

| | | |
|----|--|--|
| | Prestatieverklaring / Declaration of performance | DOP 16.045.BDA |
| | Borgh Swiss AG | 16-12-2016 |
| 1. | Unieke identificatiecode van het producttype: | Borgh BDA 01 / BDA-01-Th / BDA-01-X |
| 2. | Type-, partij- of serienummer, dan wel een ander indentificatiemiddel voor het bouwproduct, zoals voorgeschreven in artikel 11, lid 4: | Artikelnummer 45.580.08060 t/m 45.584.16220 |
| 3. | Beoogde gebruiken van het bouwproduct, overeenkomstig de toepasselijke geharmoniseerde technische specificatie, zoals door de fabrikant bepaald: | Momentgecontroleerd spreidanker voor gebruik in gescheurd en niet-gescheurd beton. |
| 4. | Naam, geregistreerde handelsnaam of geregistreerd handelsmerk en contactadres van de fabrikant, zoals voorgeschreven in artikel 11, lid 5: | Borgh Swiss AG Quaderstrasse 18 CH-7002 Chur, Zwitserland |
| 5. | Naam en contactadres van de gemachtigde wiens mandaat de in artikel 12, lid 2, vermelde taken bestrijkt: | Niet van toepassing |
| 6. | Het systeem of de systemen voor de beoordeling en verificatie van de prestatiebestendigheid van het bouwproduct, vermeld in bijlage V: | Systeem 1 |
| 7. | Indien de prestatieverklaring betrekking heeft op een bouwproduct dat onder een geharmoniseerde norm valt: | Niet van toepassing |
| 8. | Indien de prestatieverklaring betrekking heeft op een bouwproduct waarvoor een Europese technische beoordeling is afgegeven: | IETCC, Notified Body 1219 heeft ETA afgegeven met nummer 16/0672 op basis van ETAG 001 en heeft op onder systeem 1 uitgevoerd: vaststelling van het producttype, inspectie van kwaliteitscontrole in de fabriek en doorlopende inspecties en heeft conformiteitscertificaat afgegeven met nummer : 1219-CPR-0136 |

9. **Aangegeven prestatie volgens als gerapporteerd in ETA 16/0672 van NB 1219**

Mechanische sterkte en stabiliteit volgens ETAG 001 deel 1 en 2 en Annex E met betrekking tot de seismische eigenschappen.

| Installation parameters | | Performance | | | | | |
|-------------------------|--|---------------------|--------|--------|----------------------|-----------------------|---------|
| | | M8 | M10 | M12 | M16 | M20 | M24 |
| d_o | Nominal diameter of drill bit: [mm] | 8 | 10 | 12 | 16 | 20 | 24 |
| d_f | Fixture clearance hole diameter: [mm] | 9 | 12 | 14 | 18 | 22 | 26 |
| T_{inst} | Nominal installation torque: [Nm] | 20/15 ^{*)} | 40 | 60 | 100 | 200 | 250 |
| L_{min} | Total length of the bolt [mm] | 68 | 82 | 98 | 119 | 140 | 175 |
| L_{max} | Total length of the bolt [mm] | 200 | 200 | 250 | 250 | 300 | 400 |
| h_{min} | Minimum thickness of concrete member: [mm] | 100 | 120 | 140 | 170 | 200 | 250 |
| h_1 | Depth of drilled hole: [mm] | 60 | 75 | 85 | 105 | 125 | 155 |
| h_{nom} | Overall anchor embedment depth in the concrete: [mm] | 55 | 68 | 80 | 97 | 114 | 143 |
| h_{ef} | Effective anchorage depth: [mm] | 48 | 60 | 70 | 85 | 100 | 125 |
| t_{fix} | Thickness of fixture [mm] | L - 66 | L - 80 | L - 96 | L - 117 | L - 138 | L - 170 |
| s_{min} | Minimum spacing: [mm] | 50 | 60 | 70 | 85/128 ^{*)} | 100/150 ^{*)} | 125 |
| c_{min} | Minimum edge distance: [mm] | 50 | 60 | 70 | 85/128 ^{*)} | 100/150 ^{*)} | 125 |

*) Respective values for anchors BDA 01 / BDA 01-Th, BDA 01-X

| Characteristic values of resistance to tension loads of design according to design method A | | Performance | | | | | |
|---|---|-------------|------|------|-----------------------|-----------------------|-------|
| | | M8 | M10 | M12 | M16 | M20 | M24 |
| Tension loads: steel failure | | | | | | | |
| $N_{Rk,s}$ | Characteristic tension steel failure: [kN] | 18.1 | 31.4 | 40.4 | 72.7 | 116.6 | 179.2 |
| γ_{Ms} | Partial safety factor: ^{**) [-]} | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Tension loads: pull-out failure in concrete | | | | | | | |
| BDA 01 anchor | | | | | | | |
| $N_{Rk,p,ucr}$ | Characteristic pull out failure in non cracked C20/25 concrete [kN] | 9 | 16 | 20 | 35 | 50 | 50 |
| $N_{Rk,p,cr}$ | Characteristic pull out failure in cracked C20/25 concrete [kN] | 5 | 9 | 12 | 25 | 30 | 30 |
| BDA 01-Th anchor | | | | | | | |
| $N_{Rk,p,ucr}$ | Characteristic pull out failure in non cracked C20/25 concrete [kN] | 9 | 16 | 30 | 35 | 50 | -- |
| $N_{Rk,p,cr}$ | Characteristic pull out failure in cracked C20/25 concrete [kN] | 6 | 9 | 16 | 25 | 30 | -- |
| BDA 01-X anchor | | | | | | | |
| $N_{Rk,p,ucr}$ | Characteristic pull out failure in non C20/25 cracked concrete [kN] | 9 | 16 | 25 | 35 | 50 | -- |
| $N_{Rk,p,cr}$ | Characteristic pull out failure in cracked C20/25 concrete [kN] | 6 | 9 | 16 | 25 | 30 | -- |
| ψ_c | Increasing factor for $N_{Rk,p}$ C30/37 [-] | 1.22 | 1.16 | 1.22 | 1.22 | 1.16 | 1.22 |
| ψ_c | Increasing factor for $N_{Rk,p}$ C40/50 [-] | 1.41 | 1.31 | 1.41 | 1.41 | 1.31 | 1.41 |
| ψ_c | Increasing factor for $N_{Rk,p}$ C50/60 [-] | 1.55 | 1.41 | 1.55 | 1.55 | 1.41 | 1.55 |
| γ_{Mb} | Partial safety factor: ^{**) [-]} | 1.8 | 1.5 | 1.5 | 1.5 | 1.5 | 1.8 |
| Tension loads: concrete cone and splitting failure | | | | | | | |
| h_{ef} | Effective embedment depth: [mm] | 48 | 60 | 70 | 85 | 100 | 125 |
| $k_{ucr,N}$ | Factor for uncracked concrete [-] | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 | 11.0 |
| $k_{cr,N}$ | Factor for cracked concrete [-] | 7.7 | 7.7 | 7.7 | 7.7 | 7.7 | 7.7 |
| γ_{Mc} | Partial safety factor: ^{**) [-]} | 1.8 | 1.5 | 1.5 | 1.5 | 1.5 | 1.8 |
| $s_{cr,N}$ | Critical spacing: [mm] | 144 | 180 | 210 | 255 | 300 | 375 |
| $c_{cr,N}$ | Critical edge distance: [mm] | 72 | 90 | 105 | 128 | 150 | 188 |
| $s_{cr,sp}$ | Critical spacing (splitting): [mm] | 288 | 300 | 350 | 425/510 ^{*)} | 500/600 ^{*)} | 560 |
| $c_{cr,sp}$ | Critical edge distance (splitting): [mm] | 144 | 150 | 175 | 213/255 ^{*)} | 250/300 ^{*)} | 280 |
| γ_{Msp} | Partial safety factor: ^{**) [-]} | 1.8 | 1.5 | 1.5 | 1.5 | 1.5 | 1.8 |

*) Respective values for anchors BDA 01 / BDA 01-Th, BDA 01-X

**) In absence of other national regulations

| Displacements under tension loads | | | Performance | | | | | |
|-----------------------------------|-------------------------|------|-------------|-----|-----|------|------|------|
| | | | M8 | M10 | M12 | M16 | M20 | M24 |
| BDA 01 anchor | | | | | | | | |
| N | Service tension load | [kN] | 2.5 | 4.3 | 6.3 | 10.4 | 13.9 | 18.0 |
| $\bar{\delta}_{ND}$ | Short term displacement | [mm] | 1.1 | 0.7 | 1.0 | 0.4 | 1.6 | 0.4 |
| $\bar{\delta}_{N=}$ | Long term displacement | [mm] | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 2.0 |
| BDA 01-Th anchor | | | | | | | | |
| N | Service tension load | [kN] | 2.5 | 4.3 | 6.3 | 10.4 | 13.9 | -- |
| $\bar{\delta}_{ND}$ | Short term displacement | [mm] | 1.0 | 1.1 | 0.9 | 1.5 | 1.2 | -- |
| $\bar{\delta}_{N=}$ | Long term displacement | [mm] | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | -- |
| BDA 01-X anchor | | | | | | | | |
| N | Service tension load | [kN] | 2.5 | 4.3 | 7.6 | 11.9 | 14.3 | -- |
| $\bar{\delta}_{ND}$ | Short term displacement | [mm] | 1.0 | 1.1 | 0.9 | 1.5 | 1.3 | -- |
| $\bar{\delta}_{N=}$ | Long term displacement | [mm] | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | -- |

| Characteristic values of resistance to shear loads of design according to design method A | | | Performance | | | | | |
|---|--------------------------------------|------|-------------|------|------|-------|-------|-------|
| | | | M8 | M10 | M12 | M16 | M20 | M24 |
| BDA 01, BDA 01-Th, BDA 01-X anchors | | | | | | | | |
| Shear loads: steel failure without lever arm | | | | | | | | |
| $V_{RK,S}$ | Characteristic shear steel failure: | [kN] | 11.0 | 17.4 | 25.3 | 47.1 | 73.1 | 84.7 |
| γ_{Ms} | Partial safety factor: ¹⁾ | [-] | 1.25 | 1.25 | 1.25 | 1.25 | 1.25 | 1.25 |
| Shear loads: steel failure with lever arm | | | | | | | | |
| $M_{RK,S}^0$ | Characteristic bending moment: | [Nm] | 22.5 | 44.8 | 78.6 | 199.8 | 389.4 | 673.5 |
| γ_{Ms} | Partial safety factor: ¹⁾ | [-] | 1.25 | 1.25 | 1.25 | 1.25 | 1.25 | 1.25 |
| Shear loads: concrete pryout failure | | | | | | | | |
| k_3 | k_3 factor: | [-] | 1 | 2 | 2 | 2 | 2 | 2 |
| γ_{Mpr} | Partial safety factor: ¹⁾ | [-] | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| Shear loads: concrete edge failure | | | | | | | | |
| l_f | Effective anchorage length: | [mm] | 48 | 60 | 70 | 85 | 100 | 125 |
| d_{nom} | Outside anchor diameter: | [mm] | 8 | 10 | 12 | 16 | 20 | 24 |
| γ_{Me} | Partial safety factor: ¹⁾ | [-] | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |

¹⁾ In absence of other national regulations

| Displacements under shear loads | | | Performance | | | | | |
|---------------------------------|--------------------------|------|-------------|-----|-----|------|------|------|
| | | | M8 | M10 | M12 | M16 | M20 | M24 |
| BDA 01 anchor | | | | | | | | |
| V | Service shear load: | [kN] | 4.9 | 6.8 | 8.5 | 15.1 | 24.6 | 33.6 |
| $\bar{\delta}_{VD}$ | Short term displacement: | [mm] | 1.0 | 1.5 | 1.8 | 1.9 | 3.1 | 1.4 |
| $\bar{\delta}_{V=}$ | Long term displacement: | [mm] | 1.5 | 2.3 | 2.7 | 2.9 | 4.7 | 2.1 |
| BDA 01-Th anchor | | | | | | | | |
| V | Service shear load: | [kN] | 4.9 | 6.8 | 8.5 | 15.1 | 24.6 | - |
| $\bar{\delta}_{VD}$ | Short term displacement: | [mm] | 1.0 | 1.5 | 1.8 | 1.9 | 3.1 | -- |
| $\bar{\delta}_{V=}$ | Long term displacement: | [mm] | 1.5 | 2.3 | 2.7 | 2.9 | 4.7 | -- |
| BDA 01-X anchor | | | | | | | | |
| V | Service shear load: | [kN] | 4.9 | 6.8 | 8.5 | 15.1 | 24.6 | -- |
| $\bar{\delta}_{VD}$ | Short term displacement: | [mm] | 1.0 | 1.5 | 1.8 | 1.9 | 3.1 | -- |
| $\bar{\delta}_{V=}$ | Long term displacement: | [mm] | 1.5 | 2.3 | 2.7 | 2.9 | 4.7 | -- |

| Design information for seismic performance C1 | | | Performance | | | | | |
|---|---------------------------------------|------|-------------|------|------|------|-----|-----|
| | | | M8 | M10 | M12 | M16 | M20 | M24 |
| BDA 01 anchor | | | | | | | | |
| $N_{RK,S,seis}$ | Characteristic tension steel failure: | [kN] | -- | 31.4 | 40.4 | 72.7 | -- | -- |
| γ_{Ms} | Partial safety factor: | [-] | -- | 1.5 | 1.5 | 1.5 | -- | -- |
| $N_{RK,p,seis}$ | Characteristic pull out failure: | [kN] | -- | 5.3 | 8.4 | 17.5 | -- | -- |
| γ_{Mp} | Partial safety factor: | [-] | -- | 1.5 | 1.5 | 1.5 | -- | -- |
| $V_{RK,p,seis}$ | Characteristic shear steel failure: | [kN] | -- | 12.2 | 17.8 | 33.0 | -- | -- |
| γ_{Mp} | Partial safety factor: | [-] | -- | 1.25 | 1.25 | 1.25 | -- | -- |

| Design information for seismic performance C2 | | | Performance | | | | | |
|---|---------------------------------------|------|-------------|-----|------|-------|-----|-----|
| | | | M8 | M10 | M12 | M16 | M20 | M24 |
| BDA 01 anchor | | | | | | | | |
| $N_{RK,S,seis}^{**}$ | Characteristic tension steel failure: | [kN] | -- | -- | 40.4 | 72.7 | -- | -- |
| γ_{Ms}^{**} | Partial safety factor: | [-] | -- | -- | 1.5 | 1.5 | -- | -- |
| $N_{RK,p,seis}^{**}$ | Characteristic pull out failure: | [kN] | -- | -- | 5.2 | 8.9 | -- | -- |
| γ_{Mp}^{**} | Partial safety factor: | [-] | -- | -- | 1.5 | 1.5 | -- | -- |
| $\bar{\delta}_{N,seis}(DSL)^{**}$ | Displacement Damage Limitation State | [mm] | -- | -- | 2.34 | 3.99 | -- | -- |
| $\bar{\delta}_{N,seis}(USL)^{**}$ | Displacement Ultimate Limit State: | [mm] | -- | -- | 9.54 | 10.17 | -- | -- |
| $V_{RK,p,seis}^{**}$ | Characteristic shear steel failure: | [kN] | -- | -- | 17.8 | 33.0 | -- | -- |
| γ_{Mp}^{**} | Partial safety factor: | [-] | -- | -- | 1.25 | 1.25 | -- | -- |
| $\bar{\delta}_{V,seis}(DSL)^{**}$ | Displacement Damage Limitation State | [mm] | -- | -- | 5.53 | 5.96 | -- | -- |
| $\bar{\delta}_{V,seis}(USL)^{**}$ | Displacement Ultimate Limit State: | [mm] | -- | -- | 9.08 | 10.66 | -- | -- |

^{*)} The listed displacements represent mean values

^{**)} A small displacement may be required in the design in the case of displacement sensitive fastenings of "rigid" supports. The characteristic resistance associated with such smaller displacement may be determined by linear interpolation or proportional reduction.

^{***)} The recommended safety factors under seismic actions $\gamma_{M,seis}$ are the same as for static loading

Brandveiligheid (BWR 2) volgens Besluit 96/603/EC en Amendement 2000/65/EC

Brandreactie

Klasse A1

| Fire resistance duration = 30 minutes | | M8 | M10 | M12 | M16 | M20 | M24 |
|--|---|-----------------------|-----|-----------------------|------|------|------|
| Tension loads steel failure | | | | | | | |
| $N_{Rk,s,f,30}$ | Characteristic tension resistance [kN] | 0,4 | 0,9 | 1,7 | 3,1 | 4,9 | 7,1 |
| Pull-out failure | | | | | | | |
| $N_{Rk,p,f,30}$ | Character. resistance in concrete C20/25 to C50/60 [kN] | 1,3/1,5 ^{*)} | 2,3 | 3,0/4,0 ^{*)} | 6,3 | 7,5 | 7,5 |
| Concrete cone failure ^{**)} | | | | | | | |
| $N_{Rk,c,f,30}$ | Character. resistance in concrete C20/25 to C50/60 [kN] | 2,9 | 5,0 | 7,4 | 12,0 | 18,0 | 31,4 |
| Shear loads steel failure without lever arm | | | | | | | |
| $V_{Rk,s,f,30}$ | Characteristic shear resistance [kN] | 0,4 | 0,9 | 1,7 | 3,1 | 4,9 | 7,1 |
| Shear loads steel failure with lever arm | | | | | | | |
| $M_{Rk,s,f,30}$ | Characteristic bending resistance [Nm] | 0,4 | 1,1 | 2,6 | 6,7 | 13,0 | 22,5 |

*) Respective values for anchors BDA 01 / BDA 01-Th, BDA 01-X

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

| Fire resistance duration = 60 minutes | | M8 | M10 | M12 | M16 | M20 | M24 |
|--|---|-------------------------|-----|-------------------------|------|------|------|
| Tension loads steel failure | | | | | | | |
| $N_{Rk,s,f,60}$ | Characteristic tension resistance [kN] | 0,3 | 0,8 | 1,3 | 2,4 | 3,7 | 5,3 |
| Pull-out failure | | | | | | | |
| $N_{Rk,p,f,60}$ | Character. resistance in concrete C20/25 to C50/60 [kN] | 1,3 / 1,5 ^{*)} | 2,3 | 3,0 / 4,0 ^{*)} | 6,3 | 7,5 | 7,5 |
| Concrete cone failure ^{**)} | | | | | | | |
| $N_{Rk,c,f,60}$ | Character. resistance in concrete C20/25 to C50/60 [kN] | 2,9 | 5,0 | 7,4 | 12,0 | 18,0 | 31,4 |
| Shear loads steel failure without lever arm | | | | | | | |
| $V_{Rk,s,f,60}$ | Characteristic shear resistance [kN] | 0,3 | 0,8 | 1,3 | 2,4 | 3,7 | 5,3 |
| Shear loads steel failure with lever arm | | | | | | | |
| $M_{Rk,s,f,60}$ | Characteristic bending resistance [Nm] | 0,3 | 1,0 | 2,0 | 5,0 | 9,7 | 16,8 |

*) Respective values for anchors BDA 01 / BDA 01-Th, BDA 01-X

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

| Fire resistance duration = 90 minutes | | M8 | M10 | M12 | M16 | M20 | M24 |
|--|---|-------------------------|-----|-------------------------|------|------|------|
| Tension loads steel failure | | | | | | | |
| $N_{Rk,s,f,90}$ | Characteristic tension resistance [kN] | 0,3 | 0,6 | 1,1 | 2,0 | 3,2 | 4,6 |
| Pull-out failure | | | | | | | |
| $N_{Rk,p,f,90}$ | Character. resistance in concrete C20/25 to C50/60 [kN] | 1,3 / 1,5 ^{*)} | 2,3 | 3,0 / 4,0 ^{*)} | 6,3 | 7,5 | 7,5 |
| Concrete cone failure ^{**)} | | | | | | | |
| $N_{Rk,c,f,90}$ | Character. resistance in concrete C20/25 to C50/60 [kN] | 2,9 | 5,0 | 7,4 | 12,0 | 18,0 | 31,4 |
| Shear loads steel failure without lever arm | | | | | | | |
| $V_{Rk,s,f,90}$ | Characteristic shear resistance [kN] | 0,3 | 0,6 | 1,1 | 2,0 | 3,2 | 4,5 |
| Shear loads steel failure with lever arm | | | | | | | |
| $M_{Rk,s,f,90}$ | Characteristic bending resistance [Nm] | 0,3 | 0,7 | 1,7 | 4,3 | 8,4 | 14,6 |

*) Respective values for anchors BDA 01 / BDA 01-Th, BDA 01-X

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

10. De prestaties van het in de punten 1 en 2 omschreven product zijn conform de in punt 9 aangegeven prestaties. Deze prestatieverklaring wordt verstrekt onder de exclusieve verantwoordelijkheid van de in punt 4 vermelde fabrikant:

Ondertekend voor en namens de fabrikant,

14 december 2016

F.P.J. Balen

Technisch directeur

