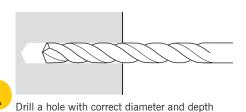
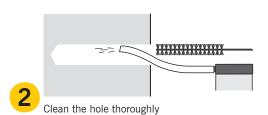
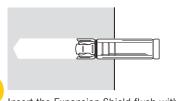


# **EXPANSION SHIELD**

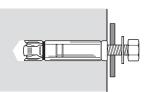
### Installation:



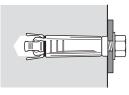




Insert the Expansion Shield flush with the wall



Mount the fixture with set screw, threaded rod or other metric screw and tighten to required setting torque



The installation is finished

Note Only use bolt diameter M6 and M8 in solid brick

## Fordele:

Free choice between set screw, threaded rod, bolt etc.

High loads in massive materials.

Fixture can be removed without affecting the anchor.

Anchorage can be designed in Expandet Calculation Software.



### For fixing of heavy objects in concrete and solid brick



### Tilbehør:

Set screw, threaded bolts or threaded rods.

### Materialer:

Expandet Expansions Shield is produced in:

Cone: 8.8 steel in accordance with EN 20898-2 Shield: Cold formed steel, zinc plated min. 5  $\mu$ m.

Ferrule: Cold formed (EN 10205) Spring coil: DIN 17223 BL 1, class B

Expansion Shield is also supplied in stainless steel A4.

## Godkendelser:

Expansion Shield HAC M6-M12 together with metric thread in 8.8 steel has European Technical Approval (ETA) in option 8 (ETA-01/0012).





EXPANDET SCREW ANCHORS A/S Svendebuen 2-6 3230 Græsted Danmark

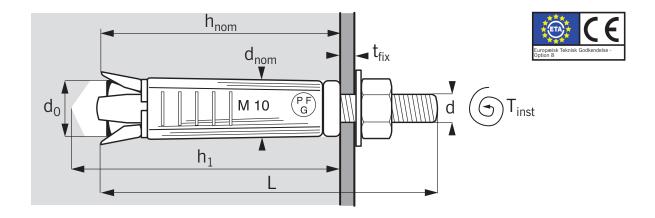
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Version 09.001

# Technical Sheet No. 314 C



## **EXPANSION SHIELD**



Type	Dimensions			Fixing							Load Capacities		
	d	d <sub>nom</sub>	L	d <sub>o</sub>	h <sub>1</sub>	h <sub>ef</sub>	h <sub>nom</sub>	T <sub>inst</sub>	h <sub>min</sub>	S <sub>min</sub>	C <sub>min</sub>	N <sub>Rd</sub>	$V_{_{ m Rd}}$
Expandet Expansion shield	Bolt- dia- meter mm	Outside diameter of anchor mm	Anchor length mm	Drill hole diameter mm	Depth of drill hole (Min.) mm	Effective anchorage depth mm	Embed- ment depth mm	Required setting torque Nm	Thickness of concrete member, min.	Minimum spacing mm	Minimum edge distance mm	Design resistance Tension kN*	<b>Design</b> <b>resistance</b> Shear kN <sup>♦</sup>
HAC240	M 6	10	40	10	45	40	40	10	100	60	60	3,3	6,4
HAC250	M 8	14	50	14	55	50	50	25	100	75	75	6,0	9,9
HAC260	M10	16	60	16	65	60	60	50	120	90	90	8,0	18,4
HAC270	M12	20	80	20	85	80	80	85	160	120	120	10,6	26,4
HAC280•	M16	25	100	25	110	100	100	200	200	150	150	11,9	50,2

- Not included in ETA-approval.
- Design resistance for tension is valid for a single anchor together with metric screw or threaded rod in 8.8 steel in non-cracked concrete C20/25 not believe the state of tension in total and the single anti-frequency depends on the state of tension in the state of the s
- Design resistance for shear is valid for a single anchor together with metric screw or threaded rod in 8.8 steel in non-cracked concrete ≥C20/25 not influenced by edge distance and/or spacing:  $C \ge 10 h_{af}$  and  $S \ge 3 h_{af}$

Combined resistance shall be verified if both tension and shear actions are applied. Se "Principles for Fastening" page 5 (Verification Method 2)

Partial safety factor for material ( $\gamma_m$ ) is included in accordance with product ETA. Partial safety factor for actions ( $\gamma_m$ ) has to be applied in accordance with national building code. If no guidance for γ, exists ETAG 001, Annex C recommends factor 1,35 for permanent actions and factor 1,5 for variable actions.

When calculating load capacities for anchors or anchorgroup use Expandet Calculation Software allowing for design with individual edge distance and spacing in accordance with ETAG 001, Annex C, Design Method A. Download Calculation Software for free at www.expandet.com.

Important: See Expandet's "Principles for fastening" for general information on fastening as well as information on limited liability. (Can be downloaded at www.expandet.com)



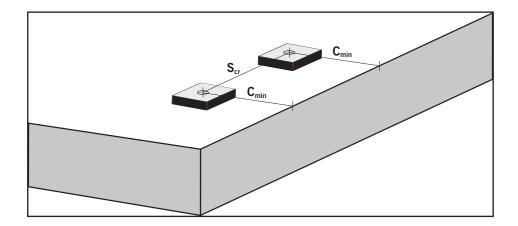
EXPANDET SCREW ANCHORS A/S Svendebuen 2-6 3230 Græsted Danmark

Telephone: +45 70 22 79 79 Telefax: +45 70 22 79 89 Telefax:

Version 09.001



# **EXPANSION SHIELD**



	Design shear load capacities for a single anchor at minimum edge distance (C <sub>min</sub> )							
Expansion shield		HAC240	HAC250	HAC260	HAC270	HAC280		
h <sub>nom</sub>	(embedment depth) mm	40	50	60	80			
V <sub>Rd, c</sub>	kN	3,7*	5,6*	7,9*	13,8*			
C <sub>min</sub>	mm	60	75	90	120	150		
S <sub>cr</sub>	mm	180	225	270	360	450		

<sup>•</sup> Design shear load capacity is valid at minimum edge distance in concrete C20/25 providing that characteristic spacing is  $\geq S_{cr}$ .

24,0

Partial safety factor for edge failure ( $\gamma_{\text{mc}}$ ) is included in accordance with product ETA.

Use Expandet Calculation Software for calculation of load capacities for single anchors and anchor groups in accordance with ETAG 001, Annex C – Design Method A.

Design shear lo	•	•	nd resistance a metric thread i	0	(lever arm)
Expansion shield	HAC240	HAC250	HAC260	HAC270	HAC280
V <sub>Rd. S</sub> kN	6,4◆	11,2*	18,4◆	26,4*	50,2◆

<sup>•</sup> Design shear load capacity includes partial safety factor for material ( $\gamma_{ms}$ ) in accordance with product ETA.

 $M_{\rm Rd}$ 

Use Expandet Calculation Software for calculation of load capacities for single anchors and anchor groups in accordance with ETAG 001, Annex C – Design Method A.



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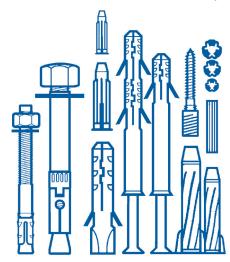
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212,0\*



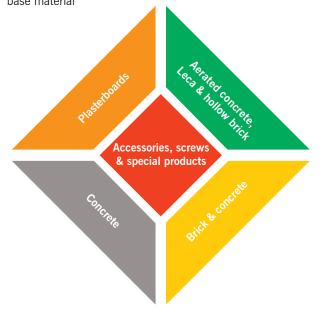


### **EXPANDET SCREW ANCHORS A/S**



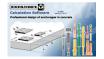
Expandet Screw Anchors A/S was established in 1955 and was pioneers in the field of fastener products for concrete and brickwork - being the first company to patent a fastener made in plastic. We are devoted to a constant development of our product range, which now covers the entire range of anchors and fasteners for both professional and DIY.

We have - with our base-material orientated colour code system - made it easy to choose the right anchor for the right base material



### **EXPANDET CALCULATION SOFTWARE**

Expandet Calculation Software offers the possibility for design of single anchors and anchors groups in concrete according to ETAG 001, Annex C with our range of products that are defined according to CC Method. This includes our range of anchor systems approved for structural connections with CEmarking.



## **TERMINOLOGY**

mm Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of concrete cone failure  Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure  S <sub>rec</sub> mm Recommended spacing (for full resistance)  Minimum allowable spacing  Cranacteristic spacing at a defined edge distance  C mm Edge distance  C mm Edge distance for ensuring the transmission of the characteristic spacing at a defined edge distance  C mm Edge distance  C mm Characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance (for full resistance)  C mm Recommended edge distance (for full resistance)  C mm Characteristic edge distance at a difined spacing  N <sub>Rd</sub> kN Design resistance, tension  N <sub>Rd,s</sub> kN Design resistance, tension (steel failure)  N <sub>Rd,s</sub> kN Design resistance, tension (steel failure)  N <sub>Rd,s</sub> kN Design resistance, tension (splitting failure)  N <sub>Rd,s</sub> kN Design resistance, tension (splitting failure)  N <sub>Rd,s</sub> kN Design resistance, shear  V <sub>Rd,s</sub> kN Design resistance, shear (steel failure)  N <sub>Rd,s</sub> kN Design resistance, shear (steel failure)  N <sub>Rd,s</sub> kN Design resistance, shear (steel failure)  P <sub>Rd,s</sub> kN Design resistance, shear (concrete pryout failure, concrete edge failure)  N <sub>Rd,s</sub> kN Design resistance, shear (concrete pryout failure, concrete edge failure)  P <sub>Rd,s</sub> kN Design resistance, bending moment  P <sub>Rd,s</sub> kN Design resistance, bending moment  P <sub>Rd,s</sub> Partial safety factor for material, steel failure  P <sub>Rd,s</sub> Partial safety factor for material, splitting failure  P <sub>Rd,s</sub> Partial saf	ode	Unit	Definition
mm		Мх	Bolt diameter
Load mm Anchor length Load mm Bolt / screw length Load mm Length of metric thread Load mm Available internal thread length Load mm Dill hole diameter  h₁ mm Depth of drilled hole h₁ mm Depth of drilled hole h₁ mm Thickness of member (concrete, brickwall etc.)  mm Anchor embedment depth h₁ mm Thickness of member (concrete, brickwall etc.)  mm Minimum acrevity behind wall  mm Thickness of member h₁ mm Minimum acrevity behind wall  mm Thickness of fixture b₁ mm Minimum acrevity behind wall  mm Thickness of fixture b₁ mm With of fixture: b₁ (direction 1) & b₁ (direction 2)  Tinut  Nm Required setting touque  S mm Spacing between anchors in an anchorgroup  S acr, N mm Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of concrete cone failure  C mm Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure  Recommended spacing (for full resistance)  mm Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure  Recommended spacing (for full resistance)  mm Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure  C mm Edge distance  C mm Characteristic edge distance for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure  C mm Characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring t	nom	mm	Outside diameter of anchor
Lensed Lam         mm         Length of metric thread length           Lam         mm         Available internal thread length           Lam         mm         Drill hole diameter           h₁         mm         Doll hole diameter           h₂         mm         Drill hole diameter           h₂         mm         Effective anchorage depth           h₂         mm         Effective anchorage depth           h₂         mm         Effective anchorage depth           h₂         mm         Minimum thickness of member           h₂         mm         Minimum thickness of member           h₂         mm         Thickness of fixture           b₀₁₂         mm         Witch of fixture: b₀₁₂ (direction 1) & b₀₂₂ (direction 2)           Treat         Nm         Required setting toque           S         mm         Spacing between anchors in an anchorgroup         Girection 1) & S₂₂ (direction 2)           S₁ S₂         mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure           S₂, co         mm         Recommended spacing (for full resistance)           S₂, co         mm         Edge distance           C₁, c₂         mm         Edge distance for ensu		mm	Anchor length
Lensed Lam         mm         Length of metric thread length           Lam         mm         Available internal thread length           Lam         mm         Drill hole diameter           h₁         mm         Doll hole diameter           h₂         mm         Drill hole diameter           h₂         mm         Effective anchorage depth           h₂         mm         Effective anchorage depth           h₂         mm         Effective anchorage depth           h₂         mm         Minimum thickness of member           h₂         mm         Minimum thickness of member           h₂         mm         Thickness of fixture           b₀₁₂         mm         Witch of fixture: b₀₁₂ (direction 1) & b₀₂₂ (direction 2)           Treat         Nm         Required setting toque           S         mm         Spacing between anchors in an anchorgroup         Girection 1) & S₂₂ (direction 2)           S₁ S₂         mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure           S₂, co         mm         Recommended spacing (for full resistance)           S₂, co         mm         Edge distance           C₁, c₂         mm         Edge distance for ensu	bolt	mm	Bolt / screw length
L <sub>botto</sub> mm Available internal thread length L <sub>dimin</sub> mm Minimum screw in depth d <sub>1</sub> mm Diril hole diameter h <sub>1</sub> mm Depth of drilled hole h <sub>1000</sub> mm Anchor embedment depth h <sub>101</sub> mm Anchor embedment depth h <sub>101</sub> mm Thickness of member (concrete, brickwall etc.) h <sub>101</sub> mm Minimum thickness of member h <sub>1</sub> mm Minimum cavity behind wall t <sub>101</sub> mm Wittl of fixture: h <sub>101</sub> mm Wittl of fixture: h <sub>101</sub> mm Spacing between anchors in an anchorgroup S <sub>1</sub> : S <sub>2</sub> mm Spacing between anchors in an anchorgroup: S <sub>1</sub> : S <sub>2</sub> mm Spacing between anchors in an anchorgroup: S <sub>1</sub> : S <sub>2</sub> mm Spacing between anchors in an anchorgroup: S <sub>1</sub> : S <sub>2</sub> mm Spacing between anchors in an anchorgroup: S <sub>1</sub> : S <sub>2</sub> mm Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of concrete cone failure Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure Recommended spacing (for full resistance)  mm Recommended spacing (for full resistance)  C <sub>1</sub> : C <sub>2</sub> mm Edge distance C <sub>3</sub> : C <sub>4</sub> mm Characteristic spacing at a defined edge distance C <sub>4</sub> : C <sub>7</sub> mm Edge distance C <sub>7</sub> c <sub>8</sub> mm Minimum allowable spacing C <sub>8</sub> mm Characteristic edge distance for ensuring the transmission of the characterist resistance of a single anchor in case of concrete cone failure C <sub>1</sub> : C <sub>2</sub> mm Edge distance C <sub>1</sub> : C <sub>2</sub> mm Recommended edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of		mm	Length of metric thread
Lobition         mm         Minimum screw in depth           d <sub>o</sub> mm         Depth of drilled hole           h <sub>10</sub> mm         Depth of drilled hole           h <sub>100</sub> mm         Anchor embedment depth           h <sub>100</sub> mm         Effective anchorage depth           h <sub>100</sub> mm         Minimum thickness of member           h <sub>100</sub> mm         Minimum cavity behind wall           t <sub>100</sub> mm         Minimum cavity behind wall           t <sub>100</sub> mm         Thickness of fixture           b <sub>101,1,2</sub> mm         Witt of fixture: b <sub>100</sub> (direction 1) & b <sub>100</sub> (direction 2)           T <sub>100</sub> Nm         Required setting toque           S <sub>100</sub> nm         Spacing between anchors in an anchorgroup           S <sub>10</sub> nm         Spacing between anchors in an anchorgroup           S <sub>11</sub> S <sub>2</sub> mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of concrete cone failure           S <sub>11</sub> S <sub>2</sub> mm         Characteristic spacing for ensuring the transmission of the characteristic spacing for ensuring the transmission of the characteristic spacing at a defined edge distance           C <sub>11</sub> mm         Characteristic spacing at a defined edge d		mm	Available internal thread length
h₁ h₀m         mm         Depth of drilled hole           h₀m         mm         Anchor embedment depth           h₀m         mm         Effective anchorage depth           h mm         Thickness of member (concrete, brickwall etc.)           h₀m         mm         Minimum thickness of member           h₁         mm         Minimum thickness of fixture           b₀1,12         mm         Witch of fixture           b₀1,13         mm         Minimum allowable seating           contracteristic spacing for ensuring the transmission of the characteristic estance of a single anchor in case of splitting failure           Contracteristic spacing at a defined edge distance         Cifracteristic edge distance for ensuring the transmis		mm	Minimum screw in depth
h <sub>nom</sub> mm         Anchor embedment depth           h <sub>nom</sub> mm         Effective anchorage depth           h <sub>min</sub> mm         Thickness of member (concrete, brickwall etc.)           h <sub>min</sub> mm         Minimum cavity behind wall           t <sub>III</sub> mm         Minimum cavity behind wall           t <sub>III</sub> mm         Thickness of fixture           b <sub>10,1,2</sub> mm         Wittle of fixture: b <sub>10,1</sub> (direction 1) & b <sub>not</sub> (direction 2)           T <sub>inst</sub> Nm         Required setting to uque           S         mm         Spacing between anchors in an anchorgroup           S <sub>cr.</sub> m         mm         Spacing between anchors in an anchorgroup           S <sub>cr.</sub> m         mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of concrete cone failure           S <sub>cr.</sub> m         mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure           S <sub>cr.</sub> p         mm         Characteristic spacing for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characte	0	mm	Drill hole diameter
h_et         mm         Effective anchorage depth           h_min         mm         Thickness of member (concrete, brickwall etc.)           h_min         mm         Minimum thickness of member           h_n         mm         Minimum cavity behind wall           t_in         mm         Minimum cavity behind wall           t_in         mm         Midt of fixture: b <sub>in</sub> (direction 1) & b <sub>in2</sub> (direction 2)           T_inst         Nm         Spacing between anchors in an anchorgroup           S_ mm         Spacing between anchors in an anchorgroup: S <sub>1</sub> (direction 1) & S <sub>2</sub> (direction 2)           S <sub>cr. N</sub> mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of concrete cone failure           C <sub>sr. N</sub> mm         Characteristic spacing for ensuring the transmission of the characteristic edge distance of a single anchor in case of splitting failure           S <sub>cr. Sp</sub> mm         Characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of	1	mm	Depth of drilled hole
h_et         mm         Effective anchorage depth           h_min         mm         Thickness of member (concrete, brickwall etc.)           h_min         mm         Minimum thickness of member           h_n         mm         Minimum cavity behind wall           t_in         mm         Minimum cavity behind wall           t_in         mm         Midt of fixture: b <sub>in</sub> (direction 1) & b <sub>in2</sub> (direction 2)           T_inst         Nm         Spacing between anchors in an anchorgroup           S_ mm         Spacing between anchors in an anchorgroup: S <sub>1</sub> (direction 1) & S <sub>2</sub> (direction 2)           S <sub>cr. N</sub> mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of concrete cone failure           C <sub>sr. N</sub> mm         Characteristic spacing for ensuring the transmission of the characteristic edge distance of a single anchor in case of splitting failure           S <sub>cr. Sp</sub> mm         Characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of	nom	mm	Anchor embedment depth
nmm h <sub>f</sub> mm Minimum thickness of member           h <sub>f</sub> mm Minimum cavity behind wall           t <sub>fit</sub> mm Minimum cavity behind wall           t <sub>fit</sub> mm Mickness of fixture           b <sub>fit,1,2</sub> mm         Witd of fixture is b <sub>fit</sub> (direction 1) & b <sub>fit</sub> (direction 2)           T <sub>inal</sub> Nm         Required setting touque           S         mm         Spacing between anchors in an anchorgroup           S <sub>c, N</sub> mm         Spacing between anchors in an anchorgroup of concrete cone failure           S <sub>c, N</sub> mm         Spacing between anchors in an anchorgroup of concrete cone failure           S <sub>c, S</sub> mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure           S <sub>cc</sub> mm         Recommended spacing (for full resistance)           S <sub>min</sub> mm         Characteristic spacing at a defined edge distance           C <sub>cr</sub> mm         Edge distance fra anchor to edge: C <sub>1</sub> (direction 1) & C <sub>2</sub> (direction 2)           C <sub>cr</sub> mm         Characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristi		mm	Effective anchorage depth
h <sub>I</sub> mm         Minimum cavity behind wall           t <sub>Incl.1.2</sub> mm         Thickness of fixture           b <sub>Incl.1.2</sub> mm         Witch of fixture: b <sub>Incl</sub> (direction 1) & b <sub>Incl</sub> (direction 2)           T <sub>inst</sub> Nm         Required setting touque           S <sub>I</sub> is S <sub>2</sub> mm         Spacing between anchors in an anchorgroup           S <sub>cr. N</sub> mm         Spacing between anchors in an anchorgroup; S <sub>1</sub> (direction 1) & S <sub>2</sub> (direction 2)           S <sub>cr. N</sub> mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure           S <sub>cr. Sp</sub> mm         Recommended spacing (for full resistance)           S <sub>min</sub> mm         Edge distance           C         mm         Edge distance           C <sub>xi</sub> D <sub>x</sub> mm         Edge distance           C <sub>xi</sub> D <sub>x</sub> mm         Edge distance         C <sub>1</sub> (direction 1) & C <sub>2</sub> (direction 2)           C <sub>xi</sub> D <sub>x</sub>		mm	Thickness of member (concrete, brickwall etc.)
h <sub>I</sub> mm         Minimum cavity behind wall           t <sub>Incl.1.2</sub> mm         Thickness of fixture           b <sub>Incl.1.2</sub> mm         Witch of fixture: b <sub>Incl</sub> (direction 1) & b <sub>Incl</sub> (direction 2)           T <sub>inst</sub> Nm         Required setting touque           S <sub>I</sub> is S <sub>2</sub> mm         Spacing between anchors in an anchorgroup           S <sub>cr. N</sub> mm         Spacing between anchors in an anchorgroup; S <sub>1</sub> (direction 1) & S <sub>2</sub> (direction 2)           S <sub>cr. N</sub> mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure           S <sub>cr. Sp</sub> mm         Recommended spacing (for full resistance)           S <sub>min</sub> mm         Edge distance           C         mm         Edge distance           C <sub>xi</sub> D <sub>x</sub> mm         Edge distance           C <sub>xi</sub> D <sub>x</sub> mm         Edge distance         C <sub>1</sub> (direction 1) & C <sub>2</sub> (direction 2)           C <sub>xi</sub> D <sub>x</sub>	min	mm	Minimum thickness of member
Tinest Nm Required setting touque  Syacing between anchors in an anchorgroup: Syacing in an anchorgroup: Syacing anchor in case of concrete cone failure  Characteristic spacing for ensuring the transmission of the characteristic expacting at a defined edge distance  C mm Edge distance  C mm Edge distance  C mm Edge distance fra anchor to edge: Cyacing and a defined edge distance  C mm Edge distance  C mm Edge distance  C mm Edge distance  C mm Edge distance fra anchor to edge: Cyacing anchor in case of concrete cone failure  C mm C Caracteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance (for full resistance)  C mm Recommended edge distance for ensuring the transmission of the characteristic edge distance (for full resistance)  C mm Characteristic edge distance at a diffined spacing  N ky D Design resistance, tension (steel failure)  N ky D D Design resistance, tension (steel failure)  N ky D D Design res	f	mm	Minimum cavity behind wall
T <sub>inst</sub> Nm         Required setting touque           S         mm         Spacing between anchors in an anchorgroup: S <sub>1</sub> (direction 1) & S <sub>2</sub> (direction 1) & S <sub>3</sub> (direction 1) & S <sub>4</sub> (direction 1) & S <sub>4</sub> (direction 1) & S <sub>5</sub> (direction 1) & S <sub>6</sub> (direction 1) & S <sub>7</sub> (direction 1) & S <sub>7</sub> (direction 1) & S <sub>7</sub> (direction 2) & S <sub>8</sub> (direction 1) & S <sub>8</sub> (direction 2) & S <sub>8</sub> (di	x	mm	Thickness of fixture
S	fix1; 2	mm	Witdt of fixture: $b_{fix1}$ (direction 1) & $b_{fix2}$ (direction 2)
Spacing between anchors in an anchorgroup: Spacing for ensuring the transmission of the characteristic spacing of the spacing (for full resistance)	inst	Nm	Required setting touque
S <sub>cr. N</sub> mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of concrete cone failure           S <sub>cr. sp</sub> mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure           S <sub>min</sub> mm         Recommended spacing (for full resistance)           S <sub>min</sub> mm         Minimum allowable spacing           C         mm         Edge distance           C         mm         Edge distance           C <sub>1</sub> :C <sub>2</sub> mm         Characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic		mm	Spacing between anchors in an anchorgroup
S <sub>cr. N</sub> mm         resistance of a single anchor in case of concrete cone failure           S <sub>cr. Sp</sub> mm         Characteristic spacing for ensuring the transmission of the characterist resistance of a single anchor in case of splitting failure           S <sub>min</sub> mm         Recommended spacing (for full resistance)           S <sub>min</sub> mm         Minimum allowable spacing           S <sub>cr.</sub> mm         Characteristic spacing at a defined edge distance           C         mm         Edge distance           C         mm         Edge distance           C <sub>cr. N</sub> mm         Characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance (for full resistance)           C <sub>cr. sp</sub> mm         Recommended edge distance (for full resistance)           C <sub>rec</sub> mm         Recommended edge distance (for full resistance)           C <sub>cr. sp</sub> mm         Characteristic edge distance (for full resistance)           C <sub>rec</sub> mm         Characteristic edge distance at a diffined spacing           N <sub>Rd</sub> kN         Design resistance, tension (steel failure)           N <sub>Rd</sub> , sk         N         Design resistance, tension (splitting	1; S <sub>2</sub>	mm	Spacing between anchors in an anchorgroup: $S_1$ (direction 1) & $S_2$ (direction 2)
Contraction		mm	Characteristic spacing for ensuring the transmission of the characteristic
S <sub>cc, sp</sub> mm         resistance of a single anchor in case of splitting failure           S <sub>min</sub> mm         Recommended spacing (for full resistance)           S <sub>min</sub> mm         Minimum allowable spacing           C         mm         Edge distance           C <sub>1</sub> :C <sub>2</sub> mm         Edge distance           C <sub>1</sub> :C <sub>2</sub> mm         Edge distance fra anchor to edge: C <sub>1</sub> (direction 1) & C <sub>2</sub> (direction 2)           C <sub>r, N</sub> mm         Characteristic edge distance for ensuring the transmission of the chara resistance of a single anchor in case of concrete cone failure           C <sub>rec</sub> mm         Recommended edge distance for ensuring the transmission of the chara resistance of a single anchor in case of splitting failure           C <sub>rec</sub> mm         Recommended edge distance (for full resistance)           C <sub>rec</sub> mm         Recommended edge distance (for full resistance)           C <sub>rec</sub> mm         Characteristic edge distance (for full resistance)           C <sub>rec</sub> mm         Recommended edge distance (for full resistance)           C <sub>rec</sub> mm         Characteristic edge distance (for full resistance)           C <sub>rec</sub> mm         Characteristic edge distance (for full resistance)           R <sub>Rd</sub> kN         Design resistance, tension (steel failure) <tr< td=""><td>cr, N</td><td></td><td></td></tr<>	cr, N		
S <sub>mc</sub> mm         Recommended spacing (for full resistance)           S <sub>min</sub> mm         Minimum allowable spacing           S <sub>cr</sub> mm         Characteristic spacing at a defined edge distance           C         mm         Edge distance           C <sub>cr</sub> , N         mm         Edge distance fra anchor to edge: C <sub>1</sub> (direction 1) & C <sub>2</sub> (direction 2)           C <sub>cr</sub> , N         mm         Edge distance fra anchor to edge: C <sub>1</sub> (direction 1) & C <sub>2</sub> (direction 2)           C <sub>cr</sub> , N         mm         Edge distance fra anchor to edge: C <sub>1</sub> (direction 1) & C <sub>2</sub> (direction 2)           C <sub>cr</sub> , N         mm         Edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge di	cr, sp	mm	
S <sub>min</sub> mm         Minimum allowable spacing           S <sub>cr</sub> mm         Characteristic spacing at a defined edge distance           C         mm         Edge distance           C <sub>1</sub> ,C <sub>2</sub> mm         Edge distance fra anchor to edge: C <sub>1</sub> (direction 1) & C <sub>2</sub> (direction 2)           C <sub>cr. N</sub> mm         Characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance (for full resistance)           C <sub>min</sub> mm         Recommended edge distance (for full resistance)           C <sub>min</sub> mm         Minimum allowable edge distance           C <sub>min</sub> mm         Characteristic edge distance at a diffined spacing           N <sub>Rd</sub> kN         Design resistance, tension           N <sub>Rd</sub> kN         Design resistance, tension (steel failure)           N <sub>Rd</sub> kN         Design resistance, tension (pull out failure)           N <sub>Rd</sub> kN         Design resistance, tension (pull out failure)           N <sub>Rd</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete		mm	
S <sub>cr</sub> mm         Characteristic spacing at a defined edge distance           C         mm         Edge distance           C <sub>1</sub> ;C <sub>2</sub> mm         Edge distance fra anchor to edge: C <sub>1</sub> (direction 1) & C <sub>2</sub> (direction 2)           C <sub>cr, N</sub> mm         Edge distance for a single anchor in case of concrete cone failure           C <sub>cr, SP</sub> mm         Characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance for ensuring the transmission of the characteristic edge distance (for full resistance)           C <sub>min</sub> mm         Recommended edge distance (for full resistance)           C <sub>min</sub> mm         Minimum allowable edge distance           C <sub>min</sub> mm         Characteristic edge distance at a diffined spacing           N <sub>Rd</sub> kN         Design resistance, tension           N <sub>Rd</sub> kN         Design resistance, tension (steel failure)           N <sub>Rd</sub> kN         Design resistance, tension (pull out failure)           N <sub>Rd</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd</sub> kN         Design resistance, sh	rec		
C         mm         Edge distance           C <sub>1</sub> ;C <sub>2</sub> mm         Edge distance fra anchor to edge: C <sub>1</sub> (direction 1) & C <sub>2</sub> (direction 2)           C <sub>cr, N</sub> mm         Characteristic edge distance for ensuring the transmission of the chararesistance of a single anchor in case of concrete cone failure           C <sub>cr, N</sub> mm         Characteristic edge distance for ensuring the transmission of the chararesistance of a single anchor in case of splitting failure           C <sub>min</sub> mm         Recommended edge distance (for full resistance)           C <sub>min</sub> mm         Minimum allowable edge distance           C <sub>cr</sub> mm         Characteristic edge distance at a difined spacing           N <sub>Rd</sub> kN         Design resistance, tension           N <sub>Rd</sub> kN         Design resistance, tension (steel failure)           N <sub>Rd</sub> kN         Design resistance, tension (concrete cone failure)           N <sub>Rd</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> kN         Design resistance, shear           V <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd</sub> kN         Design resistance, bending moment			
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			
C <sub>cr, N</sub> mm         Characteristic edge distance for ensuring the transmission of the chara resistance of a single anchor in case of concrete cone failure           C <sub>cr, Sp</sub> mm         Characteristic edge distance for ensuring the transmission of the characteristic edge distance of a single anchor in case of splitting failure           C <sub>rec</sub> mm         Recommended edge distance (for full resistance)           C <sub>min</sub> mm         Minimum allowable edge distance           C <sub>rr</sub> mm         Characteristic edge distance at a difined spacing           N <sub>Rd</sub> kN         Design resistance, tension           N <sub>Rd</sub> kN         Design resistance, tension (steel failure)           N <sub>Rd, p</sub> kN         Design resistance, tension (pull out failure)           N <sub>Rd, p</sub> kN         Design resistance, tension (splitting failure)           N <sub>Rd, p</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> kN         Design resistance, shear           V <sub>Rd</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd</sub> kN         Design resistance, shea			
C <sub>cr, N</sub> mm         resistance of a single anchor in case of concrete cone failure           C <sub>cr, sp</sub> mm         Characteristic edge distance for ensuring the transmission of the chararesistance of a single anchor in case of splitting failure           C <sub>rec</sub> mm         Recommended edge distance (for full resistance)           C <sub>rmin</sub> mm         Minimum allowable edge distance           C <sub>rmin</sub> kN         Design resistance, tension           N <sub>Rd</sub> b         kN         Design resistance, tension (steel failure)           N <sub>Rd, p</sub> c         kN         Design resistance, tension (pull out failure)           N <sub>Rd, p</sub> c         kN         Design resistance, tension (splitting failure)           N <sub>Rd, p</sub> c         kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> s         kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> s         kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> s         kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> s         kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> s         kN         Design resistance, shear         (steel failure)           V <sub>Rd</sub> s         kN         Design resistance, shear (steel failure)           V <sub>Rd</sub> s         k			
C <sub>cr, sp</sub> mm         resistance of a single anchor in case of splitting failure           C <sub>rec</sub> mm         Recommended edge distance (for full resistance)           C <sub>min</sub> mm         Minimum allowable edge distance           C <sub>cr</sub> mm         Characteristic edge distance at a difined spacing           N <sub>Rd</sub> kN         Design resistance, tension           N <sub>Rd, s</sub> kN         Design resistance, tension (steel failure)           N <sub>Rd, sp</sub> kN         Design resistance, tension (concrete cone failure)           N <sub>Rd, sp</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd, s</sub> kN         Design resistance, shear           V <sub>Rd, s</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd, s</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd, s</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd, s</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd, s</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd, s</sub> kN         Design resistance, shear (concrete pryout failure)           V <sub>Rd, s</sub> kN         Partial safety f	cr, N	mm	
C <sub>rec</sub> mm         Recommended edge distance (for full resistance)           C <sub>rmin</sub> mm         Minimum allowable edge distance           C <sub>rr</sub> mm         Characteristic edge distance at a difined spacing           N <sub>Rd</sub> kN         Design resistance, tension           N <sub>Rd,s</sub> kN         Design resistance, tension (steel failure)           N <sub>Rd,s</sub> kN         Design resistance, tension (pull out failure)           N <sub>Rd,so</sub> kN         Design resistance, tension (concrete cone failure)           N <sub>Rd,so</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd,so</sub> kN         Design resistance, shear         (see failure)           V <sub>Rd,so</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd,so</sub> kN         Design resistance, shear (concrete or material)           V <sub>Mm</sub> Partial safety factor for material, steel failure      <		mm	Characteristic edge distance for ensuring the transmission of the characteristic
C <sub>min</sub> mm         Minimum allowable edge distance           C <sub>cr</sub> mm         Characteristic edge distance at a difined spacing           N <sub>Rd</sub> kN         Design resistance, tension           N <sub>Rd,s</sub> kN         Design resistance, tension (steel failure)           N <sub>Rd,p</sub> kN         Design resistance, tension (pull out failure)           N <sub>Rd,s</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd,s</sub> kN         Design resistance, shear           V <sub>Rd,s</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd,s</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd,s</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd,s</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd,s</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd,s</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd,s</sub> kN         Partial safety factor for material, steel failure           V <sub>Mm</sub> Partial safety factor for material, steel failure           V <sub>Mm</sub> Partial safety factor for mate			
C <sub>cr</sub> mm         Characteristic edge distance at a difined spacing           N <sub>Rd</sub> kN         Design resistance, tension           N <sub>Rd,s</sub> kN         Design resistance, tension (steel failure)           N <sub>Rd,p</sub> kN         Design resistance, tension (pull out failure)           N <sub>Rd,c</sub> kN         Design resistance, tension (concrete cone failure)           N <sub>Rd,s</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> kN         Design resistance, shear           V <sub>Rd,s</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd,s</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure           F <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure           F <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure           F <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure           Y <sub>Md</sub> Partial safety factor for material, steel failure           Y <sub>Mm</sub> Partial safety factor for material, steel failure           Y <sub>Mm</sub> Partial safety factor for material, pull out failure           V <sub>Ms</sub> Partial safety factor for material, splitting failure           <			
N <sub>Rd</sub> kN         Design resistance, tension           N <sub>Rd,s</sub> kN         Design resistance, tension (steel failure)           N <sub>Rd,p</sub> kN         Design resistance, tension (pull out failure)           N <sub>Rd,c</sub> kN         Design resistance, tension (concrete cone failure)           N <sub>Rd,sp</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> kN         Design resistance, shear           V <sub>Rd,s</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd,c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           F <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           F <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           F <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           F <sub>Rd</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           F <sub>Rd</sub> kN         Partial safety factor for material, steel failure           F <sub>Rd</sub> Partial safety factor for material, steel failure           F <sub>Rd</sub> R         Partial safety factor for material, splitting failure           F <sub>Rd</sub> R <th< td=""><td>min</td><td></td><td>-</td></th<>	min		-
N <sub>Rd,s</sub> kN         Design resistance, tension (steel failure)           N <sub>Rd,p</sub> kN         Design resistance, tension (pull out failure)           N <sub>Rd,sp</sub> kN         Design resistance, tension (concrete cone failure)           N <sub>Rd,sp</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd,sp</sub> kN         Design resistance, shear           V <sub>Rd,sp</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd,c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd,c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd,c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd,c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Mm</sub> Partial safety factor for material, steel failure           V <sub>Mm</sub> Partial safety factor for material, steel failure           V <sub>Mm</sub> Partial safety factor for material, pull out failure           V <sub>Mm</sub> Partial safety factor for material, splitting failure           N <sub>Mm</sub> Partial safety factor for material, splitting failure           V <sub>Sd</sub> kN         Design value of shear actions acting on a single anchor or t			
NRd, p         kN         Design resistance, tension (pull out failure)           N <sub>Rd, c</sub> kN         Design resistance, tension (concrete cone failure)           N <sub>Rd, sc</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> kN         Design resistance, shear           V <sub>Rd, sc</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd, c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           V <sub>Rd, c</sub> kN         Design resistance, independent of load directioin           M <sub>Rd</sub> Nm         Design resistance, bending moment           γ <sub>Mm</sub> Partial safety factor for material           γ <sub>Mm</sub> Partial safety factor for material, steel failure           γ <sub>Mm</sub> Partial safety factor for material, pull out failure           γ <sub>Mm</sub> Partial safety factor for material, splitting failure           γ <sub>Mm</sub> Partial safety factor for material, splitting failure           ν <sub>Mm</sub> Partial safety factor for material, splitting failure           ν <sub>Sd</sub> kN         Design value of shear actions acting on a single anchor or the fixture of anchor group           ν <sub>Sd</sub> kN         Design value of shear actions           ν <sub>rec</sub> kN         Maximum recommended tension loa			
N <sub>Rd, so</sub> kN         Design resistance, tension (concrete cone failure)           N <sub>Rd, so</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> kN         Design resistance, shear           V <sub>Rd, s</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd, c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           F <sub>Rd</sub> kN         Design resistance, independent of load direction           M <sub>Rd</sub> Nm         Design resistance, bending moment           γ <sub>M</sub> Partial safety factor for material           γ <sub>Ms</sub> Partial safety factor for material, steel failure           γ <sub>Ms</sub> Partial safety factor for material, pull out failure           γ <sub>Ms</sub> Partial safety factor for material, concrete cone failure           γ <sub>Msp</sub> Partial safety factor for material, splitting failure           N <sub>Sd</sub> kN         Design value of tensile actions acting on a single anchor or the fixture of anchor group           γ <sub>f</sub> Partial safety factor for actions           N <sub>rec</sub> kN         Maximum recommended tension load           V <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, independent of load direction			
N <sub>Rd, so</sub> kN         Design resistance, tension (splitting failure)           V <sub>Rd</sub> kN         Design resistance, shear           V <sub>Rd, s</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd, c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           F <sub>Rd</sub> kN         Design resistance, independent of load directioin           M <sub>Rd</sub> Nm         Design resistance, bending moment           γ <sub>Mm</sub> Partial safety factor for material           γ <sub>Mm</sub> Partial safety factor for material, steel failure           γ <sub>Mm</sub> Partial safety factor for material, pull out failure           γ <sub>Mm</sub> Partial safety factor for material, concrete cone failure           γ <sub>Mm</sub> Partial safety factor for material, splitting failure           N <sub>Sd</sub> kN         Design value of tensile actions acting on a single anchor or the fixture of anchor group           ν <sub>Sd</sub> kN         Design value of shear actions acting on a single anchor or the fixture of anchor group           γ <sub>f</sub> Partial safety factor for actions           N <sub>rec</sub> kN         Maximum recommended tension load           ν <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, in	Rd, p		
V <sub>Rd</sub> kN         Design resistance, shear           V <sub>Rd,s</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd,c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           F <sub>Rd</sub> kN         Design resistance, independent of load directioin           M <sub>Rd</sub> Nm         Design resistance, bending moment           γ <sub>M</sub> Partial safety factor for material           γ <sub>Ms</sub> Partial safety factor for material, steel failure           γ <sub>Ms</sub> Partial safety factor for material, pull out failure           γ <sub>Ms</sub> Partial safety factor for material, concrete cone failure           γ <sub>Msp</sub> Partial safety factor for material, splitting failure           N <sub>Sd</sub> kN         Design value of tensile actions acting on a single anchor or the fixture of anchor group           γ <sub>Sd</sub> kN         Design value of shear actions acting on a single anchor or the fixture of anchor group           γ <sub>Fec</sub> kN         Maximum recommended tension load           V <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, independent of load direction           f <sub>ck</sub> N/mm²         Characteristic concrete compression strength messured on cylinders			
V <sub>Rd,s</sub> kN         Design resistance, shear (steel failure)           V <sub>Rd,c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure)           F <sub>Rd</sub> kN         Design resistance, independent of load direction           M <sub>Rd</sub> Nm         Design resistance, bending moment           γ <sub>M</sub> Partial safety factor for material           γ <sub>Ms</sub> Partial safety factor for material, steel failure           γ <sub>Mp</sub> Partial safety factor for material, pull out failure           γ <sub>Ms</sub> Partial safety factor for material, concrete cone failure           γ <sub>Msp</sub> Partial safety factor for material, splitting failure           N <sub>Sd</sub> kN         Design value of tensile actions acting on a single anchor or the fixture of anchor group           γ <sub>Sd</sub> kN         Design value of shear actions acting on a single anchor or the fixture of anchor group           γ <sub>Fe</sub> Partial safety factor for actions           N <sub>rec</sub> kN         Maximum recommended tension load           V <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, independent of load direction           f <sub>ck</sub> N/mm²         Characteristic concrete compression strength messured on cylinders	Rd, sp		
V <sub>Rd.c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure           F <sub>Rd</sub> kN         Design resistance, independent of load directioin           M <sub>Rd</sub> Nm         Design resistance, bending moment           γ <sub>M</sub> Partial safety factor for material           γ <sub>Ms</sub> Partial safety factor for material, steel failure           γ <sub>Mp</sub> Partial safety factor for material, pull out failure           γ <sub>Msp</sub> Partial safety factor for material, concrete cone failure           γ <sub>Msp</sub> Partial safety factor for material, splitting failure           N <sub>sd</sub> kN         Design value of tensile actions acting on a single anchor or the fixture of anchor group           γ <sub>Sd</sub> kN         Design value of shear actions acting on a single anchor or the fixture of anchor group           γ <sub>f</sub> Partial safety factor for actions           N <sub>rec</sub> kN         Maximum recommended tension load           V <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, independent of load direction           f <sub>ck</sub> N/mm²         Characteristic concrete compression strength messured on cylinders	Rd		
V <sub>Rd.c</sub> kN         Design resistance, shear (concrete pryout failure, concrete edge failure           F <sub>Rd</sub> kN         Design resistance, independent of load directioin           M <sub>Rd</sub> Nm         Design resistance, bending moment           γ <sub>M</sub> Partial safety factor for material           γ <sub>Ms</sub> Partial safety factor for material, steel failure           γ <sub>Mp</sub> Partial safety factor for material, pull out failure           γ <sub>Msp</sub> Partial safety factor for material, concrete cone failure           γ <sub>Msp</sub> Partial safety factor for material, splitting failure           N <sub>sd</sub> kN         Design value of tensile actions acting on a single anchor or the fixture of anchor group           γ <sub>Sd</sub> kN         Design value of shear actions acting on a single anchor or the fixture of anchor group           γ <sub>f</sub> Partial safety factor for actions           N <sub>rec</sub> kN         Maximum recommended tension load           V <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, independent of load direction           f <sub>ck</sub> N/mm²         Characteristic concrete compression strength messured on cylinders	Rd, s		
M <sub>Rd</sub> Nm         Design resistance, bending moment           γ <sub>M</sub> Partial safety factor for material           γ <sub>Mp</sub> Partial safety factor for material, steel failure           γ <sub>Mp</sub> Partial safety factor for material, pull out failure           γ <sub>Msp</sub> Partial safety factor for material, concrete cone failure           γ <sub>Msp</sub> Partial safety factor for material, splitting failure           N <sub>Sd</sub> kN           Design value of tensile actions acting on a single anchor or the fixture or anchor group           γ <sub>Sd</sub> kN           Design value of shear actions acting on a single anchor or the fixture or anchor group           γ <sub>f</sub> Partial safety factor for actions           N <sub>rec</sub> kN           Maximum recommended tension load           V <sub>rec</sub> kN           Maximum recommended shear load           F <sub>rec</sub> kN           Maximum recommended load, independent of load direction           f <sub>ck</sub> N/rmm²           Characteristic concrete compression strength messured on cylinders	Rd, c		
γ <sub>M</sub> Partial safety factor for material           γ <sub>Ms</sub> Partial safety factor for material, steel failure           γ <sub>Mp</sub> Partial safety factor for material, pull out failure           γ <sub>Mc</sub> Partial safety factor for material, concrete cone failure           γ <sub>Msp</sub> Partial safety factor for material, splitting failure           N <sub>sd</sub> kN         Design value of tensile actions acting on a single anchor or the fixture of anchor group           γ <sub>sd</sub> kN         Design value of shear actions acting on a single anchor or the fixture of anchor group           γ <sub>f</sub> Partial safety factor for actions           N <sub>nec</sub> kN         Maximum recommended tension load           V <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, independent of load direction           f <sub>ck</sub> N/mm²         Characteristic concrete compression strength messured on cylinders	Rd		
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γ <sub>Mp</sub> Partial safety factor for material, pull out failure           γ <sub>Mc</sub> Partial safety factor for material, concrete cone failure           γ <sub>Msp</sub> Partial safety factor for material, splitting failure           N <sub>Sd</sub> kN         Design value of tensile actions acting on a single anchor or the fixture of anchor group           γ <sub>Sd</sub> kN         Design value of shear actions acting on a single anchor or the fixture of anchor group           γ <sub>f</sub> Partial safety factor for actions           N <sub>rec</sub> kN         Maximum recommended tension load           V <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, independent of load direction           f <sub>ck</sub> N/mm²         Characteristic concrete compression strength messured on cylinders			
γ <sub>Mc</sub> Partial safety factor for material, concrete cone failure           γ <sub>Msp</sub> Partial safety factor for material, splitting failure           N <sub>Sd</sub> kN         Design value of tensile actions acting on a single anchor or the fixture of anchor group           γ <sub>Sd</sub> kN         Design value of shear actions acting on a single anchor or the fixture of anchor group           γ <sub>f</sub> Partial safety factor for actions           N <sub>rec</sub> kN         Maximum recommended tension load           V <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, independent of load direction           f <sub>ck</sub> N/mm²         Characteristic concrete compression strength messured on cylinders			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Иp		
N <sub>sd</sub> kN         Design value of tensile actions acting on a single anchor or the fixture of anchor group           V <sub>sd</sub> kN         Design value of shear actions acting on a single anchor or the fixture of anchor group           γ <sub>f</sub> Partial safety factor for actions           N <sub>rec</sub> kN         Maximum recommended tension load           V <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, independent of load direction           f <sub>ck</sub> N/mm²         Characteristic concrete compression strength messured on cylinders	Ис		-
IN <sub>sd</sub> KIN         anchor group           V <sub>sd</sub> kN         Design value of shear actions acting on a single anchor or the fixture of anchor group           γ <sub>f</sub> Partial safety factor for actions           N <sub>rec</sub> kN         Maximum recommended tension load           V <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, independent of load direction           f <sub>ck</sub> N/mm²         Characteristic concrete compression strength messured on cylinders	Msp		<u> </u>
V <sub>sd</sub>	Sd	kN	
$\begin{array}{c cccc} v_{sd} & KN & \text{anchor group} \\ \gamma_{f} & \text{Partial safety factor for actions} \\ N_{rec} & kN & \text{Maximum recommended tension load} \\ \hline V_{rec} & kN & \text{Maximum recommended shear load} \\ \hline F_{rec} & kN & \text{Maximum recommended load, independent of load direction} \\ \hline f_{ck} & N/mm^{2} & \text{Characteristic concrete compression strength messured on cylinders} \end{array}$			Design value of shear actions acting on a single anchor or the fixture of an
	Sd	kIN	
$ \begin{array}{c ccc} N_{rec} & kN & Maximum\ recommended\ tension\ load \\ \hline V_{rec} & kN & Maximum\ recommended\ shear\ load \\ \hline F_{rec} & kN & Maximum\ recommended\ load,\ independent\ of\ load\ direction \\ \hline f_{ck} & N/mm^2 & Characteristic\ concrete\ compression\ strength\ messured\ on\ cylinders \\ \hline \end{array} $			Partial safety factor for actions
V <sub>rec</sub> kN         Maximum recommended shear load           F <sub>rec</sub> kN         Maximum recommended load, independent of load direction           f <sub>ck</sub> N/mm²         Characteristic concrete compression strength messured on cylinders	rec	kN	Maximum recommended tension load
F <sub>rec</sub> kN Maximum recommended load, independent of load direction f <sub>ck</sub> N/mm² Characteristic concrete compression strength messured on cylinders	rec	kN	Maximum recommended shear load
f <sub>ck</sub> N/mm <sup>2</sup> Characteristic concrete compression strength messured on cylinders	rec	kN	Maximum recommended load, independent of load direction
		V/mm²	Characteristic concrete compression strength messured on cylinders
		V/mm²	
F <sub>yk</sub> N/mm <sup>2</sup> Characteristic steel yield strength	vk N		
F <sub>uk</sub> N/mm <sup>2</sup> Characteristic steel ultimate tensile strength		V/mm²	
<del></del>			



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