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

UK Technical Assessment	UKTA-0836-23/6828 of 02/05/2023
Technical Assessment Body issuing the UK Technical Assessment:	British Board of Agrément
Trade name of the construction product:	Nail Anchor N
Product family to which the construction product belongs:	Fixings
Manufacturer:	MKT Metall-Kunststoff-Technik GmbH & Co. KG Auf dem Immel 2 67685 Weilerbach Germany
Manufacturing plant(s):	MKT Metall-Kunststoff-Technik GmbH & Co. KG Auf dem Immel 2 67685 Weilerbach Germany
This UK Technical Assessment contains:	12 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 330747-00-0601 *Fasteners for use in concrete for redundant non-structural systems*

1. Technical description of the product

The Nail Anchor N is a fastener made of galvanized or stainless steel which is placed into a drilled hole and expanded by loading.

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

The verifications and assessment methods on which this UK Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, 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)

Not relevant.

3.2. Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C2

3.3. Health, hygiene and the environment (BWR 3)

Not relevant.

3.4. Safety and accessibility in use (BWR 4)

Essential characteristic	Performance
Characteristic resistance for all load directions and modes of failure for simplified design	See Annexes B2 and C1
Durability	See Annex B1

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. 330747-00-0601 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) 2+ applies.

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
- UKTA number.

On behalf of the British Board of Agrément 	
Date of Issue: 2 May 2023	**Hardy Giesler** Chief Executive Officer

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Nail Anchor N

Installation condition and fastener versions

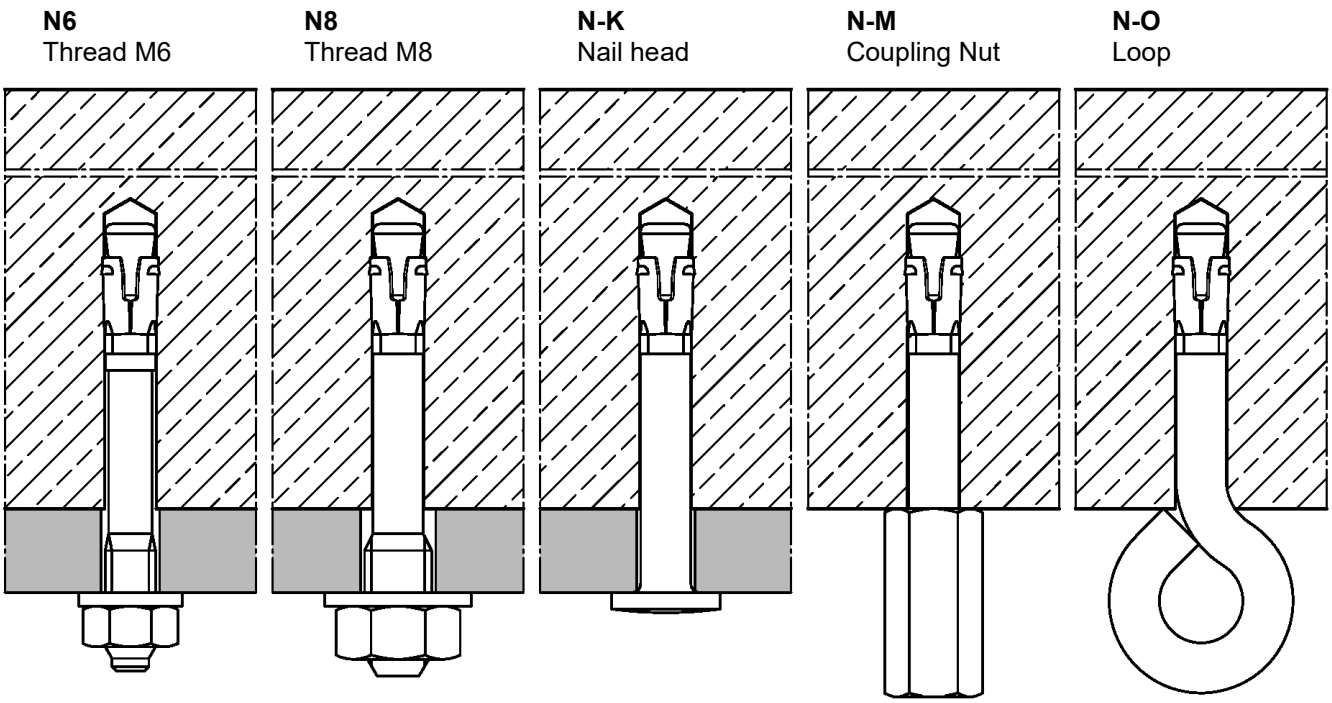
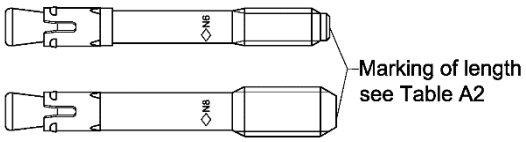
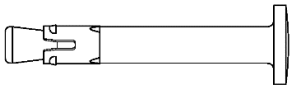
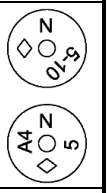
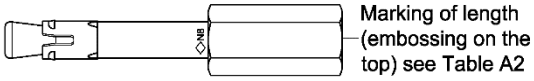
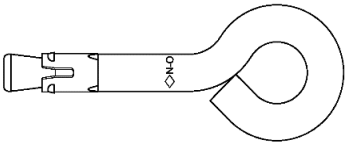


Table A1: Materials

Designation	Steel zinc plated	Stainless steel CRC III	High corrosion resistant steel CRC V
Conical bolt	Steel, galvanized ≥ 5 µm, fracture elongation A_5 ≥ 8%	Stainless steel, coated fracture elongation A_5 ≥ 8%	High corrosion resistant steel, coated fracture elongation A_5 ≥ 8%
Expansion sleeve	Stainless steel	Stainless steel	Stainless steel
Washer	Steel, galvanized ≥ 5 µm	Stainless steel	High corrosion resistant steel
Hexagon nut			
Coupling nut	Steel galvanized ≥ 5 µm	Stainless steel	High corrosion resistant steel

Nail Anchor N	Annex A1
Product description Installation conditions and fastener versions / Materials	

Marking

Version		Marking (examples)	Explanation
N6 Thread M6 **N8** [1)] Thread M8		◇ N6 5/10 ◇ N6 5 A4 ◇ N8 5/10 ◇ N8 5 A4	◇ manufacturer identification N6 fastener identity with N8 thread size M6 or M8 5 maximum thickness of fixture for h_{ef} = 30 mm 10 maximum thickness of fixture for h_{ef} = 25 mm additional markings: A4 stainless steel HCR high corrosion resistant steel -O fastener version: Loop
N-K [1)] Nail head			
N-M [1)] Coupling Nut M8/M10 M8/M12		◇ N8 5/10 ◇ N8 5 A4	
N-O Loop		◇ N-O	

[1)] optional with torsion protection

Table A2: Length identification

Fastener identifier	Marking		Thickness of fixture	
	all materials	steel, zinc plated	at h_{ef} = 30 mm	at h_{ef} = 25 mm[1)]
A	0 / 5		0	5
B	5 / 10		5	10
C	10 / 15		10	15
D	15 / 20		15	20
E	20 / 25		20	25
F	25 / 30		25	30
G	30 / 35		30	35
H	35 / 40		35	40
I	40 / 45		40	45
J	45 / 50		45	50
K	50 / 55		50	55
L	55 / 60		55	60
M	60 / 65		60	65

Fastener identifier	Marking		Thickness of fixture	
	all materials	steel, zinc plated	at h_{ef} = 30 mm	at h_{ef} = 25 mm[1)]
N	65 / 70		65	70
O	70 / 75		70	75
P	75 / 80		75	80
Q	80 / 85		80	85
R	85 / 90		85	90
S	90 / 95		90	95
T	95 / 100		95	100
U	100 / 105		100	105
V	105 / 110		105	110
W	110 / 115		110	115
X	115 / 120		115	120
Y	120 / 125		120	125
Z	125 / 130		125	130

[1)] for internal use only

Nail Anchor N

Product description
Marking / Length identification

Annex A2

Specifications of intended use

Nail Anchor	N6 Thread M6	N8 Thread M6	N-K Nail head	N-M Coupling nut	N-O Loop
Static or quasi-static action	✓				
Fire exposure	R30 / R60 / R90 / R120				
Cracked or uncracked concrete	✓				
Strength classes C12/15 to C50/60 according to EN 206:2013 + A2:2021	✓				
Compacted, reinforced or unreinforced normal weight concrete, without fibres according to EN 206:2013 + A2:2021	✓				

Use conditions (environmental conditions):	Effective anchorage depth
• Structures subject to dry internal conditions (zinc plated steel, stainless steel or high corrosion resistant steel)	h_{ef} ≥ 30mm and $h_{ef,red}$ ≥ 25mm
• Structures subject to permanently damp internal conditions, if no particularly aggressive conditions exist (stainless steel or high corrosion resistant steel)	h_{ef} ≥ 30mm and $h_{ef,red}$ ≥ 25mm
• Structures subject to external atmospheric exposure including industrial and marine environment, if no particularly aggressive conditions exist (stainless steel or high corrosion resistant steel)	h_{ef} ≥ 30mm
• Structures subject to external atmospheric exposure and to permanently damp internal conditions, if other particularly aggressive conditions exist (high corrosion resistant steel)	h_{ef} ≥ 30mm

Note: Particularly aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used.)

Design:

- Fastenings are designed under the responsibility of an engineer experienced in fastenings and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be fastened. The position of the fastener is indicated on the design drawings (e.g. position of the fastener relative to reinforcement or to supports, etc.).
- Design of fastenings according to EN 1992-4:2018, simplified design method C
- Fasteners are only to be used for redundant non-structural systems.

Installation:

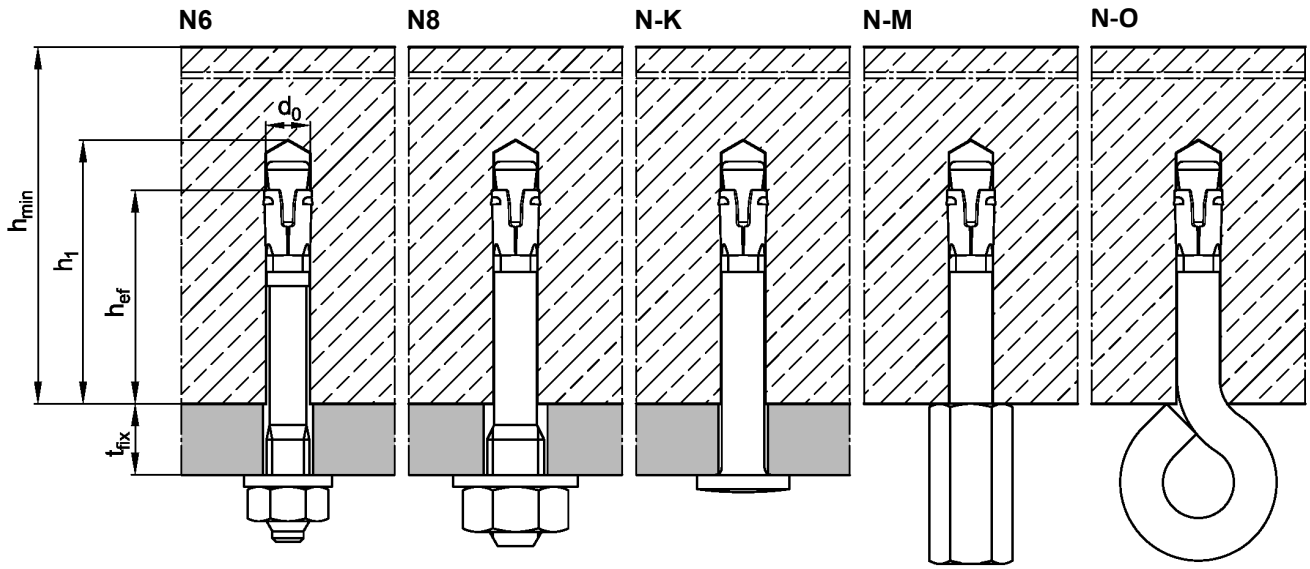
- Drill hole by hammer drilling or vacuum drilling.
- Installation only as supplied by the manufacturer, without replacement of individual parts.
- Fastener installation such that the effective setting depth is complied with. This compliance is ensured, if the admissible thickness of fixture is kept or the loop of Nail Anchor N-O rests on the concrete surface.

Nail Anchor N	**Annex B1**
Intended Use Specifications	

Table B1: Installation parameters

Fastener type			N6 N-K N-O	N8 N-M	N6 N-K N-O	N8 N-M
Effective anchorage depth	$h_{ef} \geq$	[mm]	25[1)]		30	
Nominal drill hole diameter	d_0	[mm]	6		6	
Cutting diameter to drill bit	$d_{cut} \leq$	[mm]	6,40		6,40	
Depth of drill hole	$h_1 \geq$	[mm]	35		40	
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	7	9	7	9
Maximum tightening torque (N 6 and N 8)	$T_{inst} \leq$	[Nm]	4		4	
Minimum member thickness	h_{min}	[mm]	80		80	

[1)] Internal use only

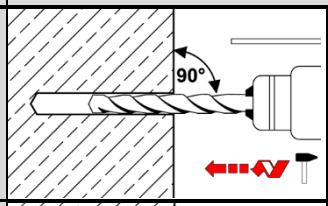
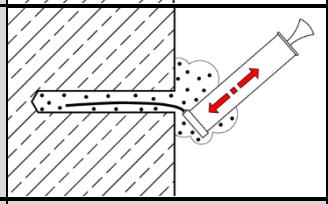
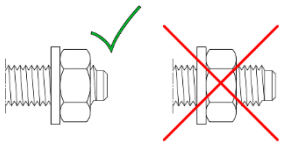
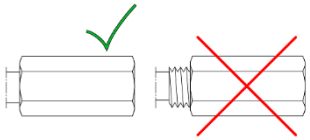
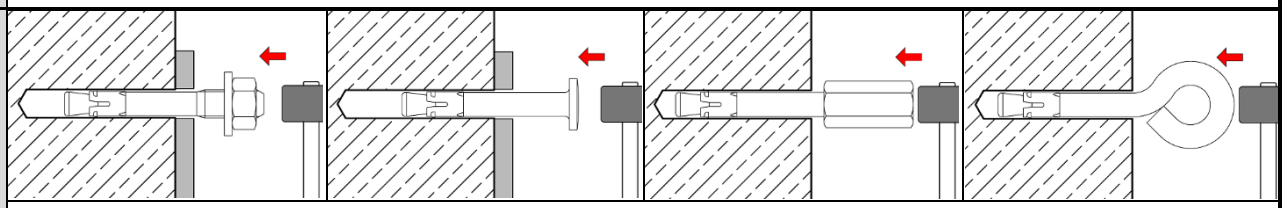
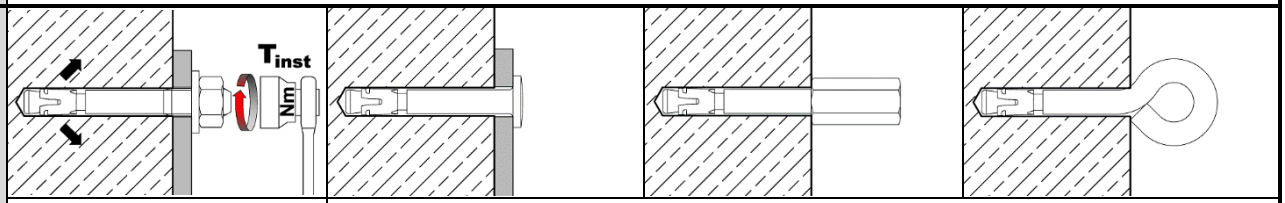


Nail Anchor N

Intended Use
Installation parameters

Annex B2

Installation instructions

	All fastener types			
1		Drill hole perpendicular to the concrete surface by hammer drilling or vacuum drilling.		
2		Blow out dust. Alternatively, vacuum clean down to the bottom of the hole.		
	N6 / N8 Thread M6 / M8	**N-K** Nail head	**N-M** Coupling nut	**N-O** Loop
3		-		-
	Check position of nut.			
4				
	Drive in fastener.			
5				
	Apply installation torque $T_{inst} \leq 4$ Nm.	Installation condition		

Nail Anchor N	**Annex B3**
Intended Use Installation instructions	

Table C1: Characteristic resistance for a fixing point [1], all directions, design method C

Fastener type				N6	N8 N-K N-M	N-O	N6	N8 N-K N-M	N-O
Effective anchorage depth		h_{ef}	[mm]	25			30		
Optimized for maximum load									
Characteristic resistance	**C12/15**	F_{Rk}	[kN]	3,0	3,0	1,5	4,0	4,0	1,5
	C20/25 to **C50/60**			4,5	4,5	1,5	5,9	5,9	1,5
Respective spacing between fixing points [1) 2)]		s_{cr}	[mm]	100					
		for $c_{cr} \geq$	[mm]	200					
Respective edge distance [2)]		c_{cr}	[mm]	100					
		for $s_{cr} \geq$	[mm]	200					
Partial factor		γ_M	-	1,5					
Optimized for minimum edge distance									
Characteristic resistance	**C12/15**	F_{Rk}	[kN]	1,5	1,5	1,5	2,0	2,0	1,5
	C20/25 to **C50/60**			2,0	2,0	1,5	2,5	2,5	1,5
Respective spacing between fixing points [1) 2)]		c_{cr}	[mm]	50					
		for $s_{cr} \geq$	[mm]	100					
Partial factor		γ_M	-	1,5					
Shear load with lever arm									
Characteristic bending resistance, **steel, zinc plated**		$M^0_{Rk,s}$	[Nm]	9,2	12,7	[3)]	9,2	12,7	[3)]
Characteristic bending resistance, **stainless steel A4 / HCR**		$M^0_{Rk,s}$	[Nm]	9,2	13,5	[3)]	9,2	13,5	[3)]
Partial factor		γ_{Ms}	-	1,25					

[1)] A fixing point is defined as:
- Single fastener
- Fastener group with a minimum spacing s of 50 mm ≤ s < s_{cr}

If the spacing in a fixing point is greater than or equal to the respective spacing in this table, the characteristic resistances apply to every single fastener.

[2)] Intermediate values can be linearly interpolated

[3)] No performance assessed.

Nail Anchor N

Performances
Characteristic resistance

Annex C1

Table C2: Characteristic resistance for a fixing point [1)] under fire exposure in concrete C20/25 to C50/60, design method C

Fire resistance class				Fastener type							
				N6 N8	N-K	N-M[3)]	N-O	N6 N8	N-K	N-M[3)]	N-O
Effective anchorage depth		h_{ef}	[mm]	**25**				**30**			
Load in any direction											
R 30	Characteristic resistance, **steel zinc plated**	$F_{Rk,fi}$	[kN]	0,6	0,6	0,6	0,2	0,9	0,9	0,8	-
R 60				0,6	0,6	0,6	0,2	0,7	0,8	0,7	-
R 90				0,5	0,6	0,6	0,1	0,5	0,6	0,6	-
R 120				0,4	0,5	0,5	0,1	0,4	0,5	0,6	-
R 30	Characteristic resistance, **stainless steel A4 / HCR**	$F_{Rk,fi}$	[kN]	0,6	0,6	0,6	0,2	0,9	0,9	0,8	0,2
R 60				0,6	0,6	0,6	0,2	0,9	0,9	0,7	0,2
R 90				0,5	0,6	0,6	0,1	0,9	0,9	0,6	0,1
R 120				0,4	0,5	0,5	0,1	0,7	0,7	0,6	0,1
R 30 - R 120	Edge distance	$c_{cr,fi}$	[mm]	50				50			
	Spacing	$s_{cr,fi}$	[mm]	100				100			
Shear load with lever arm											
R 30	Characteristic resistance, **steel zinc plated**	$M^0_{Rk,fi}$	[Nm]	0,7	1,0	0,7	[2)]	0,7	1,0	0,7	[2)]
R 60				0,5	0,8	0,7	[2)]	0,5	0,8	0,7	[2)]
R 90				0,4	0,5	0,6	[2)]	0,4	0,5	0,6	[2)]
R 120				0,3	0,4	0,5	[2)]	0,3	0,4	0,5	[2)]
R 30	Characteristic resistance, **stainless steel A4 / HCR**	$M^0_{Rk,fi}$	[Nm]	1,4	2,1	0,7	[2)]	1,4	2,1	0,7	[2)]
R 60				1,1	1,5	0,7	[2)]	1,1	1,5	0,7	[2)]
R 90				0,7	1,0	0,6	[2)]	0,7	1,0	0,6	[2)]
R 120				0,5	0,7	0,5	[2)]	0,5	0,7	0,5	[2)]
If the fire attack is from more than one side, the edge distance shall be ≥ 300 mm											

[1)] A fixing point is defined as:
- Single fastener,
- Fastener group with a minimum spacing s of 50 mm ≤ s < s_{cr}

If the spacing in a fixing point is greater than or equal to the respective spacing in this table, the characteristic resistances apply to every single fastener

[2)] No performance assessed

[3)] Only in connection with threaded rods M8, M10 or M12 minimum strength class 5.8.

Nail Anchor N

Performances
Characteristic resistance under fire exposure

Annex C2

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