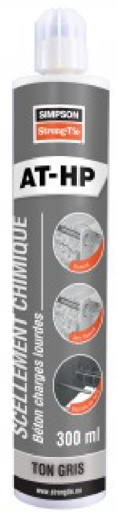
Datasheet

AT-HP - HARSEN MET HOGE STERKTE VOOR MULTIMATERIALEN



Zwaar betonhars AT-HP is geschikt voor het bevestigen van betonijzers, draadstangen in gescheurd en ongescheurd beton en C20/25 tot C50/60.

ETA-19/0265

KENMERKEN

R 30 BINNEN BUITEN

Materiaal

- Styreenvrij methacrylaathars,
- Draadstang : elektrolytisch verzinkt staal en rvs A4-70.

Voordelen

- Hoge hechtsterkte in beton en metselwerk,
- Uitstekend gedrag in vochtige en/of natte boorgaten,
- Brandwerend,
- Twee ETA's voor draadstangen op beton en metselwerk,
- Eén ETA voor inspannen van betonijzers.

TOEPASSINGEN

Ondergrond

- Beton, cellenbeton,
- Volle en holle baksteen,
- Volle en holle Bouwsteen.

Toepassingsgebieden

- Inspannen van betonijzers,
- Bevestigen van ankerstangen in beton en metselwerk,
- Balkons,
- Gevel, rekken.

SIMPSON Strong-Tie

TECHNISCHE GEGEVENS

Références

Referentie	Product information				
	Grey color	Beige color	Content [ml]	Weight [kg]	Packaging qty [pcs]
ATHP300G-FR	x	-	300	0.575	12
ATHP420G-FR	x	-	420	0.828	12
ATHP420BG-PL	x	-	420	0.828	12
ATHP300BG-PL	x	-	300	0.575	12

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

Referentie	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
AT-HP + LMAS M8	-	-	-	-	10.7	12	12	12
AT-HP + LMAS M10	-	-	-	-	15.9	17.8	19.3	19.3
AT-HP + LMAS M12	8.4	8.8	9	9.2	21.7	24.3	26.7	28
AT-HP + LMAS M16	15	15.6	16.1	16.4	34.3	38.4	42.2	44.6
AT-HP + LMAS M20	-	-	-	-	50.2	56.3	61.8	65.3
AT-HP + LMAS M24	-	-	-	-	67.5	75.6	83.1	87.8

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 – Carbon steel 5.8

Referentie	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
AT-HP + LMAS M8	-	-	-	-	12	12	12	12
AT-HP + LMAS M10	-	-	-	-	19.3	19.3	19.3	19.3
AT-HP + LMAS M12	12.7	13.2	13.5	13.8	28	28	28	28
AT-HP + LMAS M16	22.5	23.4	24.1	24.5	51.4	52.7	52.7	52.7
AT-HP + LMAS M20	-	-	-	-	75.4	82	82	82

Referentie	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
AT-HP + LMAS M24	-	-	-	-	101.3	113.4	118	118

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 = 8d – Stainless steel A4-70

Referentie	Design resistance – h_{ef} = 8d – Stainless steel A4-70							
	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
ATHP300BG-PL	-	-	-	-	-	-	-	-
AT-HP + LMAS M8	-	-	-	-	10.7	12	13.2	13.9
AT-HP + LMAS M10	-	-	-	-	15.9	17.8	19.6	20.7
AT-HP + LMAS M12	8.4	8.8	9	9.2	21.7	24.3	26.7	28.2
AT-HP + LMAS M16	15	15.6	16.1	16.4	34.3	38.4	42.2	44.6
AT-HP + LMAS M20	-	-	-	-	50.2	56.3	61.8	65.3
AT-HP + LMAS M24	-	-	-	-	67.5	75.6	83.1	87.8

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 A4-70

Referentie	Design resistance – h_{ef} = 12d – Stainless steel A4-70							
	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
AT-HP + LMAS M8	-	-	-	-	13.9	13.9	13.9	13.9
AT-HP + LMAS M10	-	-	-	-	21.9	21.9	21.9	21.9
AT-HP + LMAS M12	12.7	13.2	13.5	13.8	31.6	31.6	31.6	31.6

Referentie	Design resistance – h_{ef} = 12d – Stainless steel A4-70							
	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
AT-HP + LMAS M16	22.5	23.4	24.1	24.5	51.4	57.6	58.8	58.8
AT-HP + LMAS M20	-	-	-	-	75.4	84.4	92	92
AT-HP + LMAS M24	-	-	-	-	101.3	113.4	124.6	131.7

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 – Carbon steel 5.8

Referentie	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
AT-HP + LMAS M8	-	-	-	-	7.2	7.2	7.2	7.2
AT-HP + LMAS M10	-	-	-	-	12	12	12	12
AT-HP + LMAS M12	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
AT-HP + LMAS M16	30	31.2	31.2	31.2	31.2	31.2	31.2	31.2
AT-HP + LMAS M20	-	-	-	-	48.8	48.8	48.8	48.8
AT-HP + LMAS M24	-	-	-	-	70.4	70.4	70.4	70.4

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

Referentie	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
AT-HP + LMAS M8	-	-	-	-	7.2	7.2	7.2	7.2
AT-HP + LMAS M10	-	-	-	-	12	12	12	12

SIMPSON Strong-Tie

Referentie	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
AT-HP + LMAS M12	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8
AT-HP + LMAS M16	31.2	31.2	31.2	31.2	31.2	31.2	31.2	31.2
AT-HP + LMAS M20	-	-	-	-	48.8	48.8	48.8	48.8
AT-HP + LMAS M24	-	-	-	-	70.4	70.4	70.4	70.4

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 A4-70

Referentie	Design resistance – h_{ef} = 8d – Stainless steel A4-70							
	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
AT-HP + LMAS M8	-	-	-	-	8.3	8.3	8.3	8.3
AT-HP + LMAS M10	-	-	-	-	12.8	12.8	12.8	12.8
AT-HP + LMAS M12	16.9	17.6	18.1	18.4	19.2	19.2	19.2	19.2
AT-HP + LMAS M16	30	31.2	32.1	32.7	35.3	35.3	35.3	35.3
AT-HP + LMAS M20	-	-	-	-	55.1	55.1	55.1	55.1
AT-HP + LMAS M24	-	-	-	-	79.5	79.5	79.5	79.5

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).

Design resistance – Shear - VRd [kN] – hef = 12d – Stainless steel A4-70

Referentie	Design resistance – h_{ef} = 12d – Stainless steel A4-70							
	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
AT-HP + LMAS M8	-	-	-	-	8.3	8.3	8.3	8.3

Referentie	Design resistance – h_{ef} = 12d – Stainless steel A4-70							
	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
AT-HP + LMAS M10	-	-	-	-	12.8	12.8	12.8	12.8
AT-HP + LMAS M12	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2
AT-HP + LMAS M16	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3
AT-HP + LMAS M20	-	-	-	-	55.1	55.1	55.1	55.1
AT-HP + LMAS M24	-	-	-	-	79.5	79.5	79.5	79.5

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).

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

Referentie	Design resistance – Bending moment – M_{Rd} [Nm]	
	Carbon steel 5.8	Stainless steel A4-70
AT-HP + LMAS M8	15.2	16.7
AT-HP + LMAS M10	29.6	34
AT-HP + LMAS M12	52.8	59
AT-HP + LMAS M16	133.6	149.4
AT-HP + LMAS M20	260.8	291
AT-HP + LMAS M24	448.8	502.6

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] – Rebar

Referentie	Design resistance – N_{Rd} – Carbon steel 5.8 [kN]							
	Non-cracked concrete							
	h_{ef} = 8d				h_{ef} = 12d			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
ATHP300G-FR	-	-	-	-	-	-	-	-
ATHP420G-FR	-	-	-	8.1	-	-	-	-
ATHP420BG-PL	-	-	-	-	-	-	-	-
ATHP300BG-PL	-	-	-	-	-	-	-	-

Referentie	Design resistance – N_{Rd} – Carbon steel 5.8 [kN]							
	Non-cracked concrete							
	h_{ef} = 8d				h_{ef} = 12d			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
AT-HP + LMAS M8	-	-	-	13.6	-	-	-	-
AT-HP + LMAS M10	-	-	-	18.3	-	-	-	-
AT-HP + LMAS M12	-	-	-	24.9	-	-	-	-
AT-HP + LMAS M16	-	-	-	34.8	-	-	-	-
AT-HP + LMAS M20	-	-	-	47.2	-	-	-	-
AT-HP + LMAS M24	-	-	-	68	-	-	-	-
AT-HP + Ø8	6.3	7	7.7	8.1	9.4	10.5	11.5	12.2
AT-HP + Ø10	10.5	11.7	12.9	13.6	15.7	17.6	19.3	20.4
AT-HP + Ø12	14.1	15.8	17.3	18.3	21.1	23.6	26	27.4
AT-HP + Ø14	19.1	21.4	23.6	24.9	28.7	32.2	35.3	37.3
AT-HP + Ø16	23.2	26	28.6	34.8	34.8	39	42.8	52.2
AT-HP + Ø20	36.3	40.6	44.6	47.2	54.4	61	66.9	70.8
AT-HP + Ø25	52.3	58.6	64.4	68	78.5	87.9	96.6	102.1

Design resistance – Shear – VRd [kN] – Rebar

Referentie	Design resistance – V_{Rd} – Carbon steel 5.8 [kN]							
	Non-cracked concrete							
	h_{ef} = 8d				h_{ef} = 12d			
	C20/25	C30/37	C40/50	C50/60	C20/25	C30/37	C40/50	C50/60
AT-HP + Ø8	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3
AT-HP + Ø10	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
AT-HP + Ø12	20.7	20.7	20.7	20.7	20.7	20.7	20.7	20.7
AT-HP + Ø14	28	28	28	28	28	28	28	28
AT-HP + Ø16	36.7	36.7	36.7	36.7	36.7	36.7	36.7	36.7
AT-HP + Ø20	57.3	57.3	57.3	57.3	57.3	57.3	57.3	57.3
AT-HP + Ø25	90	90	90	90	90	90	90	90

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

Referentie	Design resistance – Bending moment – M_{Rd} [Nm]
AT-HP + Ø8	22
AT-HP + Ø10	43.3
AT-HP + Ø12	74.7
AT-HP + Ø14	118.7
AT-HP + Ø16	176.7
AT-HP + Ø20	345.3
AT-HP + Ø25	674.7

PLAATSING

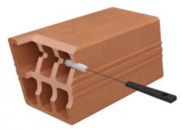
Plaatsingstijd

Morteltemperatuur [°C]	Ondersteuning temperatuur [°C]	Praktische gebruiksduur [min]	Uithardingstijd, droog / nat beton [h; min]
+ 5°C	- 5°C naar - 1°C	15 min	9 h
+ 5°C	0°C naar 4°C	12 min	4 h
+ 5°C	5°C naar 9°C	9 min	1,5 h
+ 10°C	10°C naar 19°C	4 min	60 min
+ 20°C	20°C naar 29°C	1 min	30 min
+ 30°C	30°C en hoger	< 1 min	20 min

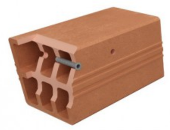
Drilling methods

Beton	Klopboren
Baksteen	Draaiboren
Cellenbeton	Klopboren

1. Gat boren.

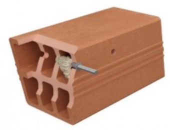


2. Schoonborstelen.

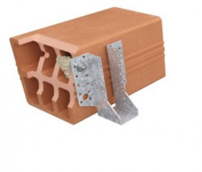


3. Zeefhuls insteken.

4. Vullen vanaf bodemgat naar buiten door bij het pompen telkens één maatstreep op de spuitmond achteruit te gaan.



5. Ankerstang licht draaiend insteken.



Fix when the curing time is reached.

1. Gat boren.

2. Boorgat reinigen door uitborstelen en uitblazen zoals aangegeven op de patroon.

3. Gat voor de helft tot twee derde vullen vanaf het bodemgat naar buiten door bij het pompen telkens één maatstreep op de spuitmond achteruit te gaan.

4. Draadstang insteken door langzaam van links naar rechts te draaien. U kunt de draadstang verplaatsen of hars toevoegen zolang de verwerkingstijd niet bereikt is.

5. Vastzetten na het bereiken van de uithardingstijd.

SIMPSON Strong-Tie

Installation parameters – Concrete

Referentie	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]
ATHP300G-FR	-	-	-	-	-	-
ATHP420G-FR	-	-	-	-	-	-
ATHP420BG-PL	-	-	-	-	-	-
ATHP300BG-PL	-	-	-	-	-	-
AT-HP + LMAS M8	10	9	64	96	13	10
AT-HP + LMAS M10	12	12	80	120	17	20
AT-HP + LMAS M12	14	14	96	144	19	30
AT-HP + LMAS M16	18	18	128	192	24	60
AT-HP + LMAS M20	24	22	160	240	30	90
AT-HP + LMAS M24	28	26	192	288	36	140
AT-HP + Ø8	-	-	-	-	-	-
AT-HP + Ø10	-	-	-	-	-	-
AT-HP + Ø12	-	-	-	-	-	-
AT-HP + Ø14	-	-	-	-	-	-
AT-HP + Ø16	-	-	-	-	-	-
AT-HP + Ø20	-	-	-	-	-	-
AT-HP + Ø25	-	-	-	-	-	-

Spacing, edge distances and member thickness - Concrete

Referentie	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]
ATHP300G-FR	-	-	-	-	-	-	-	-	-	-
ATHP420G-FR	-	-	-	-	-	-	-	-	-	-
ATHP420BG-PL	-	-	-	-	-	-	-	-	-	-
ATHP300BG-PL	-	-	-	-	-	-	-	-	-	-
AT-HP + LMAS M8	64	192	96	100	96	288	144	100	40	40
AT-HP + LMAS M10	80	240	120	110	120	360	180	150	50	50
AT-HP + LMAS M12	96	288	144	126	144	432	216	174	60	60
AT-HP + LMAS M16	128	384	192	158	192	576	288	222	80	80
AT-HP + LMAS M20	160	480	240	190	240	720	360	270	100	100
AT-HP + LMAS M24	192	576	288	222	288	864	432	318	120	120
AT-HP + Ø8	-	-	-	-	-	-	-	-	-	-
AT-HP + Ø10	-	-	-	-	-	-	-	-	-	-
AT-HP + Ø12	-	-	-	-	-	-	-	-	-	-
AT-HP + Ø14	-	-	-	-	-	-	-	-	-	-
AT-HP + Ø16	-	-	-	-	-	-	-	-	-	-

Referentie	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]
AT-HP + Ø20	-	-	-	-	-	-	-	-	-	-
AT-HP + Ø25	-	-	-	-	-	-	-	-	-	-

Installation parameters – Rebar

Referentie	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]
ATHP300G-FR	-	-	-
ATHP420G-FR	-	-	-
ATHP420BG-PL	-	-	-
ATHP300BG-PL	-	-	-
AT-HP + LMAS M8	-	-	-
AT-HP + LMAS M10	-	-	-
AT-HP + LMAS M12	-	-	-
AT-HP + LMAS M16	-	-	-
AT-HP + LMAS M20	-	-	-
AT-HP + LMAS M24	-	-	-
AT-HP + Ø8	12	64	96
AT-HP + Ø10	14	80	120
AT-HP + Ø12	16	96	144
AT-HP + Ø14	18	112	168
AT-HP + Ø16	20	128	192
AT-HP + Ø20	25	160	240
AT-HP + Ø25	32	200	300

Spacing, edge distances and member thickness – Rebar

Referentie	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]
ATHP300G-FR	-	-	-	-	-	-	-	-	-	-
ATHP420G-FR	-	-	-	-	-	-	-	-	-	-
ATHP420BG-PL	-	-	-	-	-	-	-	-	-	-
ATHP300BG-PL	-	-	-	-	-	-	-	-	-	-
AT-HP + LMAS M8	-	-	-	-	-	-	-	-	-	-
AT-HP + LMAS M10	-	-	-	-	-	-	-	-	-	-
AT-HP + LMAS M12	-	-	-	-	-	-	-	-	-	-
AT-HP + LMAS M16	-	-	-	-	-	-	-	-	-	-
AT-HP + LMAS M20	-	-	-	-	-	-	-	-	-	-

Referentie	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]
AT-HP + LMAS M24	-	-	-	-	-	-	-	-	-	-
AT-HP + Ø8	64	192	96	100	96	288	144	100	40	40
AT-HP + Ø10	80	240	120	110	120	360	180	150	50	50
AT-HP + Ø12	96	288	144	126	144	432	216	174	60	60
AT-HP + Ø14	112	336	168	148	168	504	252	204	70	70
AT-HP + Ø16	128	384	192	168	192	576	288	232	80	80
AT-HP + Ø20	160	480	240	210	240	720	360	290	100	100
AT-HP + Ø25	200	600	300	264	300	900	450	364	125	125

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