Noticia Técnica

VT-HP®
Sistema de inyección para hormigón

Características

Material

.

Advantages

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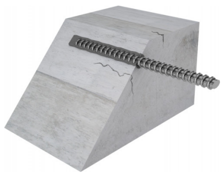
Aplicaciones

Support

.

When to use

.



Datos técnicos

Referencia

Modelo	Informacion de producto				
	Gris	Beige	Contenido [ml]	Peso [kg]	Qdad. [pcs]
VTHP420-EU	x	-	420	0.796	12

Design resistance – Tension – NRd [kN] – hef = 8d – Carbon steel 5.8

Modelo	Design resistance – h_{ef} = 8d – Carbon steel 5.8							
	Tension - N_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + LMAS M8	4.3	4.5	4.6	4.7	10.7	11.1	11.6	11.8
VT-HP + LMAS M10	7	7.3	7.5	7.7	16.7	17.4	18.1	18.4
VT-HP + LMAS M12	11.1	11.5	11.9	12.2	24.1	25.1	26	26.5
VT-HP + LMAS M16	19.6	20.4	21.2	21.6	40.6	44.6	46.3	47.2
VT-HP + LMAS M20	30.7	31.9	33.2	33.8	56.8	69	72.3	73.7
VT-HP + LMAS M24	44.2	46	47.7	48.6	74.6	90.8	95.5	97.3
VT-HP + LMAS M27	63.5	68.8	71.4	72.7	89.1	105.8	109.9	111.9
VT-HP + LMAS M30	74.4	84.9	88.2	89.8	104.3	117.6	122.1	124.3

Concrete :
1. The design loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s). The loading figures are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

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Sistema de inyección para hormigón

SIMPSON Strong-Tie®

Design resistance – Tension – NRd [kN] – hef = 12d – Carbon steel 5.8

Modelo	Design resistance – h_{ef} = 12d – Carbon steel 5.8							
	Tension - N_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + LMAS M8	6.4	6.7	6.9	7.1	12	12	12	12
VT-HP + LMAS M10	10.5	10.9	11.3	11.5	19.3	19.3	19.3	19.3
VT-HP + LMAS M12	16.6	17.2	17.9	18.2	28	28	28	28
VT-HP + LMAS M16	29.5	30.7	31.8	32.4	52	52	52	52
VT-HP + LMAS M20	46.1	47.9	49.7	50.7	81.3	81.3	81.3	81.3
VT-HP + LMAS M24	66.3	69	71.6	72.9	117.3	117.3	117.3	117.3
VT-HP + LMAS M27	99.2	103.2	107.1	109.1	152.6	153.3	153.3	153.3
VT-HP + LMAS M30	122.5	127.4	132.3	134.7	169.6	176.3	183.1	186.5

Concrete :
1. The design loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s). The loading figures are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

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SIMPSON Strong-Tie

Design resistance – Tension – NRd [kN] – hef = 8d – Stainless steel

Modelo	Design resistance – h_{ef} = 8d – Stainless steel							
	Tension - N_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + LMAS M8	4.3	4.5	4.6	4.7	10.7	11.1	11.6	11.8
VT-HP + LMAS M10	7	7.3	7.5	7.7	16.7	17.4	18.1	18.4
VT-HP + LMAS M12	11.1	11.5	11.9	12.2	24.1	25.1	26	26.5
VT-HP + LMAS M16	19.6	20.4	21.2	21.6	40.6	44.6	46.3	47.2
VT-HP + LMAS M20	30.7	31.9	33.2	60.8	56.8	69	72.3	73.7
VT-HP + LMAS M24	44.2	46	47.7	48.6	74.6	90.8	95.5	97.3
VT-HP + LMAS M27	63.5	68.8	71.4	72.7	80.4	80.4	80.4	80.4
VT-HP + LMAS M30	74.4	84.9	88.2	89.8	98.3	98.3	98.3	98.3

Threaded rod type A4-70 for M≤24 and A4-50 for M>24

Concrete :
1. The design loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s). The loading figures are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

Design resistance – Tension – NRd [kN] – hef = 12d – Stainless steel

Modelo	Design resistance – h_{ef} = 12d – Stainless steel							
	Tension - N_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + LMAS M8	6.4	6.7	6.9	7.1	13.9	13.9	13.9	13.9
VT-HP + LMAS M10	10.5	10.9	11.3	11.5	21.9	21.9	21.9	21.9
VT-HP + LMAS M12	16.6	17.2	17.9	18.2	31.6	31.6	31.6	31.6
VT-HP + LMAS M16	29.5	30.7	31.8	32.4	58.8	58.8	58.8	58.8
VT-HP + LMAS M20	46.1	47.9	49.7	91.2	91.4	91.4	91.4	91.4
VT-HP + LMAS M24	66.3	69	71.6	72.9	132.1	132.1	132.1	132.1
VT-HP + LMAS M27	80.4	80.4	80.4	80.4	80.4	80.4	80.4	80.4
VT-HP + LMAS M30	98.3	98.3	98.3	98.3	98.3	98.3	98.3	98.3

Threaded rod type A4-70 for M≤24 and A4-50 for M>24

Concrete :
1. The design loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s). The loading figures are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

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Design resistance – Shear – VRd [kN] – hef = 8d – Carbon steel 5.8

Modelo	Design resistance – h_{ef} = 8d – Carbon steel 5.8							
	Shear - V_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + LMAS M8	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
VT-HP + LMAS M10	12	12	12	12	12	12	12	12
VT-HP + LMAS M12	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
VT-HP + LMAS M16	31.2	31.2	31.2	31.2	31.2	31.2	31.2	31.2
VT-HP + LMAS M20	48.8	48.8	48.8	48.8	48.8	48.8	48.8	48.8
VT-HP + LMAS M24	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4
VT-HP + LMAS M27	92	92	92	92	92	92	92	92
VT-HP + LMAS M30	112	112	112	112	112	112	112	112

Concrete :

1. The design loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s). The loading figures are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

Design resistance – Shear – VRd [kN] – hef = 12d – Carbon steel 5.8

Modelo	Design resistance – h_{ef} = 12d – Carbon steel 5.8							
	Shear - V_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + LMAS M8	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
VT-HP + LMAS M10	12	12	12	12	12	12	12	12
VT-HP + LMAS M12	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
VT-HP + LMAS M16	31.2	31.2	31.2	31.2	31.2	31.2	31.2	31.2
VT-HP + LMAS M20	48.8	48.8	48.8	48.8	48.8	48.8	48.8	48.8
VT-HP + LMAS M24	70.4	70.4	70.4	70.4	70.4	70.4	70.4	70.4
VT-HP + LMAS M27	92	92	92	92	92	92	92	92
VT-HP + LMAS M30	112	112	112	112	112	112	112	112

Concrete :
1. The design loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s). The loading figures are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

Design resistance – Shear – VRd [kN] – hef = 8d – Stainless steel

Modelo	Design resistance – h_{ef} = 8d – Stainless steel							
	Shear - V_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + LMAS M8	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
VT-HP + LMAS M10	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8
VT-HP + LMAS M12	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
VT-HP + LMAS M16	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
VT-HP + LMAS M20	55.1	55.1	55.1	55.1	55.1	55.1	55.1	55.1
VT-HP + LMAS M24	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5
VT-HP + LMAS M27	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
VT-HP + LMAS M30	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8

Threaded rod type A4-70 for M≤24 and A4-50 for M>24

Concrete :
1. The design loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s). The loading figures are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

Design resistance – Shear – VRd [kN] – hef = 12d – Stainless steel

Modelo	Design resistance – h_{ef} = 12d – Stainless steel							
	Shear - V_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + LMAS M8	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
VT-HP + LMAS M10	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8
VT-HP + LMAS M12	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
VT-HP + LMAS M16	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
VT-HP + LMAS M20	55.1	55.1	55.1	55.1	55.1	55.1	55.1	55.1
VT-HP + LMAS M24	79.5	79.5	79.5	79.5	79.5	79.5	79.5	79.5
VT-HP + LMAS M27	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
VT-HP + LMAS M30	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8

Threaded rod type A4-70 for M≤24 and A4-50 for M>24

Concrete :
1. The design loads have been calculated using the partial safety factors for resistances stated in ETA-approval(s). The loading figures are valid for unreinforced concrete and reinforced concrete with a rebar spacing s ≥ 15 cm (any diameter) or with a rebar spacing s ≥ 10 cm, if the rebar diameter is 10mm or smaller.
2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges (c ≤ max [10 hef; 60d]) the concrete edge failure shall be checked per ETAG 001, Annex C, design method A.
3. Concrete is considered non-cracked when the tensile stress within the concrete is\sigmaL +\sigmaR ≤ 0. In the absence of detailed verification\sigmaR = 3 N/mm² can be assumed (\sigmaL equals the tensile stress within the concrete induced by external loads, anchors loads included).

Design resistance – Bending moment – MRd [Nm] – Concrete

Modelo	Design resistance – Bending moment – M_{Rd} [Nm]	
	Carbon steel 5.8	Stainless steel A4-70
VT-HP + LMAS M8	15.2	16.7
VT-HP + LMAS M10	29.6	33.3
VT-HP + LMAS M12	52	41.7
VT-HP + LMAS M16	132.8	106.4
VT-HP + LMAS M20	259.2	359
VT-HP + LMAS M24	448	502.6
VT-HP + LMAS M27	666.4	349.6
VT-HP + LMAS M30	898.4	472.7

Design resistance – Tension – NRd [kN] – Seismic performance C1/C2 – Carbon steel 5.8

Modelo	Design resistance – Tension - N_{Rd} – Seismic performance C1/C2 - Carbon steel 5.8 [kN]					
	Cracked concrete C20/25					
	h_{ef} = 8d			h_{ef} = 12d		
	Static	Category C1	Category C2	Static	Category C1	Category C2
VT-HP + LMAS M8	4.3	2.7	-	6.4	4	-
VT-HP + LMAS M10	7	4.3	-	10.5	6.5	-
VT-HP + LMAS M12	11.1	7.4	4	16.6	11.2	6
VT-HP + LMAS M16	19.6	13.2	7.1	29.5	19.8	10.7
VT-HP + LMAS M20	30.7	20.7	11.2	46.1	31	16.7
VT-HP + LMAS M24	44.2	30.5	-	66.3	45.8	-
VT-HP + LMAS M27	63.5	45.8	-	99.2	68.7	-
VT-HP + LMAS M30	74.4	56.5	-	122.5	84.8	-

Design resistance – Tension – NRd [kN] – Seismic performance C1/C2 – Stainless steel

Modelo	Design resistance – Tension - N_{Rd} – Seismic performance C1/C2 - Stainless steel [kN]					
	Cracked concrete C20/25					
	h_{ef} = 8d			h_{ef} = 12d		
	Static	Category C1	Category C2	Static	Category C1	Category C2
VT-HP + LMAS M8	4.3	2.7	-	6.4	4	-
VT-HP + LMAS M10	7	4.3	-	10.5	6.5	-
VT-HP + LMAS M12	11.1	7.4	4	16.6	11.2	6
VT-HP + LMAS M16	19.6	13.2	7.1	29.5	19.8	10.7
VT-HP + LMAS M20	30.7	20.7	11.2	46.1	31	16.7
VT-HP + LMAS M24	44.2	30.5	-	66.3	45.8	-
VT-HP + LMAS M27	63.5	45.8	-	80.4	68.7	-
VT-HP + LMAS M30	74.4	56.5	-	98.3	84.8	-
Threaded rod type A4-70 for M≤24 and A4-50 for M>24						

Design resistance – Shear – VRd [kN] – Seismic performance C1/C2 – Carbon steel 5.8

Modelo	Design resistance – Shear - V_{Rd} – Seismic performance C1/C2 - Carbon steel 5.8 [kN]					
	Cracked concrete C20/25					
	h_{ef} = 8d			h_{ef} = 12d		
	Static	Category C1	Category C2	Static	Category C1	Category C2
VT-HP + LMAS M8	7.2	2.3	-	7.2	2.5	-
VT-HP + LMAS M10	12	4.2	-	12	4.2	-
VT-HP + LMAS M12	16.8	5.9	4.1	16.8	5.9	5
VT-HP + LMAS M16	31.2	10.9	7.3	31.2	10.9	10.9
VT-HP + LMAS M20	48.8	17.1	11.4	48.8	17.1	17.1
VT-HP + LMAS M24	70.4	24.6	-	70.4	24.6	-
VT-HP + LMAS M27	92	32.2	-	92	32.2	-
VT-HP + LMAS M30	112	39.2	-	112	39.2	-

Design resistance – Shear – VRd [kN] – Seismic performance C1/C2 – Stainless steel

Modelo	Design resistance – Shear - V_{Rd} – Seismic performance C1/C2 - Stainless steel [kN]					
	Cracked concrete C20/25					
	h_{ef} = 8d			h_{ef} = 12d		
	Static	Category C1	Category C2	Static	Category C1	Category C2
VT-HP + LMAS M8	8.3	2.3	-	8.3	2.9	-
VT-HP + LMAS M10	12.8	4.4	-	12.8	4.5	-
VT-HP + LMAS M12	19.2	6.7	4.1	19.2	6.7	5.8
VT-HP + LMAS M16	35.3	12.3	7.3	35.3	12.3	10.9
VT-HP + LMAS M20	55.1	19.3	11.4	55.1	19.3	17.1
VT-HP + LMAS M24	79.5	27.8	-	79.5	27.8	-
VT-HP + LMAS M27	48.3	16.9	-	48.3	16.9	-
VT-HP + LMAS M30	58.8	29.4	-	58.8	29.4	-
Threaded rod type A4-70 for M≤24 and A4-50 for M>24						

Design resistance – Tension – NRd [kN] – hef = 8d – Carbon steel 5.8 – Rebar

Modelo	Design resistance – h_{ef} = 8d – Carbon steel 5.8							
	Tension - N_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + Ø8	4.3	4.5	4.6	4.7	10.7	11.1	11.6	11.8
VT-HP + Ø10	7	7.3	7.5	7.7	16.7	17.4	18.1	18.4
VT-HP + Ø12	11.1	11.5	11.9	12.2	24.1	25.1	26	26.5
VT-HP + Ø14	15	15.6	16.2	16.5	32.8	34.1	35.4	36.1
VT-HP + Ø16	19.6	20.4	21.2	21.6	40.6	44.6	46.3	47.2
VT-HP + Ø20	30.7	31.9	33.2	33.8	56.8	69	72.3	73.7
VT-HP + Ø25	48	49.9	51.8	52.8	79.4	96.5	103.6	105.5
VT-HP + Ø27	-	-	-	-	-	-	-	-
VT-HP + Ø28	67.1	74	76.8	78.2	94.1	113.8	118.2	120.4
VT-HP + Ø32	81.9	96.6	100.3	102.2	114.9	126.3	131.2	133.6

Design resistance – Tension – NRd [kN] – hef = 12d – Carbon steel 5.8 – Rebar

Modelo	Design resistance – h_{ef} = 12d – Carbon steel 5.8							
	Tension - N_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + Ø8	6.4	6.7	6.9	7.1	16.1	16.7	17.4	17.7
VT-HP + Ø10	10.5	10.9	11.3	11.5	25.1	26.1	27.1	27.6
VT-HP + Ø12	16.6	17.2	17.9	18.2	36.2	37.6	39.1	39.8
VT-HP + Ø14	22.6	23.5	24.4	24.8	49.2	51.2	53.2	54.2
VT-HP + Ø16	29.5	30.7	31.8	32.4	64.3	66.9	69.5	70.7
VT-HP + Ø20	46.1	47.9	49.7	50.7	100.5	104.5	108.5	110.5
VT-HP + Ø25	72	74.8	77.7	79.2	143.9	149.7	155.4	158.3
VT-HP + Ø27	-	-	-	-	-	-	-	-
VT-HP + Ø28	106.7	110.9	115.2	117.3	164.1	170.7	177.2	180.5
VT-HP + Ø32	139.3	144.9	150.5	153.3	182.2	189.5	196.8	200.4

Design resistance – Shear – VRd [kN] – hef = 8d – Carbon steel 5.8 – Rebar

Modelo	Design resistance – h_{ef} = 8d – Carbon steel 5.8							
	Shear - V_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + Ø8	8.6	8.9	9.3	9.3	9.3	9.3	9.3	9.3
VT-HP + Ø10	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
VT-HP + Ø12	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7
VT-HP + Ø14	28	28	28	28	28	28	28	28
VT-HP + Ø16	36	36	36	36	36	36	36	36
VT-HP + Ø20	56.7	56.7	56.7	56.7	56.7	56.7	56.7	56.7
VT-HP + Ø25	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7
VT-HP + Ø27	-	-	-	-	-	-	-	-
VT-HP + Ø28	110.7	110.7	110.7	110.7	110.7	110.7	110.7	110.7
VT-HP + Ø32	144.7	144.7	144.7	144.7	144.7	144.7	144.7	144.7

Design resistance – Shear – VRd [kN] – hef = 12d – Carbon steel 5.8 – Rebar

Modelo	Design resistance – h_{ef} = 12d – Carbon steel 5.8							
	Shear - V_{Rd} [kN]							
	Cracked concrete				Non-cracked concrete			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
VT-HP + Ø8	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
VT-HP + Ø10	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
VT-HP + Ø12	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7
VT-HP + Ø14	28	28	28	28	28	28	28	28
VT-HP + Ø16	36	36	36	36	36	36	36	36
VT-HP + Ø20	56.7	56.7	56.7	56.7	56.7	56.7	56.7	56.7
VT-HP + Ø25	88.7	88.7	88.7	88.7	88.7	88.7	88.7	88.7
VT-HP + Ø27	-	-	-	-	-	-	-	-
VT-HP + Ø28	110.7	110.7	110.7	110.7	110.7	110.7	110.7	110.7
VT-HP + Ø32	144.7	144.7	144.7	144.7	144.7	144.7	144.7	144.7

Design resistance – Bending moment – MRd [Nm] – Rebar

Modelo	Design resistance – Bending moment – M_{Rd} - Rebar [Nm]
	Carbon steel 5.8
VT-HP + Ø8	22
VT-HP + Ø10	43.3
VT-HP + Ø12	74.7
VT-HP + Ø14	118.7
VT-HP + Ø16	176.7
VT-HP + Ø20	345.3
VT-HP + Ø25	674.7
VT-HP + Ø27	-
VT-HP + Ø28	948
VT-HP + Ø32	1415.3

Design resistance – Tension – NRd [kN] – Seismic performance C1 – Carbon steel 5.8 – Rebar

Modelo	Design resistance – Tension – N_{Rd} – Seismic performance C1 – Carbon steel 5.8 [kN]			
	Cracked concrete C20/25			
	h_{ef} = 8d		h_{ef} = 12d	
	Static	Category C1	Static	Category C1
VT-HP + Ø8	4.3	2.7	6.4	4
VT-HP + Ø10	7	4.3	10.5	6.5
VT-HP + Ø12	11.1	7.4	16.6	11.2
VT-HP + Ø14	15	10.1	22.6	15.2
VT-HP + Ø16	19.6	13.2	29.5	19.8
VT-HP + Ø20	30.7	20.7	46.1	31
VT-HP + Ø25	48	33.1	72	49.7
VT-HP + Ø27	-	-	-	-
VT-HP + Ø28	67.1	49.2	106.7	73.9
VT-HP + Ø32	81.9	64.3	139.3	96.5

Design resistance – Shear – VRd [kN] – Seismic performance C1 – Carbon steel 5.8 – Rebar

Modelo	Design resistance – Shear – V_{Rd} – Seismic performance C1 – Carbon steel 5.8 [kN]			
	Cracked concrete C20/25			
	h_{ef} = 8d		h_{ef} = 12d	
	Static	Category C1	Static	Category C1
VT-HP + Ø8	8.6	4.6	9.3	6.3
VT-HP + Ø10	14.7	8.8	14.7	10
VT-HP + Ø12	20.7	14.2	20.7	14.2
VT-HP + Ø14	28	19.4	28	19.4
VT-HP + Ø16	36.7	25.3	36.7	25.3
VT-HP + Ø20	57.3	39.6	57.3	39.6
VT-HP + Ø25	90	61.9	90	61.9
VT-HP + Ø27	-	-	-	-
VT-HP + Ø28	113.3	77.6	113.3	77.6
VT-HP + Ø32	147.3	101.3	147.3	101.3

Instalación

Curring Schedule

Temperature of the anchorage base $T_{base\ material}$	**Working time (Gel time)** t_{gel}	**Curing time (in dry concrete)** $t_{cure,\ dry}$	**Curing time (in wet concrete)** $t_{cure,\ wet}$
0°C ≤ $T_{base\ material}$ ≤ +4°C	45 min	7 h	14 h
4°C ≤ $T_{base\ material}$ ≤ +9°C	25 min	2 h	4 h
10°C ≤ $T_{base\ material}$ ≤ +19°C	15 min	80 min	2h40 min
20°C ≤ $T_{base\ material}$ ≤ +29°C	6 min	45 min	1h30
30°C ≤ $T_{base\ material}$ ≤ +34°C	4 min	25 min	50 min
35°C ≤ $T_{base\ material}$ ≤ +39°C	2 min	20 min	40 min
+40°C	1,5 min	15 min	30 min

- **Manual Air Cleaning (MAC) for all drill hole diameters d_0 ≤ 24 mm and drill holl depth h_0 ≤ 10d :**
  - **4x blowing (hand pump)**
  - **4x brushing**
  - **4x blowing (Hand pump)**
- **Compressed Air Cleaning (CAC) for all drill hole diameters d_0 and drill hole depths :**
  - **2x blowing (min. 6 bar - oil free compressed air)**
  - **2x brushing**
  - **2x blowing (min. 6 bar - oil free compressed air)**
- **Cartridge temperature (Bond material) : +5°C to +40°C**

Perfore.

Limpie el orificio con un cepillo e insuflando aire, según lo especificado en el cartucho.

Llene entre 1/2 y 2/3 del orificio desde el fondo hacia el exterior, inyectando cada vez una dosis de producto con la boquilla.

Introduzca la varilla LMAS, girándola lentamente de izquierda a derecha. Ajústela.

Fije el anclaje una vez haya transcurrido el tiempo de solicitación.

Installation parameters – Concrete

Modelo	Installation parameters - Concrete					
	Ø drilling [d_0] [mm]	Max. fixture hole Ø [d_f] [mm]	Drilling depth (8d) [h_0=h_{ef}=8d] [mm]	Drilling depth (12d) [h_0=h_{ef}=12d] [mm]	Wrench size [SW]	Installation torque [T_{inst}] [Nm]
VT-HP + LMAS M8	10	9	64	96	13	10
VT-HP + LMAS M10	12	12	80	120	17	20
VT-HP + LMAS M12	14	14	96	144	19	40
VT-HP + LMAS M16	18	18	128	192	24	80
VT-HP + LMAS M20	24	22	160	240	30	120
VT-HP + LMAS M24	28	26	192	288	36	160
VT-HP + LMAS M27	28	30	216	324	41	180
VT-HP + LMAS M30	28	33	240	360	46	200

Spacing, edge distances and member thickness – Concrete

Modelo	Spacing, edge distance and member thickness - Concrete									
	Effective embedment depth (8d) [$h_{ef,8d}$] [mm]	Characteristic spacing for $h_{ef,8d}$ [$S_{cr,N}$] [mm]	Characteristic edge distance for $h_{ef,8d}$ [$c_{cr,N}$] [mm]	Min. member thickness for $h_{ef,8d}$ [h_{min}] [mm]	Effective embedment depth (12d) [$h_{ef,12d}$] [mm]	Characteristic spacing for $h_{ef,12d}$ [$S_{cr,N}$] [mm]	Characteristic edge distance for $h_{ef,12d}$ [$c_{cr,N}$] [mm]	Min. member thickness for $h_{ef,12d}$ [h_{min}] [mm]	Min. spacing [S_{min}] [mm]	Min. edge distance [C_{min}] [mm]
VT-HP + LMAS M8	64	192	96	100	96	288	144	126	40	40
VT-HP + LMAS M10	80	240	120	110	120	360	180	150	50	50
VT-HP + LMAS M12	96	288	144	126	144	432	216	174	60	60
VT-HP + LMAS M16	128	384	192	158	192	576	288	222	80	80
VT-HP + LMAS M20	160	480	240	190	240	720	360	270	100	100
VT-HP + LMAS M24	192	576	288	222	288	864	432	318	120	120
VT-HP + LMAS M27	216	648	324	246	324	972	486	354	135	135
VT-HP + LMAS M30	240	720	360	270	360	1060	540	390	150	150

Installation parameters – Rebar

Modelo	Installation parameters - Rebar		
	Ø drilling [d_0] [mm]	Drilling depth (8d) [$h_0=h_{ef}=8d$] [mm]	Drilling depth (12d) [$h_0=h_{ef}=12d$] [mm]
VT-HP + Ø8	12	64	96
VT-HP + Ø10	14	80	120
VT-HP + Ø12	16	96	144
VT-HP + Ø14	18	112	168
VT-HP + Ø16	20	128	192
VT-HP + Ø20	24	160	240
VT-HP + Ø25	32	200	300
VT-HP + Ø27	-	-	-
VT-HP + Ø28	35	224	336
VT-HP + Ø32	40	256	384

Spacing, edge distances and member thickness – Rebar

Modelo	Spacing, edge distance and member thickness - Rebar									
	Effective embedment depth (8d) [$h_{ef,8d}$] [mm]	Characteristic spacing for $h_{ef,8d}$ [$S_{cr,N}$] [mm]	Characteristic edge distance for $h_{ef,8d}$ [$c_{cr,N}$] [mm]	Min. member thickness for $h_{ef,8d}$ [h_{min}] [mm]	Effective embedment depth (12d) [$h_{ef,12d}$] [mm]	Characteristic spacing for $h_{ef,12d}$ [$S_{cr,N}$] [mm]	Characteristic edge distance for $h_{ef,12d}$ [$c_{cr,N}$] [mm]	Min. member thickness for $h_{ef,12d}$ [h_{min}] [mm]	Min. spacing [S_{min}] [mm]	Min. edge distance [C_{min}] [mm]
VT-HP + Ø8	64	192	96	100	96	288	144	126	40	40
VT-HP + Ø10	80	240	120	110	120	360	180	150	50	50
VT-HP + Ø12	96	288	144	128	144	432	216	176	60	60
VT-HP + Ø14	112	336	168	148	168	504	252	204	70	70
VT-HP + Ø16	128	384	192	168	192	576	288	232	80	80
VT-HP + Ø20	160	480	240	208	240	720	360	288	100	100
VT-HP + Ø25	200	600	300	264	300	900	450	364	125	125
VT-HP + Ø27	-	-	-	-	-	-	-	-	-	-
VT-HP + Ø28	224	672	335	294	336	1008	504	406	140	140
VT-HP + Ø32	256	768	384	336	384	1152	576	464	160	160

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