Heavy Duty Anchor
Stainless Steel Hexagon Nut

INFORMATION

The torque controlled Heavy Duty Anchor Hexagon Nut is a stainless steel A4/316 high performance anchor for use in cracked/non-cracked concrete and structural applications such as:

- Columns
- Guard rails
- Façades
- Staircases
- Silo installation
- Machines
- Cantilever beams

BASE MATERIAL

- Concrete C20/25 to C50/60
- Cracked Concrete
- Non-Cracked Concrete

FEATURES

- High Performance
- Wide Range Of Sizes
- Fast And Secure Installation
- Through Fixing
- Three way Expansion Sleeve
- Stainless Steel A4/316
- Close Spacing And Edge Distance
- Reaction To Fire Class A1
- Fire Resistant Loading

APPROVALS

European Technical Assessment
Option 1 Cracked Concrete

ETA-07/0331

Fire Resistance

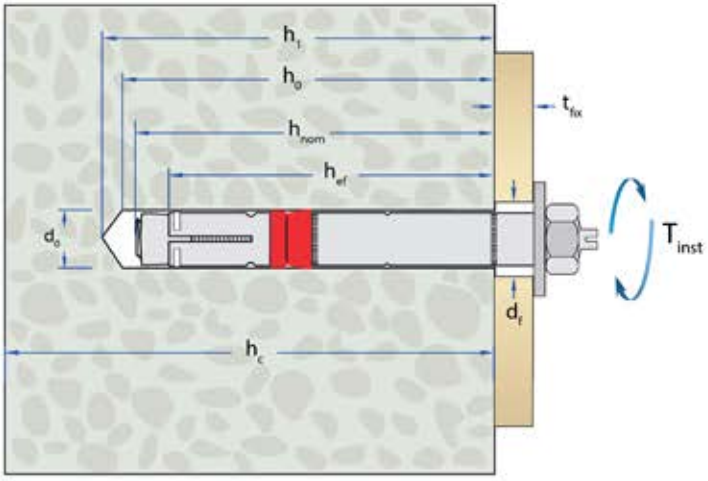
ETA-07/0331

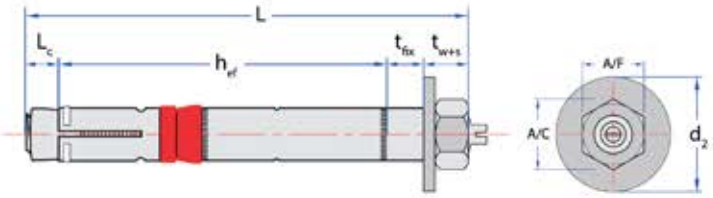
RELATED PRODUCTS

SDS+ Drill Bits

Hole Cleaning Pump

RANGE AND LOAD DATA





For combined loads, variations in structure thickness, reduced spacing and edge calculations download the free **A**nchor **C**alculation **P**rogram from **www.jcpfixings.co.uk**

Technical Data Sheet

Supplied By
FFT
Fasteners, Fixings & Tools

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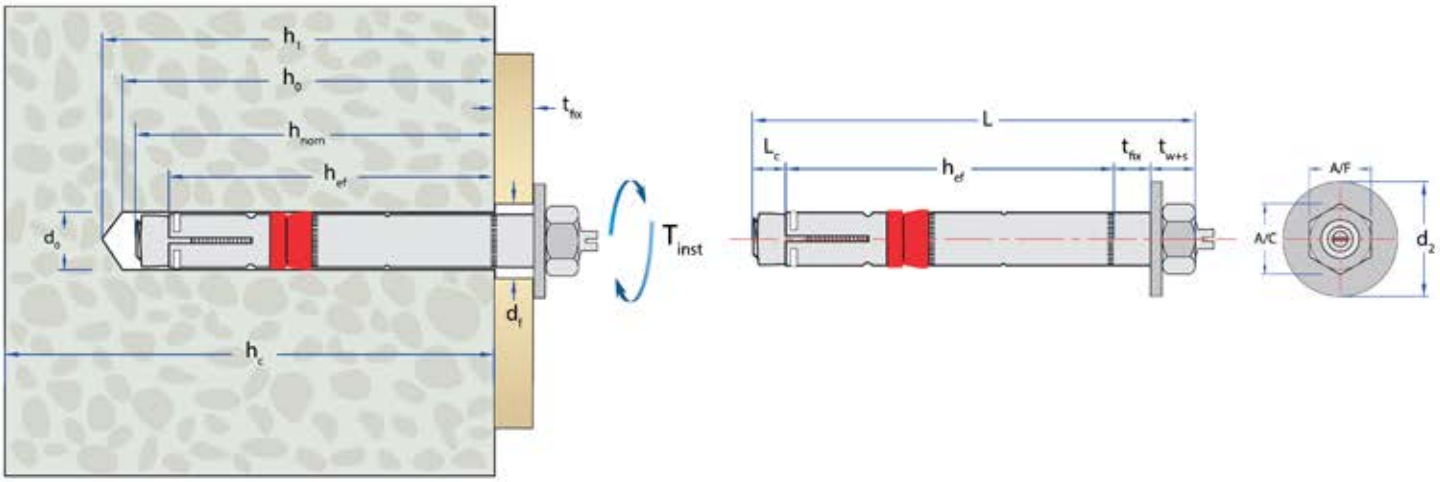
FAX- 01234 211069
info@fasteners-ft.co.uk
www.fastenersfixingsandtools.co.uk

Heavy Duty Anchor
Stainless Steel Hexagon Nut

RANGE AND LOAD DATA

RANGE DATA													
Part Number	Size of Thread	Min. Structure Thickness (h_c)	Drill Hole Diameter (d_o)	Min Hole Depth (h_1)	Fixture Clearance Hole (d_f)	Cone Length (L_c)	Effective Embedment Depth (h_{ef})	Max Fixture Thickness (t_{fix})	Washer and Screw Thickness (t_{w+s})	Total Length (L)	Width Across Flats (A/F)	Washer Outer diameter (d_2)	Tightening Torque (T_{inst})
	-	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	Nm
SLB12/10SS	M8	120	12	80	14	11	60	10	8.8	90	13	20	35
SLB12/30SS								30		110			
SLB14/15SS	M10	140	15	95	17	14	71	15	10.9	111	17	25	55
SLB14/25SS								25		121			
SLB18/20SS	M12	160	18	105	20	16	80	20	13.8	130	19	30	90
SLB18/40SS								40		150			



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JCP CONSTRUCTION PRODUCTS

Technical Data Sheet

NON-CRACKED CONCRETE

Performance Data (C20/25 non-cracked concrete)												
Size Of Thread	Effective Embedment Depth (h_{ef})	Minimum Concrete Thickness (h_{min})	Characteristic Resistance		Design Resistance		Approved Resistance		Design Spacing (s)		Design Edge Distance (c)	
			Tensile (N_{Rk})	Shear (V_{Rk})	Tensile (N_{Rd})	Shear (V_{Rd})	Tensile(N_{Ra})	Shear (V_{Ra})	Tensile	Shear	Tensile	Shear
-	mm	mm	kN	kN	kN	kN	kN	kN	mm	mm	mm	mm
M8	60	120	16.0	24.0	10.6	19.2	7.5	13.7	130	50	110	190
M10	71	140	25.0	37.0	16.6	29.6	11.8	21.1	310	100	190	270
M12	80	160	35.0	72.2	23.3	48.1	16.6	34.3	500	240	260	410

CRACKED CONCRETE

Performance Data (C20/25 cracked concrete)												
Size Of Thread	Effective Embedment Depth (h_{ef})	Minimum Concrete Thickness (h_{min})	Characteristic Resistance		Design Resistance		Approved Resistance		Design Spacing (s)		Design Edge Distance (c)	
			Tensile (N_{Rk})	Shear (V_{Rk})	Tensile (N_{Rd})	Shear (V_{Rd})	Tensile(N_{Ra})	Shear (V_{Ra})	Tensile	Shear	Tensile	Shear
-	mm	mm	kN	kN	kN	kN	kN	kN	mm	mm	mm	mm
M8	60	120	9.0	24.0	6.0	19.2	4.2	13.7	50	130	50	280
M10	71	140	16.0	43.0	10.6	28.6	7.5	20.4	110	220	70	380
M12	80	160	25.7	51.5	17.1	34.3	12.2	24.5	240	240	120	410

FIRE RESISTANCE DATA

Fire Resistance Data (C20/25 to C50/60 cracked or non-cracked concrete)*																		
Size Of Thread	Effective Embedment Depth	Minimum Concrete Thickness	Design Resistance**								Approved Resistance							
			30min (R30)		60min (R60)		90min (R90)		120min (R120)		30min (R30)		60min (R60)		90min (R90)		120min (R120)	
	(h_{ef})	(h_{min})	Tensile ($N_{Rd,fi}$)	Shear ($V_{Rd,fi}$)	Tensile ($N_{Rd,fi}$)	Shear ($V_{Rd,fi}$)	Tensile ($N_{Rd,fi}$)	Shear ($V_{Rd,fi}$)	Tensile ($N_{Rd,fi}$)	Shear ($V_{Rd,fi}$)	Tensile ($N_{Rd,fi}$)	Shear ($V_{Rd,fi}$)	Tensile ($N_{Rd,fi}$)	Shear ($V_{Rd,fi}$)	Tensile ($N_{Rd,fi}$)	Shear ($V_{Rd,fi}$)	Tensile ($N_{Rd,fi}$)	Shear ($V_{Rd,fi}$)
-	mm	mm	kN		kN		kN		kN		kN		kN		kN		kN	
M8	60	120	6.1	14.3	4.4	11.1	2.6	7.9	1.8	6.3	4.4	10.2	3.1	7.9	1.9	5.6	1.3	4.5
M10	71	140	10.2	22.7	7.3	17.6	4.3	12.6	2.8	10.0	7.3	16.2	5.2	12.6	3.1	9.0	2.0	7.1
M12	80	160	15.7	32.8	11.1	25.5	6.4	18.3	4.1	14.6	11.2	23.4	7.9	18.2	4.6	13.1	2.9	10.4

* The determination covers anchors with a fire attack from one side only. If the fire attack is from more than one side, the design method may be taken only, if the edge distance of the anchor is $c \geq 300$ mm and $\geq 2\ h_{ef}$.

**For combined loads, use Anchor Calculation Program.

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SUPPLEMENTARY DATA

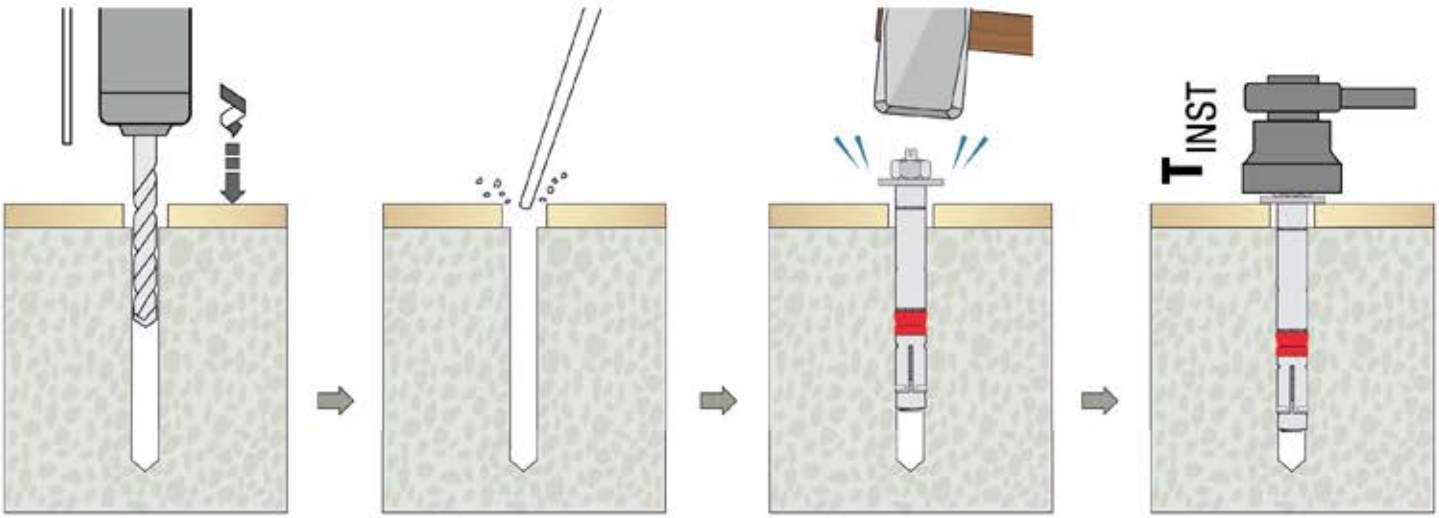
Influence Of Concrete Strength (Cracked/Non-cracked Concrete)					
Concrete strength		C20/25	C30/37	C40/50	C50/60
Cylinder	N/mm²	20	30	40	50
Cube	N/mm²	25	37	50	60
Factor	-	1.0	1.22	1.41	1.55

Important Note:
When using concrete factors ensure that loads do not exceed Steel Design Resistance.

Steel Failure						
Size Of Thread	Tensile Resistance			Shear Resistance		
	Characteristic Resistance ($N_{Rk,s}$)	Design Resistance ($N_{Rd,s}$)*	Approved Resistance ($N_{Ra,s}$)	Characteristic Resistance ($V_{Rk,s}$)	Design Resistance ($V_{Rd,s}$)**	Approved Resistance ($V_{Ra,s}$)
-	kN	kN	kN	kN	kN	kN
M8	26.0	17.3	12.3	24.0	19.2	13.7
M10	41.0	27.3	19.5	37.0	29.6	21.1
M12	60.0	40.0	28.5	62.0	49.6	35.4

* A partial safety factor (γ_{MS}) equal to 1.5 is included.
** A partial safety factor (γ_{MS}) equal to 1.25 is included.

INSTALLATION INSTRUCTIONS



-Position fixture and drill correct diameter hole to corresponding depth

-Clean hole by blowing to remove drilling debris and dust

-Insert anchor through fixture into concrete and lightly hammer into concrete

-Tighten with torque wrench to recommended torque

Technical Data Sheet

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Notified body No. 1343
Staatliche Materialprüfungsanstalt Darmstadt,
Grafenstraße 2, 64283 Darmstadt

Certificate of constancy of performance

No. 1343-CPR-M 556-3/07.15

In compliance with Regulation 305/2011/EU of the European Parliament and of the Council of 9 March 2011 (the Construction products Regulation or CPR) this certificate applies to the construction product

JCP Heavy Duty Anchor

Mechanical anchor for use in concrete

placed on the market by

Hexstone Ltd. T/A JCP Construction Products
Opal Way
Stone Business Park, Stone
Staffordshire ST 15 0SW
Great Britain

and produced in the manufacturing plant

Plant 2, Germany.

This certificate attests that all provisions concerning the assessment and verification of constancy of performance described in the European Technical Assessment

ETA-07/0331 of 27 March 2018

and

EAD 330232-00-0601

under system 1 for the performances set out in this certificate are applied and that the construction product fulfil all the prescribed requirements for these performances.

This certificate was first issued on 25/07/2018 and will remain valid as long as the ETA remains valid and the manufacturing conditions in the plant or the factory production control itself are not modified significantly, unless suspended or withdrawn by the product certification body.

Darmstadt, 25/07/2018

Dr.-Ing. P. Bender
Head of the notified certification body

Dipl.-Ing. F. Persichella
Technical responsibility

DAkkS
Deutsche Akkreditierungsstelle
D-ZE-11048-01-00

Declaration of Performance No. 0756-CPR-0215SS

Heavy Duty Anchor (Torque controlled expansion anchor made of stainless steel)

JCP Construction Products,
Unit 14 Teddington Business Park, Station Rd, Teddington, Middlesex TW11 9BQ
Telephone +44 (0)208 943 1800

Intended use or uses of the products according to EAD 330232-00-0601	
Generic type	Torque controlled expansion anchor
Base material	Cracked and Non-cracked concrete C20/25 to C50/60 acc. EN 206-2:2003
Batch Number	Marked on individual boxes
Material	Stainless Steel 1.4401, 1.4404 or 1.4571, EN 10088
Durability	Dry internal conditions Internal and external atmospheric exposure including industrial and marine environments or exposure in permenantly damp internal conditions, if no particular aggressive conditions exist.
Loading	Static, quasi-static, fire and seismic
Fire Resistance	120mins
Fire Reaction	ETAG 001 Annex C Option 1
ETA 07/0331 issued by	DIBt
On the basis of	EAD 330232-00-0601
Certificate of Conformity 0756-CPD-0215 issued by	Technische Universitat Darmstadt
Under system	1

Declared performances according to EAD 330232-00-0601								
Essential Characteristics			Performance					
				M8	M10	M12	M16		
Installation parameters								
d_o	Nominal diameter of drill bit	[mm]		12	15	18	24	
d_f	Fixture clearance hole	[mm]		14	17	20	26	
h_{ef}	Effective anchorage depth	[mm]		60	71	80	100	
h_1	Depth of drill hole to deepest point	[mm]		80	95	105	130	
h_{min}	Minimum thickness of concrete member	[mm]		120	140	160	200	
T_{inst}	Nominal torque moment	[mm]		30	50	80	160	
S_{min}	Minimum spacing	[mm]		70	85	100	180	
for C≥	Edge distance	[mm]		100	130	170	180	
C_{min}	Minimum edged distance	[mm]		75	85	100	180	
for S≥	Anchor spacing	[mm]		135	185	210	180	
Tensile Steel failure								
$N_{Rk,s}$	Characteristic tensile steel failure	[kN]		26	41	60	110	
$\gamma M,s$	Partial safety factor	[-]		1.5				
Pull-out failure								
NRk,p,cr	Characteristic tensile resistance in cracked concrete C20/25	[kN]		9	16	26	36	
NRk,p,ucr	Characteristic tensile resistance in non-cracked concrete C20/25	[kN]		16	25	35	53	
$\gamma M,p$	Partial safety factor (Includes $\gamma 2$)	[-]		1.5				
$\Psi cC30/37$	Increasing factor for concrete C30/37	[-]		1.22				
$\Psi cC40/50$	Increasing factor for concrete C40/50	[-]		1.41				
$\Psi cC50/60$	Increasing factor for concrete C50/60	[-]		1.55				
Splitting failure								
$S_{cr,sp}$	Critical spacing (Splitting)	[mm]		360	470	530	600	
$C_{cr,sp}$	Critical edge distance (Splitting)	[mm]		180	235	265	300	

Concrete cone failure									
h_{ef}	Effective anchorage depth	[mm]		60	71	80	100		
$S_{cr,N}$	Critical spacing	[mm]		180	213	240	300		
$C_{cr,N}$	Critical edge distance	[mm]		90	106.5	120	150		
$\gamma M,s$	Partial safety factor	[-]		1.5					
Displacement under tensile loading									
N_{cr}	Tensile loads in cracked concrete	[kN]		4.3	7.6	12.1	17.0		
$\delta N0_{,cr}$	Short term displacement under tensile loads	[mm]		0.5	0.5	1.3	0.5		
$\delta N\infty_{,cr}$	Long term displacement under tensile loads	[mm]		1.2	1.6	1.8	1.6		
Nu_{cr}	Tensile loads in non-cracked concrete	[kN]		7.6	11.9	16.7	24.1		
$\delta N0,u_{cr}$	Short term displacement under tensile loads	[mm]		0.2	0.3	1.2	1.5		
$\delta N\infty_{,ucr}$	Long term displacement under tensile loads	[mm]		1.1					
Shear steel failure									
$V_{,Rk,s}$	Characteristic shear steel failure without lever arm	[kN]		24	37	62	92		
$M^0_{Rk,s}$	Characteristic shear steel failure with lever arm	[Nm]		26	52	92	232		
$\gamma m,sV$	Partial safety factor	[-]		1.25					
Concrete pryout failure									
k	Factor in equation 95.6) ETAG 001 Annex C §5.2.3.3	[-]		2.0					
$\gamma M,cp$	Partial safety factor	[-]		1.5					
Shear concrete edge failure									
l_{ef}	Effective anchorage length	[mm]		60	71	80	100		
Displacement on shear load									
V	Service shear load in cracked and non-cracked concrete	[kN]		13.9	21.1	34.7	50.8		
δ_{v0}	Short term displacement under shear load	[mm]		3.4	4.9	4.8	6.7		
$\delta V\infty$	Long term displacement under shear load	[mm]		5.1	7.4	7.1	10.1		
Characteristic tensile fire resistance									
$N_{Rk,fi30}$	Fire resistance duration = 30 minutes	[kN]		2.3	4.0	6.4	9.0		
$N_{Rk,fi60}$	Fire resistance duration = 60 minutes	[kN]		2.3	4.0	6.4	9.0		
$N_{Rk,fi90}$	Fire resistance duration = 90 minutes	[kN]		2.3	4.0	6.4	9.0		
$N_{Rk,fi120}$	Fire resistance duration = 120 minutes	[kN]		1.8	3.2	5.2	7.2		
Characteristic shear fire resistance without lever arm									
$V_{Rk,fi30}$	Fire resistance duration = 30 minutes	[kN]		14.3	22.7	32.8	61.0		
$V_{Rk,fi60}$	Fire resistance duration = 60 minutes	[kN]		11.1	17.6	25.5	47.5		
$V_{Rk,fi90}$	Fire resistance duration = 90 minutes	[kN]		7.9	12.6	18.3	34.0		
$V_{Rk,fi120}$	Fire resistance duration = 120 minutes	[kN]		6.3	10.0	14.6	27.2		
Characteristic shear fire resistance with lever arm									
$V_{Rk,fi30}$	Fire resistance duration = 30 minutes	[kN]		6.2	13.2	24.4	61.8		
$V_{Rk,fi60}$	Fire resistance duration = 60 minutes	[kN]		4.5	9.4	17.2	43.6		
$V_{Rk,fi90}$	Fire resistance duration = 90 minutes	[kN]		2.7	5.6	10.0	25.3		
$V_{Rk,fi120}$	Fire resistance duration = 120 minutes	[kN]		1.8	3.6	6.4	16.2		

The previous performance data relates to the following product codes

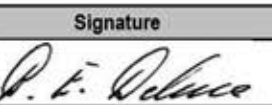
d	Marking	t_{fix}	Product Code
	d_o/L	[mm]	
M8	SZM8/12-10A4	10	SLB12/10SS
	SZM8/12-30A4	30	SLB12/25SS
M10	SZM10/15-15A4	15	SLB14/10SS
	SZM10/15-25A4	25	SLB14/25SS
M12	SZM12/18-10A4	10	SLB18/15SS
	SZM12/18-20A4	20	SLB18/25SS
	SZM12/18-40A4	40	SLB18/40SS

Ammendments		
[1]	CPD changed to CPR	03/11/2017
[2]	ETAG changed to EAD	03/11/2017

The performances of the product identified by the above product codes are in conformity with the declared performance

This Declaration of performance is issued under the sole responsibility of JCP Construction products

Signed for and on behalf of the manufacturers

Name and function	Place and date of issue	Signature
Brian Deluce	Teddington	
Technical Manager	03/11/2017	

Deutsches Institut für Bautechnik

DIBt

Member of EOTA

www.eota.eu

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-07/0331 of 27 March 2018

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	JCP Heavy Duty Anchor
Product family to which the construction product belongs	Mechanical anchor for use in concrete
Manufacturer	Hexstone Ltd. T/A JCP Construction Products Opal Way Stone Business Park, Stone Staffordshire ST 15 0SW . GROSSBRITANNIEN
Manufacturing plant	Plant2, Germany
This European Technical Assessment contains	20 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

Deutsches Institut für Bautechnik
Kolonnenstraße 30 B | 10829 Berlin | GERMANY | Phone: +49 30 78730-0 | Fax: +49 30 78730-320 | Email: dibt@dibt.de | www.dibt.de

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Specific Part

1 Technical description of the product

The JCP Heavy Duty Anchor is an anchor made of galvanised steel or made of stainless steel which is placed into a drilled hole and anchored by torque-controlled expansion. The following anchor types are covered:

- Anchor type NHD with threaded bolt,
- Anchor type JHD with hexagon head screw,
- Anchor type SLSK with countersunk washer and countersunk screw.

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 anchor 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 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)

Essential characteristic	Performance
Characteristic resistance for static and quasi-static loading	See Annex C1 to C5
Characteristic resistance for seismic performance category C1 and C2	See Annex C6 to C7
Displacements under tension and shear loads	See Annex C9 and C10

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for Class A1
Resistance to fire	See Annex C8

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

In accordance with the European Assessment Document EAD 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 27 March 2018 by Deutsches Institut für Bautechnik

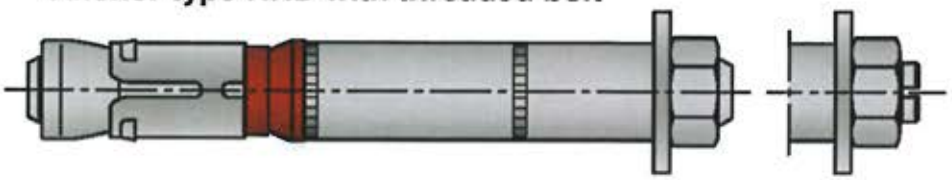
BD Dipl.-Ing. Andreas Kummerow
Head of Department

beglaubigt:
Baderschneider

Deutsches Institut für Bautechnik DIBt

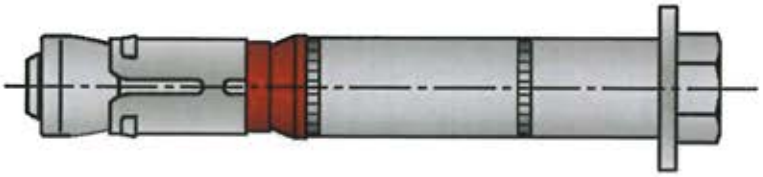
JCP Heavy Duty Anchor

Anchor type NHD with threaded bolt



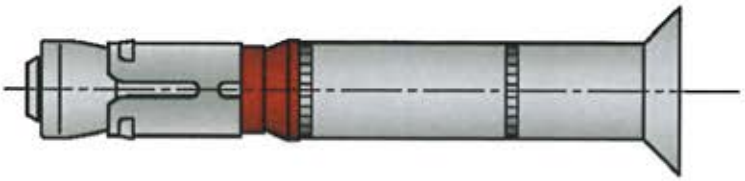
NHD (M6-M24)
NHD (M8-M16) A4

Anchor type JHD with hexagon head screw



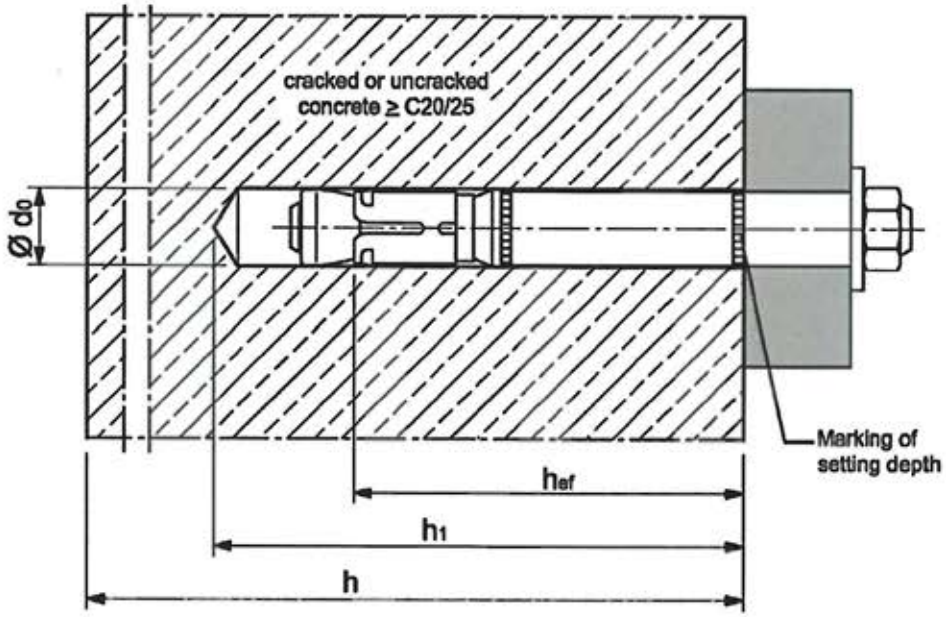
JHD (M6-M24)
JHD (M8-M16) A4

Anchor type SLSK with countersunk washer and countersunk screw



SLSK (M6-M12)
SLSK (M8-M12) A4

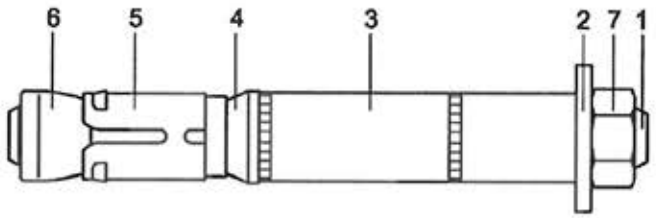
Installation condition



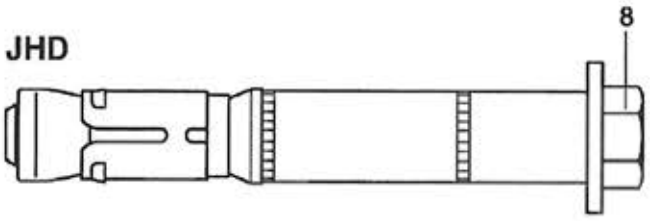
JCP Heavy Duty Anchor	Annex A1
Product description Product and installation situation	

Deutsches Institut für Bautechnik DIBt

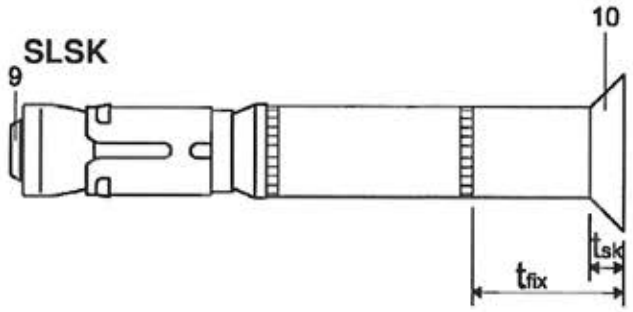
NHD



JHD



SLSK



Marking:

expansion sleeve:
- Identifying mark of manufacturing plant ◇
- additional marking of stainless steel A4 A4
- Anchor identity (alternatively on distance sleeve) SZ
- size of thread (alternatively on distance sleeve) M10

Distance sleeve:
- Diameter 15
- max. thickness of fixture 25
- additional marking for countersunk version SK

marking on the washer of anchor size SZ 24/M16L L

Table A1: Designation of anchor parts and materials

Part	Designation	Materials galvanised ≥ 5 µm, acc. to EN ISO 4042:1999	Stainless steel A4
1	Threaded bolt	Steel, Strength class 8.8, EN ISO 898-1:2013	Stainless steel, 1.4401, 1.4404 or 1.4571, EN 10088:2014
2	Washer	Steel, EN 10139:2016	Stainless steel, EN 10088:2014
3	Distance sleeve	Steel tube EN 10305-2:2016, EN 10305-3:2016;	Steel tube stainless steel, 1.4401, 1.4404 or 1.4571; EN 10217-7:2014, EN 10216-5:2013
4	Ring	Polyethylene	Polyethylene
5	Expansion sleeve	Steel, EN 10139:2016	Stainless steel, 1.4401, 1.4404 or 1.4571, EN 10088:2014
6	Threaded cone	Steel EN 10083-2:2006	Stainless steel, 1.4401, 1.4404 or 1.4571, EN 10088:2014
7	Hexagon nut	Steel, Strength class 8, EN ISO 898-2:2012	Stainless steel, strength class 70, EN ISO 3506-2:2009
8	Hexagon head screw	Steel, Strength class 8.8, EN ISO 898-1:2013	Stainless steel, strength class 70, EN ISO 3506-1:2009
9	Countersunk screw	Steel, Strength class 8.8, EN ISO 898-1:2013	Stainless steel, strength class 70, EN ISO 3506-1:2009
10	Countersunk washer	Steel, EN 10083-2:2006	Stainless steel, 1.4401, 1.4404 or 1.4571, EN 10088:2014, zinc plated

JCP Heavy Duty Anchor

Product description
Marking and materials

Annex A2

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Specification of intended use

JCP Heavy Duty Anchor, steel zinc plated	10/M6	12/M8	15/M10	18/M12	24/M16	24/ M16L	28/M20	32/M24
Static or quasi-static action	✓							
Seismic action (NHD and JHD)	-	C1 + C2						
Seismic action (SLSK)	-	C1 + C2			-			
Fire exposure	R 30 ... R 120							

JCP Heavy Duty Anchor, stainless steel A4	12/M8	15/M10	18/M12	24/M16
Static or quasi-static action	✓			
Seismic action (NHD and JHD)	C1 + C2			
Seismic action (SLSK)	C1 + C2			-
Fire exposure	R30 ... R120			

Base materials:

- Cracked and uncracked concrete
- Reinforced or unreinforced normal weight concrete according to EN 206-1:2000
- Strength classes C20/25 to C50/60 according to EN 206-1:2000

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (zinc plated steel or stainless steel).
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to 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 of indoor 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 under static or quasi-static actions, seismic actions and under fire exposure are designed in accordance with FprEN 1992-4:2016 and TR 055.

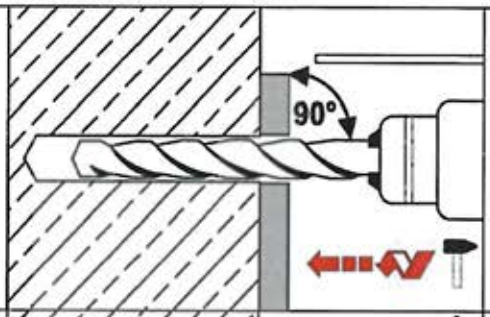
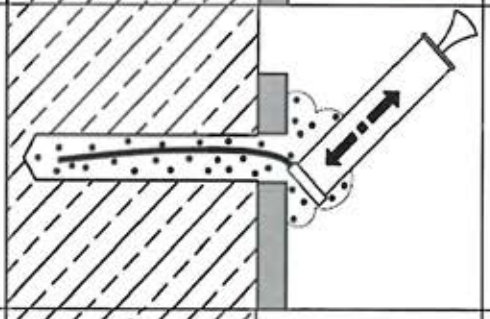
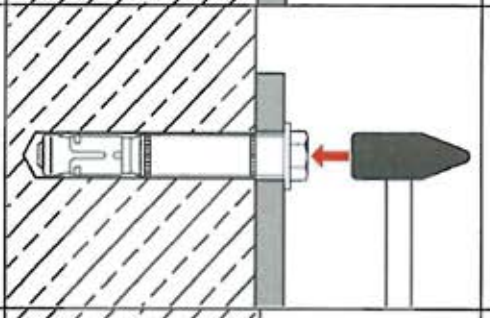
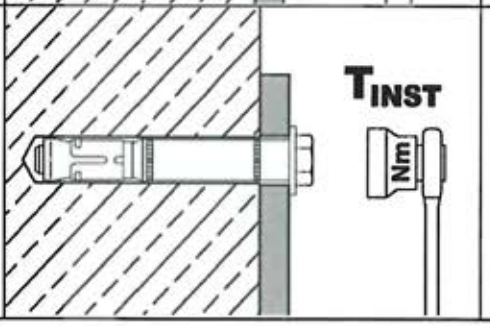
Installation:

- 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 at a minimum distance away of twice the depth of the aborted hole or smaller distance if the aborted drill hole is filled with high strength mortar and if under shear or oblique tension load it is not in the direction of load application.
- Anchor installation such that the effective anchorage depth is complied with. This compliance is ensured when the embedment mark of the anchor does no more exceed the concrete surface.
- Use as supplied by the manufacturer without replacing individual parts.
- Drilling of hole only by hammer drilling (use of vacuum drill bits is admissible)

JCP Heavy Duty Anchor	
Intended use Specification of intended use	**Annex B1**

Deutsches Institut für Bautechnik DIBt

Installation instructions

1		Drill hole perpendicular to concrete surface. If using a vacuum drill bit, proceed with step 3.
2		Blow out dust. Alternatively vacuum clean down to the bottom of the hole.
3		Drive in anchor.
4		Apply installation torque T_{inst} by using calibrated torque wrench.

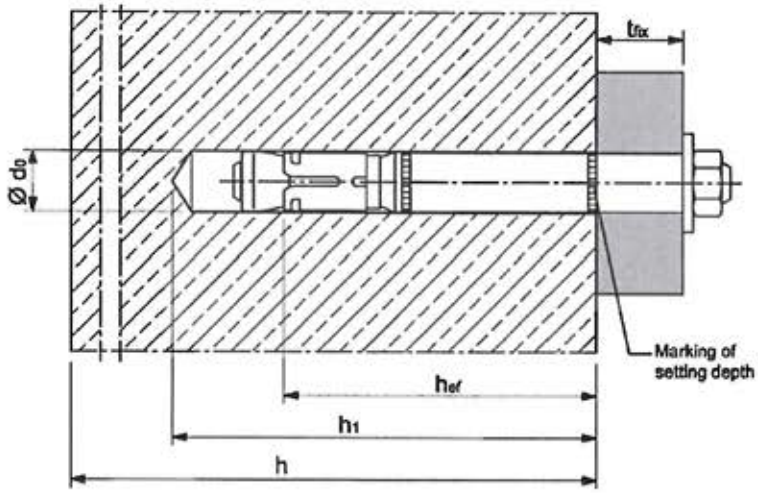
JCP Heavy Duty Anchor	
Intended use Installation instructions	**Annex B2**

Deutsches Institut für Bautechnik DIBt

Table B1: Installation parameters, steel zinc plated

Anchor size			10/M6	12/ M8	15/ M10	18/ M12	24/ M16	24/ M16L	28/ M20	32/ M24
Size of thread		[-]	M6	M8	M10	M12	M16	M16	M20	M24
Effective anchorage depth	h_{ef}	[mm]	50	60	71	80	100	115	125	150
Nominal diameter of drill bit	d_0 =	[mm]	10	12	15	18	24	24	28	32
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	10,45	12,5	15,5	18,5	24,55	24,55	28,55	32,7
Depth of drill hole	$h_1 \geq$	[mm]	65	80	95	105	130	145	160	180
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	12	14	17	20	26	26	31	35
Thickness of countersunk washer SLSK	t_{sk}	[mm]	4	5	6	7	-	-	-	-
Minimum thickness of fixture SLSK	$t_{fix\,min}$ [2]	[mm]	8	10	14	18	-	-	-	-
Installation torque	T_{inst} (NHD, JHD)	[Nm]	15	30	50	80	160	160	280	280
	T_{inst} (SLSK)	[Nm]	10	25	55	70	-	-	-	-
Minimum thickness of member	h_{min}	[mm]	100	120	140	160	200	230	250	300
Minimum spacing [1) 3)]	s_{min}	[mm]	50	50	60	70	100	100	125	150
cracked concrete	for c ≥	[mm]	50	80	120	140	180	180	300	300
Minimum edge distance [1) 3)]	c_{min}	[mm]	50	55	60	70	100	100	180	150
cracked concrete	for s ≥	[mm]	50	100	120	160	220	220	540	300
Minimum spacing [1) 3)]	s_{min}	[mm]	50	60	60	70	100	100	125	150
uncracked concrete	for c ≥	[mm]	80	100	120	140	180	180	300	300
Minimum edge distance [1) 3)]	c_{min}	[mm]	50	60	60	70	100	100	180	150
uncracked concrete	for s ≥	[mm]	100	120	120	160	220	220	540	300

[1] Intermediate values by linear interpolation
[2] Depending on the existing shear load, the thickness of the fixture may be reduced to the thickness of the countersunk washer t_{sk} (see Annex A2). It must be verified that the present shear load can be transferred completely into the distance sleeve (bearing of hole).
[3] For fire exposure from more than one side c ≥ 300 mm or c_{min} ≥ 300 mm applies.



JCP Heavy Duty Anchor

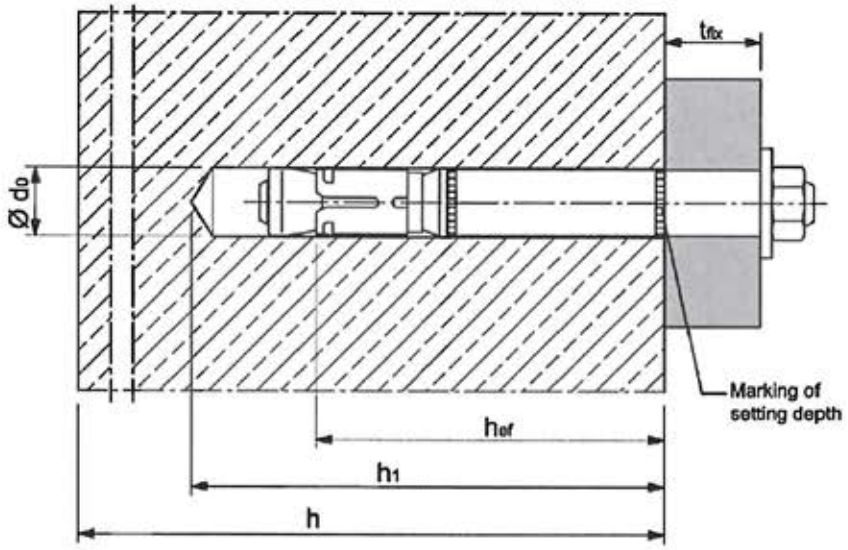
Intended use
Installation parameters, **steel zinc plated**

Annex B3

Table B2: Installation parameters, stainless steel A4

Anchor size			12/M8	15/M10	18/M12	24/M16
Size of thread		[-]	M8	M10	M12	M16
Effective anchorage depth	h_{ef}	[mm]	60	71	80	100
Nominal diameter of drill bit	d_0 =	[mm]	12	15	18	24
Cutting diameter of drill bit	$d_{cut} \leq$	[mm]	12,5	15,5	18,5	24,55
Depth of drill hole	$h_1 \geq$	[mm]	80	95	105	130
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	14	17	20	26
Thickness of countersunk washer SLSK	t_{sk}	[mm]	5	6	7	-
Minimum thickness of fixture SLSK	$t_{fix\ min}$ [2]	[mm]	10	14	18	-
Installation torque	T_{inst} (NHD)	[Nm]	35	55	90	170
	T_{inst} (JHD)	[Nm]	30	50	80	170
	T_{inst} (SLSK))	[Nm]	17,5	42,5	50	-
Minimum thickness of member	h_{min}	[mm]	120	140	160	200
Minimum spacing [1) 3)]	s_{min}	[mm]	50	60	70	80
cracked concrete	for c ≥	[mm]	80	120	140	180
Minimum edge distance [1) 3)]	c_{min}	[mm]	50	60	70	80
cracked concrete	for s ≥	[mm]	80	120	160	200
Minimum spacing [1) 3)]	s_{min}	[mm]	50	60	70	80
uncracked concrete	for c ≥	[mm]	80	120	140	180
Minimum edge distance [1) 3)]	c_{min}	[mm]	50	85	70	180
uncracked concrete	for s ≥	[mm]	80	185	160	80

[1] Intermediate values by linear interpolation
[2] Depending on the existing shear load, the thickness of the fixture may be reduced to the thickness of the countersunk washer t_{sk} (see Annex A2). It must be verified that the present shear load can be transferred completely into the distance sleeve (bearing of hole).
[3] For fire exposure from more than one side c ≥ 300 mm or c_{min} ≥ 300 mm applies.



JCP Heavy Duty Anchor

Intended use
Installation parameters, **stainless steel A4**

Annex B4

Deutsches Institut für Bautechnik DIBt

Table C1: Characteristic values for **tension load, cracked concrete,** static or quasi-static action**, steel zinc plated**

Anchor size			**10/M6**	**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/ M16L**	**28/M20**	**32/M24**
Installation safety factor	γ_{inst}	[-]	1,0							
Steel failure										
Characteristic resistance	$N_{Rk,s}$	[kN]	16	29	46	67	126	126	196	282
Partial safety factor	γ_{Ms}	[-]	1,5							
Pull-out failure										
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	5	12	16	1)	1)	1)	1)	1)
Increasing factor for $N_{Rk,p}$	ψ_C	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$							
Concrete cone failure										
Effective anchorage depth	h_{ef}	[mm]	50	60	71	80	100	115	125	150
Factor k_1 =	$k_{cr,N}$	[-]	7,7							

1) Pull-out is not decisive

Table C2: Characteristic values for **tension load, cracked concrete,** static or quasi-static action**, stainless steel A4**

Anchor size			**12/M8**	**15/M10**	**18/M12**	**24/M16**
Installation safety factor	γ_{inst}	[-]	1,0			
Steel failure						
NHD						
Characteristic resistance	$N_{Rk,s}$	[kN]	26	41	60	110
Partial safety factor	γ_{Ms}	[-]	1,5			
JHD and SLSK						
Characteristic resistance	$N_{Rk,s}$	[kN]	26	41	60	110
Partial safety factor	γ_{Ms}	[-]	1,87			
Pull-out failure						
Characteristic resistance in cracked concrete C20/25	$N_{Rk,p}$	[kN]	9	16	1)	1)
Increasing factor for $N_{Rk,p}$	ψ_C	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$			
Concrete cone failure						
Effective anchorage depth	h_{ef}	[mm]	60	71	80	100
Factor k_1 =	$k_{cr,N}$	[-]	7,7			

1) Pull-out is not decisive

JCP Heavy Duty Anchor

Performance
Characteristic values for **tension load, cracked concrete,** static or quasi-static action

Annex C1

Deutsches Institut für Bautechnik DIBt

Table C3: Characteristic values for **tension load, uncracked concrete,** static or quasi-static action, **steel zinc plated**

Anchor size			**10/M6**	**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/ M16L**	**28/M20**	**32/M24**
Installation safety factor	γ_{inst}	[-]	1,0							
Steel failure										
Characteristic resistance	$N_{Rk,s}$	[kN]	16	29	46	67	126	126	196	282
Partial safety factor	γ_{Ms}	[-]	1,5							
Pull-out failure										
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	1)	20	1)	1)	1)	1)	1)	1)
Increasing factor for $N_{Rk,p}$	ψ_c	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$							
Splitting failure (The higher resistance of case 1 and case 2 may be applied)										
Case 1										
Characteristic resistance in uncracked concrete C20/25	$N^0_{Rk,sp}$	[kN]	12	16	25	30	40	70	50	70
Edge distance	$c_{cr,sp}$	[mm]	$1,5\ h_{ef}$							
Increasing factor for $N^0_{Rk,sp}$	ψ_c	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$							
Case 2										
Characteristic resistance in uncracked concrete	$N^0_{Rk,sp}$	[kN]	$\min\{N_{Rk,p};\ N^0_{Rk,c}\}$							
Edge distance	$c_{cr,sp}$	[mm]	$2,5\ h_{ef}$					$1,5\ h_{ef}$	$2,5\ h_{ef}$	$2\ h_{ef}$
Concrete cone failure										
Effective Anchorage depth	h_{ef}	[mm]	50	60	71	80	100	115	125	150
Edge distance	$c_{cr,N}$	[mm]	$1,5\ h_{ef}$							
Factor k_1 =	$k_{ucr,N}$	[-]	11,0							

1) Pull-out is not decisive

JCP Heavy Duty Anchor

Performance
Characteristic values for **tension load, uncracked concrete,** static or quasi-static action, **steel zinc plated**

Annex C2

Deutsches Institut für Bautechnik DIBt

Table C4: Characteristic values for **tension load, uncracked concrete**, static or quasi-static action, **stainless steel A4**

Anchor size			**12/M8**	**15/M10**	**18/M12**	**24/M16**
Installation safety factor	γ_{inst}	[-]	1,0			
Steel failure						
NHD						
Characteristic resistance	$N_{Rk,s}$	[kN]	26	41	60	110
Partial safety factor	γ_{Ms}	[-]	1,5			
JHD and SLSK						
Characteristic resistance	$N_{Rk,s}$	[kN]	26	41	60	110
Partial safety factor	γ_{Ms}	[-]	1,87			
Pull-out failure						
Characteristic resistance in uncracked concrete C20/25	$N_{Rk,p}$	[kN]	16	25	35	[1]
Increasing factor for $N_{Rk,p}$	ψ_C	[-]	$\left(\frac{f_{ck}}{20}\right)^{0,5}$			
Splitting failure						
Edge distance	$c_{cr,sp}$	[mm]	180	235	265	300
Concrete cone failure						
Effective anchorage depth	h_{ef}	[mm]	60	71	80	100
Edge distance	$c_{cr,N}$	[mm]	1,5 h_{ef}			
Factor k_1 =	$k_{ucr,N}$	[-]	11,0			

[1] Pull-out is not decisive.

JCP Heavy Duty Anchor

Performance
Characteristic values for **tension loads, uncracked concrete,** static or quasi-static action, **stainless steel A4**

Annex C3

Deutsches Institut für Bautechnik DIBt

Table C5: Characteristic values of **shear load,** static or quasi-static action, **steel zinc plated**

Anchor size			**10/M6**	**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/ M16L**	**28/M20**	**32/M24**
Steel failure without lever arm										
NHD										
Characteristic resistance	$V^0_{Rk,s}$	[kN]	16	25	36	63	91	91	122	200
Factor	k_7	[-]	1,0							
JHD and SLSK										
Characteristic resistance	$V^0_{Rk,s}$	[kN]	18	30	48	73	126	126	150	200
Factor	k_7	[-]	1,0							
Partial safety factor	γ_{Ms}	[-]	1,25							
Steel failure with lever arm										
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	12	30	60	105	266	266	519	898
Partial safety factor	γ_{Ms}	[-]	1,25							
Concrete pry-out failure										
Factor	k_8	[-]	1,8	2,0						
Concrete edge failure										
Effective length of anchor in shear loading	l_f	[mm]	50	60	71	80	100	115	125	150
Outside diameter of anchor	d_{nom}	[mm]	10	12	15	18	24	24	28	32

JCP Heavy Duty Anchor

Performance
Characteristic values for **shear load**, static or quasi-static action, **steel zinc plated**

Annex C4

Deutsches Institut für Bautechnik DIBt

Table C6: Characteristic values for **shear load**, static or quasi-static action, **stainless steel A4**

Anchor size			**12/M8**	**15/M10**	**18/M12**	**24/M16**
Steel failure without lever arm						
Characteristic resistance	$V^0_{Rk,s}$	[kN]	24	37	62	92
NHD						
Factor	k_7	[-]	1,0			
Partial safety factor	γ_{Ms}	[-]	1,25			
JHD						
Factor	k_7	[-]	1,0			
Partial safety factor	γ_{Ms}	[-]	1,36			
SLSK						
Factor	k_7	[-]	0,8			-
Partial safety factor	γ_{Ms}	[-]	1,36			-
Steel failure with lever arm						
Characteristic resistance	$M^0_{Rk,s}$	[Nm]	26	52	92	232
NHD						
Partial safety factor	γ_{Ms}	[-]	1,25			
JHD and SLSK						
Partial safety factor	γ_{Ms}	[-]	1,56			
Concrete pry-out failure						
Factor	k_8	[-]	2,0			
Concrete edge failure						
Effective length of anchor in shear loading	l_f	[mm]	60	71	80	100
Outside diameter of anchor	d_{nom}	[mm]	12	15	18	24

JCP Heavy Duty Anchor

Performance
Characteristic values for **shear load,** static or quasi-static action,
stainless steel A4

Annex C5

Deutsches Institut für Bautechnik DIBt

Table C7: Characteristic values for **seismic action, Category C1 and C2, steel zinc plated**

Anchor size			**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/M16L**	**28/M20**	**32/M24**
Tension load									
Installation safety factor	γ_{inst}	[-]	1,0						
Steel failure									
Characteristic tension resistance category **C1**	$N_{Rk,s,eq,C1}$	[kN]	29	46	67	126	126	196	280
Characteristic tension resistance category **C2**	$N_{Rk,s,eq,C2}$	[kN]	29	46	67	126	126	196	280
Partial safety factor	γ_{Ms}	[-]	1,5						
Pull-out failure									
Characteristic tension resistance category **C1**	$N_{Rk,p,eq,C1}$	[kN]	12	16	25	36	44,4	50,3	63,3
Characteristic tension resistance category **C2**	$N_{Rk,p,eq,C2}$	[kN]	5,4	16,4	22,6	29,0	41,2	43,6	63,3
Shear load									
Steel failure without lever arm									
NHD									
Characteristic shear resistance category **C1**	$V_{Rk,s,eq,C1}$	[kN]	18,0	27,1	43,4	51,9	51,9	96,4	160,1
Characteristic shear resistance category **C2**	$V_{Rk,s,eq,C2}$	[kN]	12,7	20,5	31,5	50,1	50,1	67,1	108,1
JHD									
Characteristic shear resistance category **C1**	$V_{Rk,s,eq,C1}$	[kN]	18,0	27,1	43,4	51,9	51,9	96,4	160,1
Characteristic shear resistance category **C2**	$V_{Rk,s,eq,C2}$	[kN]	12,7	20,5	31,5	69,3	69,3	67,1	108,1
SLSK									
Characteristic shear resistance category **C1**	$V_{Rk,s,eq,C1}$	[kN]	25,2	36,5	50,4	-	-	-	-
Characteristic shear resistance category **C2**	$V_{Rk,s,eq,C2}$	[kN]	19,2	29,3	39,4	-	-	-	-
Partial safety factor	γ_{Ms}	[-]	1,25						

JCP Heavy Duty Anchor

Performance
Characteristic values for **seismic action, steel zinc plated**

Annex C6

Deutsches Institut für Bautechnik DIBt

Table C8: Characteristic values for **seismic action, Category C1 and C2, stainless steel A4**

Anchor size			**12/M8**	**15/M10**	**18/M12**	**24/M16**
Tension load						
Installation safety factor	γ_{inst}	[-]	1,0			
Steel failure						
Characteristic tension resistance, category **C1**	$N_{Rk,s,eq,C1}$	[kN]	26	41	60	110
Characteristic tension resistance, category **C2**	$N_{Rk,s,eq,C2}$	[kN]	26	41	60	110
Partial safety factor **NHD**	γ_{Ms}	[-]	1,5			
Partial safety factor **JHD and SLSK**	γ_{Ms}	[-]	1,87			
Pull-out failure						
Characteristic tension resistance, category **C1**	$N_{Rk,p,eq,C1}$	[kN]	9	16	26	36
Characteristic tension resistance, category **C2**	$N_{Rk,p,eq,C2}$	[kN]	4,8	16,5	24,8	44,5
Shear load						
Steel failure without lever arm						
NHD						
Characteristic shear resistance, category **C1**	$V_{Rk,s,eq,C1}$	[kN]	9,6	13,3	25,4	75,4
Characteristic shear resistance, category **C2**	$V_{Rk,s,eq,C2}$	[kN]	9,7	14,0	18,0	32,2
Partial safety factor	γ_{Ms}	[-]	1,25			
JHD						
Characteristic shear resistance, category **C1**	$V_{Rk,s,eq,C1}$	[kN]	9,6	13,3	25,4	75,4
Characteristic shear resistance, category **C2**	$V_{Rk,s,eq,C2}$	[kN]	9,7	14,0	18,0	32,2
Partial safety factor	γ_{Ms}	[-]	1,36			
SLSK						
Characteristic shear resistance, category **C1**	$V_{Rk,s,eq,C1}$	[kN]	11,5	23,3	31,6	-
Characteristic shear resistance, category **C2**	$V_{Rk,s,eq,C2}$	[kN]	10,8	17,4	15,4	-
Partial safety factor	γ_{Ms}	[-]	1,36			-

JCP Heavy Duty Anchor

Performance
Characteristic values for **seismic action, stainless steel A4**

Annex C7

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Table C9: Characteristic values under **fire exposure** in cracked and uncracked concrete C20/25 to C50/60

Anchor size				**10/M6**	**12/M8**	**15/M10**	**18/M12**	**24/M16**	**24/ M16L**	**28/M20**	**32/M24**
Tension load											
Steel failure											
Steel zinc plated											
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	1,0	1,9	4,3	6,3	11,6		18,3	26,3
	R60			0,8	1,5	3,2	4,6	8,6		13,5	19,5
	R90			0,6	1,0	2,1	3,0	5,0		7,7	12,6
	R120			0,4	0,8	1,5	2,0	3,1		4,9	9,2
Stainless steel A4											
Characteristic resistance	R30	$N_{Rk,s,fi}$	[kN]	-	6,1	10,2	15,7	29,2	-	-	-
	R60			-	4,4	7,3	11,1	20,6	-	-	-
	R90			-	2,6	4,3	6,4	12,0	-	-	-
	R120			-	1,8	2,8	4,1	7,7	-	-	-
Shear load											
Steel failure without lever arm											
Steel zinc plated											
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	1,0	1,9	4,3	6,3	11,6		18,3	26,3
	R60			0,8	1,5	3,2	4,6	8,6		13,5	19,5
	R90			0,6	1,0	2,1	3,0	5,0		7,7	12,6
	R120			0,4	0,8	1,5	2,0	3,1		4,9	9,2
Stainless steel A4											
Characteristic resistance	R30	$V_{Rk,s,fi}$	[kN]	-	14,3	22,7	32,8	61,0	-	-	-
	R60			-	11,1	17,6	25,5	47,5	-	-	-
	R90			-	7,9	12,6	18,3	34,0	-	-	-
	R120			-	6,3	10,0	14,6	27,2	-	-	-
Steel failure with lever arm											
Steel zinc plated											
Characteristic resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	0,8	2,0	5,6	9,7	24,8		42,4	83,6
	R60			0,6	1,5	4,1	7,2	18,3		29,8	61,9
	R90			0,4	1,0	2,7	4,7	11,9		17,1	40,1
	R120			0,3	0,8	1,9	3,1	6,6		10,7	29,2
Stainless steel A4											
Characteristic resistance	R30	$M^0_{Rk,s,fi}$	[Nm]	-	6,2	13,2	24,4	61,8	-	-	-
	R60			-	4,5	9,4	17,2	43,6	-	-	-
	R90			-	2,7	5,6	10,0	25,3	-	-	-
	R120			-	1,8	3,6	6,4	16,2	-	-	-

If pull-out is not decisive in equation D.4 and D.5, FprEN 1992-4:2016 $N_{Rk,p}$ must be replaced by $N^0_{Rk,c}$.

JCP Heavy Duty Anchor

Performance
Characteristic values under **fire exposure**

Annex C8

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Table C10: Displacements under tension and shear load, **steel zinc plated**

Anchor size			**10/ M6**	**12/ M8**	**15/ M10**	**18/ M12**	**24/ M16**	**24 /M16L**	**28/ M20**	**32/ M24**
Tension load										
Tension load in cracked concrete	N	[kN]	2,4	5,7	7,6	12,3	17,1	21,1	24	26,2
Displacement	δ_{N0}	[mm]	0,5	0,5	0,5	0,7	0,8	0,7	0,9	1,4
	$\delta_{N\infty}$	[mm]	2,0	2,0	1,3	1,3	1,3	1,3	1,4	1,9
Tension load in uncracked concrete	N	[kN]	8,5	9,5	14,3	17,2	24	29,6	34	43
Displacement	δ_{N0}	[mm]	0,8	1,0	1,1			1,3	0,3	0,7
	$\delta_{N\infty}$	[mm]	3,4		1,7			2,3	1,4	0,7
Seismic action C2										
Displacement for DLS	$\delta_{N,eq\ (DLS)}$	[mm]	-	3,3	3,0	5,0	3,0	3,0	4,0	5,3
Displacement for ULS	$\delta_{N,eq\ (ULS)}$	[mm]	-	12,2	11,3	16,0	9,2	9,2	13,8	12,4
Shear load										
NHD										
Shear load in cracked and uncracked concrete	V	[kN]	9,1	14	20,7	35,1	52,1	52,1	77	86,6
Displacement	δ_{V0}	[mm]	2,5	2,1	2,7	3,0	5,1	5,1	4,3	10,5
	$\delta_{V\infty}$	[mm]	3,8	3,1	4,1	4,5	7,6	7,6	6,5	15,8
Seismic action C2										
Displacement for DLS	$\delta_{V,eq\ (DLS)}$	[mm]	-	2,3	3,1	3,0	2,6	2,6	1,6	6,1
Displacement for ULS	$\delta_{V,eq\ (ULS)}$	[mm]	-	4,8	6,4	6,1	6,6	6,6	4,8	9,5
JHD										
Shear load in cracked and uncracked concrete	V	[kN]	10,1	17,1	27,5	41,5	72	72	77	86,6
Displacement	δ_{V0}	[mm]	2,9	2,5	3,6	3,5	7,0	7,0	4,3	10,5
	$\delta_{V\infty}$	[mm]	4,4	3,8	5,4	5,3	10,5	10,5	6,5	15,8
Seismic action C2										
Displacement for DLS	$\delta_{V,eq\ (DLS)}$	[mm]	-	2,3	3,1	3,0	3,3	3,3	1,6	6,1
Displacement for ULS	$\delta_{V,eq\ (ULS)}$	[mm]	-	4,8	6,4	6,1	8,2	8,2	4,8	9,5
SLSK										
Shear load in cracked and uncracked concrete	V	[kN]	10,1	17,1	27,5	41,5	-	-	-	-
Displacement	δ_{V0}	[mm]	2,9	2,5	3,6	3,5	-	-	-	-
	$\delta_{V\infty}$	[mm]	4,4	3,8	5,4	5,3	-	-	-	-
Seismic action C2										
Displacement for DLS	$\delta_{V,eq\ (DLS)}$	[mm]	-	3,1	3,9	3,9	-	-	-	-
Displacement for ULS	$\delta_{V,eq\ (ULS)}$	[mm]	-	10,2	11,8	13,0	-	-	-	-

JCP Heavy Duty Anchor

Performance
Displacements under tension and shear load, **steel zinc plated**

Annex C9

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Table C11: Displacements under tension and shear load, **stainless steel A4**

Anchor size			**12/M8**	**15/M10**	**18/M12**	**24/M16**
Tension load						
Tension load in cracked concrete	N	[kN]	4,3	7,6	12,1	17,0
Displacement	δ_{N0}	[mm]	0,5	0,5	1,3	0,5
	$\delta_{N\infty}$	[mm]	1,2	1,6	1,8	1,6
Tension load in uncracked concrete	N	[kN]	7,6	11,9	16,7	24,1
Displacement	δ_{N0}	[mm]	0,2	0,3	1,2	1,5
	$\delta_{N\infty}$	[mm]	1,1	1,1	1,1	1,1
Seismic action C2						
Displacement for DLS	$\delta_{N,eq\ (DLS)}$	[mm]	4,7	4,5	4,3	4,9
Displacement for ULS	$\delta_{N,eq\ (ULS)}$	[mm]	13,3	12,7	9,7	10,1
Shear load						
Shear load in cracked concrete	V	[kN]	13,9	21,1	34,7	50,8
Displacement	δ_{V0}	[mm]	3,4	4,9	4,8	6,7
	$\delta_{V\infty}$	[mm]	5,1	7,4	7,1	10,1
Seismic action C2						
NHD, JHD						
Displacement for DLS	$\delta_{V,eq(DLS)}$	[mm]	2,8	3,1	2,6	3,3
Displacement for ULS	$\delta_{V,eq\ (ULS)}$	[mm]	5,6	5,8	5,0	6,9
SLSK						
Displacement for DLS	$\delta_{V,eq(DLS)}$	[mm]	2,5	2,8	2,9	-
Displacement for ULS	$\delta_{V,eq\ (ULS)}$	[mm]	5,8	5,9	6,9	-