

1. Identificación del producto / Identification of the product: DESA-TORK ULTRA

Descripción Description	Código Code
DESA-TORK ULTRA Ø6x45	25020604
DESA-TORK ULTRA Ø6x60	25020606
DESA-TORK ULTRA Ø6x80	25020608
DESA-TORK ULTRA Ø8x65	25020806
DESA-TORK ULTRA Ø8x75	25020807
DESA-TORK ULTRA Ø8x90	25020809
DESA-TORK ULTRA Ø8x110	25020811
DESA-TORK ULTRA Ø10x65	25021006
DESA-TORK ULTRA Ø10x75	25021007
DESA-TORK ULTRA Ø10x85	25021008
DESA-TORK ULTRA Ø10x100	25021010
DESA-TORK ULTRA Ø10x120	25021012
DESA-TORK ULTRA Ø10x140	25021014
DESA-TORK ULTRA Ø14x115	25021411
DESA-TORK ULTRA Ø14x135	25021413

2. Uso o usos previstos del producto de construcción / Intended use or uses of the construction product

Tipo de producto/ Generic type	Anclaje metálico para uso en hormigón Metallic Anchor for use in concrete
Material Base/Base material	Hormigón no fisurado y fisurado C20/25 a C50/60 según EN 206-1 un-cracked and cracked concrete C20/25 to C50/60 acc. to EN 206-1
Material	Acero al carbono estampado en frío, galvanizado de acuerdo con EN ISO 4042 Zn5 Carbon steel wire rod cold forged, zinc coated according to EN ISO 4042 Zn5
Durabilidad / Durability	condiciones internas secas / internal dry conditions
Carga / Loading	Estática, quasi-estática, sísmica / static, quasi-static, seismic
Resistencia al fuego / Fire Resistance	R120
Reacción al fuego / Fire Reaction	A1 according to EN13501-1

3. Nombre o marca registrados y dirección del fabricante según lo dispuesto en el artículo 11, apartado 5 / Name, registered trade name or registered trade marks and contact address of the manufacturer as required pursuant to article 11(5):

Grupodesa Fasteners, S.A.U. | C/ Basters, 29 Pol. Ind. Palau de Reig | 43800 Valls - Tarragona (España)

4. En su caso, nombre y dirección de contacto del representante autorizado cuyo mandato abarca las tareas especificadas en el artículo 12, apartado 2 / Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in article 12 (2):

No aplica / Not apply

5. Sistema o sistemas de evaluación y verificación de la constancia de las prestaciones del producto de construcción tal y como figura en el anexo V / System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:

Sistema 1 / System 1

6.a En caso de declaración de prestaciones relativa a un producto de construcción cubierto por una norma armonizada / In case of the declaration of performance concerning a construction product cover by a harmonised standard:

No aplica / Not apply

6.b En caso de declaración de prestaciones relativa a un producto de construcción para el que se ha emitido una evaluación técnica europea / In case of the declaration of performance concerning a construction product for which a European Technical Assessment has been issued:

Nombre y número de identificación de Organismo de Evaluación Técnica / Name and identification number of the Technical Assessment Body	1219 - Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)
Número de referencia de la evaluación técnica europea / Reference number of the European Technical Assessment	EAD 330232-01-0601
Número de referencia del documento de evaluación europeo / Reference number of the European Assessment Document	ETA-23/0715
Certificado de constancia de prestaciones (certificado de conformidad) emitido por / Certificate of constancy of performance (certificate of conformity) issued by	1219-CPR-0395 IETcc

7. Prestaciones declaradas / Declared performance:

Declaración de prestaciones en base a EAD 330232-01-0601 Método de diseño A EN 1992-4 / Declared performances according to EAD 330232-01-0601 design method A EN 1992-4

Características esenciales Resistencia mecánica y estabilidad Essential characteristics Mechanical Resistance and stability	Prestaciones Performance
resistencia característica bajo cargas estáticas o cuasi estáticas Characteristic resistance under Static or quasi static loads	ETA 23/0715 annex C1, C2, C5, C6
Valores de desplazamiento bajo cargas estáticas o cuasi estáticas Displacement values under Static or quasi static loads	ETA 23/0715 annex C4, C7
resistencia característica bajo cargas sísmicas C1 Characteristic resistance under seismic loads C1	ETA 23/0715 annex C8
resistencia característica bajo cargas sísmicas C2 y desplazamiento Characteristic resistance under seismic loads C2 and displacement	ETA 23/0715 annex C9

Características esenciales Seguridad en caso de incendio Essential characteristics Safety in case of safety	Prestaciones Performance
Resistance to fire	ETA 23/0715 annex D1, D2
Reacción al fuego Fire Reaction	A1

8. Le informamos que Grupodesa Fasteners S.A.U se clasifica en el marco de la Directiva Reach EC 1907/2006 como usuario intermedio. El producto indicado no contiene sustancias clasificadas como SVHC altamente preocupantes de acuerdo con la Lista de candidatas propuesta por ECHA en una concentración igual o superior al 0,1% (peso/peso). El artículo 31 no es aplicable en estos productos / We inform you that Grupodesa Fasteners SAU is classified in the EC 1907/2006 Reach Directive as a Downstream-user of substances. The product supplied does not contain substances classified as SVHC according to the Candidate List in a concentration equal or greater than 0.1% (weight / weight). Article 31 is not applicable to the present product.
9. **Las prestaciones del producto identificado en los puntos 1 y 2 son conformes con las prestaciones declaradas en el punto 9. La presente declaración de prestaciones se emite bajo la sola responsabilidad del fabricante identificado en el punto 4. / The performances of the product identified in point 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.**

Firmado por y en nombre del fabricante / Signed for and on behalf of the manufacturer by:

Nombre y Cargo / Name and functions	Lugar y fecha de emisión / Place and date of issue	Firma / Signature
José Maria Vidal Via (CEO)	Valls, 05 de marzo 2024	

Tablas anexos a continuación | Annexes tables below:

Annex C1

Characteristic values of resistance to tension loads of design method A			Performance						
			6		8		10		
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	40	55	50	60	60	70	85
Tension loads: steel failure									
$N_{Rk,s}$	Tension steel characteristic resistance:	[kN]	18.7		32.7		51.2		
γ_{Ms}	Partial safety factor: ¹⁾	[-]	1.5		1.5		1.5		
Tension loads: pull-out failure in concrete									
$N_{Rk,p,ucr}$	Tension characteristic resistance in C20/25 uncracked concrete:	[kN]	6.0	9.0	12.5 ²⁾	12.0 ²⁾	22.0 ²⁾	20.0 ²⁾	34.0 ²⁾
$N_{Rk,p,cr}$	Tension characteristic resistance in C20/25 cracked concrete:	[kN]	3.0	6.0	6.0	9.0	14.0 ²⁾	12.0	24.0 ²⁾
ψ_c	C30/37	[-]	1.16	1.22	1.16	1.08	1.14	1.04	1.18
ψ_c	C40/45	[-]	1.29	1.41	1.28	1.15	1.25	1.07	1.33
ψ_c	C50/60	[-]	1.40	1.55	1.39	1.19	1.34	1.09	1.46
Tension loads: concrete cone and splitting failure									
γ_{inst}	Installation safety factor: ¹⁾	[-]	1.2	1.2	1.2	1.2	1.2	1.2	1.0
h_{ef}	Effective embedment depth:	[mm]	29	42	37	45	44	52	65
$k_{ucr,N}$	Factor for uncracked concrete:	[-]	11.0						
$N_{Rk,c,ucr}^0$	Tension characteristic resistance in C20/25 uncracked concrete: ³⁾	[kN]	7.7	13.4	11.1	14.8	14.4	18.4	25.8
$k_{cr,N}$	Factor for cracked concrete:	[-]	7.7						
$N_{Rk,c,cr}^0$	Tension characteristic resistance in C20/25 cracked concrete: ³⁾	[kN]	5.4	9.4	7.8	10.4	10.1	12.9	18.0
$s_{cr,N}$	Critical spacing:	[mm]	3.0 x h_{ef}						
$c_{cr,N}$	Critical edge distance:	[mm]	1.5 x h_{ef}						
$s_{cr,sp}$	Critical spacing (splitting):	[mm]	3.0 x h_{ef}						
$c_{cr,sp}$	Critical edge distance (splitting):	[mm]	1.5 x h_{ef}						

- ¹⁾ In absence of other national regulations
²⁾ Pull-out failure is not decisive ($N_{Rk,c}^0 < N_{Rk,p}$)
³⁾ Equation 7.2 from EN 1992-4:2018

Annex C2:

Characteristic values of resistance to tension loads of design method A			Performance			
			12		14	
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	75	105	75	110
Tension loads: steel failure						
$N_{Rk,s}$	Tension steel characteristic resistance:	[kN]	80.6		115.9	
γ_{Ms}	Partial safety factor: ¹⁾	[-]	1.5		1.5	
Tension loads: pull-out failure in concrete						
$N_{Rk,p,ucr}$	Tension characteristic resistance in C20/25 uncracked concrete:	[kN]	24.0 ²⁾	40.0 ²⁾	30.0 ²⁾	40.0 ²⁾
$N_{Rk,p,cr}$	Tension characteristic resistance in C20/25 cracked concrete:	[kN]	19.0 ²⁾	32.0 ²⁾	20.0 ²⁾	30.0 ²⁾
ψ_c	C30/37	[-]	1.10	1.08	1.13	1.04
ψ_c	C40/45	[-]	1.17	1.15	1.24	1.07
ψ_c	C50/60	[-]	1.23	1.20	1.33	1.09
Tension loads: concrete cone and splitting failure						
γ_{ins}	Installation safety factor: ¹⁾	[-]	1.2	1.0	1.2	1.0
h_{ef}	Effective embedment depth:	[mm]	57	82	56	86
$k_{ucr,N}$	Factor for uncracked concrete:	[-]	11.0			
$N_{Rk,c,ucr}^0$	Tension characteristic resistance in C20/25 uncracked concrete: ³⁾	[kN]	21.2	36.5	20.6	39.2
$k_{cr,N}$	Factor for cracked concrete:	[-]	7.7			
$N_{Rk,c,cr}^0$	Tension characteristic resistance in C20/25 cracked concrete: ³⁾	[kN]	14.8	25.6	14.4	27.5
$s_{cr,N}$	Critical spacing:	[mm]	3.0 x h_{ef}			
$c_{cr,N}$	Critical edge distance:	[mm]	1.5 x h_{ef}			
$s_{cr,sp}$	Critical spacing (splitting):	[mm]	3.0 x h_{ef}			
$c_{cr,sp}$	Critical edge distance (splitting):	[mm]	1.5 x h_{ef}			

- ¹⁾ In absence of other national regulations
²⁾ Pull-out failure is not decisive ($N_{Rk,c}^0 < N_{Rk,p}$)
³⁾ Equation 7.2 from EN 1992-4:2018

Annex C3

Characteristic values of resistance to tension loads of design method A			Performance					
			6		8		10	
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	40	55	50	60	70	85
Tension loads: steel failure								
$N_{Rk,s}$	Tension steel characteristic resistance:	[kN]	17.0		33.5		54.3	
γ_{Ms}	Partial safety factor: ¹⁾	[-]	1.5		1.5		1.5	
Tension loads: pull-out failure in concrete								
$N_{Rk,p,ucr}$	Tension characteristic resistance in C20/25 uncracked concrete:	[kN]	6.0	13.0 ²⁾	11.0 ²⁾	17.0 ²⁾	22.0 ²⁾	32.0 ²⁾
$N_{Rk,p,cr}$	Tension characteristic resistance in C20/25 cracked concrete:	[kN]	2.0	11.0 ²⁾	7.5 ²⁾	12.0 ²⁾	17.0 ²⁾	24.0 ²⁾
ψ_c	C30/37	[-]	1.09	1.11	1.09	1.12	1.09	1.13
ψ_c	C40/45	[-]	1.16	1.20	1.16	1.21	1.16	1.23
ψ_c	C50/60	[-]	1.22	1.27	1.21	1.28	1.22	1.31
Tension loads: concrete cone and splitting failure								
γ_{ins}	Installation safety factor: ¹⁾	[-]	1.2	1.2	1.2	1.2	1.2	1.2
h_{ef}	Effective embedment depth:	[mm]	29	42	37	45	52	65
$k_{ucr,N}$	Factor for uncracked concrete:	[-]	11.0					
$N^0_{Rk,c,ucr}$	Tension characteristic resistance in C20/25 uncracked concrete: ³⁾	[kN]	7.7	13.4	11.1	14.8	18.4	25.8
$k_{cr,N}$	Factor for cracked concrete:	[-]	7.7					
$N^0_{Rk,c,cr}$	Tension characteristic resistance in C20/25 cracked concrete: ³⁾	[kN]	5.4	9.4	7.8	10.4	12.9	18.0
$s_{cr,N}$	Critical spacing:	[mm]	3.0 x h_{ef}					
$c_{cr,N}$	Critical edge distance:	[mm]	1.5 x h_{ef}					
$s_{cr,sp}$	Critical spacing (splitting):	[mm]	3.0 x h_{ef}					
$c_{cr,sp}$	Critical edge distance (splitting):	[mm]	1.5 x h_{ef}					

¹⁾ In absence of other national regulations

²⁾ Pull-out failure is not decisive ($N^0_{Rk,c} < N_{Rk,p}$)

³⁾ Equation 7.2 from EN 1992-4:2018

Annex C4:

Characteristic values of displacements under tension loads of design method A			Performance						
			6		8		10		
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	40	55	50	60	60	70	85
Displacements under tension loads in uncracked concrete									
N	Service tension load in uncracked concrete C20/25 to C50/60:	[kN]	2.4	3.6	4.4	4.8	5.7	9.5	12.3
δ_{N0}	Short term displacement under tension loads:	[mm]	0.06	0.40	0.08	0.40	0.09	0.40	0.12
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	0.30	1.00	0.35	1.10	0.40	1.40	0.55
Displacements under tension loads in cracked concrete									
N	Service tension load in cracked concrete C20/25 to C50/60:	[kN]	1.2	2.4	2.5	3.6	4.0	5.7	8.6
δ_{N0}	Short term displacement under tension loads:	[mm]	0.10	0.60	0.12	0.70	0.15	0.50	0.17
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	1.10	1.40	1.20	1.20	1.25	1.40	0.55

Characteristic values of displacements under tension loads of design method A			Performance			
			12		14	
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	75	105	75	110
Displacements under tension loads in uncracked concrete						
N	Service tension load in uncracked concrete C20/25 to C50/60:	[kN]	11.3	18.1	8.2	19.0
δ_{N0}	Short term displacement under tension loads:	[mm]	0.08	0.10	0.10	0.90
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	0.40	0.40	0.45	1.40
Displacements under tension loads in cracked concrete						
N	Service tension load in cracked concrete C20/25 to C50/60:	[kN]	7.7	13.3	5.7	11.9
δ_{N0}	Short term displacement under tension loads:	[mm]	0.13	0.15	0.20	0.60
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	1.25	1.35	1.32	1.20

Annex C5:

Characteristic values of resistance to shear loads			Performance						
			6		8		10		
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	40	55	50	60	60	70	85
Shear loads: steel failure without lever arm									
$V_{Rk,s}$	Shear steel characteristic resistance:	[kN]	9.3	7.5	16.3			25.6	
k_7	k_7 factor: ¹⁾	[-]	0.8		0.8			0.8	
γ_{Ms}	Partial safety factor: ²⁾	[-]	1.25		1.25			1.25	
Shear loads: steel failure with lever arm									
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	15.2		35.3			69.3	
γ_{Ms}	Partial safety factor: ²⁾	[-]	1.25		1.25			1.25	
Shear loads: concrete pryout failure									
k_8	k_8 factor:	[-]	1.0	1.0	1.2	1.0	1.0	1.0	2.0
γ_{inst}	Installation safety factor: ²⁾	[-]	1.0		1.0			1.0	
Shear loads: concrete edge failure									
l_f	Effective anchorage depth under shear loads:	[mm]	29	42	37	45	44	52	65
d_{nom}	Nominal outer diameter of screw:	[mm]	6	6	8	8	10	10	10
γ_{inst}	Installation safety factor: ²⁾	[-]	1.0		1.0			1.0	

¹⁾ The diameter of the clearance hole does not meet the values given in EN 1992-4 Table 6.1. However, the group resistance under shear loading has been verified in the assessment through testing and accounted for in the factor k_7 .

²⁾ In absence of other national regulations.

Characteristic values of resistance to shear loads			Performance			
			12		14	
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	75	105	75	110
Shear loads: steel failure without lever arm						
$V_{Rk,s}$	Shear steel characteristic resistance:	[kN]	40.3		57.9	
k_7	k_7 factor: ¹⁾	[-]	0.8		0.8	
γ_{Ms}	Partial safety factor: ²⁾	[-]	1.25		1.25	
Shear loads: steel failure with lever arm						
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	137.1		235.9	
γ_{Ms}	Partial safety factor: ²⁾	[-]	1.25		1.25	
Shear loads: concrete pryout failure						
k_8	k_8 factor:	[-]	1.5	2.0	1.6	2.0
γ_{inst}	Installation safety factor: ²⁾	[-]	1.0		1.0	
Shear loads: concrete edge failure						
l_f	Effective anchorage depth under shear loads:	[mm]	57	82	56	86
d_{nom}	Nominal outer diameter of screw:	[mm]	12	12	14	14
γ_{inst}	Installation safety factor: ²⁾	[-]	1.0		1.0	

¹⁾ The diameter of the clearance hole does not meet the values given in EN 1992-4 Table 6.1. However, the group resistance under shear loading has been verified in the assessment through testing and accounted for in the factor k_7 .

²⁾ In absence of other national regulations.

Annex C7:

Characteristic values of displacements under shear loads of design method A			Performances						
			6		8		10		
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	40	55	50	60	60	70	85
Displacements under shear loads in uncracked concrete									
V	Service shear load in uncracked concrete C20/25 to C50/60:	[kN]	3.0	3.6	4.4	4.8	5.7	9.5	12.3
δ_{V0}	Short term displacement under shear loads:	[mm]	0.47	0.4	0.50	0.40	0.40	0.40	0.80
$\delta_{V\infty}$	Long term displacement under shear loads:	[mm]	0.70	1.0	0.75	1.10	0.60	1.40	1.20
Displacements under shear loads in cracked concrete									
V	Service shear load in cracked concrete C20/25 to C50/60:	[kN]	2.1	2.4	3.1	3.6	4.0	5.7	8.6
δ_{V0}	Short term displacement under shear loads:	[mm]	0.40	0.60	0.45	0.70	0.50	0.50	0.6
$\delta_{V\infty}$	Long term displacement under shear loads:	[mm]	0.60	1.40	0.67	1.20	0.75	1.40	0.90

Characteristic values of displacements under shear loads of design method A			Performances			
			12		14	
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	75	105	75	110
Displacements under shear loads in uncracked concrete						
V	Service shear load in uncracked concrete C20/25 to C50/60:	[kN]	8.4	17.4	8.2	19.0
δ_{V0}	Short term displacement under shear loads:	[mm]	1.00	1.10	0.55	0.90
$\delta_{V\infty}$	Long term displacement under shear loads:	[mm]	1.50	1.80	0.82	1.4
Displacements under shear loads in cracked concrete						
V	Service shear load in cracked concrete C20/25 to C50/60:	[kN]	5.9	12.2	5.7	11.9
δ_{V0}	Short term displacement under shear loads:	[mm]	0.85	1.00	0.50	0.60
$\delta_{V\infty}$	Long term displacement under shear loads:	[mm]	1.20	1.50	0.75	1.20

¹⁾ No Performance Determined (NPD)

Annex C8:

Essential characteristics for seismic performance category C1			Performances					
			6	8	10	12	14	
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	40	55	60	85	105	110
Steel failure for tension and shear loads								
$N_{Rk,s,C1}$	Characteristic resistance:	[kN]	18.7	32.7	51.2	80.6	115.9	
γ_{Ms}	Partial safety factor ¹⁾ :	[-]	1.5	1.5	1.5	1.5	1.5	1.5
$V_{Rk,s,C1}$	Characteristic resistance:	[kN]	6.4	7.5	16.3	24.3	39.9	57.9
γ_{Ms}	Partial safety factor ¹⁾ :	[-]	1.25	1.25	1.25	1.25	1.25	1.25
Pull out failure								
$N_{Rk,p,C1}$	Characteristic resistance in cracked concrete:	[kN]	2.9	5.6	9.0	24.0	24.3	30.0
γ_{inst}	Robustness:	[-]	1.2	1.2	1.2	1.0	1.0	1.0
Concrete cone failure								
h_{ef}	Effective embedment depth:	[mm]	29	42	45	65	82	86
$s_{cr,N}$	Concrete Spacing:	[mm]	87	126	135	195	246	258
$c_{cr,N}$	cone failure Edge distance:	[mm]	43	63	67	98	123	129
γ_{inst}	Installation safety factor:	[-]	1.2	1.2	1.2	1.0	1.0	1.0
Concrete pry-out failure								
k_a	Pry-out factor:	[-]	1.0	1.0	1.0	2.0	2.0	2.0
γ_{inst}	Installation safety factor:	[-]	1.0	1.0	1.0	1.0	1.0	1.0
Concrete edge failure								
$l_f = h_{ef}$	Effective length of fastener under shear loads:	[mm]	29	42	45	65	82	86
d_{nom}	Nominal outer diameter of screw:	[mm]	6	6	8	10	12	14
γ_{inst}	Installation safety factor:	[-]	1.0	1.0	1.0	1.0	1.0	1.0

¹⁾ In absence of other national regulations

Annex C9:

Essential characteristics for seismic performance category C2			Performances				estabi
			8	10	12	14	
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	60	85	105	110	
Steel failure for tension and shear loads							
$N_{Rk,s,C2}$	Characteristic resistance:	[kN]	32.7	51.2	80.6	115.9	
γ_{Ms}	Partial safety factor ¹⁾ :	[--]	1.5	1.5	1.5	1.5	
$V_{Rk,s,C2}$	Characteristic resistance:	[kN]	13.7	16.1	28.3	41.1	
γ_{Ms}	Partial safety factor ¹⁾ :	[--]	1.25	1.25	1.25	1.25	
Pull out failure							
$N_{Rk,p,C2}$	Characteristic resistance in cracked concrete:	[kN]	5.2	11.0	3.2	9.6	
γ_{inst}	Robustness:	[--]	1.2	1.0	1.0	1.0	
Concrete cone failure							
h_{ef}	Effective embedment depth:	[mm]	45	65	82	86	
$s_{cr,N}$	Concrete Spacing:	[mm]	135	195	246	258	
$c_{cr,N}$	cone failure Edge distance:	[mm]	68	98	123	129	
γ_{inst}	Installation safety factor:	[--]	1.2	1.0	1.0	1.0	
Concrete pry-out failure							
k_8	Pry-out factor:	[--]	1.0	2.0	2.0	2.0	
γ_{inst}	Installation safety factor:	[--]	1.0	1.0	1.0	1.0	
Concrete edge failure							
$l_f = h_{ef}$	Effective length of fastener under shear loads:	[mm]	45	65	82	86	
d_{nom}	Nominal outer diameter of screw:	[mm]	8.0	10.0	12.0	14.0	
γ_{inst}	Installation safety factor:	[--]	1.0	1.0	1.0	1.0	
Displacements							
$\bar{\Delta}_{N,C2} (DLS)$	Displacement at	[mm]	0.15	0.35	0.65	0.73	
$\bar{\Delta}_{V,C2} (DLS)$	Damage Limitation State: ²⁾	[mm]	4.15	5.16	5.65	5.67	
$\bar{\Delta}_{N,C2} (ULS)$	Displacement at	[mm]	1.41	1.11	4.66	2.06	
$\bar{\Delta}_{V,C2} (ULS)$	Ultimate Limitation State: ²⁾	[mm]	8.27	7.90	12.14	7.90	

DLS: Damage Limitation State: see EN 1992-4, 2.2.1)

ULS: Ultimate Limitation State: see EN 1992-4 2.2.1)

Annex D1:

Fire resistance duration = 30 minutes			Performances										
			6		8		10		12		14		
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	40	55	50	60	60	70	85	75	105	75	110
Tension loads, steel failure													
$N_{Rk,s,fi,30}$	Characteristic resistance:	[kN]	0.23	0.23	0.41	0.41	0.95	0.95	0.95	2.02	2.02	2.91	2.91
Pull-out failure													
$N_{Rk,p,fi,30}$	Character. resistance in concrete:	[kN]	0.77	1.43	1.58	2.28	3.66	3.60	6.09	4.85	8.38	5.04	7.43
Concrete cone failure ¹⁾													
$N_{Rk,c,fi,30}$	Character. resistance in concrete:	[kN]	0.78	1.97	1.43	2.34	2.21	3.36	5.86	4.22	10.48	4.04	11.81
Shear loads steel failure without lever arm													
$V_{Rk,s,fi,30}$	Characteristic resistance	[kN]	0.23	0.23	0.41	0.41	0.95	0.95	0.95	2.02	2.02	2.91	2.91
Shear loads, steel failure with lever arm													
$M_{Rk,s,fi,30}$	Characteristic bending resistance:	[Nm]	0.19	0.19	0.44	0.44	1.29	1.29	1.29	3.43	3.43	5.93	5.93

Fire resistance duration = 60 minutes			Performances										
			6		8		10			12		14	
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	40	55	50	60	60	70	85	75	105	75	110
Tension loads, steel failure													
$N_{Rk,s,fi,60}$	Characteristic resistance:	[kN]	0.21	0.21	0.37	0.37	0.83	0.83	0.83	1.51	1.51	2.18	2.18
Pull-out failure													
$N_{Rk,p,fi,60}$	Character. resistance in concrete:	[kN]	0.77	1.43	1.58	2.28	3.66	3.60	6.09	4.85	8.38	5.04	7.43
Concrete cone failure ¹⁾													
$N_{Rk,c,fi,60}$	Character. resistance in concrete:	[kN]	0.78	1.97	1.43	2.34	2.21	3.36	5.86	4.22	10.48	4.04	11.81
Shear loads steel failure without lever arm													
$V_{Rk,s,fi,60}$	Characteristic resistance:	[kN]	0.21	0.21	0.37	0.37	0.83	0.83	0.83	1.51	1.51	2.18	2.18
Shear loads, steel failure with lever arm													
$M_{Rk,s,fi,60}$	Characteristic bending resistance:	[Nm]	0.17	0.17	0.40	0.40	1.12	1.12	1.12	2.57	2.57	4.45	4.45

¹⁾ As a rule, splitting failure can be neglected when cracked concrete and reinforcement is assumed.

Fire resistance duration = 90 minutes			Performances										
			6		8		10			12		14	
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	40	55	50	60	60	70	85	75	105	75	110
Tension loads, steel failure													
$N_{Rk,s,fi,90}$	Characteristic resistance:	[kN]	0.16	0.16	0.29	0.29	0.64	0.64	0.64	1.31	1.31	1.89	1.89
Pull-out failure													
$N_{Rk,p,fi,90}$	Character. resistance in concrete:	[kN]	0.77	1.43	1.58	2.28	3.66	3.60	6.09	4.85	8.38	5.04	7.43
Concrete cone failure ¹⁾													
$N_{Rk,c,fi,90}$	Character. resistance in concrete:	[kN]	0.78	1.97	1.43	2.34	2.21	3.36	5.86	4.22	10.48	4.04	11.81
Shear loads steel failure without lever arm													
$V_{Rk,s,fi,90}$	Characteristic resistance:	[kN]	0.16	0.16	0.29	0.29	0.64	0.64	0.64	1.31	1.31	1.89	1.89
Shear loads, steel failure with lever arm													
$M_{Rk,s,fi,90}$	Characteristic bending resistance:	[Nm]	0.13	0.13	0.31	0.31	0.86	0.86	0.86	2.23	2.23	3.85	3.85

Fire resistance duration = 120 minutes			Performances											
			6		8		10			12		14		
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	40	55	50	60	60	70	85	75	105	75	110	
Tension loads, steel failure														
$N_{Rk,s,fi,120}$	Characteristic resistance:	[kN]	0.11	0.11	0.20	0.20	0.51	0.51	0.51	1.01	1.01	1.45	1.45	
Pull-out failure														
$N_{Rk,p,fi,120}$	Character. resistance in concrete:	[kN]	0.62	1.14	1.27	1.82	2.93	2.88	4.87	3.88	6.70	4.03	5.94	
Concrete cone failure ¹⁾														
$N_{Rk,c,fi,120}$	Character. resistance in concrete:	[kN]	0.62	1.57	1.15	1.87	1.77	2.69	4.69	3.38	8.39	3.23	9.45	
Shear loads steel failure without lever arm														
$V_{Rk,s,fi,120}$	Characteristic resistance:	[kN]	0.11	0.11	0.20	0.20	0.51	0.51	0.51	1.01	1.01	1.45	1.45	
Shear loads, steel failure with lever arm														
$M_{Rk,s,fi,120}$	Characteristic bending resistance:	[Nm]	0.09	0.09	0.22	0.22	0.69	0.69	0.69	1.71	1.71	2.96	2.96	

¹⁾ As a rule, splitting failure can be neglected when cracked concrete and reinforcement is assumed.