

## AT-HP PLUS

### Hars voor multimaterialen met plaatsingsindicatie

*Dit chemisch verankeringshars AT-HP Plus is geschikt voor 100% van de courante toepassingen op hol en vol metselwerk. Het kan veilig binnen worden gebruikt (COV A+) en waarborgt een eenvoudige en perfecte bevestiging dankzij een exclusieve innovatie: de plaatsingsindicatie Simpson Strong-Tie.*

## Kenmerken

### 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.

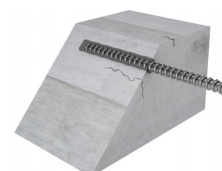
## Toepassingen

### 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.



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## Technische gegevens

### Références

| Referentie      | Product information |             |              |             |                     |
|-----------------|---------------------|-------------|--------------|-------------|---------------------|
|                 | Grey color          | Beige color | Content [ml] | Weight [kg] | Packaging qty [pcs] |
| ATHP300PLUSG-FR | x                   | -           | 300          | 0.575       | 12                  |
| ATHP420PLUSG-FR | x                   | -           | 420          | 0.828       | 12                  |

 Design resistance – Tension –  $N_{Rd}$  [kN] –  $h_{ef} = 8d$  – 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 PLUS + LMAS M8  | -                                                    | -      | -      | -      | 10.7                 | 12     | 12     | 12     |
| AT-HP PLUS + LMAS M10 | -                                                    | -      | -      | -      | 15.9                 | 17.8   | 19.3   | 19.3   |
| AT-HP PLUS + LMAS M12 | 8.4                                                  | 8.8    | 9      | 9.2    | 21.7                 | 24.3   | 26.7   | 28     |
| AT-HP PLUS + LMAS M16 | 15                                                   | 15.6   | 16.1   | 16.4   | 34.3                 | 38.4   | 42.2   | 44.6   |
| AT-HP PLUS + LMAS M20 | -                                                    | -      | -      | -      | 50.2                 | 56.3   | 61.8   | 65.3   |
| AT-HP PLUS + 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  $s \geq 15$  cm (any diameter) or with a rebar spacing  $s \geq 10$  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 ( $c \leq \max [10 h_{ef}; 60d]$ ) 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  $\sigma_L + \sigma_R \leq 0$ . In the absence of detailed verification  $\sigma_R = 3$  N/mm<sup>2</sup> can be assumed ( $\sigma_L$  equals the tensile stress within the concrete induced by external loads, anchors loads included).

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

| Referentie            | Design resistance – hef = 12d – Carbon steel 5.8 |        |        |        |                      |        |        |        |
|-----------------------|--------------------------------------------------|--------|--------|--------|----------------------|--------|--------|--------|
|                       | Tension - NRd [kN]                               |        |        |        |                      |        |        |        |
|                       | Cracked concrete                                 |        |        |        | Non-cracked concrete |        |        |        |
|                       | C20/25                                           | C30/37 | C40/50 | C50/60 | C20/25               | C30/37 | C40/50 | C50/60 |
| AT-HP PLUS + LMAS M8  | -                                                | -      | -      | -      | 12                   | 12     | 12     | 12     |
| AT-HP PLUS + LMAS M10 | -                                                | -      | -      | -      | 19.3                 | 19.3   | 19.3   | 19.3   |
| AT-HP PLUS + LMAS M12 | 12.7                                             | 13.2   | 13.5   | 13.8   | 28                   | 28     | 28     | 28     |
| AT-HP PLUS + LMAS M16 | 22.5                                             | 23.4   | 24.1   | 24.5   | 51.4                 | 52.7   | 52.7   | 52.7   |
| AT-HP PLUS + LMAS M20 | -                                                | -      | -      | -      | 75.4                 | 82     | 82     | 82     |
| AT-HP PLUS + LMAS M24 | -                                                | -      | -      | -      | 101.3                | 113.4  | 118    | 118    |

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2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges ( $c \leq \max [10 \text{ hef}; 60d]$ ) 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  $\sigma_L + \sigma_R \leq 0$ . In the absence of detailed verification  $\sigma_R = 3 \text{ N/mm}^2$  can be assumed ( $\sigma_L$  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 – hef = 8d – Stainless steel A4-70 |        |        |        |                      |        |        |        |
|-----------------------|------------------------------------------------------|--------|--------|--------|----------------------|--------|--------|--------|
|                       | Tension - NRd [kN]                                   |        |        |        |                      |        |        |        |
|                       | Cracked concrete                                     |        |        |        | Non-cracked concrete |        |        |        |
|                       | C20/25                                               | C30/37 | C40/50 | C50/60 | C20/25               | C30/37 | C40/50 | C50/60 |
| AT-HP PLUS + LMAS M8  | -                                                    | -      | -      | -      | 10.7                 | 12     | 13.2   | 13.9   |
| AT-HP PLUS + LMAS M10 | -                                                    | -      | -      | -      | 15.9                 | 17.8   | 19.6   | 20.7   |
| AT-HP PLUS + LMAS M12 | 8.4                                                  | 8.8    | 9      | 9.2    | 21.7                 | 24.3   | 26.7   | 28.2   |
| AT-HP PLUS + LMAS M16 | 15                                                   | 15.6   | 16.1   | 16.4   | 34.3                 | 38.4   | 42.2   | 44.6   |
| AT-HP PLUS + LMAS M20 | -                                                    | -      | -      | -      | 50.2                 | 56.3   | 61.8   | 65.3   |
| AT-HP PLUS + 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  $s \geq 15$  cm (any diameter) or with a rebar spacing  $s \geq 10$  cm, if the rebar diameter is 10mm or smaller.
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3. Concrete is considered non-cracked when the tensile stress within the concrete is  $\sigma_L + \sigma_R \leq 0$ . In the absence of detailed verification  $\sigma_R = 3 \text{ N/mm}^2$  can be assumed ( $\sigma_L$  equals the tensile stress within the concrete induced by external loads, anchors loads included).

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## Hars voor multimaterialen met plaatsingsindicatie

Design resistance – Tension –  $N_{Rd}$  [kN] –  $h_{ef} = 12d$  – 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 PLUS + LMAS M8  | -                                                          | -      | -      | -      | 13.9                 | 13.9   | 13.9   | 13.9   |
| AT-HP PLUS + LMAS M10 | -                                                          | -      | -      | -      | 21.9                 | 21.9   | 21.9   | 21.9   |
| AT-HP PLUS + LMAS M12 | 12.7                                                       | 13.2   | 13.5   | 13.8   | 31.6                 | 31.6   | 31.6   | 31.6   |
| AT-HP PLUS + LMAS M16 | 22.5                                                       | 23.4   | 24.1   | 24.5   | 51.4                 | 57.6   | 58.8   | 58.8   |
| AT-HP PLUS + LMAS M20 | -                                                          | -      | -      | -      | 75.4                 | 84.4   | 92     | 92     |
| AT-HP PLUS + 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  $s \geq 15$  cm (any diameter) or with a rebar spacing  $s \geq 10$  cm, if the rebar diameter is 10mm or smaller.
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Design resistance – Shear –  $V_{Rd}$  [kN] –  $h_{ef} = 8d$  – 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 PLUS + LMAS M8  | -                                                    | -      | -      | -      | 7.2                  | 7.2    | 7.2    | 7.2    |
| AT-HP PLUS + LMAS M10 | -                                                    | -      | -      | -      | 12                   | 12     | 12     | 12     |
| AT-HP PLUS + LMAS M12 | 16.8                                                 | 16.8   | 16.8   | 16.8   | 16.8                 | 16.8   | 16.8   | 16.8   |
| AT-HP PLUS + LMAS M16 | 30                                                   | 31.2   | 31.2   | 31.2   | 31.2                 | 31.2   | 31.2   | 31.2   |
| AT-HP PLUS + LMAS M20 | -                                                    | -      | -      | -      | 48.8                 | 48.8   | 48.8   | 48.8   |
| AT-HP PLUS + LMAS M24 | -                                                    | -      | -      | -      | 70.4                 | 70.4   | 70.4   | 70.4   |

### Concrete :

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Design resistance – Shear –  $V_{Rd}$  [kN] –  $h_{ef} = 12d$  – 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 PLUS + LMAS M8  | -                                                     | -      | -      | -      | 7.2                  | 7.2    | 7.2    | 7.2    |
| AT-HP PLUS + LMAS M10 | -                                                     | -      | -      | -      | 12                   | 12     | 12     | 12     |
| AT-HP PLUS + LMAS M12 | 16.8                                                  | 16.8   | 16.8   | 16.8   | 16.8                 | 16.8   | 16.8   | 16.8   |
| AT-HP PLUS + LMAS M16 | 31.2                                                  | 31.2   | 31.2   | 31.2   | 31.2                 | 31.2   | 31.2   | 31.2   |
| AT-HP PLUS + LMAS M20 | -                                                     | -      | -      | -      | 48.8                 | 48.8   | 48.8   | 48.8   |
| AT-HP PLUS + 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  $s \geq 15$  cm (any diameter) or with a rebar spacing  $s \geq 10$  cm, if the rebar diameter is 10mm or smaller.
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Design resistance – Shear –  $V_{Rd}$  [kN] –  $h_{ef} = 8d$  – 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 PLUS + LMAS M8  | -                                                         | -      | -      | -      | 8.3                  | 8.3    | 8.3    | 8.3    |
| AT-HP PLUS + LMAS M10 | -                                                         | -      | -      | -      | 12.8                 | 12.8   | 12.8   | 12.8   |
| AT-HP PLUS + LMAS M12 | 16.9                                                      | 17.6   | 18.1   | 18.4   | 19.2                 | 19.2   | 19.2   | 19.2   |
| AT-HP PLUS + LMAS M16 | 30                                                        | 31.2   | 32.1   | 32.7   | 35.3                 | 35.3   | 35.3   | 35.3   |
| AT-HP PLUS + LMAS M20 | -                                                         | -      | -      | -      | 55.1                 | 55.1   | 55.1   | 55.1   |
| AT-HP PLUS + LMAS M24 | -                                                         | -      | -      | -      | 79.5                 | 79.5   | 79.5   | 79.5   |

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Design resistance – Shear –  $V_{Rd}$  [kN] –  $h_{ef} = 12d$  – 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 PLUS + LMAS M8  | -                                                          | -      | -      | -      | 8.3                  | 8.3    | 8.3    | 8.3    |
| AT-HP PLUS + LMAS M10 | -                                                          | -      | -      | -      | 12.8                 | 12.8   | 12.8   | 12.8   |
| AT-HP PLUS + LMAS M12 | 19.2                                                       | 19.2   | 19.2   | 19.2   | 19.2                 | 19.2   | 19.2   | 19.2   |
| AT-HP PLUS + LMAS M16 | 35.3                                                       | 35.3   | 35.3   | 35.3   | 35.3                 | 35.3   | 35.3   | 35.3   |
| AT-HP PLUS + LMAS M20 | -                                                          | -      | -      | -      | 55.1                 | 55.1   | 55.1   | 55.1   |
| AT-HP PLUS + LMAS M24 | -                                                          | -      | -      | -      | 79.5                 | 79.5   | 79.5   | 79.5   |

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2. The figures for shear are based on a single anchor without influence of concrete edges. For anchorages close to edges ( $c \leq \max [10 h_{ef}; 60d]$ ) 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  $\sigma_L + \sigma_R \leq 0$ . In the absence of detailed verification  $\sigma_R = 3$  N/mm<sup>2</sup> can be assumed ( $\sigma_L$  equals the tensile stress within the concrete induced by external loads, anchors loads included).

Design resistance – Bending moment –  $M_{Rd}$  [Nm] – Concrete

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

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Design resistance – Tension –  $N_{Rd}$  [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 |
| AT-HP PLUS + Ø8  | 6.3                                                  | 7      | 7.7    | 8.1    | 9.4            | 10.5   | 11.5   | 12.2   |
| AT-HP PLUS + Ø10 | 10.5                                                 | 11.7   | 12.9   | 13.6   | 15.7           | 17.6   | 19.3   | 20.4   |
| AT-HP PLUS + Ø12 | 14.1                                                 | 15.8   | 17.3   | 18.3   | 21.1           | 23.6   | 26     | 27.4   |
| AT-HP PLUS + Ø14 | 19.1                                                 | 21.4   | 23.6   | 24.9   | 28.7           | 32.2   | 35.3   | 37.3   |
| AT-HP PLUS + Ø16 | 23.2                                                 | 26     | 28.6   | 34.8   | 34.8           | 39     | 42.8   | 52.2   |
| AT-HP PLUS + Ø20 | 36.3                                                 | 40.6   | 44.6   | 47.2   | 54.4           | 61     | 66.9   | 70.8   |
| AT-HP PLUS + Ø25 | 52.3                                                 | 58.6   | 64.4   | 68     | 78.5           | 87.9   | 96.6   | 102.1  |

Design resistance – Shear –  $V_{Rd}$  [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 PLUS + Ø8  | 9.3                                                  | 9.3    | 9.3    | 9.3    | 9.3            | 9.3    | 9.3    | 9.3    |
| AT-HP PLUS + Ø10 | 14.7                                                 | 14.7   | 14.7   | 14.7   | 14.7           | 14.7   | 14.7   | 14.7   |
| AT-HP PLUS + Ø12 | 20.7                                                 | 20.7   | 20.7   | 20.7   | 20.7           | 20.7   | 20.7   | 20.7   |
| AT-HP PLUS + Ø14 | 28                                                   | 28     | 28     | 28     | 28             | 28     | 28     | 28     |
| AT-HP PLUS + Ø16 | 36.7                                                 | 36.7   | 36.7   | 36.7   | 36.7           | 36.7   | 36.7   | 36.7   |
| AT-HP PLUS + Ø20 | 57.3                                                 | 57.3   | 57.3   | 57.3   | 57.3           | 57.3   | 57.3   | 57.3   |
| AT-HP PLUS + Ø25 | 90                                                   | 90     | 90     | 90     | 90             | 90     | 90     | 90     |

Design resistance – Bending moment –  $M_{Rd}$  [Nm] – Rebar

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

AT-HP PLUS

Hars voor multimaterialen met plaatsingsindicatie

## Plaatsing

Plaatsingstijd

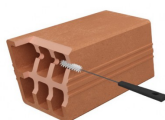
| Temperatuur [°C] | -5    | 0     | 5     | 10    | 20    | 30    |
|------------------|-------|-------|-------|-------|-------|-------|
| Verwerkingstijd  | 45min | 15min | 12min | 9min  | 4min  | 1min  |
| Belastbaar na    | 9.00  | 4.00  | 1.30  | 60min | 30min | 20min |

Méthodes de perçage

|                     |                      |
|---------------------|----------------------|
| Brique pleine/Béton | perçage à percussion |
| Brique creuse       | perçage rotatif      |
| Béton cellulaire    | perçage à percussion |



1. Gat boren.



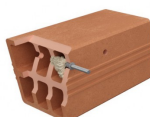
2. Schoonborstelen.



3. Zeefhuls insteken.



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



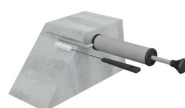
5. Ankerstang licht draaiend insteken.



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 maatstreek 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.

**AT-HP PLUS**
**Hars voor multimaterialen met plaatsingsindicatie**

### Installation parameters – Concrete

| Referentie            | Installation parameters - Concrete |                                            |                                                                |                                                                  |                  |                                               |
|-----------------------|------------------------------------|--------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------|------------------|-----------------------------------------------|
|                       | Ø drilling [d <sub>0</sub> ] [mm]  | Max. fixture hole Ø [d <sub>f</sub> ] [mm] | Drilling depth (8d) [h <sub>0</sub> =h <sub>ef</sub> =8d] [mm] | Drilling depth (12d) [h <sub>0</sub> =h <sub>ef</sub> =12d] [mm] | Wrench size [SW] | Installation torque [T <sub>inst</sub> ] [Nm] |
| AT-HP PLUS + LMAS M8  | 10                                 | 9                                          | 64                                                             | 96                                                               | 13               | 10                                            |
| AT-HP PLUS + LMAS M10 | 12                                 | 12                                         | 80                                                             | 120                                                              | 17               | 20                                            |
| AT-HP PLUS + LMAS M12 | 14                                 | 14                                         | 96                                                             | 144                                                              | 19               | 30                                            |
| AT-HP PLUS + LMAS M16 | 18                                 | 18                                         | 128                                                            | 192                                                              | 24               | 60                                            |
| AT-HP PLUS + LMAS M20 | 24                                 | 22                                         | 160                                                            | 240                                                              | 30               | 90                                            |
| AT-HP PLUS + LMAS M24 | 28                                 | 26                                         | 192                                                            | 288                                                              | 36               | 140                                           |

### Spacing, edge distances and member thickness – Concrete

| Referentie            | Spacing, edge distance and member thickness - Concrete    |                                                                         |                                                                               |                                                                       |                                                             |                                                                          |                                                                                |                                                                        |                                       |                                             |
|-----------------------|-----------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------|---------------------------------------------|
|                       | Effective embedment depth (8d) [h <sub>ef,8d</sub> ] [mm] | Characteristic spacing for h <sub>ef,8d</sub> [S <sub>cr,N</sub> ] [mm] | Characteristic edge distance for h <sub>ef,8d</sub> [c <sub>cr,N</sub> ] [mm] | Min. member thickness for h <sub>ef,8d</sub> [h <sub>min</sub> ] [mm] | Effective embedment depth (12d) [h <sub>ef,12d</sub> ] [mm] | Characteristic spacing for h <sub>ef,12d</sub> [S <sub>cr,N</sub> ] [mm] | Characteristic edge distance for h <sub>ef,12d</sub> [c <sub>cr,N</sub> ] [mm] | Min. member thickness for h <sub>ef,12d</sub> [h <sub>min</sub> ] [mm] | Min. spacing [S <sub>min</sub> ] [mm] | Min. edge distance [c <sub>min</sub> ] [mm] |
| AT-HP PLUS + LMAS M8  | 64                                                        | 192                                                                     | 96                                                                            | 100                                                                   | 96                                                          | 288                                                                      | 144                                                                            | 100                                                                    | 40                                    | 40                                          |
| AT-HP PLUS + LMAS M10 | 80                                                        | 240                                                                     | 120                                                                           | 110                                                                   | 120                                                         | 360                                                                      | 180                                                                            | 150                                                                    | 50                                    | 50                                          |
| AT-HP PLUS + LMAS M12 | 96                                                        | 288                                                                     | 144                                                                           | 126                                                                   | 144                                                         | 432                                                                      | 216                                                                            | 174                                                                    | 60                                    | 60                                          |
| AT-HP PLUS + LMAS M16 | 128                                                       | 384                                                                     | 192                                                                           | 158                                                                   | 192                                                         | 576                                                                      | 288                                                                            | 222                                                                    | 80                                    | 80                                          |
| AT-HP PLUS + LMAS M20 | 160                                                       | 480                                                                     | 240                                                                           | 190                                                                   | 240                                                         | 720                                                                      | 360                                                                            | 270                                                                    | 100                                   | 100                                         |
| AT-HP PLUS + LMAS M24 | 192                                                       | 576                                                                     | 288                                                                           | 222                                                                   | 288                                                         | 864                                                                      | 432                                                                            | 318                                                                    | 120                                   | 120                                         |

## AT-HP PLUS

## Hars voor multimaterialen met plaatsingsindicatie

### Installation parameters – Rebar

| Referentie       | Installation parameters - Rebar   |                                                                |                                                                  |
|------------------|-----------------------------------|----------------------------------------------------------------|------------------------------------------------------------------|
|                  | Ø drilling [d <sub>0</sub> ] [mm] | Drilling depth (8d) [h <sub>0</sub> =h <sub>ef</sub> =8d] [mm] | Drilling depth (12d) [h <sub>0</sub> =h <sub>ef</sub> =12d] [mm] |
| AT-HP PLUS + Ø8  | 12                                | 64                                                             | 96                                                               |
| AT-HP PLUS + Ø10 | 14                                | 80                                                             | 120                                                              |
| AT-HP PLUS + Ø12 | 16                                | 96                                                             | 144                                                              |
| AT-HP PLUS + Ø14 | 18                                | 112                                                            | 168                                                              |
| AT-HP PLUS + Ø16 | 20                                | 128                                                            | 192                                                              |
| AT-HP PLUS + Ø20 | 25                                | 160                                                            | 240                                                              |
| AT-HP PLUS + Ø25 | 32                                | 200                                                            | 300                                                              |

### Spacing, edge distances and member thickness – Rebar

| Referentie       | Spacing, edge distance and member thickness - Rebar       |                                                                         |                                                                               |                                                                       |                                                             |                                                                          |                                                                                |                                                                        |                                       |                                             |
|------------------|-----------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------|---------------------------------------------|
|                  | Effective embedment depth (8d) [h <sub>ef,8d</sub> ] [mm] | Characteristic spacing for h <sub>ef,8d</sub> [S <sub>cr,N</sub> ] [mm] | Characteristic edge distance for h <sub>ef,8d</sub> [C <sub>cr,N</sub> ] [mm] | Min. member thickness for h <sub>ef,8d</sub> [h <sub>min</sub> ] [mm] | Effective embedment depth (12d) [h <sub>ef,12d</sub> ] [mm] | Characteristic spacing for h <sub>ef,12d</sub> [S <sub>cr,N</sub> ] [mm] | Characteristic edge distance for h <sub>ef,12d</sub> [C <sub>cr,N</sub> ] [mm] | Min. member thickness for h <sub>ef,12d</sub> [h <sub>min</sub> ] [mm] | Min. spacing [S <sub>min</sub> ] [mm] | Min. edge distance [C <sub>min</sub> ] [mm] |
| AT-HP PLUS + Ø8  | 64                                                        | 192                                                                     | 96                                                                            | 100                                                                   | 96                                                          | 288                                                                      | 144                                                                            | 100                                                                    | 40                                    | 40                                          |
| AT-HP PLUS + Ø10 | 80                                                        | 240                                                                     | 120                                                                           | 110                                                                   | 120                                                         | 360                                                                      | 180                                                                            | 150                                                                    | 50                                    | 50                                          |
| AT-HP PLUS + Ø12 | 96                                                        | 288                                                                     | 144                                                                           | 126                                                                   | 144                                                         | 432                                                                      | 216                                                                            | 174                                                                    | 60                                    | 60                                          |
| AT-HP PLUS + Ø14 | 112                                                       | 336                                                                     | 168                                                                           | 148                                                                   | 168                                                         | 504                                                                      | 252                                                                            | 204                                                                    | 70                                    | 70                                          |
| AT-HP PLUS + Ø16 | 128                                                       | 384                                                                     | 192                                                                           | 168                                                                   | 192                                                         | 576                                                                      | 288                                                                            | 232                                                                    | 80                                    | 80                                          |
| AT-HP PLUS + Ø20 | 160                                                       | 480                                                                     | 240                                                                           | 210                                                                   | 240                                                         | 720                                                                      | 360                                                                            | 290                                                                    | 100                                   | 100                                         |
| AT-HP PLUS + Ø25 | 200                                                       | 600                                                                     | 300                                                                           | 264                                                                   | 300                                                         | 900                                                                      | 450                                                                            | 364                                                                    | 125                                   | 125                                         |

