

# Sika AnchorFix®-3030

## DECLARATION OF PERFORMANCE

### No. 25601660

|    |                                                 |                                                                                                                                |
|----|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| 1  | UNIQUE IDENTIFICATION CODE OF THE PRODUCT-TYPE: | 25601660                                                                                                                       |
| 2  | INTENDED USE/S                                  | EAD 330499-01-0601:2018<br>Bonded fastener for use in cracked and uncracked concrete for a service life of 50 and/or 100 years |
| 3  | MANUFACTURER:                                   | Sika Services AG<br>Tüffenwies 16-22<br>8064 Zürich                                                                            |
| 4  | AUTHORISED REPRESENTATIVE:                      | -                                                                                                                              |
| 5  | SYSTEM/S OF AVCP:                               | System 1                                                                                                                       |
| 6b | EUROPEAN ASSESSMENT DOCUMENT:                   | EAD 330499-01-0601:2018                                                                                                        |
|    | European Technical Assessment:                  | ETA_17/0694 of 25/10/2021                                                                                                      |
|    | Technical Assessment Body:                      | TECHNICKY A ZKUSEBNI USTAV STAVEBNI PRAHA S. P.                                                                                |
|    | Notified body/ies:                              | 1020                                                                                                                           |

#### Declaration of Performance

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**7 DECLARED PERFORMANCE/S**

| Essential Characteristics                                                   | Performance            | AVCP     | Harmonised Technical Specification |
|-----------------------------------------------------------------------------|------------------------|----------|------------------------------------|
| Characteristic resistance to tension load (static and quasi-static loading) | Annex C 1, C 2         | System 1 | EAD 330499-01-0601:2018            |
| Characteristic resistance to shear load (static and quasi-static loading)   | See Annex C 3, C 4     | System 1 |                                    |
| Displacements under short-term                                              | See Annex C 5          | System 1 |                                    |
| Characteristic resistance for seismic performance categories C1             | See Annex C 6, C 7, C8 | System 1 |                                    |

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**Table C1:** Design method EN 1992-4  
Characteristic values of resistance to tension load of threaded rod

| Steel failure – Characteristic resistance                                                                  |                                |          |                        |      |     |     |     |     |     |     |
|------------------------------------------------------------------------------------------------------------|--------------------------------|----------|------------------------|------|-----|-----|-----|-----|-----|-----|
| Size                                                                                                       |                                |          | M8                     | M10  | M12 | M16 | M20 | M24 | M27 | M30 |
| Steel grade 4.6                                                                                            | $N_{Rk,s}$                     | [kN]     | 15                     | 23   | 34  | 63  | 98  | 141 | 184 | 224 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 2,00                   |      |     |     |     |     |     |     |
| Steel grade 4.8                                                                                            | $N_{Rk,s}$                     | [kN]     | 15                     | 23   | 34  | 63  | 98  | 141 | 184 | 224 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,50                   |      |     |     |     |     |     |     |
| Steel grade 5.8                                                                                            | $N_{Rk,s}$                     | [kN]     | 18                     | 29   | 42  | 79  | 123 | 177 | 230 | 281 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,50                   |      |     |     |     |     |     |     |
| Steel grade 8.8                                                                                            | $N_{Rk,s}$                     | [kN]     | 29                     | 46   | 67  | 126 | 196 | 282 | 367 | 449 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,50                   |      |     |     |     |     |     |     |
| Steel grade 10.9                                                                                           | $N_{Rk,s}$                     | [kN]     | 37                     | 58   | 84  | 157 | 245 | 353 | 459 | 561 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,33                   |      |     |     |     |     |     |     |
| Stainless steel grade A2-70, A4-70                                                                         | $N_{Rk,s}$                     | [kN]     | 26                     | 41   | 59  | 110 | 172 | 247 | 321 | 393 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,87                   |      |     |     |     |     |     |     |
| Stainless steel grade A4-80                                                                                | $N_{Rk,s}$                     | [kN]     | 29                     | 46   | 67  | 126 | 196 | 282 | 367 | 449 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,60                   |      |     |     |     |     |     |     |
| Stainless steel grade 1.4529                                                                               | $N_{Rk,s}$                     | [kN]     | 26                     | 41   | 59  | 110 | 172 | 247 | 321 | 393 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,50                   |      |     |     |     |     |     |     |
| Stainless steel grade 1.4565                                                                               | $N_{Rk,s}$                     | [kN]     | 26                     | 41   | 59  | 110 | 172 | 247 | 321 | 393 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,87                   |      |     |     |     |     |     |     |
| Combined pullout and concrete cone failure in concrete C20/25 for a working life of 50 years and 100 years |                                |          |                        |      |     |     |     |     |     |     |
| Size                                                                                                       |                                |          | M8                     | M10  | M12 | M16 | M20 | M24 | M27 | M30 |
| Characteristic bond resistance in uncracked concrete                                                       |                                |          |                        |      |     |     |     |     |     |     |
| Temperature T3: -40°C to +70°C                                                                             | $\tau_{Rk,ucr}$                | [N/mm²]  | 17                     | 15   | 15  | 12  | 12  | 12  | 11  | 9,5 |
| Dry, wet concrete, flooded hole                                                                            |                                |          |                        |      |     |     |     |     |     |     |
| Partial safety factor                                                                                      | $\gamma_{inst}$                | [-]      | 1,0                    |      |     |     |     |     |     |     |
| Characteristic bond resistance in cracked concrete                                                         |                                |          |                        |      |     |     |     |     |     |     |
| Temperature T3: -40°C to +70°C                                                                             | $\tau_{Rk,cr}$                 | [N/mm²]  | 10                     | 10   | 10  | 9,5 | 9   | 9   | 6   | 6   |
| Dry, wet concrete, flooded hole                                                                            |                                |          |                        |      |     |     |     |     |     |     |
| Partial safety factor                                                                                      | $\gamma_{inst}$                | [-]      | 1,0                    |      |     |     |     |     |     |     |
| Factor for influence of sustained load for a working life 50 years                                         | T3: 50°C / 70°C $\psi^0_{sus}$ | [-]      | 0,72                   |      |     |     |     |     |     |     |
| Factor for concrete                                                                                        | C25/30                         | $\psi_c$ | [-]                    | 1,02 |     |     |     |     |     |     |
|                                                                                                            | C30/37                         |          |                        | 1,04 |     |     |     |     |     |     |
|                                                                                                            | C35/45                         |          |                        | 1,06 |     |     |     |     |     |     |
|                                                                                                            | C40/50                         |          |                        | 1,07 |     |     |     |     |     |     |
|                                                                                                            | C45/55                         |          |                        | 1,08 |     |     |     |     |     |     |
|                                                                                                            | C50/60                         |          |                        | 1,09 |     |     |     |     |     |     |
| Concrete cone failure                                                                                      |                                |          |                        |      |     |     |     |     |     |     |
| Factor for concrete cone failure for uncracked concrete                                                    | $k_{ucr,N}$                    | [-]      | 11                     |      |     |     |     |     |     |     |
| Factor for concrete cone failure for cracked concrete                                                      | $k_{cr,N}$                     |          | 7,7                    |      |     |     |     |     |     |     |
| Edge distance                                                                                              | $c_{cr,N}$                     | [mm]     | 1,5h <sub>ef</sub>     |      |     |     |     |     |     |     |
| Splitting failure                                                                                          |                                |          |                        |      |     |     |     |     |     |     |
| Size                                                                                                       |                                |          | M8                     | M10  | M12 | M16 | M20 | M24 | M27 | M30 |
| Edge distance                                                                                              | $c_{cr,sp}$                    | [mm]     | 2 • h <sub>ef</sub>    |      |     |     |     |     |     |     |
| Spacing                                                                                                    | $s_{cr,sp}$                    | [mm]     | 2 • c <sub>cr,sp</sub> |      |     |     |     |     |     |     |

**Performances** - Design according to EN 1992-4  
Characteristic resistance for tension loads - threaded rod

**Annex C 1**

**Declaration of Performance**

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**Table C2:** Design method EN 1992-4  
Characteristic values of resistance to tension load of rebar

| Steel failure – Characteristic resistance |                   |      |     |     |     |     |     |     |     |
|-------------------------------------------|-------------------|------|-----|-----|-----|-----|-----|-----|-----|
| Size                                      |                   |      | Ø8  | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| Rebar BSt 500 S                           | N <sub>Rk,s</sub> | [kN] | 28  | 43  | 62  | 111 | 173 | 270 | 442 |
| Partial safety factor                     | γ <sub>Ms</sub>   | [-]  | 1,4 |     |     |     |     |     |     |

| Combined pullout and concrete cone failure in concrete C20/25 for a working life of 50 years and 100 years |        |                                    |      |     |     |     |     |     |     |
|------------------------------------------------------------------------------------------------------------|--------|------------------------------------|------|-----|-----|-----|-----|-----|-----|
| Size                                                                                                       |        |                                    | Ø8   | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| Characteristic bond resistance in uncracked concrete                                                       |        |                                    |      |     |     |     |     |     |     |
| Temperature T3: -40°C to +70°C                                                                             |        | $\tau_{Rk,ucr}$ [N/mm²]            | 13   | 13  | 13  | 12  | 12  | 12  | 8   |
| Dry and wet concrete                                                                                       |        |                                    |      |     |     |     |     |     |     |
| Installation safety factor                                                                                 |        | $\gamma_{inst}$ [-]                | 1,0  |     |     |     |     |     |     |
| Flooded hole                                                                                               |        |                                    |      |     |     |     |     |     |     |
| Installation safety factor                                                                                 |        | $\gamma_{inst}$ [-]                | 1,2  |     |     |     |     |     |     |
| Characteristic bond resistance in cracked concrete                                                         |        |                                    |      |     |     |     |     |     |     |
| Temperature T3: -40°C to +70°C                                                                             |        | $\tau_{Rk,cr}$ [N/mm²]             | 8    | 11  | 10  | 10  | 9   | 8,5 | 6,5 |
| Dry and wet concrete                                                                                       |        |                                    |      |     |     |     |     |     |     |
| Installation safety factor                                                                                 |        | $\gamma_{inst}$ [-]                | 1,0  |     |     |     |     |     |     |
| Flooded hole                                                                                               |        |                                    |      |     |     |     |     |     |     |
| Installation safety factor                                                                                 |        | $\gamma_{inst}$ [-]                | 1,2  |     |     |     |     |     |     |
| Factor for influence of sustained load for a working life 50 years                                         |        | T3: 50°C / 70°C $\psi^0_{sus}$ [-] | 0,72 |     |     |     |     |     |     |
| Factor for concrete                                                                                        | C25/30 | $\psi_c$ [-]                       | 1,02 |     |     |     |     |     |     |
|                                                                                                            | C30/37 |                                    | 1,04 |     |     |     |     |     |     |
|                                                                                                            | C35/45 |                                    | 1,06 |     |     |     |     |     |     |
|                                                                                                            | C40/50 |                                    | 1,07 |     |     |     |     |     |     |
|                                                                                                            | C45/55 |                                    | 1,08 |     |     |     |     |     |     |
|                                                                                                            | C50/60 |                                    | 1,09 |     |     |     |     |     |     |

| Concrete cone failure                                   |             |      |                    |
|---------------------------------------------------------|-------------|------|--------------------|
| Factor for concrete cone failure for uncracked concrete | $k_{ucr,N}$ | [-]  | 11                 |
| Factor for concrete cone failure for cracked concrete   | $k_{cr,N}$  |      | 7,7                |
| Edge distance                                           | $c_{cr,N}$  | [mm] | 1,5h <sub>ef</sub> |

| Splitting failure |             |      |                        |     |     |     |     |     |     |
|-------------------|-------------|------|------------------------|-----|-----|-----|-----|-----|-----|
| Size              |             |      | Ø8                     | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| Edge distance     | $c_{cr,sp}$ | [mm] | 2 • h <sub>ef</sub>    |     |     |     |     |     |     |
| Spacing           | $s_{cr,sp}$ | [mm] | 2 • c <sub>cr,sp</sub> |     |     |     |     |     |     |

#### Performances

Design according to EN 1992-4  
Characteristic resistance for tension loads - rebar

**Annex C 2**

#### Declaration of Performance

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**Table C3:** Design method EN 1992-4  
Characteristic values of resistance to shear load of threaded rod

| Steel failure without lever arm                                            |                   |      |     |     |     |     |     |     |     |
|----------------------------------------------------------------------------|-------------------|------|-----|-----|-----|-----|-----|-----|-----|
| Size                                                                       |                   | M8   | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
| Steel grade <b>4.6</b>                                                     | $V_{Rk,s}$ [kN]   | 7    | 12  | 17  | 31  | 49  | 71  | 92  | 112 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,67 |     |     |     |     |     |     |     |
| Steel grade <b>4.8</b>                                                     | $V_{Rk,s}$ [kN]   | 7    | 12  | 17  | 31  | 49  | 71  | 92  | 112 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,25 |     |     |     |     |     |     |     |
| Steel grade <b>5.8</b>                                                     | $V_{Rk,s}$ [kN]   | 9    | 15  | 21  | 39  | 61  | 88  | 115 | 140 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,25 |     |     |     |     |     |     |     |
| Steel grade <b>8.8</b>                                                     | $V_{Rk,s}$ [kN]   | 15   | 23  | 34  | 63  | 98  | 141 | 184 | 224 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,25 |     |     |     |     |     |     |     |
| Steel grade <b>10.9</b>                                                    | $V_{Rk,s}$ [kN]   | 18   | 29  | 42  | 79  | 123 | 177 | 230 | 281 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,5  |     |     |     |     |     |     |     |
| Stainless steel grade <b>A2-70, A4-70</b>                                  | $V_{Rk,s}$ [kN]   | 13   | 20  | 30  | 55  | 86  | 124 | 161 | 196 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,56 |     |     |     |     |     |     |     |
| Stainless steel grade <b>A4-80</b>                                         | $V_{Rk,s}$ [kN]   | 15   | 23  | 34  | 63  | 98  | 141 | 184 | 224 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,33 |     |     |     |     |     |     |     |
| Stainless steel grade <b>1.4529</b>                                        | $V_{Rk,s}$ [kN]   | 13   | 20  | 30  | 55  | 86  | 124 | 161 | 196 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,25 |     |     |     |     |     |     |     |
| Stainless steel grade <b>1.4565</b>                                        | $V_{Rk,s}$ [kN]   | 13   | 20  | 30  | 55  | 86  | 124 | 161 | 196 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,56 |     |     |     |     |     |     |     |
| Characteristic resistance of group of fasteners                            |                   |      |     |     |     |     |     |     |     |
| Ductility factor $k_7 = 1,0$ for steel with rupture elongation $A_5 > 8\%$ |                   |      |     |     |     |     |     |     |     |

| Steel failure with lever arm              |                                |       |      |     |     |     |     |      |      |      |
|-------------------------------------------|--------------------------------|-------|------|-----|-----|-----|-----|------|------|------|
| Size                                      |                                |       | M8   | M10 | M12 | M16 | M20 | M24  | M27  | M30  |
| Steel grade <b>4.6</b>                    | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 15   | 30  | 52  | 133 | 260 | 449  | 666  | 900  |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,67 |     |     |     |     |      |      |      |
| Steel grade <b>4.8</b>                    | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 15   | 30  | 52  | 133 | 260 | 449  | 666  | 900  |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,25 |     |     |     |     |      |      |      |
| Steel grade <b>5.8</b>                    | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 19   | 37  | 66  | 166 | 325 | 561  | 832  | 1125 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,25 |     |     |     |     |      |      |      |
| Steel grade <b>8.8</b>                    | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 30   | 60  | 105 | 266 | 519 | 898  | 1332 | 1799 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,25 |     |     |     |     |      |      |      |
| Steel grade <b>10.9</b>                   | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 37   | 75  | 131 | 333 | 649 | 1123 | 1664 | 2249 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,50 |     |     |     |     |      |      |      |
| Stainless steel grade <b>A2-70, A4-70</b> | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 26   | 52  | 92  | 233 | 454 | 786  | 1165 | 1574 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,56 |     |     |     |     |      |      |      |
| Stainless steel grade <b>A4-80</b>        | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 30   | 60  | 105 | 266 | 519 | 898  | 1332 | 1799 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,33 |     |     |     |     |      |      |      |
| Stainless steel grade <b>1.4529</b>       | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 26   | 52  | 92  | 233 | 454 | 786  | 1165 | 1574 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,25 |     |     |     |     |      |      |      |
| Stainless steel grade <b>1.4565</b>       | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 26   | 52  | 92  | 233 | 454 | 786  | 1165 | 1574 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,56 |     |     |     |     |      |      |      |
| Concrete pryout failure                   |                                |       |      |     |     |     |     |      |      |      |
| Factor for resistance to pry-out failure  | k <sub>8</sub>                 | [-]   | 2    |     |     |     |     |      |      |      |

| Concrete edge failure        |                |                           |     |     |     |     |     |     |     |
|------------------------------|----------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|
| Size                         |                | M8                        | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
| Outside diameter of fastener | $d_{nom}$ [mm] | 8                         | 10  | 12  | 16  | 20  | 24  | 27  | 30  |
| Effective length of fastener | $\ell_f$ [mm]  | $\min(h_{ef}, 8 d_{nom})$ |     |     |     |     |     |     |     |

Performances - Design according to EN 1992-4  
Characteristic resistance for shear loads - threaded rod

**Annex C 3**

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**Table C4:** Design method EN 1992-4  
Characteristic values of resistance to shear load of rebar

| Steel failure without lever arm                                            |               |      |     |     |     |     |     |     |     |
|----------------------------------------------------------------------------|---------------|------|-----|-----|-----|-----|-----|-----|-----|
| Size                                                                       |               |      | Ø8  | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| Rebar BSt 500 S                                                            | $V_{Rk,S}$    | [kN] | 14  | 22  | 31  | 55  | 86  | 135 | 221 |
| Partial safety factor                                                      | $\gamma_{Ms}$ | [-]  | 1,5 |     |     |     |     |     |     |
| Characteristic resistance of group of fasteners                            |               |      |     |     |     |     |     |     |     |
| Ductility factor $k_7 = 1,0$ for steel with rupture elongation $A_5 > 8\%$ |               |      |     |     |     |     |     |     |     |

| Steel failure with lever arm             |                                      |     |     |     |     |     |      |      |
|------------------------------------------|--------------------------------------|-----|-----|-----|-----|-----|------|------|
| Size                                     |                                      | Ø8  | Ø10 | Ø12 | Ø16 | Ø20 | Ø25  | Ø32  |
| Rebar BSt 500 S                          | M <sup>o</sup> <sub>Rk,S</sub> [N.m] | 33  | 65  | 112 | 265 | 518 | 1013 | 2122 |
| Partial safety factor                    | γ <sub>Ms</sub> [-]                  | 1,5 |     |     |     |     |      |      |
| Concrete pryout failure                  |                                      |     |     |     |     |     |      |      |
| Factor for resistance to pry-out failure | k <sub>8</sub> [-]                   | 2   |     |     |     |     |      |      |

| Concrete edge failure        |                |                           |     |     |     |     |     |     |
|------------------------------|----------------|---------------------------|-----|-----|-----|-----|-----|-----|
| Size                         |                | Ø8                        | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| Outside diameter of fastener | $d_{nom}$ [mm] | 8                         | 10  | 12  | 16  | 20  | 25  | 32  |
| Effective length of fastener | $\ell_f$ [mm]  | $\min(h_{ef}, 8 d_{nom})$ |     |     |     |     |     |     |

**Performances**

Design according to EN 1992-4  
Characteristic resistance for shear loads - rebar

**Annex C 4**

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**Table C5:** Displacement of threaded rod under tension and shear load

| Size               |         | M8   | M10  | M12  | M16  | M20  | M24  | M27  | M30  |
|--------------------|---------|------|------|------|------|------|------|------|------|
| Tension load       |         |      |      |      |      |      |      |      |      |
| Uncracked concrete |         |      |      |      |      |      |      |      |      |
| $\delta_{N0}$      | [mm/kN] | 0,03 | 0,02 | 0,02 | 0,02 | 0,01 | 0,01 | 0,01 | 0,01 |
| $\delta_{N\infty}$ | [mm/kN] | 0,05 | 0,04 | 0,03 | 0,03 | 0,02 | 0,02 | 0,01 | 0,01 |
| Cracked concrete   |         |      |      |      |      |      |      |      |      |
| $\delta_{N0}$      | [mm/kN] | 0,05 | 0,04 | 0,03 | 0,03 | 0,02 | 0,02 | 0,02 | 0,02 |
| $\delta_{N\infty}$ | [mm/kN] | 0,35 | 0,21 | 0,14 | 0,12 | 0,08 | 0,07 | 0,07 | 0,07 |
| Shear load         |         |      |      |      |      |      |      |      |      |
| $\delta_{V0}$      | [mm/kN] | 0,71 | 0,45 | 0,31 | 0,17 | 0,11 | 0,07 | 0,06 | 0,05 |
| $\delta_{V\infty}$ | [mm/kN] | 1,06 | 0,67 | 0,46 | 0,25 | 0,16 | 0,11 | 0,08 | 0,07 |

**Table C6:** Displacement of rebar under tension and shear load

| Size               |         | Ø8   | Ø10  | Ø12  | Ø16  | Ø20  | Ø25  | Ø32  |
|--------------------|---------|------|------|------|------|------|------|------|
| Tension load       |         |      |      |      |      |      |      |      |
| Uncracked concrete |         |      |      |      |      |      |      |      |
| $\delta_{N0}$      | [mm/kN] | 0,04 | 0,03 | 0,02 | 0,01 | 0,01 | 0,01 | 0,01 |
| $\delta_{N\infty}$ | [mm/kN] | 0,08 | 0,05 | 0,04 | 0,02 | 0,02 | 0,01 | 0,01 |
| Cracked concrete   |         |      |      |      |      |      |      |      |
| $\delta_{N0}$      | [mm/kN] | 0,05 | 0,04 | 0,03 | 0,03 | 0,02 | 0,02 | 0,02 |
| $\delta_{N\infty}$ | [mm/kN] | 0,35 | 0,21 | 0,17 | 0,11 | 0,08 | 0,07 | 0,06 |
| Shear load         |         |      |      |      |      |      |      |      |
| $\delta_{V0}$      | [mm/kN] | 0,38 | 0,24 | 0,17 | 0,10 | 0,06 | 0,04 | 0,02 |
| $\delta_{V\infty}$ | [mm/kN] | 0,56 | 0,36 | 0,25 | 0,14 | 0,09 | 0,06 | 0,04 |

**Performances**

Displacement for threaded rod and rebar

**Annex C 5****Declaration of Performance**

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**Table C7: Seismic performance category C1 of threaded rod**

| Size                                                                                                                                                                 |                      |         | M8   | M10  | M12  | M16  | M20  | M24  | M27  | M30  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------|------|------|------|------|------|------|------|------|
| Tension load                                                                                                                                                         |                      |         |      |      |      |      |      |      |      |      |
| Steel failure                                                                                                                                                        |                      |         |      |      |      |      |      |      |      |      |
| Characteristic resistance grade 4.6                                                                                                                                  | $N_{Rk,s,eq,C1}$     | [kN]    | 15   | 23   | 34   | 63   | 98   | 141  | 184  | 224  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 2,00 |      |      |      |      |      |      |      |
| Characteristic resistance grade 4.8                                                                                                                                  | $N_{Rk,s,eq,C1}$     | [kN]    | 15   | 23   | 34   | 63   | 98   | 141  | 184  | 224  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,50 |      |      |      |      |      |      |      |
| Characteristic resistance grade 5.8                                                                                                                                  | $N_{Rk,s,eq,C1}$     | [kN]    | 18   | 29   | 42   | 79   | 123  | 177  | 230  | 281  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,50 |      |      |      |      |      |      |      |
| Characteristic resistance grade 8.8                                                                                                                                  | $N_{Rk,s,eq,C1}$     | [kN]    | 29   | 46   | 67   | 126  | 196  | 282  | 367  | 449  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,50 |      |      |      |      |      |      |      |
| Characteristic resistance grade 10.9                                                                                                                                 | $N_{Rk,s,eq,C1}$     | [kN]    | 37   | 58   | 84   | 157  | 245  | 353  | 459  | 561  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,33 |      |      |      |      |      |      |      |
| Characteristic resistance A2-70, A4-70                                                                                                                               | $N_{Rk,s,eq,C1}$     | [kN]    | 26   | 41   | 59   | 110  | 172  | 247  | 321  | 393  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,87 |      |      |      |      |      |      |      |
| Characteristic resistance A4-80                                                                                                                                      | $N_{Rk,s,eq,C1}$     | [kN]    | 29   | 46   | 67   | 126  | 196  | 282  | 367  | 449  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,60 |      |      |      |      |      |      |      |
| Characteristic resistance 1.4529                                                                                                                                     | $N_{Rk,s,eq,C1}$     | [kN]    | 26   | 41   | 59   | 110  | 172  | 247  | 321  | 393  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,50 |      |      |      |      |      |      |      |
| Characteristic resistance 1.4565                                                                                                                                     | $N_{Rk,s,eq,C1}$     | [kN]    | 26   | 41   | 59   | 110  | 172  | 247  | 321  | 393  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,87 |      |      |      |      |      |      |      |
| Combined pullout and concrete cone failure in concrete C20/25 for a working life of 50 years and 100 years                                                           |                      |         |      |      |      |      |      |      |      |      |
| Characteristic bond resistance                                                                                                                                       |                      |         |      |      |      |      |      |      |      |      |
| Temperature T3: -40°C to +70°C                                                                                                                                       | $\tau_{Rk,p,eq,C1}$  | [N/mm²] | 9,4  | 8,5  | 10,0 | 8,7  | 7,4  | 7,7  | 5,7  | 4,9  |
| Installation safety factor                                                                                                                                           | $\gamma_{Inst}$      | [-]     | 1,0  |      |      |      |      |      |      |      |
| Shear load                                                                                                                                                           |                      |         |      |      |      |      |      |      |      |      |
| Steel failure without lever arm                                                                                                                                      |                      |         |      |      |      |      |      |      |      |      |
| Characteristic resistance grade 4.6                                                                                                                                  | $V_{Rk,s,eq,C1}$     | [kN]    | 5    | 9    | 13   | 20   | 32   | 28   | 37   | 45   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,67 |      |      |      |      |      |      |      |
| Characteristic resistance grade 4.8                                                                                                                                  | $V_{Rk,s,eq,C1}$     | [kN]    | 5    | 9    | 13   | 20   | 32   | 28   | 37   | 45   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,25 |      |      |      |      |      |      |      |
| Characteristic resistance grade 5.8                                                                                                                                  | $V_{Rk,s,eq,C1}$     | [kN]    | 7    | 11   | 16   | 26   | 40   | 35   | 46   | 56   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,25 |      |      |      |      |      |      |      |
| Characteristic resistance grade 8.8                                                                                                                                  | $V_{Rk,s,eq,C1}$     | [kN]    | 11   | 17   | 25   | 41   | 64   | 56   | 73   | 90   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,25 |      |      |      |      |      |      |      |
| Characteristic resistance grade 10.9                                                                                                                                 | $V_{Rk,s,eq,C1}$     | [kN]    | 14   | 22   | 32   | 51   | 80   | 71   | 92   | 112  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,50 |      |      |      |      |      |      |      |
| Characteristic resistance A2-70, A4-70                                                                                                                               | $V_{Rk,s,eq,C1}$     | [kN]    | 10   | 15   | 22   | 36   | 56   | 49   | 64   | 79   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,56 |      |      |      |      |      |      |      |
| Characteristic resistance A4-80                                                                                                                                      | $V_{Rk,s,eq,C1}$     | [kN]    | 11   | 17   | 25   | 41   | 64   | 56   | 73   | 90   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,33 |      |      |      |      |      |      |      |
| Characteristic resistance 1.4529                                                                                                                                     | $V_{Rk,s,eq,C1}$     | [kN]    | 10   | 15   | 22   | 36   | 56   | 49   | 64   | 79   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,25 |      |      |      |      |      |      |      |
| Characteristic resistance 1.4565                                                                                                                                     | $V_{Rk,s,eq,C1}$     | [kN]    | 10   | 15   | 22   | 36   | 56   | 49   | 64   | 79   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,56 |      |      |      |      |      |      |      |
| Characteristic shear load resistance $V_{Rk,s,eq}$ in the Table C7 shall be multiplied by following reduction factor for hot-dip galvanized commercial standard rods |                      |         |      |      |      |      |      |      |      |      |
| Reduction factor for hot-dip galvanized rods                                                                                                                         | $\alpha_{v,h-dg,c1}$ | [-]     | 0,47 | 0,47 | 0,47 | 0,54 | 0,54 | 0,88 | 0,88 | 0,88 |
| Factor for annular gap                                                                                                                                               | $\alpha_{gap}$       | [-]     | 0,5  |      |      |      |      |      |      |      |

The anchor shall be used with minimum rupture elongation after fracture  $A_5$  equal to 19%.

**Performances**

Seismic performance category C1 of threaded rod

**Annex C 6**

**Declaration of Performance**

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**Table C8:** Seismic performance category C1 of rebar

| Size                                                                                                       |                             | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
|------------------------------------------------------------------------------------------------------------|-----------------------------|-----|-----|-----|-----|-----|-----|
| Tension load                                                                                               |                             |     |     |     |     |     |     |
| Steel failure                                                                                              |                             |     |     |     |     |     |     |
| Rebar BSt 500 S                                                                                            | $N_{Rk,s,eq,C1}$ [kN]       | 43  | 62  | 111 | 173 | 270 | 442 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           | 1,4 |     |     |     |     |     |
| Combined pullout and concrete cone failure in concrete C20/25 for a working life of 50 years and 100 years |                             |     |     |     |     |     |     |
| Temperature T3: -40°C to +70°C                                                                             | $\tau_{Rk,p,eq,C1}$ [N/mm²] | 9,4 | 9,8 | 9,5 | 8,8 | 8,0 | 5,3 |
| Dry and wet concrete                                                                                       |                             |     |     |     |     |     |     |
| Installation safety factor                                                                                 | $\gamma_{inst}$ [-]         | 1,0 |     |     |     |     |     |
| Flooded hole                                                                                               |                             |     |     |     |     |     |     |
| Installation safety factor                                                                                 | $\gamma_{inst}$ [-]         | 1,2 |     |     |     |     |     |
| Shear load                                                                                                 |                             |     |     |     |     |     |     |
| Steel failure without lever arm                                                                            |                             |     |     |     |     |     |     |
| Rebar BSt 500 S                                                                                            | $V_{Rk,s,eq,C1}$ [kN]       | 16  | 23  | 41  | 69  | 67  | 111 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           | 1,5 |     |     |     |     |     |
| Factor for annular gap                                                                                     | $\alpha_{gap}$ [-]          | 0,5 |     |     |     |     |     |

**Performances**

Seismic performance category C1 of rebar

**Annex C 7****Annex C 8 Performances**

Seismic performance category C2 of threaded rod

**Table C9:** Seismic performance category C2 of threaded rod

| Size                                                                                                       |                                          | M12 | M16       | M20 |
|------------------------------------------------------------------------------------------------------------|------------------------------------------|-----|-----------|-----|
| Tension load                                                                                               |                                          |     |           |     |
| Steel failure                                                                                              |                                          |     |           |     |
| Characteristic resistance grade 4.6                                                                        | $N_{Rk,s,eq,C2}$ [kN]                    | 34  | 63        | 98  |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]                        |     | 2,00      |     |
| Characteristic resistance grade 4.8                                                                        | $N_{Rk,s,eq,C2}$ [kN]                    | 34  | 63        | 98  |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]                        |     | 1,50      |     |
| Characteristic resistance grade 5.8                                                                        | $N_{Rk,s,eq,C2}$ [kN]                    | 42  | 79        | 123 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]                        |     | 1,50      |     |
| Characteristic resistance grade 8.8                                                                        | $N_{Rk,s,eq,C2}$ [kN]                    | 67  | 126       | 196 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]                        |     | 1,50      |     |
| Characteristic resistance grade 10.9                                                                       | $N_{Rk,s,eq,C2}$ [kN]                    | 84  | 157       | 245 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]                        |     | 1,33      |     |
| Characteristic resistance A2-70, A4-70                                                                     | $N_{Rk,s,eq,C2}$ [kN]                    | 59  | 110       | 172 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]                        |     | 1,87      |     |
| Characteristic resistance A4-80                                                                            | $N_{Rk,s,eq,C2}$ [kN]                    | 67  | 126       | 196 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]                        |     | 1,60      |     |
| Characteristic resistance 1.4529                                                                           | $N_{Rk,s,eq,C2}$ [kN]                    | 59  | 110       | 172 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]                        |     | 1,50      |     |
| Characteristic resistance 1.4565                                                                           | $N_{Rk,s,eq,C2}$ [kN]                    | 59  | 110       | 172 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]                        |     | 1,87      |     |
| Combined pullout and concrete cone failure in concrete C20/25 for a working life of 50 years and 100 years |                                          |     |           |     |
| Characteristic bond resistance                                                                             |                                          |     |           |     |
| Temperature T3: -40°C to +70°C                                                                             | $\tau_{Rk,p,eq,C2}$ [N/mm <sup>2</sup> ] | 3,5 | 4,0       | 4,5 |
| Installation safety factor                                                                                 | $\gamma_{inst}$ [-]                      |     | 1,0       |     |
| Performances                                                                                               |                                          |     | Annex C 8 |     |
| Seismic performance category C2 of threaded rod                                                            |                                          |     |           |     |

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**Table C9 (cont):** Seismic performance category C2 of threaded rod

| <b>Shear load</b>                                                                                                                                                           |                      |      |      |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------|------|------|
| Steel failure without lever arm                                                                                                                                             |                      |      |      |      |
| Characteristic resistance grade <b>4.6</b>                                                                                                                                  | $V_{Rk,s,eq,C2}$     | [kN] | 13   | 18   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,67 |
| Characteristic resistance grade <b>4.8</b>                                                                                                                                  | $V_{Rk,s,eq,C2}$     | [kN] | 13   | 18   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,25 |
| Characteristic resistance grade <b>5.8</b>                                                                                                                                  | $V_{Rk,s,eq,C2}$     | [kN] | 16   | 22   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,25 |
| Characteristic resistance grade <b>8.8</b>                                                                                                                                  | $V_{Rk,s,eq,C2}$     | [kN] | 25   | 36   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,25 |
| Characteristic resistance grade <b>10.9</b>                                                                                                                                 | $V_{Rk,s,eq,C2}$     | [kN] | 32   | 45   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,50 |
| Characteristic resistance <b>A2-70, A4-70</b>                                                                                                                               | $V_{Rk,s,eq,C2}$     | [kN] | 22   | 31   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,56 |
| Characteristic resistance <b>A4-80</b>                                                                                                                                      | $V_{Rk,s,eq,C2}$     | [kN] | 25   | 36   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,33 |
| Characteristic resistance <b>1.4529</b>                                                                                                                                     | $V_{Rk,s,eq,C2}$     | [kN] | 22   | 31   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,25 |
| Characteristic resistance <b>1.4565</b>                                                                                                                                     | $V_{Rk,s,eq,C2}$     | [kN] | 22   | 31   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,56 |
| Characteristic shear load resistance $V_{Rk,s,eq}$ in the Table C9 shall be multiplied by following reduction factor for <b>hot-dip galvanized commercial standard rods</b> |                      |      |      |      |
| Reduction factor for hot-dip galvanized rods                                                                                                                                | $\alpha_{v,h-dg,c2}$ | [-]  | 0,46 | 0,61 |
| Factor for annular gap                                                                                                                                                      | $\alpha_{gap}$       | [-]  |      | 0,5  |

**Table C10:** Displacement under tensile and shear load - seismic category C2 of threaded rod

| Size                 |      | M12   | M16  | M20   |
|----------------------|------|-------|------|-------|
| $\delta_{N,eq}(DLS)$ | [mm] | 0,20  | 0,40 | 0,77  |
| $\delta_{N,eq}(ULS)$ | [mm] | 0,76  | 0,74 | 1,68  |
| $\delta_{V,eq}(DLS)$ | [mm] | 5,29  | 4,12 | 4,94  |
| $\delta_{V,eq}(ULS)$ | [mm] | 10,20 | 9,05 | 10,99 |

The anchor shall be used with minimum rupture elongation after fracture  $A_5$  equal to 19%.

**Performances**

Seismic performance category C2 of threaded rod

**Annex C 8****Declaration of Performance**

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**8 APPROPRIATE TECHNICAL DOCUMENTATION AND/OR -  
SPECIFIC TECHNICAL DOCUMENTATION**

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The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

Signed for and on behalf of the manufacturer by:

---

Name : Tomasz Gutowski  
Function: Corporate Standardization  
and Approvals  
At Warsaw on 14 December 2021



Name : Marco Poltera  
Function: CPE  
At Zurich on 16 December 2021



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End of information as required by Regulation (EU) No 305/2011

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## FULL CE MARKING

|                                                                                             |
|---------------------------------------------------------------------------------------------|
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| Sika Services AG, Zurich, Switzerland                                                       |
| 25601660                                                                                    |
| Characteristic resistance to tension load (static and quasi-static loading - Annex C 1, C 2 |
| Characteristic resistance to shear load (static and quasi-static loading) - Annex C 3, C 4  |
| Displacements under short-term and long term loading - Annex C 5                            |
| Characteristic resistance for seismic performance categories C1 - Annex C 6, C 7, C 8       |

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**Table C1:** Design method EN 1992-4  
Characteristic values of resistance to tension load of threaded rod

| Steel failure – Characteristic resistance                                                                  |                                |          |                        |      |     |     |     |     |     |     |
|------------------------------------------------------------------------------------------------------------|--------------------------------|----------|------------------------|------|-----|-----|-----|-----|-----|-----|
| Size                                                                                                       |                                |          | M8                     | M10  | M12 | M16 | M20 | M24 | M27 | M30 |
| Steel grade 4.6                                                                                            | $N_{Rk,s}$                     | [kN]     | 15                     | 23   | 34  | 63  | 98  | 141 | 184 | 224 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 2,00                   |      |     |     |     |     |     |     |
| Steel grade 4.8                                                                                            | $N_{Rk,s}$                     | [kN]     | 15                     | 23   | 34  | 63  | 98  | 141 | 184 | 224 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,50                   |      |     |     |     |     |     |     |
| Steel grade 5.8                                                                                            | $N_{Rk,s}$                     | [kN]     | 18                     | 29   | 42  | 79  | 123 | 177 | 230 | 281 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,50                   |      |     |     |     |     |     |     |
| Steel grade 8.8                                                                                            | $N_{Rk,s}$                     | [kN]     | 29                     | 46   | 67  | 126 | 196 | 282 | 367 | 449 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,50                   |      |     |     |     |     |     |     |
| Steel grade 10.9                                                                                           | $N_{Rk,s}$                     | [kN]     | 37                     | 58   | 84  | 157 | 245 | 353 | 459 | 561 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,33                   |      |     |     |     |     |     |     |
| Stainless steel grade A2-70, A4-70                                                                         | $N_{Rk,s}$                     | [kN]     | 26                     | 41   | 59  | 110 | 172 | 247 | 321 | 393 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,87                   |      |     |     |     |     |     |     |
| Stainless steel grade A4-80                                                                                | $N_{Rk,s}$                     | [kN]     | 29                     | 46   | 67  | 126 | 196 | 282 | 367 | 449 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,60                   |      |     |     |     |     |     |     |
| Stainless steel grade 1.4529                                                                               | $N_{Rk,s}$                     | [kN]     | 26                     | 41   | 59  | 110 | 172 | 247 | 321 | 393 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,50                   |      |     |     |     |     |     |     |
| Stainless steel grade 1.4565                                                                               | $N_{Rk,s}$                     | [kN]     | 26                     | 41   | 59  | 110 | 172 | 247 | 321 | 393 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$                  | [-]      | 1,87                   |      |     |     |     |     |     |     |
| Combined pullout and concrete cone failure in concrete C20/25 for a working life of 50 years and 100 years |                                |          |                        |      |     |     |     |     |     |     |
| Size                                                                                                       |                                |          | M8                     | M10  | M12 | M16 | M20 | M24 | M27 | M30 |
| Characteristic bond resistance in uncracked concrete                                                       |                                |          |                        |      |     |     |     |     |     |     |
| Temperature T3: -40°C to +70°C                                                                             | $\tau_{Rk,ucr}$                | [N/mm²]  | 17                     | 15   | 15  | 12  | 12  | 12  | 11  | 9,5 |
| Dry, wet concrete, flooded hole                                                                            |                                |          |                        |      |     |     |     |     |     |     |
| Partial safety factor                                                                                      | $\gamma_{inst}$                | [-]      | 1,0                    |      |     |     |     |     |     |     |
| Characteristic bond resistance in cracked concrete                                                         |                                |          |                        |      |     |     |     |     |     |     |
| Temperature T3: -40°C to +70°C                                                                             | $\tau_{Rk,cr}$                 | [N/mm²]  | 10                     | 10   | 10  | 9,5 | 9   | 9   | 6   | 6   |
| Dry, wet concrete, flooded hole                                                                            |                                |          |                        |      |     |     |     |     |     |     |
| Partial safety factor                                                                                      | $\gamma_{inst}$                | [-]      | 1,0                    |      |     |     |     |     |     |     |
| Factor for influence of sustained load for a working life 50 years                                         | T3: 50°C / 70°C $\psi^0_{sus}$ | [-]      | 0,72                   |      |     |     |     |     |     |     |
| Factor for concrete                                                                                        | C25/30                         | $\psi_c$ | [-]                    | 1,02 |     |     |     |     |     |     |
|                                                                                                            | C30/37                         |          |                        | 1,04 |     |     |     |     |     |     |
|                                                                                                            | C35/45                         |          |                        | 1,06 |     |     |     |     |     |     |
|                                                                                                            | C40/50                         |          |                        | 1,07 |     |     |     |     |     |     |
|                                                                                                            | C45/55                         |          |                        | 1,08 |     |     |     |     |     |     |
|                                                                                                            | C50/60                         |          |                        | 1,09 |     |     |     |     |     |     |
| Concrete cone failure                                                                                      |                                |          |                        |      |     |     |     |     |     |     |
| Factor for concrete cone failure for uncracked concrete                                                    | $k_{ucr,N}$                    | [-]      | 11                     |      |     |     |     |     |     |     |
| Factor for concrete cone failure for cracked concrete                                                      | $k_{cr,N}$                     |          | 7,7                    |      |     |     |     |     |     |     |
| Edge distance                                                                                              | $c_{cr,N}$                     | [mm]     | 1,5h <sub>ef</sub>     |      |     |     |     |     |     |     |
| Splitting failure                                                                                          |                                |          |                        |      |     |     |     |     |     |     |
| Size                                                                                                       |                                |          | M8                     | M10  | M12 | M16 | M20 | M24 | M27 | M30 |
| Edge distance                                                                                              | $c_{cr,sp}$                    | [mm]     | 2 • h <sub>ef</sub>    |      |     |     |     |     |     |     |
| Spacing                                                                                                    | $s_{cr,sp}$                    | [mm]     | 2 • c <sub>cr,sp</sub> |      |     |     |     |     |     |     |

**Performances** - Design according to EN 1992-4  
Characteristic resistance for tension loads - threaded rod

**Annex C 1**

#### Declaration of Performance

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**Table C2:** Design method EN 1992-4  
Characteristic values of resistance to tension load of rebar

| Steel failure – Characteristic resistance |                   |      |     |     |     |     |     |     |     |
|-------------------------------------------|-------------------|------|-----|-----|-----|-----|-----|-----|-----|
| Size                                      |                   |      | Ø8  | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| Rebar BSt 500 S                           | N <sub>Rk,s</sub> | [kN] | 28  | 43  | 62  | 111 | 173 | 270 | 442 |
| Partial safety factor                     | γ <sub>Ms</sub>   | [-]  | 1,4 |     |     |     |     |     |     |

| Combined pullout and concrete cone failure in concrete C20/25 for a working life of 50 years and 100 years |        |                                    |      |     |     |     |     |     |     |
|------------------------------------------------------------------------------------------------------------|--------|------------------------------------|------|-----|-----|-----|-----|-----|-----|
| Size                                                                                                       |        |                                    | Ø8   | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| Characteristic bond resistance in uncracked concrete                                                       |        |                                    |      |     |     |     |     |     |     |
| Temperature T3: -40°C to +70°C                                                                             |        | $\tau_{Rk,ucr}$ [N/mm²]            | 13   | 13  | 13  | 12  | 12  | 12  | 8   |
| Dry and wet concrete                                                                                       |        |                                    |      |     |     |     |     |     |     |
| Installation safety factor                                                                                 |        | $\gamma_{inst}$ [-]                | 1,0  |     |     |     |     |     |     |
| Flooded hole                                                                                               |        |                                    |      |     |     |     |     |     |     |
| Installation safety factor                                                                                 |        | $\gamma_{inst}$ [-]                | 1,2  |     |     |     |     |     |     |
| Characteristic bond resistance in cracked concrete                                                         |        |                                    |      |     |     |     |     |     |     |
| Temperature T3: -40°C to +70°C                                                                             |        | $\tau_{Rk,cr}$ [N/mm²]             | 8    | 11  | 10  | 10  | 9   | 8,5 | 6,5 |
| Dry and wet concrete                                                                                       |        |                                    |      |     |     |     |     |     |     |
| Installation safety factor                                                                                 |        | $\gamma_{inst}$ [-]                | 1,0  |     |     |     |     |     |     |
| Flooded hole                                                                                               |        |                                    |      |     |     |     |     |     |     |
| Installation safety factor                                                                                 |        | $\gamma_{inst}$ [-]                | 1,2  |     |     |     |     |     |     |
| Factor for influence of sustained load for a working life 50 years                                         |        | T3: 50°C / 70°C $\psi^0_{sus}$ [-] | 0,72 |     |     |     |     |     |     |
| Factor for concrete                                                                                        | C25/30 | $\psi_c$ [-]                       | 1,02 |     |     |     |     |     |     |
|                                                                                                            | C30/37 |                                    | 1,04 |     |     |     |     |     |     |
|                                                                                                            | C35/45 |                                    | 1,06 |     |     |     |     |     |     |
|                                                                                                            | C40/50 |                                    | 1,07 |     |     |     |     |     |     |
|                                                                                                            | C45/55 |                                    | 1,08 |     |     |     |     |     |     |
|                                                                                                            | C50/60 |                                    | 1,09 |     |     |     |     |     |     |

| Concrete cone failure                                   |             |      |                    |
|---------------------------------------------------------|-------------|------|--------------------|
| Factor for concrete cone failure for uncracked concrete | $k_{ucr,N}$ | [-]  | 11                 |
| Factor for concrete cone failure for cracked concrete   | $k_{cr,N}$  |      | 7,7                |
| Edge distance                                           | $c_{cr,N}$  | [mm] | 1,5h <sub>ef</sub> |

| Splitting failure |             |      |                        |     |     |     |     |     |     |
|-------------------|-------------|------|------------------------|-----|-----|-----|-----|-----|-----|
| Size              |             |      | Ø8                     | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| Edge distance     | $c_{cr,sp}$ | [mm] | 2 • h <sub>ef</sub>    |     |     |     |     |     |     |
| Spacing           | $s_{cr,sp}$ | [mm] | 2 • c <sub>cr,sp</sub> |     |     |     |     |     |     |

#### Performances

Design according to EN 1992-4  
Characteristic resistance for tension loads - rebar

**Annex C 2**

#### Declaration of Performance

Sika AnchorFix®-3030  
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**Table C3:** Design method EN 1992-4  
Characteristic values of resistance to shear load of threaded rod

| Steel failure without lever arm                                            |                   |      |     |     |     |     |     |     |     |
|----------------------------------------------------------------------------|-------------------|------|-----|-----|-----|-----|-----|-----|-----|
| Size                                                                       |                   | M8   | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
| Steel grade <b>4.6</b>                                                     | $V_{Rk,s}$ [kN]   | 7    | 12  | 17  | 31  | 49  | 71  | 92  | 112 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,67 |     |     |     |     |     |     |     |
| Steel grade <b>4.8</b>                                                     | $V_{Rk,s}$ [kN]   | 7    | 12  | 17  | 31  | 49  | 71  | 92  | 112 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,25 |     |     |     |     |     |     |     |
| Steel grade <b>5.8</b>                                                     | $V_{Rk,s}$ [kN]   | 9    | 15  | 21  | 39  | 61  | 88  | 115 | 140 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,25 |     |     |     |     |     |     |     |
| Steel grade <b>8.8</b>                                                     | $V_{Rk,s}$ [kN]   | 15   | 23  | 34  | 63  | 98  | 141 | 184 | 224 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,25 |     |     |     |     |     |     |     |
| Steel grade <b>10.9</b>                                                    | $V_{Rk,s}$ [kN]   | 18   | 29  | 42  | 79  | 123 | 177 | 230 | 281 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,5  |     |     |     |     |     |     |     |
| Stainless steel grade <b>A2-70, A4-70</b>                                  | $V_{Rk,s}$ [kN]   | 13   | 20  | 30  | 55  | 86  | 124 | 161 | 196 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,56 |     |     |     |     |     |     |     |
| Stainless steel grade <b>A4-80</b>                                         | $V_{Rk,s}$ [kN]   | 15   | 23  | 34  | 63  | 98  | 141 | 184 | 224 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,33 |     |     |     |     |     |     |     |
| Stainless steel grade <b>1.4529</b>                                        | $V_{Rk,s}$ [kN]   | 13   | 20  | 30  | 55  | 86  | 124 | 161 | 196 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,25 |     |     |     |     |     |     |     |
| Stainless steel grade <b>1.4565</b>                                        | $V_{Rk,s}$ [kN]   | 13   | 20  | 30  | 55  | 86  | 124 | 161 | 196 |
| Partial safety factor                                                      | $\gamma_{Ms}$ [-] | 1,56 |     |     |     |     |     |     |     |
| Characteristic resistance of group of fasteners                            |                   |      |     |     |     |     |     |     |     |
| Ductility factor $k_7 = 1,0$ for steel with rupture elongation $A_5 > 8\%$ |                   |      |     |     |     |     |     |     |     |

| Steel failure with lever arm              |                                |       |      |     |     |     |     |      |      |      |
|-------------------------------------------|--------------------------------|-------|------|-----|-----|-----|-----|------|------|------|
| Size                                      |                                |       | M8   | M10 | M12 | M16 | M20 | M24  | M27  | M30  |
| Steel grade <b>4.6</b>                    | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 15   | 30  | 52  | 133 | 260 | 449  | 666  | 900  |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,67 |     |     |     |     |      |      |      |
| Steel grade <b>4.8</b>                    | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 15   | 30  | 52  | 133 | 260 | 449  | 666  | 900  |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,25 |     |     |     |     |      |      |      |
| Steel grade <b>5.8</b>                    | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 19   | 37  | 66  | 166 | 325 | 561  | 832  | 1125 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,25 |     |     |     |     |      |      |      |
| Steel grade <b>8.8</b>                    | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 30   | 60  | 105 | 266 | 519 | 898  | 1332 | 1799 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,25 |     |     |     |     |      |      |      |
| Steel grade <b>10.9</b>                   | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 37   | 75  | 131 | 333 | 649 | 1123 | 1664 | 2249 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,50 |     |     |     |     |      |      |      |
| Stainless steel grade <b>A2-70, A4-70</b> | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 26   | 52  | 92  | 233 | 454 | 786  | 1165 | 1574 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,56 |     |     |     |     |      |      |      |
| Stainless steel grade <b>A4-80</b>        | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 30   | 60  | 105 | 266 | 519 | 898  | 1332 | 1799 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,33 |     |     |     |     |      |      |      |
| Stainless steel grade <b>1.4529</b>       | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 26   | 52  | 92  | 233 | 454 | 786  | 1165 | 1574 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,25 |     |     |     |     |      |      |      |
| Stainless steel grade <b>1.4565</b>       | M <sup>o</sup> <sub>Rk,s</sub> | [N.m] | 26   | 52  | 92  | 233 | 454 | 786  | 1165 | 1574 |
| Partial safety factor                     | γ <sub>Ms</sub>                | [-]   | 1,56 |     |     |     |     |      |      |      |
| Concrete pryout failure                   |                                |       |      |     |     |     |     |      |      |      |
| Factor for resistance to pry-out failure  | k <sub>8</sub>                 | [-]   | 2    |     |     |     |     |      |      |      |

| Concrete edge failure        |                |                           |     |     |     |     |     |     |     |
|------------------------------|----------------|---------------------------|-----|-----|-----|-----|-----|-----|-----|
| Size                         |                | M8                        | M10 | M12 | M16 | M20 | M24 | M27 | M30 |
| Outside diameter of fastener | $d_{nom}$ [mm] | 8                         | 10  | 12  | 16  | 20  | 24  | 27  | 30  |
| Effective length of fastener | $\ell_f$ [mm]  | $\min(h_{ef}, 8 d_{nom})$ |     |     |     |     |     |     |     |

Performances - Design according to EN 1992-4  
Characteristic resistance for shear loads - threaded rod

**Annex C 3**

#### Declaration of Performance

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**Table C4:** Design method EN 1992-4  
Characteristic values of resistance to shear load of rebar

| Steel failure without lever arm                                            |               |      |     |     |     |     |     |     |     |
|----------------------------------------------------------------------------|---------------|------|-----|-----|-----|-----|-----|-----|-----|
| Size                                                                       |               |      | Ø8  | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| Rebar BSt 500 S                                                            | $V_{Rk,S}$    | [kN] | 14  | 22  | 31  | 55  | 86  | 135 | 221 |
| Partial safety factor                                                      | $\gamma_{Ms}$ | [-]  | 1,5 |     |     |     |     |     |     |
| Characteristic resistance of group of fasteners                            |               |      |     |     |     |     |     |     |     |
| Ductility factor $k_7 = 1,0$ for steel with rupture elongation $A_5 > 8\%$ |               |      |     |     |     |     |     |     |     |

| Steel failure with lever arm             |                                      |     |     |     |     |     |      |      |
|------------------------------------------|--------------------------------------|-----|-----|-----|-----|-----|------|------|
| Size                                     |                                      | Ø8  | Ø10 | Ø12 | Ø16 | Ø20 | Ø25  | Ø32  |
| Rebar BSt 500 S                          | M <sup>o</sup> <sub>Rk,S</sub> [N.m] | 33  | 65  | 112 | 265 | 518 | 1013 | 2122 |
| Partial safety factor                    | γ <sub>Ms</sub> [-]                  | 1,5 |     |     |     |     |      |      |
| Concrete pryout failure                  |                                      |     |     |     |     |     |      |      |
| Factor for resistance to pry-out failure | k <sub>8</sub> [-]                   | 2   |     |     |     |     |      |      |

| Concrete edge failure        |                |                           |     |     |     |     |     |     |
|------------------------------|----------------|---------------------------|-----|-----|-----|-----|-----|-----|
| Size                         |                | Ø8                        | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
| Outside diameter of fastener | $d_{nom}$ [mm] | 8                         | 10  | 12  | 16  | 20  | 25  | 32  |
| Effective length of fastener | $\ell_f$ [mm]  | $\min(h_{ef}, 8 d_{nom})$ |     |     |     |     |     |     |

## Performances

Design according to EN 1992-4  
Characteristic resistance for shear loads - rebar

**Annex C 4**

## Declaration of Performance

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**Table C5:** Displacement of threaded rod under tension and shear load

| Size               |         | M8   | M10  | M12  | M16  | M20  | M24  | M27  | M30  |
|--------------------|---------|------|------|------|------|------|------|------|------|
| Tension load       |         |      |      |      |      |      |      |      |      |
| Uncracked concrete |         |      |      |      |      |      |      |      |      |
| $\delta_{N0}$      | [mm/kN] | 0,03 | 0,02 | 0,02 | 0,02 | 0,01 | 0,01 | 0,01 | 0,01 |
| $\delta_{N\infty}$ | [mm/kN] | 0,05 | 0,04 | 0,03 | 0,03 | 0,02 | 0,02 | 0,01 | 0,01 |
| Cracked concrete   |         |      |      |      |      |      |      |      |      |
| $\delta_{N0}$      | [mm/kN] | 0,05 | 0,04 | 0,03 | 0,03 | 0,02 | 0,02 | 0,02 | 0,02 |
| $\delta_{N\infty}$ | [mm/kN] | 0,35 | 0,21 | 0,14 | 0,12 | 0,08 | 0,07 | 0,07 | 0,07 |
| Shear load         |         |      |      |      |      |      |      |      |      |
| $\delta_{V0}$      | [mm/kN] | 0,71 | 0,45 | 0,31 | 0,17 | 0,11 | 0,07 | 0,06 | 0,05 |
| $\delta_{V\infty}$ | [mm/kN] | 1,06 | 0,67 | 0,46 | 0,25 | 0,16 | 0,11 | 0,08 | 0,07 |

**Table C6:** Displacement of rebar under tension and shear load

| Size               |         | Ø8   | Ø10  | Ø12  | Ø16  | Ø20  | Ø25  | Ø32  |
|--------------------|---------|------|------|------|------|------|------|------|
| Tension load       |         |      |      |      |      |      |      |      |
| Uncracked concrete |         |      |      |      |      |      |      |      |
| $\delta_{N0}$      | [mm/kN] | 0,04 | 0,03 | 0,02 | 0,01 | 0,01 | 0,01 | 0,01 |
| $\delta_{N\infty}$ | [mm/kN] | 0,08 | 0,05 | 0,04 | 0,02 | 0,02 | 0,01 | 0,01 |
| Cracked concrete   |         |      |      |      |      |      |      |      |
| $\delta_{N0}$      | [mm/kN] | 0,05 | 0,04 | 0,03 | 0,03 | 0,02 | 0,02 | 0,02 |
| $\delta_{N\infty}$ | [mm/kN] | 0,35 | 0,21 | 0,17 | 0,11 | 0,08 | 0,07 | 0,06 |
| Shear load         |         |      |      |      |      |      |      |      |
| $\delta_{V0}$      | [mm/kN] | 0,38 | 0,24 | 0,17 | 0,10 | 0,06 | 0,04 | 0,02 |
| $\delta_{V\infty}$ | [mm/kN] | 0,56 | 0,36 | 0,25 | 0,14 | 0,09 | 0,06 | 0,04 |

**Performances**

Displacement for threaded rod and rebar

**Annex C 5****Declaration of Performance**

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**Table C7: Seismic performance category C1 of threaded rod**

| Size                                                                                                                                                                 |                      |         | M8   | M10  | M12  | M16  | M20  | M24  | M27  | M30  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------|------|------|------|------|------|------|------|------|
| Tension load                                                                                                                                                         |                      |         |      |      |      |      |      |      |      |      |
| Steel failure                                                                                                                                                        |                      |         |      |      |      |      |      |      |      |      |
| Characteristic resistance grade 4.6                                                                                                                                  | $N_{Rk,s,eq,C1}$     | [kN]    | 15   | 23   | 34   | 63   | 98   | 141  | 184  | 224  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 2,00 |      |      |      |      |      |      |      |
| Characteristic resistance grade 4.8                                                                                                                                  | $N_{Rk,s,eq,C1}$     | [kN]    | 15   | 23   | 34   | 63   | 98   | 141  | 184  | 224  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,50 |      |      |      |      |      |      |      |
| Characteristic resistance grade 5.8                                                                                                                                  | $N_{Rk,s,eq,C1}$     | [kN]    | 18   | 29   | 42   | 79   | 123  | 177  | 230  | 281  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,50 |      |      |      |      |      |      |      |
| Characteristic resistance grade 8.8                                                                                                                                  | $N_{Rk,s,eq,C1}$     | [kN]    | 29   | 46   | 67   | 126  | 196  | 282  | 367  | 449  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,50 |      |      |      |      |      |      |      |
| Characteristic resistance grade 10.9                                                                                                                                 | $N_{Rk,s,eq,C1}$     | [kN]    | 37   | 58   | 84   | 157  | 245  | 353  | 459  | 561  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,33 |      |      |      |      |      |      |      |
| Characteristic resistance A2-70, A4-70                                                                                                                               | $N_{Rk,s,eq,C1}$     | [kN]    | 26   | 41   | 59   | 110  | 172  | 247  | 321  | 393  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,87 |      |      |      |      |      |      |      |
| Characteristic resistance A4-80                                                                                                                                      | $N_{Rk,s,eq,C1}$     | [kN]    | 29   | 46   | 67   | 126  | 196  | 282  | 367  | 449  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,60 |      |      |      |      |      |      |      |
| Characteristic resistance 1.4529                                                                                                                                     | $N_{Rk,s,eq,C1}$     | [kN]    | 26   | 41   | 59   | 110  | 172  | 247  | 321  | 393  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,50 |      |      |      |      |      |      |      |
| Characteristic resistance 1.4565                                                                                                                                     | $N_{Rk,s,eq,C1}$     | [kN]    | 26   | 41   | 59   | 110  | 172  | 247  | 321  | 393  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,87 |      |      |      |      |      |      |      |
| Combined pullout and concrete cone failure in concrete C20/25 for a working life of 50 years and 100 years                                                           |                      |         |      |      |      |      |      |      |      |      |
| Characteristic bond resistance                                                                                                                                       |                      |         |      |      |      |      |      |      |      |      |
| Temperature T3: -40°C to +70°C                                                                                                                                       | $\tau_{Rk,p,eq,C1}$  | [N/mm²] | 9,4  | 8,5  | 10,0 | 8,7  | 7,4  | 7,7  | 5,7  | 4,9  |
| Installation safety factor                                                                                                                                           | $\gamma_{inst}$      | [-]     | 1,0  |      |      |      |      |      |      |      |
| Shear load                                                                                                                                                           |                      |         |      |      |      |      |      |      |      |      |
| Steel failure without lever arm                                                                                                                                      |                      |         |      |      |      |      |      |      |      |      |
| Characteristic resistance grade 4.6                                                                                                                                  | $V_{Rk,s,eq,C1}$     | [kN]    | 5    | 9    | 13   | 20   | 32   | 28   | 37   | 45   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,67 |      |      |      |      |      |      |      |
| Characteristic resistance grade 4.8                                                                                                                                  | $V_{Rk,s,eq,C1}$     | [kN]    | 5    | 9    | 13   | 20   | 32   | 28   | 37   | 45   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,25 |      |      |      |      |      |      |      |
| Characteristic resistance grade 5.8                                                                                                                                  | $V_{Rk,s,eq,C1}$     | [kN]    | 7    | 11   | 16   | 26   | 40   | 35   | 46   | 56   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,25 |      |      |      |      |      |      |      |
| Characteristic resistance grade 8.8                                                                                                                                  | $V_{Rk,s,eq,C1}$     | [kN]    | 11   | 17   | 25   | 41   | 64   | 56   | 73   | 90   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,25 |      |      |      |      |      |      |      |
| Characteristic resistance grade 10.9                                                                                                                                 | $V_{Rk,s,eq,C1}$     | [kN]    | 14   | 22   | 32   | 51   | 80   | 71   | 92   | 112  |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,50 |      |      |      |      |      |      |      |
| Characteristic resistance A2-70, A4-70                                                                                                                               | $V_{Rk,s,eq,C1}$     | [kN]    | 10   | 15   | 22   | 36   | 56   | 49   | 64   | 79   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,56 |      |      |      |      |      |      |      |
| Characteristic resistance A4-80                                                                                                                                      | $V_{Rk,s,eq,C1}$     | [kN]    | 11   | 17   | 25   | 41   | 64   | 56   | 73   | 90   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,33 |      |      |      |      |      |      |      |
| Characteristic resistance 1.4529                                                                                                                                     | $V_{Rk,s,eq,C1}$     | [kN]    | 10   | 15   | 22   | 36   | 56   | 49   | 64   | 79   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,25 |      |      |      |      |      |      |      |
| Characteristic resistance 1.4565                                                                                                                                     | $V_{Rk,s,eq,C1}$     | [kN]    | 10   | 15   | 22   | 36   | 56   | 49   | 64   | 79   |
| Partial safety factor                                                                                                                                                | $\gamma_{Ms}$        | [-]     | 1,56 |      |      |      |      |      |      |      |
| Characteristic shear load resistance $V_{Rk,s,eq}$ in the Table C7 shall be multiplied by following reduction factor for hot-dip galvanized commercial standard rods |                      |         |      |      |      |      |      |      |      |      |
| Reduction factor for hot-dip galvanized rods                                                                                                                         | $\alpha_{v,h-dg,c1}$ | [-]     | 0,47 | 0,47 | 0,47 | 0,54 | 0,54 | 0,88 | 0,88 | 0,88 |
| Factor for annular gap                                                                                                                                               | $\alpha_{gap}$       | [-]     | 0,5  |      |      |      |      |      |      |      |

**The anchor shall be used with minimum rupture elongation after fracture  $A_5$  equal to 19%.**

**Performances**

Seismic performance category C1 of threaded rod

**Annex C 6**

**Declaration of Performance**

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**Table C8:** Seismic performance category C1 of rebar

| Size                                                                                                       |                             | Ø10 | Ø12 | Ø16 | Ø20 | Ø25 | Ø32 |
|------------------------------------------------------------------------------------------------------------|-----------------------------|-----|-----|-----|-----|-----|-----|
| Tension load                                                                                               |                             |     |     |     |     |     |     |
| Steel failure                                                                                              |                             |     |     |     |     |     |     |
| Rebar BSt 500 S                                                                                            | $N_{Rk,s,eq,C1}$ [kN]       | 43  | 62  | 111 | 173 | 270 | 442 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           | 1,4 |     |     |     |     |     |
| Combined pullout and concrete cone failure in concrete C20/25 for a working life of 50 years and 100 years |                             |     |     |     |     |     |     |
| Temperature T3: -40°C to +70°C                                                                             | $\tau_{Rk,p,eq,C1}$ [N/mm²] | 9,4 | 9,8 | 9,5 | 8,8 | 8,0 | 5,3 |
| Dry and wet concrete                                                                                       |                             |     |     |     |     |     |     |
| Installation safety factor                                                                                 | $\gamma_{inst}$ [-]         | 1,0 |     |     |     |     |     |
| Flooded hole                                                                                               |                             |     |     |     |     |     |     |
| Installation safety factor                                                                                 | $\gamma_{inst}$ [-]         | 1,2 |     |     |     |     |     |
| Shear load                                                                                                 |                             |     |     |     |     |     |     |
| Steel failure without lever arm                                                                            |                             |     |     |     |     |     |     |
| Rebar BSt 500 S                                                                                            | $V_{Rk,s,eq,C1}$ [kN]       | 16  | 23  | 41  | 69  | 67  | 111 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           | 1,5 |     |     |     |     |     |
| Factor for annular gap                                                                                     | $\alpha_{gan}$ [-]          | 0,5 |     |     |     |     |     |

**Performances**

Seismic performance category C1 of rebar

**Annex C 7****Annex C 8 Performances**

Seismic performance category C2 of threaded rod

**Table C9:** Seismic performance category C2 of threaded rod

| Size                                                                                                       |                             | M12 | M16       | M20 |
|------------------------------------------------------------------------------------------------------------|-----------------------------|-----|-----------|-----|
| Tension load                                                                                               |                             |     |           |     |
| Steel failure                                                                                              |                             |     |           |     |
| Characteristic resistance grade 4.6                                                                        | $N_{Rk,s,eq,C2}$ [kN]       | 34  | 63        | 98  |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           |     | 2,00      |     |
| Characteristic resistance grade 4.8                                                                        | $N_{Rk,s,eq,C2}$ [kN]       | 34  | 63        | 98  |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           |     | 1,50      |     |
| Characteristic resistance grade 5.8                                                                        | $N_{Rk,s,eq,C2}$ [kN]       | 42  | 79        | 123 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           |     | 1,50      |     |
| Characteristic resistance grade 8.8                                                                        | $N_{Rk,s,eq,C2}$ [kN]       | 67  | 126       | 196 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           |     | 1,50      |     |
| Characteristic resistance grade 10.9                                                                       | $N_{Rk,s,eq,C2}$ [kN]       | 84  | 157       | 245 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           |     | 1,33      |     |
| Characteristic resistance A2-70, A4-70                                                                     | $N_{Rk,s,eq,C2}$ [kN]       | 59  | 110       | 172 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           |     | 1,87      |     |
| Characteristic resistance A4-80                                                                            | $N_{Rk,s,eq,C2}$ [kN]       | 67  | 126       | 196 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           |     | 1,60      |     |
| Characteristic resistance 1.4529                                                                           | $N_{Rk,s,eq,C2}$ [kN]       | 59  | 110       | 172 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           |     | 1,50      |     |
| Characteristic resistance 1.4565                                                                           | $N_{Rk,s,eq,C2}$ [kN]       | 59  | 110       | 172 |
| Partial safety factor                                                                                      | $\gamma_{Ms}$ [-]           |     | 1,87      |     |
| Combined pullout and concrete cone failure in concrete C20/25 for a working life of 50 years and 100 years |                             |     |           |     |
| Characteristic bond resistance                                                                             |                             |     |           |     |
| Temperature T3: -40°C to +70°C                                                                             | $\tau_{Rk,p,eq,C2}$ [N/mm²] | 3,5 | 4,0       | 4,5 |
| Installation safety factor                                                                                 | $\gamma_{inst}$ [-]         |     | 1,0       |     |
| Performances                                                                                               |                             |     | Annex C 8 |     |
| Seismic performance category C2 of threaded rod                                                            |                             |     |           |     |

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**Table C9 (cont):** Seismic performance category C2 of threaded rod

| <b>Shear load</b>                                                                                                                                                           |                      |      |      |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------|------|------|
| Steel failure without lever arm                                                                                                                                             |                      |      |      |      |
| Characteristic resistance grade <b>4.6</b>                                                                                                                                  | $V_{Rk,s,eq,C2}$     | [kN] | 13   | 18   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,67 |
| Characteristic resistance grade <b>4.8</b>                                                                                                                                  | $V_{Rk,s,eq,C2}$     | [kN] | 13   | 18   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,25 |
| Characteristic resistance grade <b>5.8</b>                                                                                                                                  | $V_{Rk,s,eq,C2}$     | [kN] | 16   | 22   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,25 |
| Characteristic resistance grade <b>8.8</b>                                                                                                                                  | $V_{Rk,s,eq,C2}$     | [kN] | 25   | 36   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,25 |
| Characteristic resistance grade <b>10.9</b>                                                                                                                                 | $V_{Rk,s,eq,C2}$     | [kN] | 32   | 45   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,50 |
| Characteristic resistance <b>A2-70, A4-70</b>                                                                                                                               | $V_{Rk,s,eq,C2}$     | [kN] | 22   | 31   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,56 |
| Characteristic resistance <b>A4-80</b>                                                                                                                                      | $V_{Rk,s,eq,C2}$     | [kN] | 25   | 36   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,33 |
| Characteristic resistance <b>1.4529</b>                                                                                                                                     | $V_{Rk,s,eq,C2}$     | [kN] | 22   | 31   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,25 |
| Characteristic resistance <b>1.4565</b>                                                                                                                                     | $V_{Rk,s,eq,C2}$     | [kN] | 22   | 31   |
| Partial safety factor                                                                                                                                                       | $\gamma_{Ms}$        | [-]  |      | 1,56 |
| Characteristic shear load resistance $V_{Rk,s,eq}$ in the Table C9 shall be multiplied by following reduction factor for <b>hot-dip galvanized commercial standard rods</b> |                      |      |      |      |
| Reduction factor for hot-dip galvanized rods                                                                                                                                | $\alpha_{v,h-dg,c2}$ | [-]  | 0,46 | 0,61 |
| Factor for annular gap                                                                                                                                                      | $\alpha_{gap}$       | [-]  |      | 0,5  |

**Table C10:** Displacement under tensile and shear load - seismic category C2 of threaded rod

| Size                 |      | M12   | M16  | M20   |
|----------------------|------|-------|------|-------|
| $\delta_{N,eq}(DLS)$ | [mm] | 0,20  | 0,40 | 0,77  |
| $\delta_{N,eq}(ULS)$ | [mm] | 0,76  | 0,74 | 1,68  |
| $\delta_{V,eq}(DLS)$ | [mm] | 5,29  | 4,12 | 4,94  |
| $\delta_{V,eq}(ULS)$ | [mm] | 10,20 | 9,05 | 10,99 |

The anchor shall be used with minimum rupture elongation after fracture  $A_5$  equal to 19%.

**Performances**

Seismic performance category C2 of threaded rod

**Annex C 8**

EAD 330499-01-0601:2018

Notified Body 1020

Bonded fastener for use in cracked and uncracked concrete for a service life of 50 and/or 100 years

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| Notified Body 1020                                                                                  |
| Bonded fastener for use in cracked and uncracked concrete for a service life of 50 and/or 100 years |

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