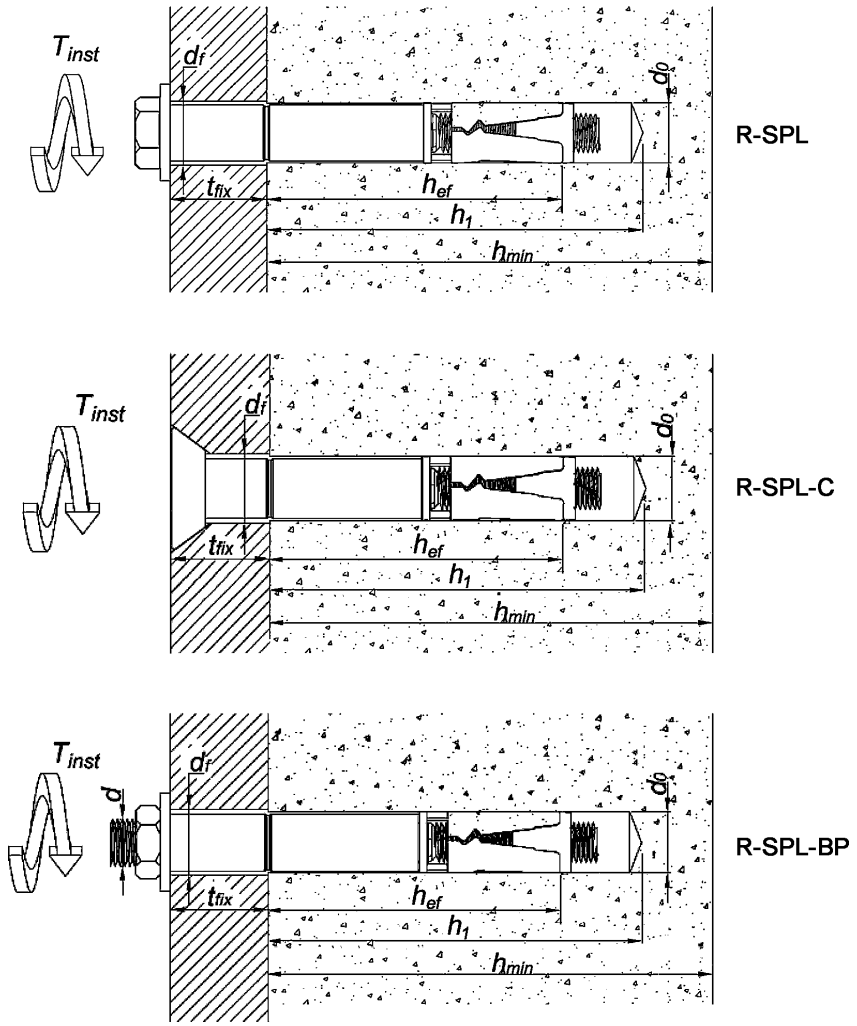


Table B1: Installation parameters

Anchor size		M8	M10	M12	M16	M20
Effective anchorage depth	h_{ef} [mm]	60	70	80	100	125
Nominal drill hole diameter	d_o = [mm]	12	15	18	24	28
Depth of drill hole	$h_0 \geq$ [mm]	85	95	105	130	160
Diameter of clearance hole in the fixture	$d_f \leq$ [mm]	14	17	20	26	30
Installation torque	T_{inst} = [Nm]	25	50	80	180	275
Minimum thickness of member	h_{min} [mm]	100	105	120	150	187.5
Minimum spacing	s_{min} [mm]	60	70	80	100	125
Minimum edge distance	c_{min} [mm]	90	105	120	150	185.5

SafetyPlus	Annex B 2
Product description Installation parameters	

ANNEX B : Specification of intended use (continued)

Figure B2 Installation instruction

Installation instruction for R-SLP anchor

Installation instruction for R-SPL-C anchor

Installation instruction for R-SPL-C anchor

SafetyPlus	Annex B 3
Product description Installation instruction	

ANNEX C : Characteristic values for loads and displacements

Table C1: Characteristic values for tension loads (static and quasi-static loading)

Anchor size			M8	M10	M12	M16	M20
Steel failure							
Characteristic resistance		$N_{Rk,s}$ [kN]	29.3	46.4	57.4	125.6	196.0
Partial safety factor		γ_{Ms} 1)	1.5				
Pull-out failure							
Characteristic resistance in Uncracked concrete C20/25		$N_{Rk,p}$ [kN]	9	12	16	35	40
Installation safety factor		γ_2 2) = γ_{inst} 3) 4)	1.2				
Increasing factor	concrete C30/37	ψ_c	1.22				
	concrete C40/50		1.41				
	concrete C50/60		1.55				
Concrete cone failure and splitting failure							
Effective anchorage depth		h_{ef} [mm]	60	70	80	100	125
Factor for Uncracked concrete		k_1 2) = k_{ucr} 3)	10.1	10.1	10.1	10.1	10.1
		k_1 2) = $k_{ucr,N}$ 4)	11.0	11.0	11.0	11.0	11.0
Installation safety factor		γ_2 2) = γ_{inst} 3) 4)	1.2				
Increasing factor	concrete C30/37	ψ_c	1.22				
	concrete C40/50		1.41				
	concrete C50/60		1.55				
Characteristic resistance for splitting		$N^0_{Rk,sp}$ 4) [kN]	9	12	16	35	40
Characteristic spacing	concrete cone failure	$s_{cr,N}$ [mm]	180	210	240	300	375
	splitting failure	$s_{cr,sp}$ [mm]	180	210	240	300	375
Characteristic edge distance	concrete cone failure	$c_{cr,N}$ [mm]	90	105	120	150	188
	splitting failure	$c_{cr,sp}$ [mm]	90	105	120	150	188

1) in absence of other national regulations
2) parameter for design according to UKAD 330232-00-0601
3) parameter for design according to CEN/TS 1992-4-4:2009
4) parameter for design according to FprEN 1992-4:2016

Table C2: Displacements under tension loads

Anchor size		M8	M10	M12	M16	M20
Tension load	N [kN]	3.06	4.08	6.80	11.90	13.61
Displacement	δ_{N0} [mm]	0.08	0.27	0.11	0.15	0.36
	$\delta_{N\infty}$ [mm]	1.00	1.00	1.00	1.00	1.00

SafetyPlus	Annex C 1
Product description Characteristic values for tension loads, displacements	

ANNEX C : Characteristic values for loads and displacements (continued)

Table C3: Characteristic values for shear loads (static and quasi-static loading)

Anchor size		M8	M10	M12	M16	M20
Steel failure without lever arm						
Characteristic resistance	$V_{Rk,s}$[2)3)] = $V^0_{Rk,s}$[4)] [kN]	19.20	30.00	43.20	77.60	73.68
Ductility factor	k[2)] = k_2[3)] = k_7[4)]	0.8	0.8	0.8	0.8	0.8
Partial safety factor	γ_{Ms}[1)]	1.25				
Steel failure with lever arm						
Characteristic bending resistance	$M^0_{Rk,s}$ [Nm]	45.04	87.97	152.01	365.97	728.54
Partial safety factor	γ_{Ms}[1)]	1.25				
Concrete pry-out failure						
Factor	k[2)] = k_3[3)] = k_8[4)]	2.0				
Partial safety factor	γ_{Ms}[1)]	1.25				
Concrete edge failure						
Effective length of anchor under shear loading	l_f [mm]	60	70	80	100	125
Outside diameter of anchor	d_{nom} [mm]	8	10	12	16	20
Partial safety factor	γ_{Mc}[1)]	1.5				

1) in absence of other national regulations
2) parameter for design according to UKAD 330232-00-0601
3) parameter for design according to CEN/TS 1992-4-4:2009
4) parameter for design according to FprEN 1992-4:2016

Table C4: Displacements under shear loads

Anchor size		M8	M10	M12	M16	M20
Shear load	V [kN]	6.53	10.20	14.69	26.39	25.06
Displacement	δ_{V0} [mm]	1.91	0.99	2.07	2.44	2.81
	$\delta_{V\infty}$ [mm]	2.86	1.49	3.11	3.66	4.21

SafetyPlus	Annex C 2
Product description Characteristic values for shear loads, displacements	

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