Deutsches Institut für Bautechnik

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Approval body for construction products and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and Laender Governments

Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-21/0351 of 7 October 2021

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	EJOT concrete screw J6
Product family to which the construction product belongs	Mechanical fasterners for use in concrete
Manufacturer	EJOT UK Limited Hurricane Close, Sherburn Enterprise Park SHERBURN IN ELMET, LS25 6PB GROSSBRITANNIEN
Manufacturing plant	EJOT Plant 16
This European Technical Assessment contains	13 pages including 3 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 330232-00-0601, Edition 10/2016

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Specific Part

1 Technical description of the product

The EJOT concrete screw J6 is an anchor made of stainless steel of sizes 8, 10 and 12. 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 characterised by mechanical interlock in the special thread.

The product description is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document

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

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the concrete screw 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)

Essential characteristic	Performance
Characteristic resistance to tension load (static and quasi-static loading)	see Annex B 3 and C 1
Characteristic resistance to shear load (static and quasi-static loading)	see Annex C 2
Displacements (static and quasi-static loading)	see Annex C 3
Characteristic resistance and displacements for seismic performance categories C1 and C2	No performance assessed
Durability	See Annex B 1

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C 4 and C 5

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

In accordance with European Assessment Documents EAD No. 330232-00-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 7 October 2021 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

beglaubigt:
Baderschneider

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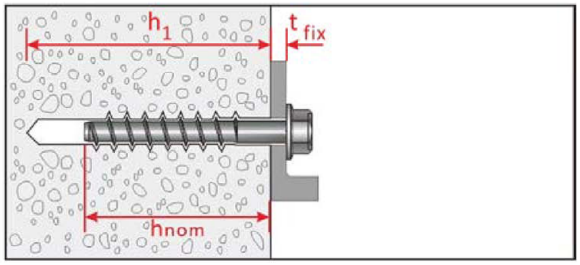
Product in the installed condition

Stainless steel A4



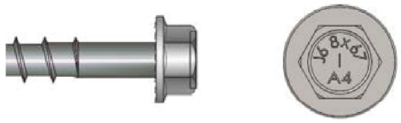
Hexagon Head: J-H
A4 (J6 8, J6 10, J6 12)

Table A1: Materials and screw types

Name	Material
Screw fastener	

Head marking	material
J A4	Stainless steel 1.4401, 1.4404 (both A4)

Anchor size / head types			J6 8	J6 10	J6 12
			-H	-H	-H
Material			A4	A4	A4
Characteristic yield strength	f_{yk}	N/mm^2	640	640	640
Characteristic tensile strength	f_{uk}	N/mm^2	800	800	800
Elongation at rupture	As	[%]	≤ 8		



Hexagon washer head
1) J-H A4 size 8,10,12 (stainless A4)

EJOT concrete screw J6

Product description
Installed condition, Materials and screw types

Annex A1

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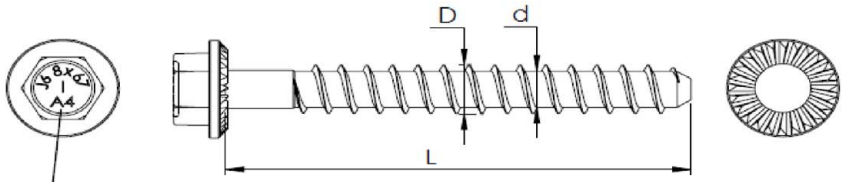
Table A2: Dimensions and markings

Fastener size			**J6 8**	**J6 10**	**J6 12**
Embedment depth	h_{nom}	[mm]	85	100	120
Length of fastener	min L	[mm]	90	105	125
	max L	[mm]	150	150	150
Thread diameter	D	[mm]	9,9	12,5	14,3
Shaft diameter	d	[mm]	7,4	9,4	11,3
Thread pitch	p	[mm]	5,8	7,7	8,1

Stainless Steel A4



Head Marking:
Identifying mark of producer: J6
Nominal Size: e.g. 8mm
Length: e.g. 67mm

EJOT concrete screw J6	**Annex A2**
Product description Dimensions and markings	

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Specifications of Intended use

Anchorages subject to:

- Static and quasi-static loads: All sizes.
- Fire exposure: All sizes

Base materials:

- Compacted reinforced or unreinforced normal weight concrete without fibres according to EN 206:2013,
- Strength classes C20/25 to C50/60 according to EN 206:2013,
- Uncracked or cracked concrete: all sizes.

Use conditions (Environmental conditions)

- Anchorages subject to dry internal conditions. (zinc plated steel and stainless steel)
- Anchorages subject to external atmospheric exposure (including industrial and marine environment) or exposure in permanently damp internal conditions if no particular aggressive conditions exist. (Stainless steel)

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

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are 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.).
- Anchorages are designed in accordance with EN 1992-4:2018 and Technical Report TR 055, Edition February 2018.

Installation:

- Hammer drilling only.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted hole is filled with high strength mortar and if under shear or oblique tension load it is not the direction of the load application.
- After installation further turning of the anchor shall not be possible.
- The head of the anchor must be fully engaged on the fixture and show no signs of damage.

EJOT concrete screw J6	Annex B1
Intended Use Specifications	

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Table B1: Installation parameters

Fastener size			**J6 8**	**J6 10**	**J6 12**
Diameter of drill bit	d_0	[mm]	8	10	12
Embedment depth	h_{nom}	[mm]	85	100	120
Minimum hole depth in concrete	$h_1 \geq$	[mm]	95	110	130
Effective embedment depth	h_{ef}	[mm]	51,9	58,7	75,6
Clearance hole	d_f	[mm]	11	13	15
Thickness of fixture	t_{fix}	[mm]	5-65	5-50	5-30
Wrench size	WS	[mm]	13	17	19
Maximum torque moment, machine setting	$T_{max} \leq$	[Nm]	120	185	185

Table B2: Minimum thickness of member, Minimum spacing and edge distance

Fastener size			**J6 8**	**J6 10**	**J6 12**
Minimum member thickness	h_{min}	[mm]	125	140	170
Minimum edge distance	c_{min}	[mm]	50	60	70
Minimum spacing	s_{min}	[mm]	50	60	70

EJOT concrete screw J6	**Annex B2**
Intended Use Installation parameters, minimum member thickness, minimum edge distance and anchor spacing	

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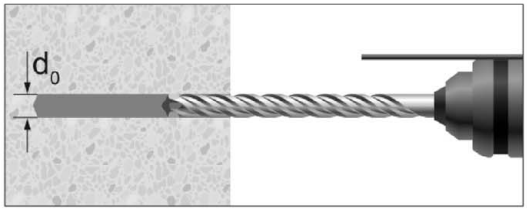
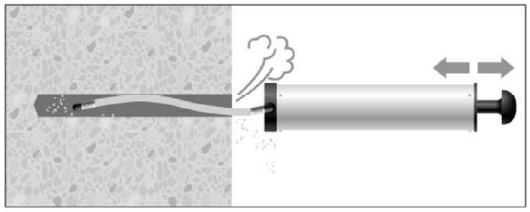
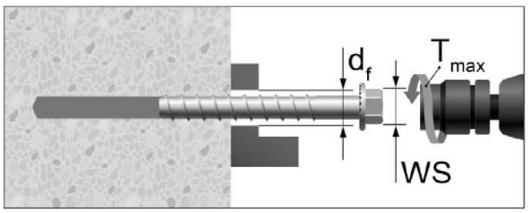
Installation instruction



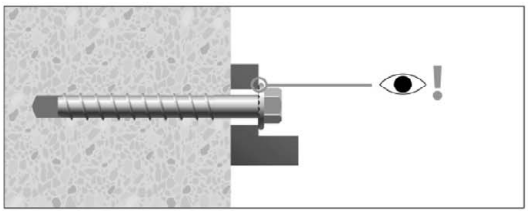
Drill the hole to the bore hole depth $\mathbf{h_1}$.



Clean the hole.



Screw in the anchor by using an impact screw driver.
In case of using impact screw driver: T_{max} acc. to Table B1
WS= Wrench Size



Control of complete setting, full contact of screw head with fixture part.

EJOT concrete screw J6	Annex B3
Intended Use Installation Instruction	

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Table C1: Characteristic resistance under tension loading

Fastener size			**J6 8**	**J6 10**	**J6 12**
Steel failure					
Characteristic resistance	$N_{Rk,s}$	[kN]	33,0	53,7	78,1
Partial factor	γ_{Ms} [1)]	[-]	1,5	1,5	1,5
Pull-out failure					
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	4,5	7,0	12,0
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	9,0	16,0	25,0
Increasing factors for $N_{Rk,p}$ in cracked or uncracked concrete	ψ_c	C30/37	1,22		
		C40/50	1,41		
		C50/60	1,58		
Installation factor	γ_{inst}	[-]	1,4	1,0	1,2
Concrete cone failure					
Effective embedment depth	h_{ef}	[mm]	51,9	58,7	75,6
Characteristic edge distance	$c_{cr,N}$	[mm]	$1{,}5h_{ef}$		
Characteristic spacing	$s_{cr,N}$	[mm]	$3h_{ef}$		
Factor for cracked concrete	k_{cr}	[-]	7,7		
Factor for uncracked concrete	k_{ucr}	[-]	11,0		
Splitting failure					
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	$N^0_{Rk,sp} = N_{Rk,p}$		
Characteristic edge distance for splitting	$c_{cr,sp}$	[mm]	$1{,}5h_{ef}$		
Characteristic anchor spacing for splitting	$s_{cr,sp}$	[mm]	$3h_{ef}$		

[1)] In absence of other national regulations.

Table C2: Displacements under tension loads for uncracked and cracked concrete

Fastener size	**Concrete**	**Tension load N**	**Displacement**	
			δ_{N0}	$\delta_{N\infty}$
[-]	[-]	[kN]	[mm]	[mm]
J6 8	cracked C20/25	1,5	0,1	0,8
J610		3,3	0,2	1,0
J612		4,8	0,3	1,2
J6 8	uncracked C20/25	3,1	0,1	0,8
J6 10		7,6	0,1	1,0
J6 12		9,9	0,3	1,2

EJOT concrete screw J6	**Annex C1**
Performance Characteristic values under tension loading, Displacements under tension loading	

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Table C3: Characteristic resistance under shear loading

Fastener size			**J6 8**	**J6 10**	**J6 12**
Setting depth	h_{nom}	[mm]	85	100	120
Effective embedment depth	h_{ef}	[mm]	51,9	58,7	75,6
Steel failure without lever arm					
Characteristic resistance	$V^0_{Rk,s}$	[kN]	16,5	26,8	39,0
Ductility factor	k_7	[-]	0,8		
Partial factor	γ_{Ms} 1)	[-]	1,25	1,25	1,25
Steel failure with lever arm					
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	35,9	74,4	130.6
Partial factor	γ_{Ms} 1)	[-]	1,25	1,25	1,25
Concrete pryout failure					
k-factor	k_8	[-]	1,0		2,0
Partial factor	γ_{Mcp} 1)	[-]	1,5		
Concrete edge failure					
Effective length of anchor	ℓ_f	[mm]	51,9	58,7	75,6
Outside diameter of fastener	d_{nom}	[mm]	7,25	9,24	11,15
Partial factor	γ_{Mc} 1)	[-]	1,5		

Table C4: Displacements under shear loads for uncracked and cracked concrete

Fastener size	**Concrete**	**Shear load V**	**Displacement**	
			δ_{V0}	$\delta_{V\infty}$
[-]	[-]	[kN]	[mm]	[mm]
J6 8	Cracked and uncracked C20/25	9,4	1,8	2,7
J6 10		15,3		
J6 12		22,3		

EJOT concrete screw J6	**Annex C2**
Performance Characteristic values under shear loading, Displacements under shear loading	

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Table C5: Characteristic tension resistance values for resistance to fire

Fastener size				J6 8	J6 10	J6 12
Steel failure						
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	0,8	1,7	2,9
	R60	$N_{Rk,s,fi}$	[kN]	0,7	1,3	2,4
	R90	$N_{Rk,s,fi}$	[kN]	0,5	1,0	2,0
	R120	$N_{Rk,s,fi}$	[kN]	0,4	0,9	1,6
Pull-out failure						
Characteristic resistance in concrete ≥ C20/25	R30	$N_{Rk,p,fi}$	[kN]	1,1	1,8	3,0
	R60					
	R90					
	R120	$N_{Rk,p,fi}$	[kN]	0,9	1,4	2,4
Concrete cone failure						
Characteristic resistance in concrete ≥ C20/25	R30	$N^0_{Rk,c,fi}$	[kN]	3,3	4,5	8,6
	R60					
	R90					
	R120	$N^0_{Rk,c,fi}$	[kN]	2,7	3,6	6,8
Effective embedment depth		h_{ef}	[mm]	51,9	58,7	75,6
Minimum member thickness		h_{min}	[mm]	125	140	170
Spacing		$s_{cr,N,fi}$	[mm]	$4h_{ef}$		
		s_{min}	[mm]	50	60	70
Edge distance		$c_{cr,N,fi}$	[mm]	$2h_{ef}$		
Fire exposure from one side only		c_{min}	[mm]	50	60	70
Fire exposure from more than one side		c_{min}	[mm]	≥ 300 mm		

1) In absence of other national regulations.

EJOT concrete screw J6	Annex C3
Performance Characteristic tension resistance values for resistance to fire	

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Table C6: Characteristic shear resistance values for resistance to fire

Fastener size				**J6 8**	**J6 10**	**J6 12**
Steel failure without level arm						
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	0,8	1,7	2,9
	R60	$V_{Rk,s,fi}$	[kN]	0,7	1,3	2,4
	R90	$V_{Rk,s,fi}$	[kN]	0,5	1,0	2,0
	R120	$V_{Rk,s,fi}$	[kN]	0,4	0,9	1,6
Steel failure with level arm						
Characteristic resistance	R30	$M^0_{Rk,p,fi}$	[Nm]	0,9	2,3	4,9
	R60	$M^0_{Rk,p,fi}$	[Nm]	0,7	1,9	4,0
	R90	$M^0_{Rk,p,fi}$	[Nm]	0,5	1,5	3,3
	R120	$M^0_{Rk,p,fi}$	[Nm]	0,45	1,3	2,6
Pry-out failure						
k_8			[-]	1	1	2
Characteristic resistance	R30	$V_{Rk,cp,fi}$	[kN]	3,3	4,5	17,1
	R60					
	R90					
	R120	$V_{Rk,cp,fi}$	[kN]	2,7	3,6	13,7
Concrete edge failure						
Characteristic resistance	≤ R90	$V_{Rk,c,fi}$	[kN]	$V^0_{Rk,c,fi} = 0.25 * V^0_{Rk,c}$ [2)]		
	R120	$V_{Rk,c,fi}$	[kN]	$V^0_{Rk,c,fi} = 0.20 * V^0_{Rk,c}$ [2)]		

1) In absence of other national regulations.
2) $V^0_{Rk,c}$ = characteristic resistance for concrete edge failure in cracked concrete C20/C25 under normal temperature calculated acc. to EN 1992-4:2018.

EJOT concrete screw J6	**Annex C4**
Performance Characteristic shear resistance values for resistance to fire	