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Authorized and notified according
to Article 29 of the Regulation (EU)
No 305/2011 of the European
Parliament and of the Council of
9 March 2011

MEMBER OF EOTA



European Technical Assessment ETA-24/0954 of 2024/10/15

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:

Ramset™ AnkaScrew™ Tapcon Xtrem™

Product family to which the above construction product belongs:

Mechanical fasteners for use in cracked and uncracked concrete

Manufacturer:

ITW Australia (Ramset)
1 Ramset Drive
Chirnside Park
VIC 3116
AUSTRALIA

Manufacturing plant:

ITW Plant 1

This European Technical Assessment contains:

18 pages including 11 annexes which form an integral part of the document

This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:

EAD 330232-01-0601; Mechanical fasteners for use in concrete

Note:

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es) referred to above). However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product

The Ramset™ concrete screw AnkaScrew™ Tapcon Xtrem™ is an anchor made of zinc plated steel. The AnkaScrew™ Tapcon Xtrem™ comes in size 6 with an embedment depth of 40 mm or 55 mm. The anchor is screwed into a predrilled cylindrical drill hole. The special thread of the anchor cuts an internal thread into the member while setting. The anchorage is characterized by mechanical interlock in the special thread.

The product description is given in Annex A and the intended use specifications of the product are detailed in Annex B.

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

The performances given in Section 3 are only valid if the anchor is used in compliance with the specifications and conditions given in Annex B.

The provisions made in this European Technical Assessment are based on an assumed intended working life of the anchor of 50 years.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or 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

Characteristic	Assessment of characteristic
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3.1 Mechanical resistance and stability (BWR1)

Characteristic resistance to tension load (static and quasi-static loading) Method A

Resistance to steel failure	Annex C
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Resistance to pull-out failure	Annex C
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Resistance to concrete cone failure	Annex C
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Robustness	Annex C
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Minimum edge distance and spacing	Annex B
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Edge distance to prevent splitting under load	Annex B
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Characteristic resistance to shear load (static and quasi-static loading)

Resistance to steel failure under shear load	Annex C
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Resistance to pry-out failure	Annex C
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Characteristic resistance for simplified design

Method B	Annex C
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Method C	Annex C
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Displacements

Displacements under static and quasi-static loading	Annex C
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Characteristic resistance and displacements for seismic performance categories C1

Resistance to tension load, displacements	Annex C
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Resistance to shear load, displacements	Annex C
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Factor for annual gap	Annex C
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3.2 Safety in case of fire (BWR2)

Reaction to fire	Class A1
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Characteristic	Assessment of characteristic
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Resistance to fire

Fire resistance to steel failure (tension load)	Annex C
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Fire resistance to pull-out failure (tension load)	Annex C
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Fire resistance to steel failure (shear load)	Annex C
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3.3 Aspects of durability

Durability	Annex B
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See additional information in section 3.9

3.9 General aspects related to the performance of the product

The European Technical Assessment is issued for the product on the basis of agreed data/information, deposited with ETA-Danmark, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, should be notified to ETA-Danmark before the changes are introduced. ETA-Danmark will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

4 Assessment and verification of constancy of performance (AVCP) (hereinafter AVCP) system applied, with reference to its legal base.

4.1 AVCP system

According to the decision 1996/582/EC of the European Commission, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No. 305/2011) is **1**.

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

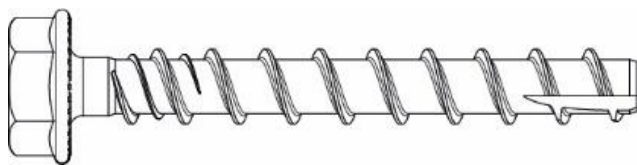
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking

Issued in Copenhagen on 2024-10-15 by



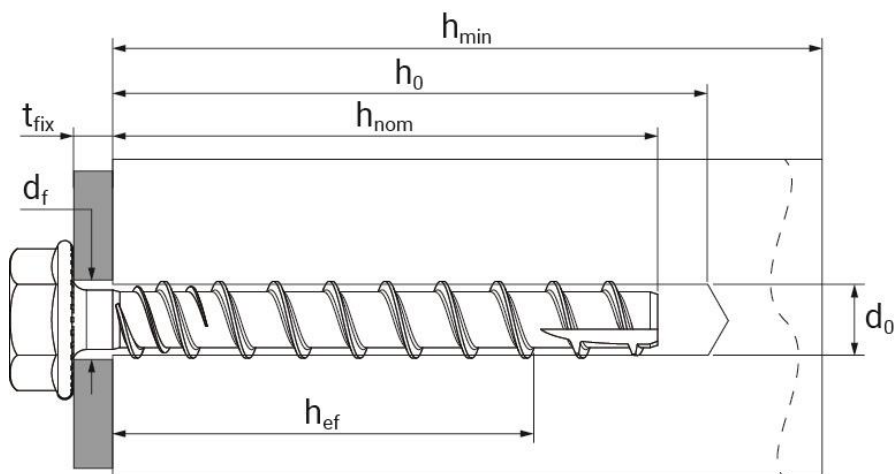
Thomas Bruun
Managing Director, ETA-Danmark

Ramset™ AnkaScrew™ Tapcon Xtrem™



Installed condition in concrete

e.g. Ramset™ AnkaScrew™ Tapcon Xtrem™ concrete screw, with hexagon head and fixture



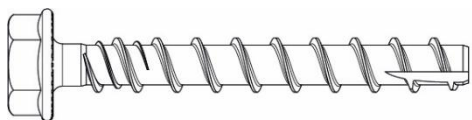
- h_{min} : Minimum thickness of member
- d_0 : Nominal drill hole diameter
- h_0 : Drill hole depth
- d_f : Clearance hole diameter
- h_{nom} : Nominal embedment depth
- h_{ef} : Effective embedment depth
- t_{fix} : Thickness of fixture

Ramset™ AnkaScrew™ Tapcon Xtrem™

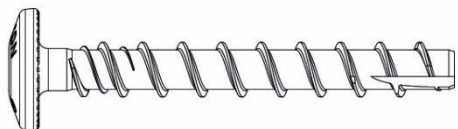
Product description
Installation condition

Annex A1

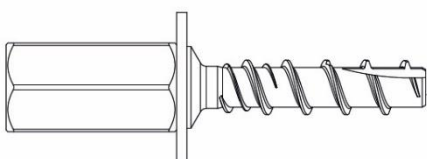
Product version



HFL Version with washer
Hexagon head SW13 and TORX drive30
e.g. AnkaScrew™ Tapcon Xtrem™ HFL 6x43



DOME Version with large pan head
TORX drive 30
e.g. AnkaScrew™ Tapcon Xtrem™ DOME 6x60



ROD Version Hexagon drive SW13
e.g. AnkaScrew™ Tapcon Xtrem™ ROD 6x55 M8/M10

Marking:

- Designation: TAPCON
- Screw size: 6
- Screw length: 60



Material

Table A1: Material

Product name	Material
AnkaScrew™ Tapcon Xtrem™	Steel EN 10263-4:2017 galvanized acc. to EN ISO 4042:2022

Ramset™ AnkaScrew™ Tapcon Xtrem™

Product description
Product versions, Marking, and Material

Annex A2

Dimensions

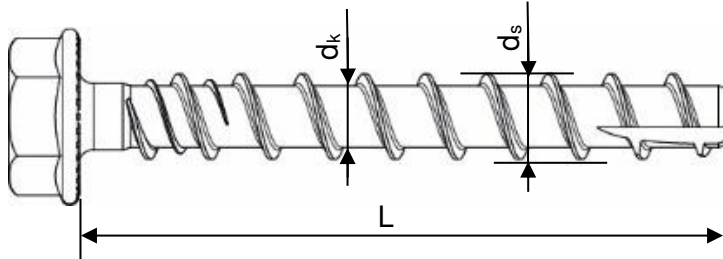


Table A2: Dimensions

Fastener size AnkaScrew™ Tapcon Xtrem™			6
Screw length	$\leq L$	[mm]	100
Core diameter	d_k	[mm]	5,8
Thread outer diameter	d_s	[mm]	8,0

Ramset™ AnkaScrew™ Tapcon Xtrem™

Product description
Dimensions

Annex A3

Specification of Intended use

Table B1 : Anchorages subject to:

Fastener size AnkaScrew™ Tapcon Xtrem™		6	
Nominal embedment depth	h_{nom} [mm]	h_{nom1}	h_{nom2}
		40	55
Static and quasi-static loads		✓	✓
Fire exposure		✓	✓
C1 seismic category performance		✓	✓

Base materials:

- Compacted reinforced and unreinforced concrete without fibres of concrete Strength classes C20/25 to C50/60 according to EN 206:2013.
- Cracked or uncracked concrete.

Use conditions (Environmental conditions):

- Concrete screws subject to dry internal conditions: all screw types.

Design:

- Anchorages are designed in accordance with EN 1992-4:2018 and EOTA Technical Report TR 055
- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are to be prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.).

Installation:

- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters on site.
- In case of aborted hole: new drilling must be drilled at a minimum distance of twice the depth of aborted hole or closer, if the aborted hole is filled with high strength mortar and only if the hole is not in the direction of the oblique tensile or shear load.
- After installation further turning of the anchor must not be possible. The head of the anchor is supported in the fixture and is not damaged.

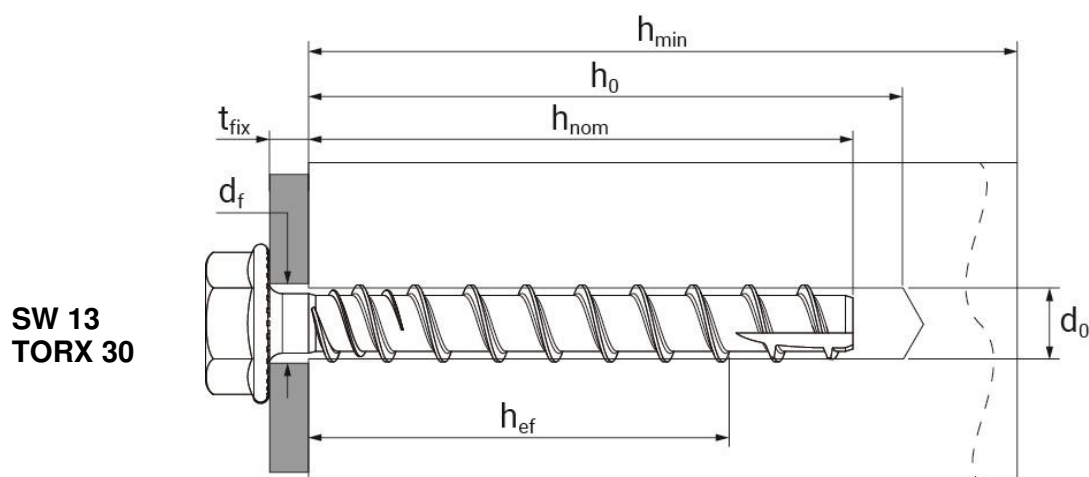
Ramset™ AnkaScrew™ Tapcon Xtrem™

Intended use
Specification

Annex B1

Table B2 : Setting data in concrete for AnkaScrew™ Tapcon Xtrem™ HFL / DOME / ROD

Fastener size AnkaScrew™ Tapcon Xtrem™			6					
Type			HFL	DOME	ROD	HFL	DOME	ROD
Nominal embedment depth		h_{nom}	h_{nom1}			h_{nom2}		
		[mm]	40			55		
Nominal drill hole diameter	d_0	[mm]	6					
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	6,40					
Drill hole depth	$h_0 \geq$	[mm]	50			65		
Clearance hole diameter	$d_f \leq$	[mm]	9					
Wrench size	SW	[mm]	13	-	13	13	-	13
Torx Size	TX	[-]	30	30	-	30	30	-
Torque impact screw driver (Max. torque according to manufacturer's instructions)		[Nm]	170			210		



Ramset™ AnkaScrew™ Tapcon Xtrem™

Intended use
Installation parameters

Annex B2

Table B3: Minimum thickness of member, minimum edge distance and minimum spacing

Fastener size AnkaScrew™ Tapcon Xtrem™			6	
Nominal embedment depth	h_{nom} [mm]		h_{nom1}	h_{nom2}
			40	55
Minimum thickness of member	h_{min}	[mm]	80	100
Minimum edge distance	c_{min}	[mm]	40	
Minimum spacing	s_{min}	[mm]	40	



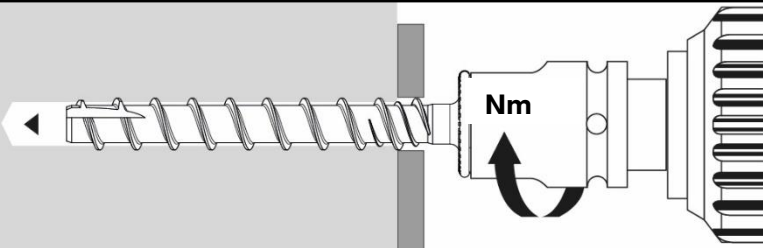
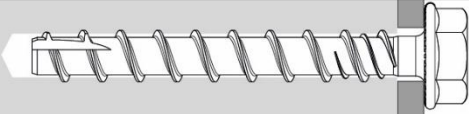
Ramset™ AnkaScrew™ Tapcon Xtrem™

Intended use

Minimum thickness of member, minimum edge distance and minimum spacing

Annex B3

Installation Instructions

	Drill hole perpendicular to concrete surface
	Blow out dust beginning from the depth of the bore hole
	Install with torque Impact screw driver and stop screwing when the head is in contact with the fixture
	The head must be undamaged and in contact with the fixture

Ramset™ AnkaScrew™ Tapcon Xtrem™

Intended use
Installation instructions

Annex B4

Table C1: Characteristic values for static and quasi-static loading

Fastener size AnkaScrew™ Tapcon Xtrem™ HFL / DOME / ROD			6		
Nominal embedment depth		h_{nom}	h_{nom1}	h_{nom2}	
		[mm]	40	55	
Steel failure for tension and shear loading					
Characteristic tension load	$N_{Rk,s}$	[kN]	23,6		
Partial factor	$\gamma_{Ms,N}$	[-]	1,4		
Characteristic shear load	$V_{Rk,s}^0$	[kN]	8,5		
Partial factor	$\gamma_{Ms,V}$	[-]	1,5		
Ductility factor	k_7	[-]	0,98		
Characteristic bending load	$M_{Rk,s}^0$	[Nm]	22,9		
Pull-out failure					
Characteristic tension load in uncracked concrete C20/25		$N_{Rk,p}$	[kN]	7,0	10,0
Increasing factor for $N_{Rk,p}$	C25/30	ψ_c	[-]	1,04	1,08
	C30/37			1,07	1,14
	C40/50			1,13	1,26
	C50/60			1,17	1,35
Characteristic tension load in cracked concrete C20/25		$N_{Rk,p}$	[kN]	2,5	5,5
Increasing factor for $N_{Rk,p}$	C25/30	ψ_c	[-]	1,12	1,05
	C30/37			1,22	1,08
	C40/50			1,41	1,15
	C50/60			1,58	1,20
Installation safety factor		γ_{inst}	[-]	1,4	1,2
Concrete cone failure and splitting failure					
Effective embedment depth		h_{ef}	[mm]	31,5	44,3
k-factor	cracked	$k_{cr,N}$	[-]	7,7	
	uncracked	$k_{ucr,N}$	[-]	11,0	
Concrete cone failure	spacing	$S_{cr,N}$	[mm]	3 h_{ef}	
	Edge distance	$C_{cr,N}$	[mm]	1,5 h_{ef}	
Splitting failure	resistance	$N_{Rk,sp}^0$	[kN]	$N_{Rk,p}$	
	spacing	$S_{cr,sp}$	[mm]	180	200
	edge distance	$C_{cr,sp}$	[mm]	90	100
Installation safety factor		γ_{inst}	[-]	1,4	1,2
Concrete pryout failure					
Factor for pry-out failure		k_8	[-]	1,0	
Installation safety factor		γ_{inst}	[-]	1,0	
Concrete edge failure					
Effective length in concrete		$l_f = h_{ef}$	[mm]	31,5	44,3
Nominal outer diameter of screw		d_{nom}	[mm]	6	
Installation safety factor		γ_{inst}	[-]	1,0	

Ramset™ AnkaScrew™ Tapcon Xtrem™

Performances

Characteristic values for static and quasi-static loading

Annex C1

Table C2 : Seismic category C1 – Characteristic load values

Fastener size AnkaScrew™ Tapcon Xtrem™ HFL / DOME / ROD		6	
Nominal embedment depth	h_{nom}	h_{nom1}	h_{nom2}
	[mm]	40	55
Steel failure for tension and shear load			
Characteristic tension load	$N_{Rk,s,C1}$	[kN]	23,6
Partial factor	$\gamma_{Ms,N}$	[-]	1,4
Characteristic shear load	$V_{Rk,s,C1}$	[kN]	4,3 7,3
Partial factor	$\gamma_{Ms,V}$	[-]	1,5
Pull-out failure			
Characteristic tension load in cracked concrete C20/25	$N_{Rk,p,C1}$	[kN]	2,2 4,4
Installation safety factor	γ_{inst}	[-]	1,4 1,2
Concrete cone failure			
Effective embedment depth	h_{ef}	[mm]	31,5 44,3
Edge distance	$C_{cr,N}$	[mm]	1,5 h_{ef}
Spacing	$S_{cr,N}$	[mm]	3 h_{ef}
Installation safety factor	γ_{inst}	[-]	1,4 1,2
Concrete pry-out failure			
Factor for pry-out failure	k_8	[-]	1,0
Installation safety factor	γ_{inst}	[-]	1,0
Concrete edge failure			
Effective length in concrete	$l_f = h_{ef}$	[mm]	31,5 44,3
Nominal outer diameter of screw	d_{nom}	[mm]	6 6
Installation safety factor	γ_{inst}	[-]	1,0

Ramset™ AnkaScrew™ Tapcon Xtrem™

Performances
Seismic category C1 – Characteristic load values

Annex C2

Table C3 : Displacements under static and quasi-static tension load

Fastener size AnkaScrew™ Tapcon Xtrem™				6	
Nominal embedment depth			h_{nom}	h_{nom1}	h_{nom2}
			[mm]	40	55
Cracked concrete	tension load	N	[kN]	1,2	2,4
	displacement	δ_{N0}	[mm]	0,03	0,01
		$\delta_{N\infty}$	[mm]	0,30	0,32
Uncracked concrete	tension load	N	[kN]	3,3	4,8
	displacement	δ_{N0}	[mm]	0,04	0,02
		$\delta_{N\infty}$	[mm]	0,07	0,17

Table C4 : Displacements under static and quasi-static

Fastener size AnkaScrew™ Tapcon Xtrem™				6	
Nominal embedment depth			h_{nom}	h_{nom1}	h_{nom2}
			[mm]	40	55
Cracked and uncracked concrete	shear load	V	[kN]	4,0	
	displacement	δ_{V0}	[mm]	0,83	
		$\delta_{V\infty}$	[mm]	1,25	

Ramset™ AnkaScrew™ Tapcon Xtrem™

Performances

Displacements under static and quasi-static loads

Annex C3

Table C3: Fire exposure – characteristic values of resistance

Fastener size AnkaScrew™ Tapcon Xtrem™ HFL / DOME / ROD M				6	
Nominal embedment depth		h_{nom}		h_{nom1}	h_{nom2}
		[mm]		40	55
Steel failure for tension and shear load					
Characteristic resistance	R30	$N_{Rk,s,fi30}$	[kN]	1,00	1,50
	R60	$N_{Rk,s,fi60}$	[kN]	1,00	1,28
	R90	$N_{Rk,s,fi90}$	[kN]	0,70	0,84
	R120	$N_{Rk,s,fi120}$	[kN]	0,54	0,62
	R30	$V_{Rk,s,fi30}$	[kN]	1,00	1,50
	R60	$V_{Rk,s,fi60}$	[kN]	1,00	1,28
	R90	$V_{Rk,s,fi90}$	[kN]	0,70	0,84
	R120	$V_{Rk,s,fi120}$	[kN]	0,54	0,62
	R30	$M^0_{Rk,s,fi30}$	[kNm]	0,76	1,14
	R60	$M^0_{Rk,s,fi60}$	[kNm]	0,76	0,97
	R90	$M^0_{Rk,s,fi90}$	[kNm]	0,53	0,64
	R120	$M^0_{Rk,s,fi120}$	[kNm]	0,41	0,47
Pull-out failure					
Characteristic resistance	R30-90	$N_{Rk,p,fi}$	[kN]	0,60	1,4
	R120	$N_{Rk,p,fi}$	[kN]	0,50	1,1
Concrete cone failure					
Characteristic resistance	R30-90	$N_{Rk,c,fi}$	[kN]	1,2	2,9
	R120	$N_{Rk,c,fi}$	[kN]	1,0	2,3
Edge distance					
R30 - R120		$C_{cr,N,fi}$	[mm]	$2 \times h_{ef}$	
In case of fire attack from more than one side, the minimum edge distance shall be ≥ 300 mm.					
Spacing distance					
R30 - R120		$S_{cr,N,fi}$	[mm]	$4 \times h_{ef}$	
Pryout failure					
R30 - R120		k_8	[-]	1,0	1,0
Characteristic resistance	R30-90	$V_{Rk,cp,fi}$	[kN]	1,2	2,9
	R120	$V_{Rk,cp,fi}$	[kN]	1,0	2,3
The anchorage depth has to be increased for wet concrete by at least 30 mm compared to the given value.					

Ramset™ AnkaScrew™ Tapcon Xtrem™

Performances

Fire exposure – characteristic values of resistance

Annex C4