



Materials:

Fastener: stainless steel (A2/ 1.4567) – EN ISO 3506
 Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal

Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573
 Component II: S235 – EN 10025-1
 S280GD to S350GD – EN 10346
 timber – EN 14081

Pre-drill diameter: see table

Timber substructures:
 performance determined with

$M_{y,Rk} = 9,742 \text{ Nm}$
 $F_{ax,k} = 8,575 \text{ N/mm}^2$ for $l_{ef} \geq 26,0 \text{ mm}$

$t_{N,II}$ [mm]	0,63	0,75	0,88	1,00	1,25	1,50	2,00	2,50	3,00	/	
d_{pd} [mm]	Ø 3,5	Ø 4,0	Ø 4,5			Ø 5,0	Ø 5,3				
$M_{t,nom}$	—										
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,45 —	0,58 —	0,72 —	0,85 —	1,12 —	1,20 ac	1,20 ac	1,20 abcd	1,20 abcd	1,20
	0,60	0,45 —	0,58 —	0,72 —	0,85 —	1,12 —	1,30 —	1,50 ac	1,50 ac	1,50 ac	1,50
	0,70	0,45 —	0,58 —	0,72 —	0,85 —	1,12 —	1,40 —	1,80 —	1,80 ac	1,80 ac	1,80
	0,80	0,45 —	0,58 —	0,72 —	0,85 —	1,12 —	1,50 —	1,90 —	2,10 —	2,10 ac	2,10
	0,90	0,45 —	0,58 —	0,72 —	0,85 —	1,12 —	1,65 —	2,10 —	2,30 —	2,40 —	2,40
	1,00	0,45 —	0,58 —	0,72 —	0,88 —	1,12 —	1,80 —	2,30 —	2,50 —	2,70 —	2,70
	1,20	0,45 —	0,58 —	0,72 —	0,88 —	1,20 —	2,10 —	2,40 —	2,80 —	3,10 —	3,10
	1,50	0,45 —	0,58 —	0,72 —	0,88 —	1,23 —	2,80 —	3,00 —	3,30 —	3,60 —	3,60
	2,00	0,45 —	0,58 —	0,72 —	0,88 —	1,23 —	2,80 —	3,00 —	3,30 —	3,60 —	3,60
$N_{R,II,k}$ [kN] =	1,00	1,20	1,40	1,50	1,90	2,30	2,30	2,30	2,30	failure of component II see chapter 4.2.2	

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.
- Timber substructures (component II): predrilling the holes with Ø4,80 mm is necessary.

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JA3-6,5xL

with hexagon head and sealing washer $\geq \text{Ø}16 \text{ mm}$

Annex 108

Materials:
 Fastener: stainless steel (A2) – EN ISO 3506
 Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal
 Component I: S280GD to S350GD – EN 10346
 Component II: S235 to S355 – EN 10025-1
 S280GD to S450GD – EN 10346
 HX300LAD to HX460LAD – EN 10346

Pre-drill diameter: see table

Timber substructures:
no performance determined

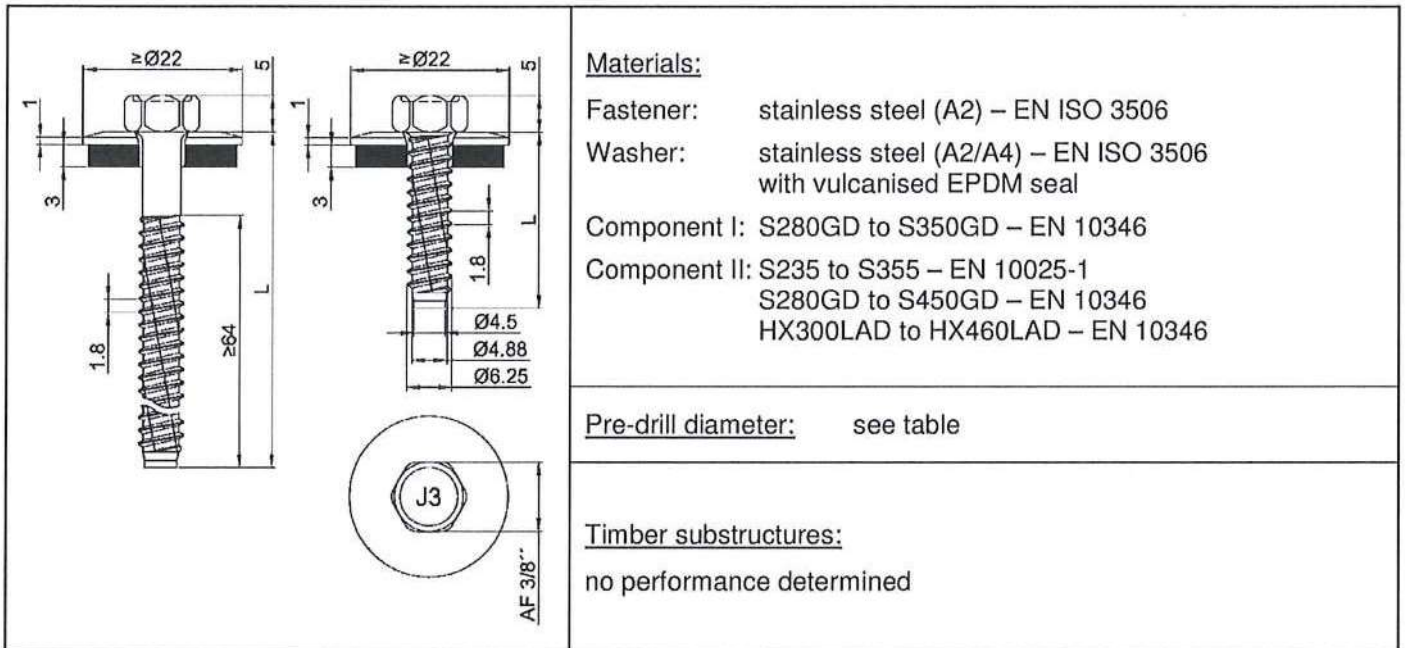
$t_{N,II}$ [mm]	1,25	1,50	2,00	3,00	4,00	6,00	$\geq 7,00$
d_{pd} [mm]	$\varnothing 5,0$		$\varnothing 5,3$			$\varnothing 5,5$	$\varnothing 5,7$
$M_{t,nom}$	5 Nm						
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	—	—	—	—	—	—
	0,55	—	—	—	—	—	—
	0,63	2,50 ac	2,70 ac	2,90 abcd	3,00 abcd	3,10 abcd	3,10 abcd
	0,75	2,60 ac	3,10 ac	3,30 abcd	3,60 abcd	3,70 abcd	3,70 abcd
	0,88	2,80 ac	3,20 ac	3,80 ac	4,10 abcd	4,30 abcd	4,40 abcd
	1,00	3,20 ac	3,60 ac	4,10 ac	4,80 ac	4,90 ac	5,10 ac
	1,13	3,40 ac	4,00 ac	4,60 ac	5,40 ac	5,60 ac	5,80 ac
	1,25	3,60 ac	4,20 ac	5,00 ac	6,10 ac	6,30 ac	6,50 ac
	1,50	3,70 ac	4,40 ac	5,70 ac	6,80 ac	7,10 ac	7,30 ac
	1,75	3,70 ac	4,70 ac	6,20 ac	7,60 ac	7,70 ac	8,10 ac
2,00	5,00 —	6,50 —	8,80 —	10,30 —	10,60 —	11,30 —	
$N_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,97 ac	1,35 ac	1,51 abcd	1,51 abcd	1,51 abcd	1,51 abcd
	0,55	1,23 ac	1,71 ac	1,91 abcd	1,91 abcd	1,91 abcd	1,91 abcd
	0,63	1,80 ac	2,50 ac	2,80 abcd	2,80 abcd	2,80 abcd	2,80 abcd
	0,75	2,00 ac	2,60 ac	3,10 abcd	3,60 abcd	3,60 abcd	3,60 abcd
	0,88	2,00 ac	2,70 ac	3,30 ac	3,80 ac	3,80 abcd	3,80 abcd
	1,00	2,00 ac	2,70 ac	3,40 ac	4,00 ac	4,00 ac	4,00 ac
	1,13	2,00 ac	2,70 ac	3,60 ac	4,40 ac	4,40 ac	4,40 ac
	1,25	2,00 ac	2,70 ac	3,60 ac	4,80 ac	4,90 ac	4,90 ac
	1,50	2,00 ac	2,70 ac	3,60 ac	5,60 ac	5,90 ac	5,90 ac
	1,75	2,00 ac	2,70 ac	3,60 ac	5,80 ac	6,90 ac	6,90 ac
2,00	2,00 —	2,70 —	3,60 —	6,00 —	7,30 —	7,30 —	

- JZ3-6,3 x L for components II with $t_{II} \geq 1,25$ mm
- JB3-6,3 x L for components II mit $t_{II} \leq 2,00$ mm
- HX340 LAD to HX460LAD only for JZ5-6,3xL

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JZ3-6,3xL, JB3-6,3xL, JZ5-6,3xL
with hexagon head and sealing washer $\geq \varnothing 16$ mm

Annex 109



Materials:

Fastener: stainless steel (A2) – EN ISO 3506
 Washer: stainless steel (A2/A4) – EN ISO 3506
 with vulcanised EPDM seal
 Component I: S280GD to S350GD – EN 10346
 Component II: S235 to S355 – EN 10025-1
 S280GD to S450GD – EN 10346
 HX300LAD to HX460LAD – EN 10346

Pre-drill diameter: see table

Timber substructures:

no performance determined

$t_{N,II}$ [mm]	4,00	5,00	6,00	$\geq 7,00$	
d_{pd} [mm]	$\varnothing 5,3$		$\varnothing 5,5$	$\varnothing 5,7$	
$M_{t,nom}$	5 Nm				
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	— —	— —	— —	
	0,55	— —	— —	— —	
	0,63	3,40 abcd	3,40 abcd	3,40 abcd	3,40 abcd
	0,75	4,20 ac	4,20 ac	4,20 ac	4,20 ac
	0,88	4,70 ac	4,70 ac	4,70 ac	4,70 ac
	1,00	5,00 ac	5,00 ac	5,10 ac	5,10 ac
	1,13	5,60 ac	5,60 ac	5,80 ac	5,80 ac
	1,25	6,30 —	6,40 —	6,50 ac	6,50 ac
	1,50	7,10 —	7,20 —	7,30 —	7,30 —
	1,75	7,70 —	7,90 —	8,10 —	8,10 —
2,00	7,70 —	7,90 —	8,10 —	8,10 —	
$N_{R,k}$ [kN] for $t_{N,I} =$	0,50	1,67 abcd	1,67 abcd	1,67 abcd	1,67 abcd
	0,55	2,11 abcd	2,11 abcd	2,11 abcd	2,11 abcd
	0,63	3,10 abcd	3,10 abcd	3,10 abcd	3,10 abcd
	0,75	4,00 ac	4,00 ac	4,00 ac	4,00 ac
	0,88	4,40 ac	4,40 ac	4,40 ac	4,40 ac
	1,00	4,60 ac	4,60 ac	4,60 ac	4,60 ac
	1,13	5,10 ac	5,10 ac	5,10 ac	5,10 ac
	1,25	5,10 —	5,10 —	5,10 ac	5,10 ac
	1,50	5,90 —	5,90 —	5,90 —	5,90 —
	1,75	6,90 —	6,90 —	7,10 —	7,10 —
2,00	8,80 —	11,60 —	13,40 —	13,40 —	

— HX340LAD to HX460LAD only JZ5-6,3xL

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JZ3-6,3xL, JZ5-6,3xL
with hexagonal head and sealing washer $\geq \varnothing 22$ mm

Annex 110

<p>Typ JB</p>	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p>
	<p>Pre-drill diameter: see table</p>
<p>Timber substructures: no performance determined</p>	

$t_{N,II}$ [mm]	1,20	1,50	2,00	2,50	3,00	4,00	5,00	6,00	$\geq 7,00$	
d_{pd} [mm]	Ø 4,5				Ø 5,0	Ø 5,3			Ø 5,5	
$M_{t,nom}$	—									
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,79 — 0,84 ac	0,84 ac	0,84 abcd	0,84 abcd	0,84 abcd	0,84 abcd	0,84 abcd	0,84 abcd	0,84 abcd
	0,60	0,79 — 0,96 —	1,07 ac	1,07 ac	1,07 ac	1,07 abcd	1,07 abcd	1,07 abcd	1,07 abcd	1,07 abcd
	0,70	0,79 — 1,07 —	1,30 —	1,30 ac	1,30 ac	1,30 abcd	1,30 abcd	1,30 abcd	1,30 abcd	1,30 abcd
	0,80	0,79 — 1,15 —	1,46 —	1,53 —	1,53 —	1,53 ac	1,53 abcd	1,53 abcd	1,53 abcd	1,53 abcd
	0,90	0,79 — 1,27 —	1,53 —	1,73 —	1,77 —	1,77 ac	1,77 ac	1,77 abcd	1,77 abcd	1,77 abcd
	1,00	0,80 — 1,38 —	1,61 —	1,92 —	2,00 —	2,00 ac	2,00 ac	2,00 abcd	2,00 abcd	2,00 abcd
	1,20	0,87 — 1,61 —	1,84 —	2,07 —	2,30 —	2,38 ac	2,38 ac	2,38 abcd	2,38 abcd	2,38 abcd
	1,50	0,87 — 2,15 —	2,30 —	2,53 —	2,69 —	3,07 ac	3,07 ac	3,07 ac	3,07 ac	3,07 ac
	2,00	0,87 — 2,15 —	2,30 —	2,53 —	2,69 —	3,07 —	3,07 —	3,07 —	3,07 —	3,33 —
$N_{R,II,k}$ [kN] =	0,54	0,77	1,23	1,77	2,38	3,68	5,30	7,06	7,06	

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JZ3-6,3xL, JB3-6,3xL, JZ5-6,3xL
with hexagon head and sealing washer $\geq \text{Ø}16 \text{ mm}$

Annex 111

<p>Typ JB</p>	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p>
	<p>Pre-drill diameter: see table</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	1,20	1,50	2,00	2,50	3,00	4,00	5,00	6,00	$\geq 7,00$	
d_{pd} [mm]	$\text{Ø } 4,5$				$\text{Ø } 5,0$	$\text{Ø } 5,3$			$\text{Ø } 5,5$	
$M_{t,nom}$	—									
$V_{R,k}$ [kN] for $t_{N,j} =$	0,50	1,03 —	1,10 ac	1,10 ac	1,10 abcd	1,10 abcd	1,10 abcd	1,10 abcd	1,10 abcd	1,10 abcd
	0,60	1,03 —	1,25 ac	1,40 ac	1,40 ac	1,40 ac	1,40 abcd	1,40 abcd	1,40 abcd	1,40 abcd
	0,70	1,03 —	1,40 —	1,70 —	1,70 ac	1,70 ac	1,70 abcd	1,70 abcd	1,70 abcd	1,70 abcd
	0,80	1,03 —	1,50 —	1,90 —	2,00 —	2,00 —	2,00 ac	2,00 abcd	2,00 abcd	2,00 abcd
	0,90	1,03 —	1,65 —	2,00 —	2,25 —	2,30 —	2,30 ac	2,30 ac	2,30 abcd	2,30 abcd
	1,00	1,04 —	1,80 —	2,10 —	2,50 —	2,60 —	2,6 ac	2,6 ac	2,6 abcd	2,6 abcd
	1,20	1,14 —	2,10 —	2,40 —	2,70 —	3,00 —	3,10 ac	3,10 ac	3,10 abcd	3,10 abcd
	1,50	1,14 —	2,80 —	3,00 —	3,30 —	3,50 —	4,00 ac	4,00 ac	4,00 ac	4,00 ac
2,00	1,14 —	2,80 —	3,00 —	3,30 —	3,50 —	4,00 —	4,00 —	4,00 —	4,33 —	
$N_{R,II,k}$ [kN] =	0,71	1,00	1,60	2,30	3,10	4,80	6,90	9,20	9,20	

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JZ3-6,3xL, JB3-6,3xL, JZ5-6,3xL
with hexagon head and sealing washer $\geq \text{Ø}16 \text{ mm}$

Annex 112

<p>Typ JB</p>	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <p>Component II: S235 to S355 – EN 10025-1 S280GD to S450GD – EN 10346 HX300LAD to HX460LAD – EN 10346</p>
	<p>Pre-drill diameter: see table</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	1,25	1,50	2,00	2,50	3,00	4,00	5,00	6,00	$\geq 7,00$	
d_{pd} [mm]	$\varnothing 5,0$		$\varnothing 5,3$					$\varnothing 5,5$	$\varnothing 5,7$	
$M_{t,nom}$	—									
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,83 — 0,84 ac	0,84 ac	0,84 abcd	0,84 abcd	0,84 abcd	0,84 abcd	0,84 abcd	0,84 —	
	0,60	0,83 — 0,96 —	1,07 ac	1,07 ac	1,07 ac	1,07 abcd	1,07 abcd	1,07 abcd	1,07 —	
	0,70	0,83 — 1,07 —	1,30 —	1,30 ac	1,30 ac	1,30 abcd	1,30 abcd	1,30 abcd	1,30 —	
	0,80	0,83 — 1,15 —	1,46 —	1,53 —	1,53 —	1,53 ac	1,53 abcd	1,53 abcd	1,53 —	
	0,90	0,83 — 1,27 —	1,53 —	1,73 —	1,77 —	1,77 ac	1,77 ac	1,77 abcd	1,77 —	
	1,00	0,83 — 1,38 —	1,61 —	1,92 —	2,00 —	2,00 ac	2,00 ac	2,00 abcd	2,00 —	
	1,20	0,90 — 1,61 —	1,84 —	2,07 —	2,30 —	2,38 ac	2,38 ac	2,38 abcd	2,38 —	
	1,50	0,93 — 2,15 —	2,30 —	2,53 —	2,69 —	3,07 ac	3,07 ac	3,07 ac	3,07 —	
	2,00	0,93 — 2,15 —	2,30 —	2,53 —	2,69 —	3,07 —	3,07 —	3,07 —	3,33 —	
$N_{R,II,k}$ [kN] =		2,00	2,70	3,60	3,60	6,00	7,30	7,45	7,60	7,60

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.
- HX340LAD to HX460LAD only JZ5-6,3xL

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JZ3-6,3xL, JB3-6,3xL, JZ5-6,3xL
with hexagon head and sealing washer $\geq \varnothing 16 \text{ mm}$

Annex 113

<p>Typ JB</p>	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: S235 to S355 – EN 10025-1 S280GD to S350GD – EN 10346 HX300LAD to HX460LAD – EN 10346</p>
	<p>Pre-drill diameter: see table</p>
	<p>Timber substructures:</p> <p>no performance determined</p>

$t_{N,II}$ [mm]	1,25	1,50	2,00	2,50	3,00	4,00	5,00	6,00	$\geq 7,00$
d_{pd} [mm]	$\text{Ø } 5,0$		$\text{Ø } 5,3$					$\text{Ø } 5,5$	$\text{Ø } 5,7$
$M_{t,nom}$	—								
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	1,08 — 1,10 ac	1,10 ac	1,10 abcd	1,10 abcd	1,10 abcd	1,10 abcd	1,10 abcd	1,10 —
	0,60	1,08 — 1,25 —	1,40 ac	1,40 ac	1,40 ac	1,40 abcd	1,40 abcd	1,40 abcd	1,40 —
	0,70	1,08 — 1,40 —	1,70 —	1,70 ac	1,70 ac	1,70 abcd	1,70 abcd	1,70 abcd	1,70 —
	0,80	1,08 — 1,50 —	1,90 —	2,00 —	2,00 —	2,00 ac	2,00 abcd	2,00 abcd	2,00 —
	0,90	1,08 — 1,65 —	2,00 —	2,25 —	2,30 —	2,30 ac	2,30 ac	2,30 abcd	2,30 —
	1,00	1,08 — 1,80 —	2,10 —	2,50 —	2,60 —	2,60 ac	2,60 ac	2,60 abcd	2,60 —
	1,20	1,18 — 2,10 —	2,40 —	2,70 —	3,00 —	3,10 ac	3,10 ac	3,10 abcd	3,10 —
	1,50	1,21 — 2,80 —	3,00 —	3,30 —	3,50 —	4,00 ac	4,00 ac	4,00 ac	4,00 —
	2,00	1,21 — 2,80 —	3,00 —	3,30 —	3,50 —	4,00 —	4,00 —	4,00 —	4,33 —
$N_{R,II,k}$ [kN] =	2,00	2,70	3,60	3,60	6,00	7,30	7,45	7,60	7,60

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.
- HX340LAD to HX460LAD only JZ5-6,3xL

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JZ3-6,3xL, JB3-6,3xL, JZ5-6,3xL
with hexagon head and sealing washer $\geq \text{Ø}16 \text{ mm}$

Annex 114

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: S280GD to S350GD – EN 10346</p> <p>Component II: S235 to S355 – EN 10025-1 S280GD to S350GD – EN 10346</p>
	<p>Pre-drill diameter: see table</p>
	<p>Timber substructures:</p> <p>no performance determined</p>

$t_{N,II}$ [mm]	1,50	2,00	3,00	4,00	6,00	8,00	$\geq 10,00$
d_{pd} [mm]	$\phi 6,8$				$\phi 5,3$	$\phi 5,5$	$\phi 5,7$
$M_{t,nom}$	10 Nm						
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,86 ac	0,86 ac	0,86 ac	0,86 abcd	0,86 abcd	0,86 abcd
	0,55	1,30 ac	1,30 ac	1,30 ac	1,30 abcd	1,30 abcd	1,30 abcd
	0,63	3,80 ac	3,80 ac	3,80 ac	3,80 abcd	3,80 abcd	3,80 abcd
	0,75	4,70 ac	4,70 ac	4,70 ac	4,70 ac	4,70 abcd	4,70 abcd
	0,88	5,30 —	5,30 ac	5,30 ac	5,30 ac	5,30 ac	5,30 ac
	1,00	5,90 —	5,90 —	5,90 —	5,90 ac	5,90 ac	5,90 ac
	1,13	6,40 —	6,60 —	6,60 —	6,60 —	6,60 —	6,60 —
	1,25	6,40 —	6,60 —	6,60 —	6,60 —	6,60 —	6,60 —
	1,50	6,40 —	7,00 —	7,00 —	7,00 —	7,00 —	7,00 —
	1,75	6,40 —	7,00 —	7,00 —	7,00 —	7,00 —	7,00 —
2,00	6,40 —	7,00 —	7,00 —	7,00 —	7,00 —	7,00 —	
$N_{R,k}$ [kN] for $t_{N,I} =$	0,50	1,19 ac	1,84 ac	2,38 ac	2,38 abcd	2,38 abcd	2,38 abcd
	0,55	1,50 ac	2,32 ac	3,00 ac	3,00 abcd	3,00 abcd	3,00 abcd
	0,63	2,20 ac	3,40 ac	4,40 ac	4,40 abcd	4,40 abcd	4,40 abcd
	0,75	2,20 ac	3,40 ac	5,10 ac	5,30 ac	5,30 ac	5,30 abcd
	0,88	2,20 —	3,40 ac	5,40 ac	5,70 ac	5,70 ac	5,70 ac
	1,00	2,20 —	3,40 —	5,80 —	6,20 ac	6,20 ac	6,20 ac
	1,13	2,20 —	3,40 —	5,80 —	6,70 —	6,70 —	6,70 —
	1,25	2,20 —	3,40 —	5,80 —	6,80 —	6,80 —	6,80 —
	1,50	2,20 —	3,40 —	5,80 —	6,80 —	6,80 —	6,80 —
	1,75	2,20 —	3,40 —	5,80 —	6,80 —	6,80 —	6,80 —
2,00	2,20 —	3,40 —	5,80 —	6,80 —	6,80 —	6,80 —	

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JZ3-8,0xL, JZ5-8,0xL
with hexagon head and sealing washer $\geq \phi 22$ mm

Annex 115

	<p>Materials:</p> <p>Fastener: stainless steel CRONIMAKS® similar to stainless steel (A2) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: S280GD to S350GD – EN 10346</p> <p>Component II: S235 to S355 – EN 10025-1 S280GD to 350GD – EN 10346</p> <hr/> <p>Pre-drill diameter: see table</p> <hr/> <p>Timber substructures: no performance determined</p>
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$t_{N,II}$ [mm]	1,25	1,50	2,00	3,00	4,00	6,00	≥7,00
d_{pd} [mm]	Ø 5,0		Ø 5,3			Ø 5,5	Ø 5,7
$M_{t,nom}$	5 Nm						
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	—	—	—	—	—	—
	0,55	—	—	—	—	—	—
	0,63	2,50	ac	2,70	ac	2,80	abcd
	0,75	2,60	ac	3,10	ac	3,30	abcd
	0,88	2,80	ac	3,20	ac	3,80	ac
	1,00	3,20	ac	3,60	ac	4,10	abcd
	1,13	3,40	ac	4,00	ac	4,60	ac
	1,25	3,60	ac	4,20	ac	5,00	ac
	1,50	3,70	ac	4,40	ac	5,70	ac
	1,75	3,70	ac	4,70	ac	6,20	ac
2,00	5,00	—	6,50	—	8,80	—	
$N_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,97	ac	1,35	ac	1,51	abcd
	0,55	1,23	ac	1,71	ac	1,91	abcd
	0,63	1,80	ac	2,50	ac	2,80	abcd
	0,75	2,00	ac	2,70	ac	3,10	abcd
	0,88	2,00	ac	2,70	ac	3,30	ac
	1,00	2,00	ac	2,70	ac	3,40	ac
	1,13	2,00	ac	2,70	ac	3,60	ac
	1,25	2,00	ac	2,70	ac	3,60	ac
	1,50	2,00	ac	2,70	ac	3,60	ac
	1,75	2,00	ac	2,70	ac	3,60	ac
2,00	2,00	—	2,70	—	3,60	—	

- JZ7-6,3 x L for components II with $t_{II} \geq 1,25$ mm
- JB7-6,3 x L for components II mit $t_{II} \leq 2,00$ mm

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JZ7-6,3xL, JB7-6,3xL
with hexagon head and sealing washer $\geq \text{Ø}16$ mm

Annex 116

	<p>Materials:</p> <p>Fastener: stainless steel CRONIMAKS® similar to stainless steel (A2) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: S280GD to S350GD – EN 10346</p> <p>Component II: S235 to S355 – EN 10025-1 S280GD to S350GD – EN 10346</p>
	<p>Pre-drill diameter: see table</p> <p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	4,00	5,00	6,00	$\geq 7,00$
d_{pd} [mm]	$\varnothing 5,3$		$\varnothing 5,5$	$\varnothing 5,7$
$M_{t,nom}$	5 Nm			
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	— —	— —	— —
	0,55	— —	— —	— —
	0,63	3,40 abcd	3,40 abcd	3,40 abcd
	0,75	4,20 ac	4,20 ac	4,20 ac
	0,88	4,70 ac	4,70 ac	4,70 ac
	1,00	5,00 ac	5,00 ac	5,10 ac
	1,13	5,60 ac	5,60 ac	5,80 ac
	1,25	6,30 —	6,40 —	6,50 ac
	1,50	7,10 —	7,20 —	7,30 —
	1,75	7,70 —	7,90 —	8,10 —
2,00	7,70 —	7,90 —	8,10 —	
$N_{R,k}$ [kN] for $t_{N,I} =$	0,50	1,67 abcd	1,67 abcd	1,67 abcd
	0,55	2,11 abcd	2,11 abcd	2,11 abcd
	0,63	3,10 abcd	3,10 abcd	3,10 abcd
	0,75	4,00 ac	4,00 ac	4,00 ac
	0,88	4,40 ac	4,40 ac	4,40 ac
	1,00	4,60 ac	4,60 ac	4,60 ac
	1,13	5,10 ac	5,10 ac	5,10 ac
	1,25	5,10 —	5,10 —	5,10 ac
	1,50	5,90 —	5,90 —	5,90 —
	1,75	6,90 —	6,90 —	7,10 —
2,00	8,80 —	11,60 —	13,40 —	

- JZ7-6,3 x L for Bauteile II mit $t_{II} \geq 1,25$ mm
- JB7-6,3 x L for Bauteile II mit $t_{II} \leq 2,00$ mm

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JZ7-6,3xL, JB7-6,3xL
with hexagon head and sealing washer $\geq \varnothing 22$ mm

Annex 117

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: S280GD to S350GD – EN 10346 Component II: S280GD to S350GD – EN 10346</p>
	<p>Drilling capacity: $\Sigma t \leq 2,00$ mm</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	0,40	0,50	0,55	0,63	0,75	0,88
$M_{t,nom}$	—					
$V_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,65	0,65	0,65	0,65	0,65
	0,50	0,65	0,81	0,81	0,81	0,81
	0,55	0,65	0,81	0,99	0,99	0,99
	0,63	0,65	0,81	0,99	1,26	1,26
	0,75	0,65	0,81	0,99	1,26	1,71
	0,88	0,65	0,81	0,99	1,26	1,71
	1,00	—	—	—	—	—
	1,13	—	—	—	—	—
	1,25	—	—	—	—	—
	1,50	—	—	—	—	—
	2,00	—	—	—	—	—
$N_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,45	0,67	0,78	0,94	1,21
	0,50	0,45	0,67	0,78	0,94	1,21
	0,55	0,45	0,67	0,78	0,94	1,21
	0,63	0,45	0,67	0,78	0,94	1,21
	0,75	0,45	0,67	0,78	0,94	1,21
	0,88	0,45	0,67	0,78	0,94	1,21
	1,00	—	—	—	—	—
	1,13	—	—	—	—	—
	1,25	—	—	—	—	—
	1,50	—	—	—	—	—
	2,00	—	—	—	—	—

– If both components I and II are made of S320GD or S350GD the values may be increased by 8,3%.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-(FR-)2H-4,8xL, JF6-(FR-)2H-4,8xL
with hexagon head or round head with Torx® drive system and sealing washer $\geq \text{Ø}14$ mm

Annex 118

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <hr/> <p>Drilling capacity: $\Sigma t \leq 2,00 \text{ mm}$</p> <hr/> <p>Timber substructures: no performance determined</p>
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$t_{N,II}$ [mm]	0,50	0,60	0,70	0,80	0,90	1,00
$M_{t,nom}$	—					
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,60	0,70	0,80	0,90	1,00
	0,45 —	0,45 —	0,45 —	0,45 —	0,45 —	0,45 —
	0,60	0,66	0,66	0,66	0,66	0,66
	0,70	0,66	0,88	0,88	0,88	0,88
	0,80	0,66	0,88	1,09	1,09	1,09
	0,90	0,66	0,88	1,09	1,46	1,46
	1,00	0,66	0,88	1,09	1,46	1,83
$N_{R,II,k}$ [kN] =	0,32	0,42	0,51	0,61	0,71	0,80

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-(FR-)2H-4,8xL, JF6-(FR-)2H-4,8xL
with hexagon head or round head with Torx® drive system and sealing washer $\geq \text{Ø}14 \text{ mm}$

Annex 119

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <hr/> <p>Drilling capacity: $\Sigma t \leq 2,00 \text{ mm}$</p> <hr/> <p>Timber substructures: no performance determined</p>
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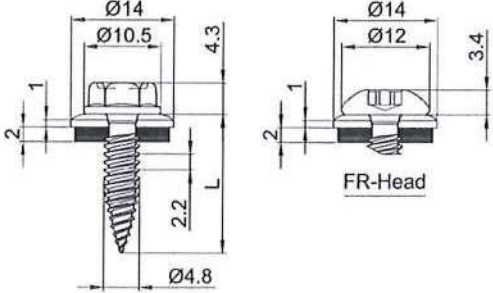
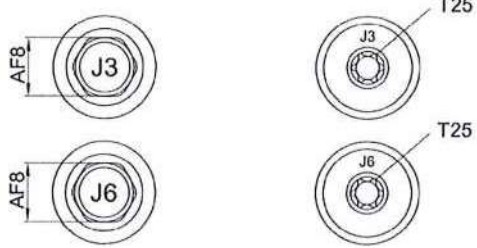
$t_{N,II}$ [mm]	0,50	0,60	0,70	0,80	0,90	1,00
$M_{t,nom}$	—					
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,58 —	0,58 —	0,58 —	0,58 —	0,58 —
	0,60	0,58 —	0,86 —	0,86 —	0,86 —	0,86 —
	0,70	0,58 —	0,86 —	1,14 —	1,14 —	1,14 —
	0,80	0,58 —	0,86 —	1,14 —	1,42 —	1,42 —
	0,90	0,58 —	0,86 —	1,14 —	1,42 —	1,90 —
	1,00	0,58 —	0,86 —	1,14 —	1,42 —	2,38 —
$N_{R,II,k}$ [kN] =	0,42	0,54	0,67	0,79	0,92	1,04

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-(FR-)2H-4,8xL, JF6-(FR-)2H-4,8xL
with hexagon head or round head with Torx® drive system and sealing washer $\geq \text{Ø}14 \text{ mm}$

Annex 120

 	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <p>Component II: S280GD to S350GD – EN 10346</p> <hr/> <p>Drilling capacity: $\Sigma t \leq 2,00 \text{ mm}$</p> <hr/> <p>Timber substructures: no performance determined</p>
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$t_{N,II}$ [mm]	0,50	0,55	0,63	0,75	0,88	1,00
$M_{t,nom}$	—					
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,60	0,70	0,80	0,90	1,00
	0,45 —	0,45 —	0,45 —	0,66 —	0,66 —	0,66 —
	0,45 —	0,45 —	0,66 —	0,88 —	0,88 —	0,88 —
	0,45 —	0,45 —	0,66 —	0,88 —	1,09 —	1,09 —
	0,45 —	0,45 —	0,66 —	0,88 —	1,09 —	1,46 —
	0,45 —	0,45 —	0,66 —	0,88 —	1,09 —	1,83 —
$N_{R,II,k}$ [kN] =	0,67	0,78	0,94	1,21	1,50	1,78

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-(FR-)2H-4,8xL, JF6-(FR-)2H-4,8xL
with hexagon head or round head with Torx® drive system and sealing washer $\geq \text{Ø}14 \text{ mm}$

Annex 121

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: S280GD to S350GD – EN 10346</p>
	<p>Drilling capacity: $\Sigma t \leq 2,00 \text{ mm}$</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	0,50	0,55	0,63	0,75	0,88	1,00
$M_{t,nom}$	—					
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,58 —	0,58 —	0,58 —	0,58 —	0,58 —
	0,60	0,58 —	0,58 —	0,86 —	0,86 —	0,86 —
	0,70	0,58 —	0,58 —	0,86 —	1,14 —	1,14 —
	0,80	0,58 —	0,58 —	0,86 —	1,14 —	1,42 —
	0,90	0,58 —	0,58 —	0,86 —	1,14 —	1,90 —
	1,00	0,58 —	0,58 —	0,86 —	1,14 —	2,38 —
$N_{R,II,k}$ [kN] =	0,67	0,78	0,94	1,21	1,50	1,78

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-(FR-)2H-4,8xL, JF6-(FR-)2H-4,8xL
with hexagon head or round head with Torx® drive system and sealing washer $\geq \text{Ø}14 \text{ mm}$

Annex 122

	<p><u>Materials</u></p> <p>Fastener: carbon steel case hardened and corrosion-resistant</p> <p>Washer: none</p> <p>Component I: S280GD to S350GD - EN 10346</p> <p>Component II: S280GD to S350GD - EN 10346</p>
	<p>Drilling capacity: $\Sigma t \leq 2 \times 0,88 \text{ mm}$</p>
	<p><u>Timber substructures:</u></p> <p>no performance determined</p>

$t_{N,II} [\text{mm}]$	0,40	0,50	0,55	0,63	0,75	0,88
$M_{t,nom}$	—					
$V_{R,k} [\text{kN}]$ for $t_{N,I} =$	0,40	0,79	0,79	0,79	0,79	0,79
	0,50	0,79	1,18	1,27	1,42	1,65
	0,55	0,79	1,18	1,41	1,56	1,79
	0,63	0,79	1,18	1,41	1,77	2,00
	0,75	0,79	1,18	1,41	1,77	2,35
	0,88	0,79	1,18	1,41	1,77	2,35
	1,00	—	—	—	—	—
	1,13	—	—	—	—	—
	1,25	—	—	—	—	—
	1,50	—	—	—	—	—
	1,75	—	—	—	—	—
2,00	—	—	—	—	—	
$N_{R,k} [\text{kN}]$ for $t_{N,I} =$	0,40	0,52	0,71	0,82	0,92	0,92
	0,50	0,52	0,71	0,82	1,01	1,30
	0,55	0,52	0,71	0,82	1,01	1,30
	0,63	0,52	0,71	0,82	1,01	1,30
	0,75	0,52	0,71	0,82	1,01	1,30
	0,88	0,52	0,71	0,82	1,01	1,30
	1,00	—	—	—	—	—
	1,13	—	—	—	—	—
	1,25	—	—	—	—	—
	1,50	—	—	—	—	—
	2,00	—	—	—	—	—

— If both components I and II are made of S320GD or S350GD the values may be increased by 8,3%.

Fastening screws JA, JB, JT, JZ and JF	Annex 123
Self-drilling screw (chipless) JF2-2H-4,8xL with hexagon head	

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: S280GD to S350GD – EN 10346 Component II: S280GD to S350GD – EN 10346</p>
	<p>Drilling capacity: $\Sigma t \leq 2 \times 1,00 \text{ mm}$</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	0,40	0,50	0,55	0,63	0,75	0,88	1,00
$M_{t,nom}$	—						
$V_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,88 —	0,88 —	0,88 —	0,88 —	0,88 —	0,88 —
	0,50	0,88 —	1,56 —	1,56 —	1,56 —	1,56 —	1,56 —
	0,55	0,88 —	1,56 —	1,76 —	1,76 —	1,76 —	1,76 —
	0,63	0,88 —	1,56 —	1,76 —	2,09 —	2,09 —	2,09 —
	0,75	0,88 —	1,56 —	1,76 —	2,09 —	2,57 —	2,57 —
	0,88	0,88 —	1,56 —	1,76 —	2,09 —	2,57 —	3,11 —
	1,00	0,88 —	1,56 —	1,76 —	2,09 —	2,57 —	3,11 —
	1,13	— —	— —	— —	— —	— —	— —
	1,25	— —	— —	— —	— —	— —	— —
$N_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,60 —	0,82 —	0,94 —	1,00 —	1,00 —	1,00 —
	0,50	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,67 —
	0,55	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,80 —
	0,63	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,80 —
	0,75	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,80 —
	0,88	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,80 —
	1,00	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,80 —
	1,13	— —	— —	— —	— —	— —	— —
	1,25	— —	— —	— —	— —	— —	— —

— If both components I and II are made of S320GD or S350GD the values may be increased by 8,3%.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-(FR)-2-5,5xL, JF6-(FR)-2-5,5xL
with hexagon head or round head with Torx® drive system and sealing washer $\geq \phi 11 \text{ mm}$

Annex 124

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>component I: S280GD to S350GD – EN 10346 Component II: S280GD to S350GD – EN 10346</p> <hr/> <p>Drilling capacity: $\Sigma t \leq 2 \times 1,00 \text{ mm}$</p> <hr/> <p>Timber substructures: no performance determined</p>
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$t_{N,II}$ [mm]	0,40	0,50	0,55	0,63	0,75	0,88	1,00
$M_{t,nom}$	—						
$V_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,96 —	0,96 —	0,96 —	0,96 —	0,96 —	0,96 —
	0,50	0,96 —	1,56 —	1,56 —	1,56 —	1,56 —	1,56 —
	0,55	0,96 —	1,56 —	1,76 —	1,76 —	1,76 —	1,76 —
	0,63	0,96 —	1,56 —	1,76 —	2,09 —	2,09 —	2,09 —
	0,75	0,96 —	1,56 —	1,76 —	2,09 —	2,57 —	2,57 —
	0,88	0,96 —	1,56 —	1,76 —	2,09 —	2,57 —	3,11 —
	1,00	0,96 —	1,56 —	1,76 —	2,09 —	2,57 —	3,11 —
	1,13	—	—	—	—	—	—
$N_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,46 —
	0,50	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,76 —
	0,55	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,80 —
	0,63	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,80 —
	0,75	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,80 —
	0,88	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,80 —
	1,00	0,60 —	0,82 —	0,94 —	1,14 —	1,44 —	1,80 —
	1,13	—	—	—	—	—	—
1,25	—	—	—	—	—	—	

– If both components I and II are made of S320GD or S350GD the values may be increased by 8,3%.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-(FR-)2-5,5xL, JF6-(FR-)2-5,5xL
with hexagon head or round head with Torx® drive system and sealing washer $\geq \varnothing 14 \text{ mm}$

Annex 125

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p>
	<p>Drilling capacity: $\Sigma t \leq 2 \times 1,50 \text{ mm}$</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,20	1,50	
$M_{t,nom}$	—									
$V_{R,k}$ [kN] for $t_{N,j} =$	0,40	0,43 — 0,43	0,43 — 0,62	0,43 — 0,62	0,43 — 0,62	0,43 — 0,62	0,43 — 0,62	0,43 — 0,62	0,43 — 0,62	0,43 — 0,62
0,50	0,43	0,62	0,62	0,71	0,71	0,71	0,71	0,71	0,71	0,71
0,60	0,43	0,62	0,71	0,71	0,71	0,71	0,71	0,71	0,71	0,71
0,70	0,43	0,62	0,71	0,79	0,79	0,79	0,79	0,79	0,79	0,79
0,80	0,43	0,62	0,71	0,79	0,88	0,88	0,88	0,88	0,88	0,88
0,90	0,43	0,62	0,71	0,79	0,88	1,04	1,04	1,04	1,04	1,04
1,00	0,43	0,62	0,71	0,79	0,88	1,04	1,19	0,88	0,88	0,88
1,20	0,43	0,62	0,71	0,79	0,88	1,04	1,19	1,24	1,24	1,24
1,50	0,43	0,62	0,71	0,79	0,88	1,04	1,19	1,24	1,24	1,87
$N_{R,II,k}$ [kN] =	0,24	0,35	0,45	0,58	0,69	0,80	0,91	1,13	1,63	

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-(FR)-2-5,5xL, JF6-(FR)-2-5,5xL
with hexagon head or round head with Torx® drive system and sealing washer $\geq \phi 11 \text{ mm}$

Annex 126

Materials:
Fastener: stainless steel (A2) – EN ISO 3506
 stainless steel (A4) – EN ISO 3506
Washer: stainless steel (A2/A4) – EN ISO 3506
 with vulcanised EPDM seal
Component I: aluminium alloy
 with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573
Component II: aluminium alloy
 with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573

Drilling capacity: $\Sigma t \leq 2 \times 1,50 \text{ mm}$

Timber substructures:
 no performance determined

$t_{N,II}$ [mm]	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,20	1,50	
$M_{t,nom}$	—									
$V_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,20	1,50	
	0,55	0,55	0,55	0,55	0,55	0,55	0,55	0,55	0,55	
	0,55	0,79	0,79	0,79	0,79	0,79	0,79	0,79	0,79	
	0,55	0,79	0,91	0,91	0,91	0,91	0,91	0,91	0,91	
	0,55	0,79	0,91	1,03	1,03	1,03	1,03	1,03	1,03	
	0,55	0,79	0,91	1,03	1,15	1,15	1,15	1,15	1,15	
	0,55	0,79	0,91	1,03	1,15	1,35	1,35	1,35	1,35	
	0,55	0,79	0,91	1,03	1,15	1,35	1,54	1,54	1,54	
	0,55	0,79	0,91	1,03	1,15	1,35	1,54	1,62	1,62	
	0,55	0,79	0,91	1,03	1,15	1,35	1,54	1,62	2,44	
$N_{R,t,k}$ [kN] =	0,31	0,46	0,60	0,75	0,89	1,04	1,18	1,47	2,12	

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-(FR-)2-5,5xL, JF6-(FR-)2-5,5xL
 with hexagon head or round head with Torx® drive system and sealing washer $\geq \varnothing 11 \text{ mm}$

Annex 127

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: S280GD to S350GD – EN 10346</p> <hr/> <p>Drilling capacity: $\Sigma t \leq 1,50 \text{ mm} + 1,00 \text{ mm}$</p> <hr/> <p>Timber substructures: no performance determined</p>
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$t_{N,II}$ [mm]	0,40	0,50	0,55	0,63	0,75	0,88	1,00
$M_{t,nom}$	—						
$V_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,55 —	0,55 —	0,55 —	0,55 —	0,55 —	0,55 —
	0,50	0,55 —	0,79 —	0,79 —	0,79 —	0,79 —	0,79 —
	0,60	0,55 —	0,79 —	0,85 —	0,91 —	0,91 —	0,91 —
	0,70	0,55 —	0,79 —	0,85 —	0,95 —	1,14 —	1,14 —
	0,80	0,55 —	0,79 —	0,85 —	0,95 —	1,14 —	1,42 —
	0,90	0,55 —	0,79 —	0,85 —	0,95 —	1,14 —	1,42 —
	1,00	0,55 —	0,79 —	0,85 —	0,95 —	1,14 —	1,42 —
	1,20	0,55 —	0,79 —	0,85 —	0,95 —	1,14 —	1,42 —
1,50	0,55 —	0,79 —	0,85 —	0,95 —	1,14 —	1,42 —	
$N_{R,k}$ [kN] =	0,60	0,82	0,94	1,14	1,44	1,80	2,14

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-(FR-)2-5,5xL, JF6-(FR-)2-5,5xL
with hexagon head or round head with Torx® drive system and sealing washer $\geq \varnothing 14 \text{ mm}$

Annex 128

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Bauteil I: S280GD to S350GD – EN 10346</p> <p>Bauteil II: S280GD to S350GD – EN 10346 timber – EN 14081</p>									
	<p>Drilling capacity: $\Sigma t_i \leq 2,00$ mm</p>									
	<p>Timber substructures:</p> <p>performance determined with</p> <p>$M_{y,Rk} = 7,911$ Nm</p> <p>$f_{ax,k} = 8,575$ N/mm² for $l_{ef} \geq 24$ mm</p> <p>$f_{ax,k} = 9,800$ N/mm² for $l_{ef} \geq 28$ mm</p>									
$t_{N,II} =$	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50		
$M_{t,nom} =$	—									
$V_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,61	0,61	0,61	0,61	0,61	0,61	0,61	0,61	bearing resistance of component I
	0,50	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	
	0,55	1,03	1,03	1,03	1,03	1,03	1,03	1,03	1,03	
	0,63	1,03	1,28	1,28	1,28	1,28	1,28	1,28	—	
	0,75	1,03	1,28	1,69	1,69	1,69	1,69	1,69	—	
	0,88	1,03	1,28	1,69	2,17	2,17	2,17	2,17	—	
	1,00	1,03	1,28	1,69	2,17	2,65	2,65	—	—	
	1,13	1,03	1,28	1,69	2,17	—	—	—	—	
	1,25	1,03	1,28	1,69	—	—	—	—	—	
	1,50	1,03	—	—	—	—	—	—	—	
$N_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,68	0,80	1,05	1,33	1,38	1,38	1,38	1,38	pull-through resistance of component I
	0,50	0,68	0,80	1,05	1,33	1,63	1,77	1,77	1,77	
	0,55	0,68	0,80	1,05	1,33	1,63	1,96	1,96	1,96	
	0,63	0,68	0,80	1,05	1,33	1,63	1,96	2,26	—	
	0,75	0,68	0,80	1,05	1,33	1,63	1,96	2,26	—	
	0,88	0,68	0,80	1,05	1,33	1,63	1,96	2,26	—	
	1,00	0,68	0,80	1,05	1,33	1,63	1,96	—	—	
	1,13	0,68	0,80	1,05	1,33	—	—	—	—	
	1,25	0,68	0,80	1,05	—	—	—	—	—	
	1,50	0,68	—	—	—	—	—	—	—	
$N_{R,I,k}$ [kN]	0,68	0,80	1,05	1,33	1,63	1,96	2,26	3,02	failure of component II see chapter 4.2.2	
Fastening screws JA, JB, JT, JZ and JF										
Self-drilling screw JT3-LT-2-6,0xL - KD16 with pan head with Torx®-drive										
Annex 129										

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Bauteil I: S280GD to S350GD – EN 10346 Bauteil II: S280GD to S350GD – EN 10346</p>																																																																																																																																																																																																																																								
	<p>Drilling capacity: $\Sigma t \leq 2,00$ mm</p>																																																																																																																																																																																																																																								
	<p>Timber substructures:</p> <p>performance determined with $M_{y,Rk} = 7,911$ Nm $f_{ax,k} = 8,575$ N/mm² for $l_{ef} \geq 24$ mm $f_{ax,k} = 9,800$ N/mm² for $l_{ef} \geq 28$ mm</p>																																																																																																																																																																																																																																								
<table border="1"> <thead> <tr> <th>$t_{N,II} =$</th> <th>0,55</th> <th>0,63</th> <th>0,75</th> <th>0,88</th> <th>1,00</th> <th>1,13</th> <th>1,25</th> <th>1,50</th> <th></th> </tr> </thead> <tbody> <tr> <td>$M_{t,nom} =$</td> <td colspan="9">—</td> </tr> <tr> <td rowspan="10">$V_{R,k}$ [kN] for $t_{N,I} =$</td> <td>0,40</td> <td>0,61</td> <td>0,61</td> <td>0,61</td> <td>0,61</td> <td>0,61</td> <td>0,61</td> <td>0,61</td> <td>0,61</td> <td>0,61</td> </tr> <tr> <td>0,50</td> <td>0,88</td> <td>0,88</td> <td>0,88</td> <td>0,88</td> <td>0,88</td> <td>0,88</td> <td>0,88</td> <td>0,88</td> <td>0,88</td> </tr> <tr> <td>0,55</td> <td>1,03</td> <td>1,03</td> <td>1,03</td> <td>1,03</td> <td>1,03</td> <td>1,03</td> <td>1,03</td> <td>1,03</td> <td>1,03</td> </tr> <tr> <td>0,63</td> <td>1,03</td> <td>1,28</td> <td>1,28</td> <td>1,28</td> <td>1,28</td> <td>1,28</td> <td>1,28</td> <td>—</td> <td>1,28</td> </tr> <tr> <td>0,75</td> <td>1,03</td> <td>1,28</td> <td>1,69</td> <td>1,69</td> <td>1,69</td> <td>1,69</td> <td>1,69</td> <td>—</td> <td>1,69</td> </tr> <tr> <td>0,88</td> <td>1,03</td> <td>1,28</td> <td>1,69</td> <td>2,17</td> <td>2,17</td> <td>2,17</td> <td>2,17</td> <td>—</td> <td>2,17</td> </tr> <tr> <td>1,00</td> <td>1,03</td> <td>1,28</td> <td>1,69</td> <td>2,17</td> <td>2,65</td> <td>2,65</td> <td>—</td> <td>—</td> <td>2,65</td> </tr> <tr> <td>1,13</td> <td>1,03</td> <td>1,28</td> <td>1,69</td> <td>2,17</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>4,94</td> </tr> <tr> <td>1,25</td> <td>1,03</td> <td>1,28</td> <td>1,69</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>5,49</td> </tr> <tr> <td>1,50</td> <td>1,03</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>6,62</td> </tr> <tr> <td rowspan="10">$N_{R,k}$ [kN] for $t_{N,I} =$</td> <td>0,40</td> <td>0,68</td> <td>0,80</td> <td>1,05</td> <td>1,33</td> <td>1,38</td> <td>1,38</td> <td>1,38</td> <td>1,38</td> <td>1,38</td> </tr> <tr> <td>0,50</td> <td>0,68</td> <td>0,80</td> <td>1,05</td> <td>1,33</td> <td>1,63</td> <td>1,77</td> <td>1,77</td> <td>1,77</td> <td>1,77</td> </tr> <tr> <td>0,55</td> <td>0,68</td> <td>0,80</td> <td>1,05</td> <td>1,33</td> <td>1,63</td> <td>1,96</td> <td>1,96</td> <td>1,96</td> <td>1,96</td> </tr> <tr> <td>0,63</td> <td>0,68</td> <td>0,80</td> <td>1,05</td> <td>1,33</td> <td>1,63</td> <td>1,96</td> <td>2,26</td> <td>—</td> <td>2,27</td> </tr> <tr> <td>0,75</td> <td>0,68</td> <td>0,80</td> <td>1,05</td> <td>1,33</td> <td>1,63</td> <td>1,96</td> <td>2,26</td> <td>—</td> <td>2,73</td> </tr> <tr> <td>0,88</td> <td>0,68</td> <td>0,80</td> <td>1,05</td> <td>1,33</td> <td>1,63</td> <td>1,96</td> <td>2,26</td> <td>—</td> <td>3,23</td> </tr> <tr> <td>1,00</td> <td>0,68</td> <td>0,80</td> <td>1,05</td> <td>1,33</td> <td>1,63</td> <td>1,96</td> <td>—</td> <td>—</td> <td>3,69</td> </tr> <tr> <td>1,13</td> <td>0,68</td> <td>0,80</td> <td>1,05</td> <td>1,33</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>3,69</td> </tr> <tr> <td>1,25</td> <td>0,68</td> <td>0,80</td> <td>1,05</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>3,69</td> </tr> <tr> <td>1,50</td> <td>0,68</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>—</td> <td>3,69</td> </tr> <tr> <td>$N_{R,II,k}$ [kN]</td> <td>0,68</td> <td>0,80</td> <td>1,05</td> <td>1,33</td> <td>1,63</td> <td>1,96</td> <td>2,26</td> <td>3,02</td> <td>failure of component II see chapter 4.2.2</td> </tr> </tbody> </table>	$t_{N,II} =$	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50		$M_{t,nom} =$	—									$V_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,61	0,61	0,61	0,61	0,61	0,61	0,61	0,61	0,61	0,50	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,55	1,03	1,03	1,03	1,03	1,03	1,03	1,03	1,03	1,03	0,63	1,03	1,28	1,28	1,28	1,28	1,28	1,28	—	1,28	0,75	1,03	1,28	1,69	1,69	1,69	1,69	1,69	—	1,69	0,88	1,03	1,28	1,69	2,17	2,17	2,17	2,17	—	2,17	1,00	1,03	1,28	1,69	2,17	2,65	2,65	—	—	2,65	1,13	1,03	1,28	1,69	2,17	—	—	—	—	4,94	1,25	1,03	1,28	1,69	—	—	—	—	—	5,49	1,50	1,03	—	—	—	—	—	—	—	6,62	$N_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,68	0,80	1,05	1,33	1,38	1,38	1,38	1,38	1,38	0,50	0,68	0,80	1,05	1,33	1,63	1,77	1,77	1,77	1,77	0,55	0,68	0,80	1,05	1,33	1,63	1,96	1,96	1,96	1,96	0,63	0,68	0,80	1,05	1,33	1,63	1,96	2,26	—	2,27	0,75	0,68	0,80	1,05	1,33	1,63	1,96	2,26	—	2,73	0,88	0,68	0,80	1,05	1,33	1,63	1,96	2,26	—	3,23	1,00	0,68	0,80	1,05	1,33	1,63	1,96	—	—	3,69	1,13	0,68	0,80	1,05	1,33	—	—	—	—	3,69	1,25	0,68	0,80	1,05	—	—	—	—	—	3,69	1,50	0,68	—	—	—	—	—	—	—	3,69	$N_{R,II,k}$ [kN]	0,68	0,80	1,05	1,33	1,63	1,96	2,26	3,02	failure of component II see chapter 4.2.2	
$t_{N,II} =$	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50																																																																																																																																																																																																																																	
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	0,63	1,03	1,28	1,28	1,28	1,28	1,28	1,28	—	1,28																																																																																																																																																																																																																															
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$N_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,68	0,80	1,05	1,33	1,38	1,38	1,38	1,38	1,38																																																																																																																																																																																																																															
	0,50	0,68	0,80	1,05	1,33	1,63	1,77	1,77	1,77	1,77																																																																																																																																																																																																																															
	0,55	0,68	0,80	1,05	1,33	1,63	1,96	1,96	1,96	1,96																																																																																																																																																																																																																															
	0,63	0,68	0,80	1,05	1,33	1,63	1,96	2,26	—	2,27																																																																																																																																																																																																																															
	0,75	0,68	0,80	1,05	1,33	1,63	1,96	2,26	—	2,73																																																																																																																																																																																																																															
	0,88	0,68	0,80	1,05	1,33	1,63	1,96	2,26	—	3,23																																																																																																																																																																																																																															
	1,00	0,68	0,80	1,05	1,33	1,63	1,96	—	—	3,69																																																																																																																																																																																																																															
	1,13	0,68	0,80	1,05	1,33	—	—	—	—	3,69																																																																																																																																																																																																																															
	1,25	0,68	0,80	1,05	—	—	—	—	—	3,69																																																																																																																																																																																																																															
	1,50	0,68	—	—	—	—	—	—	—	3,69																																																																																																																																																																																																																															
$N_{R,II,k}$ [kN]	0,68	0,80	1,05	1,33	1,63	1,96	2,26	3,02	failure of component II see chapter 4.2.2																																																																																																																																																																																																																																
<p>Fastening screws JA, JB, JT, JZ and JF</p>									Annex 130																																																																																																																																																																																																																																
<p>Self-drilling screw JT3-LT-2-6,0xL - KD16 with pan head with Torx®-drive and sealing washer $\geq \varnothing 16$ mm</p>																																																																																																																																																																																																																																									

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p>
	<p>Drilling capacity: $\Sigma t_i \leq 2,00 \text{ mm}$</p>
	<p>Timber substructures:</p> <p>performance determined with</p> <p>$M_{y,Rk} = 7,911 \text{ Nm}$</p> <p>$f_{ax,k} = 8,575 \text{ N/mm}^2$ for $l_{ef} \geq 24 \text{ mm}$</p> <p>$f_{ax,k} = 9,800 \text{ N/mm}^2$ for $l_{ef} \geq 28 \text{ mm}$</p>

$t_{N,II} =$	0,80	0,90	1,00	1,20	1,50	2,00						
$M_{t,nom} =$												
$V_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,20	1,50	1,59	bearing resistance of component I	
	0,29	0,51	0,56	0,61	0,66	0,72	0,75	0,74	—	—		0,81
	0,29	0,56	0,61	0,66	0,72	0,80	—	—	—	—		0,85
	0,29	0,63	0,68	0,72	0,80	—	—	—	—	—		0,89
	0,29	0,63	0,68	0,72	0,80	—	—	—	—	—		0,92
	0,29	0,72	0,76	0,80	0,88	—	—	—	—	—		0,97
	0,29	0,72	0,86	0,90	0,97	—	—	—	—	—		1,00
	0,29	0,72	0,86	1,01	—	—	—	—	—	—	1,24	
	0,29	—	—	—	—	—	—	—	—	—	1,59	
$N_{R,k}$ [kN]	0,50	0,58	0,68	0,86	1,18	1,81					failure of component II see chapter 4.2.2	

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF	Annex 131
Self-drilling screw JT3-LT-2-6,0xL - KD16, JT4-LT-2-6,0xL - KD16, JT9-LT-2-6,0xL - KD16 with pan head with Torx®-drive	

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p>
	<p>Drilling capacity: $\Sigma t \leq 2,00 \text{ mm}$</p>
	<p>Timber substructures:</p> <p>performance determined with</p> <p>$M_{y,Rk} = 7,911 \text{ Nm}$</p> <p>$f_{ax,k} = 8,575 \text{ N/mm}^2$ for $l_{ef} \geq 24 \text{ mm}$</p> <p>$f_{ax,k} = 9,800 \text{ N/mm}^2$ for $l_{ef} \geq 28 \text{ mm}$</p>

$t_{N,II} =$	0,80	0,90	1,00	1,20	1,50	2,00	
$M_{t,nom} =$							
$V_{R,k} [\text{kN}]$ for $t_{N,I} =$	0,38	0,38	0,38	0,38	0,38	0,38	0,38
0,50	0,67	0,73	0,80	0,93	0,97	—	1,05
0,60	0,73	0,79	0,86	0,98	—	—	1,10
0,70	0,83	0,88	0,94	1,05	—	—	1,15
0,80	0,94	0,99	1,04	1,14	—	—	1,20
0,90	0,94	1,12	1,17	1,26	—	—	1,25
1,00	0,94	1,12	1,32	—	—	—	1,30
1,20	0,94	—	—	—	—	—	1,61
1,50	—	—	—	—	—	—	2,08
$N_{R,II,k} [\text{kN}]$	0,64	0,75	0,87	1,12	1,53	2,33	failure of component II see chapter 4.2.2

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw JT3-LT-2-6,0xL - KD16, JT4-LT-2-6,0xL - KD16,
JT9-LT-2-6,0xL - KD16
with pan head with Torx®-drive

Annex 132

	Materials: Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506 Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573 Component II: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573
	Drilling capacity: $\Sigma t_i \leq 2,00 \text{ mm}$
	Timber substructures: performance determined with $M_{y,Rk} = 7,911 \text{ Nm}$ $f_{ax,k} = 8,575 \text{ N/mm}^2$ for $l_{ef} \geq 24 \text{ mm}$ $f_{ax,k} = 9,800 \text{ N/mm}^2$ for $l_{ef} \geq 28 \text{ mm}$

$t_{N,II} =$	0,80	0,90	1,00	1,20	1,50	2,00				
$M_{t,nom} =$										
$V_{R,k}$ [kN] for $t_{N,I} =$	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,20	1,50	
	0,29	0,69	0,71	0,74	0,76	0,81	0,85	0,94	—	0,29
	—	—	—	—	—	—	—	—	—	0,81
	0,29	0,75	0,78	0,82	0,85	0,85	0,85	—	—	0,85
	—	—	—	—	—	—	—	—	—	0,89
	0,29	0,81	0,85	0,89	0,92	0,92	0,92	—	—	0,92
	—	—	—	—	—	—	—	—	—	0,97
	0,29	0,81	0,88	0,92	0,97	0,97	0,97	—	—	1,00
	—	—	—	—	—	—	—	—	—	1,24
	—	—	—	—	—	—	—	—	—	1,59
$N_{R,II,k}$ [kN]	0,50	0,58	0,68	0,86	1,18	1,81				failure of component II see chapter 4.2.2

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF	Annex 133
Self-drilling screw JT3-LT-2-6,0xL - KD16, JT4-LT-2-6,0xL - KD16, JT9-LT-2-6,0xL - KD16 with pan head with Torx®-drive and sealing washer $\geq \phi 16 \text{ mm}$	

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: stainless steel (A2/A4) – EN ISO 3506 with vulcanised EPDM seal</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p>
	<p>Drilling capacity: $\Sigma t \leq 2,00 \text{ mm}$</p>
	<p>Timber substructures:</p> <p>performance determined with</p> <p>$M_{y,Rk} = 7,911 \text{ Nm}$</p> <p>$f_{ax,k} = 8,575 \text{ N/mm}^2$ for $l_{ef} \geq 24 \text{ mm}$</p> <p>$f_{ax,k} = 9,800 \text{ N/mm}^2$ for $l_{ef} \geq 28 \text{ mm}$</p>

$t_{N,II} =$	0,80	0,90	1,00	1,20	1,50	2,00	
$M_{t,nom} =$							
$V_{R,k} [\text{kN}]$ for $t_{N,I} =$	0,38	0,38	0,38	0,38	0,38	0,38	0,38
0,50	0,90	0,98	1,05	1,05	1,05	—	1,05
0,60	0,93	1,02	1,10	1,10	—	—	1,10
0,70	0,96	1,07	1,15	1,15	—	—	1,15
0,80	0,99	1,11	1,20	1,20	—	—	1,20
0,90	1,05	1,15	1,25	1,25	—	—	1,25
1,00	1,11	1,21	1,30	—	—	—	1,30
1,20	1,23	—	—	—	—	—	1,61
1,50	—	—	—	—	—	—	2,08
$N_{R,II,k} [\text{kN}]$	0,64	0,75	0,87	1,12	1,53	2,33	failure of component II see chapter 4.2.2

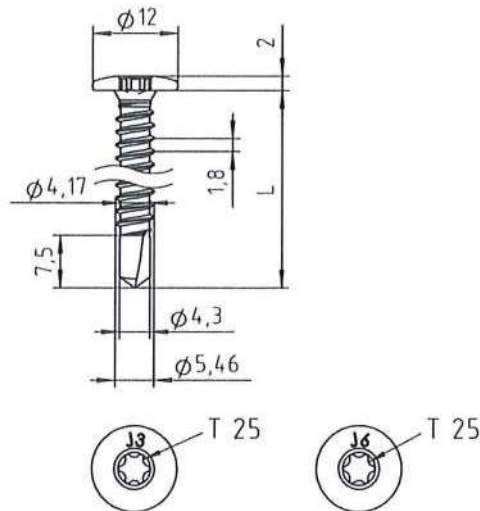
– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

**Self-drilling screw JT3-LT-2-6,0xL - KD16, JT4-LT-2-6,0xL - KD16,
JT9-LT-2-6,0xL - KD16**

with pan head with Torx®-drive and sealing washer $\geq \phi 16 \text{ mm}$

Annex 134



Materials:

Fastener: stainless steel (A2) – EN ISO 3506
stainless steel (A4) – EN ISO 3506

Washer: none

Bauteil I: S280GD to S350GD – EN 10346

Bauteil II: S280GD to S350GD – EN 10346

Drilling capacity: $\Sigma t \leq 3,50$ mm

Timber substructures:

no performance determined

$t_{N,II}$ [mm]	1,00	1,13	1,25	1,50	1,75	2,00	2,50	3,00	
$M_{t,nom}$	5 Nm								
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	1,21 — 1,30 —	1,39 — 1,52 —	1,57 — 1,71 —	1,57 — 1,74 —	1,57 — 1,78 —	1,57 — 1,84 —	1,57 — —	
	0,55	1,32 — 1,42 —	1,52 — 1,72 —	1,71 — 1,94 —	1,74 — 2,02 —	1,78 — 2,11 —	1,84 — 2,28 —	— —	
	0,63	1,51 — 1,62 —	1,72 — 2,03 —	1,94 — 2,28 —	2,02 — 2,44 —	2,11 — 2,61 —	2,28 — 2,93 —	— —	
	0,75	1,78 — 1,91 —	2,03 — 2,36 —	2,28 — 2,65 —	2,44 — 2,90 —	2,61 — 3,14 —	2,93 — 3,63 —	— —	
	0,88	2,08 — 2,23 —	2,36 — 2,67 —	2,65 — 3,00 —	2,90 — 3,32 —	3,14 — 3,64 —	3,63 — 4,29 —	— —	
	1,00	2,35 — 2,52 —	2,67 — 3,07 —	3,00 — 3,43 —	3,32 — 3,79 —	3,64 — 4,16 —	4,29 — —	— —	
	1,13	2,71 — 2,90 —	3,07 — 3,47 —	3,43 — 3,87 —	3,79 — 4,27 —	4,16 — 4,68 —	— —	— —	
	1,25	3,07 — 3,28 —	3,47 — 4,26 —	3,87 — 4,74 —	4,27 — 5,22 —	4,68 — 5,70 —	— —	— —	
	1,50	3,78 — 4,03 —	4,26 — 4,74 —	4,74 — 5,22 —	5,22 — —	5,70 — —	— —	— —	
	1,75	3,78 — 4,03 —	4,26 — 4,74 —	4,74 — 5,22 —	5,22 — —	— —	— —	— —	
	2,00	2,00 — 4,03 —	4,26 — 4,74 —	4,74 — —	— —	— —	— —	— —	
$N_{R,k}$ [kN] for $t_{N,I} =$	0,50	1,10 — 1,10 —	1,50 — 1,50 —	1,59 ^{a)} — 1,82 ^{a)} —	1,59 ^{a)} — 1,82 ^{a)} —	1,59 ^{a)} — 1,82 ^{a)} —	1,59 ^{a)} — 1,82 ^{a)} —	1,59 ^{a)} — —	
	0,55	1,10 — 1,10 —	1,50 — 1,50 —	1,82 ^{a)} — 2,00 —	1,82 ^{a)} — 2,16 ^{a)} —	1,82 ^{a)} — 2,16 ^{a)} —	1,82 ^{a)} — 2,16 ^{a)} —	— —	
	0,63	1,10 — 1,10 —	1,50 — 1,50 —	2,00 — 2,45 —	2,16 ^{a)} — 2,72 ^{a)} —	2,16 ^{a)} — 2,72 ^{a)} —	2,16 ^{a)} — 2,72 ^{a)} —	— —	
	0,75	1,10 — 1,10 —	1,50 — 1,50 —	2,45 — 2,90 —	2,45 — 2,90 —	2,72 ^{a)} — 3,35 —	2,72 ^{a)} — 3,40 —	— —	
	0,88	1,10 — 1,10 —	1,50 — 1,50 —	2,90 — 2,90 —	2,90 — 2,90 —	3,35 — 3,40 —	— —	— —	
	1,00	1,10 — 1,10 —	1,50 — 1,50 —	2,90 — 2,90 —	2,90 — 2,90 —	3,40 — —	— —	— —	
	1,13	1,10 — 1,10 —	1,50 — 1,50 —	2,90 — 2,90 —	2,90 — 2,90 —	— —	— —	— —	
	1,25	1,10 — 1,10 —	1,50 — 1,50 —	2,90 — 2,90 —	2,90 — 2,90 —	— —	— —	— —	
	1,50	1,10 — 1,10 —	1,50 — 1,50 —	2,90 — 2,90 —	2,90 — 2,90 —	— —	— —	— —	
	1,75	1,10 — 1,10 —	1,50 — 1,50 —	2,90 — 2,90 —	2,90 — 2,90 —	— —	— —	— —	
	2,00	1,10 — 1,10 —	1,50 — 1,50 —	2,90 — 2,90 —	2,90 — 2,90 —	— —	— —	— —	

– If component I is made of S320GD or S350GD, the values marked with ^{a)} may be increased by 8,3%.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw JT3-LT-3-5,5xL, JT6-LT-3-5,5xL
with pan head with Torx®-drive

Annex 135

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Bauteil I: S280GD to S350GD – EN 10346</p> <p>Bauteil II: S280GD to S350GD – EN 10346</p>
	<p>Drilling capacity: $\Sigma t \leq 3,50$ mm</p>
	<p>Timber substructures:</p> <p>no performance determined</p>

$t_{N,II}$ [mm]	1,00	1,13	1,25	1,50	1,75	2,00	2,50	3,00			
$M_{t,nom}$	5 Nm										
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,55	0,63	0,75	0,88	1,00	1,13	1,25	1,50	1,75	2,00
	1,60	1,68	1,80	1,98	2,17	2,35	2,71	3,07	3,78	3,78	3,78
	—	—	—	—	—	—	—	—	—	—	—
	1,60	1,69	1,84	2,06	2,30	2,52	2,90	3,28	4,03	4,03	4,03
	—	—	—	—	—	—	—	—	—	—	—
	1,60	1,71	1,88	2,14	2,42	2,67	3,07	3,47	4,26	4,26	4,26
	—	—	—	—	—	—	—	—	—	—	—
	1,60	1,82	2,16	2,68	3,24	3,76	4,01	4,25	4,74	4,74	4,74
	—	—	—	—	—	—	—	—	—	—	—
	1,60	1,84	2,21	2,78	3,39	3,96	4,28	4,59	5,22	5,22	5,22
	—	—	—	—	—	—	—	—	—	—	—
	1,60	1,86	2,26	2,88	3,54	4,15	4,54	4,93	4,70	—	—
	—	—	—	—	—	—	—	—	—	—	—
	1,60	1,89	2,36	3,07	3,83	4,54	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—
	1,60	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,10
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04 ^{a)}	1,10 ^{a)}	1,10 ^{a)}	1,10 ^{a)}	1,10 ^{a)}	1,10 ^{a)}	1,10 ^{a)}	1,10 ^{a)}	1,10 ^{a)}	1,10 ^{a)}
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04 ^{a)}	1,10 ^{a)}	1,50	2,00	2,00	2,00	2,00	2,00	2,00	2,00
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04 ^{a)}	1,10 ^{a)}	1,50	2,00	2,00	2,00	2,00	2,00	2,00	2,00
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04 ^{a)}	1,10 ^{a)}	1,50	2,00	2,00	2,00	2,00	2,00	2,00	2,00
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04 ^{a)}	1,10 ^{a)}	1,50	2,00	2,00	2,00	2,00	2,00	2,00	2,00
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04 ^{a)}	1,10 ^{a)}	1,50	2,00	2,00	2,00	2,00	2,00	2,00	2,00
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04 ^{a)}	1,10 ^{a)}	1,50	2,00	2,00	2,00	2,00	2,00	2,00	2,00
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04 ^{a)}	1,10 ^{a)}	1,50	2,00	2,00	2,00	2,00	2,00	2,00	2,00
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04 ^{a)}	1,10 ^{a)}	1,50	2,00	2,00	2,00	2,00	2,00	2,00	2,00
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04 ^{a)}	1,10 ^{a)}	1,50	2,00	2,00	2,00	2,00	2,00	2,00	2,00
	—	—	—	—	—	—	—	—	—	—	—
	0,86 ^{a)}	1,04 ^{a)}	1,10 ^{a)}	1,50	2,00	2,00	2,00	2,00	2,00	2,00	2,00
	—	—	—	—	—	—	—	—	—	—	—

– If component I is made of S320GD or S350GD, the values marked with ^{a)} may be increased by 8,3%.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw JT3-LT-3-5,5xL, JT6-LT-3-5,5xL
with pan head with Torx®-drive and sealing washer $\geq \varnothing 11$ mm

Annex 136

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p>
	<p>Drilling capacity: $\Sigma t \leq 5,00 \text{ mm}$</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	1,50	2,00	2,50	3,00
$M_{t,nom}$	2 Nm			
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,68 — 0,68 — 0,68 — 0,68 —	0,68	0,68
	0,60	0,82 — 0,82 — 0,82 — 0,82 —	0,82	0,82
	0,70	0,86 — 0,95 — 0,95 — 0,95 —	0,95	0,95
	0,80	0,92 — 1,09 — 1,09 — 1,09 —	1,09	1,09
	0,90	1,00 — 1,15 — 1,23 — 1,23 —	1,23	1,23
	1,00	1,10 — 1,23 — 1,36 — 1,36 —	1,36	1,36
	1,20	1,33 — 1,43 — 1,53 — 1,63 —	1,53	1,63
	1,50	1,78 — 1,84 — 1,89 — 1,95 —	1,89	1,95
	2,00	1,78 — 2,72 — 2,72 — 2,72 —	2,72	2,72
$N_{R,II,k}$ [kN] =	0,69	1,07	1,61	2,15

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

**Self-drilling screw JT3-LT-3-5,5xL - KD16, JT4-LT-3-5,5xL - KD16,
JT6-LT-3-5,5xL - KD16, JT9-LT-3-5,5xL - KD16**
with pan head with Torx®-drive

Annex 137

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <hr/> <p>Drilling capacity: $\Sigma t \leq 5,00 \text{ mm}$</p> <hr/> <p>Timber substructures: no performance determined</p>
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$t_{N,II}$ [mm]	1,50	2,00	2,50	3,00	
$M_{t,nom}$	2 Nm				
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,89 —	0,89 —	0,89 —	0,89 —
	0,60	1,06 —	1,06 —	1,06 —	1,06 —
	0,70	1,12 —	1,24 —	1,24 —	1,24 —
	0,80	1,20 —	1,42 —	1,42 —	1,42 —
	0,90	1,31 —	1,50 —	1,60 —	1,60 —
	1,00	1,43 —	1,60 —	1,77 —	1,77 —
	1,20	1,74 —	1,87 —	2,00 —	2,13 —
	1,50	2,32 —	2,39 —	2,47 —	2,55 —
	2,00	2,32 —	3,55 —	3,55 —	3,55 —
$N_{R,II,k}$ [kN] =	0,90	1,40	2,10	2,80	

– Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw JT3-LT-3-5,5xL - KD16, JT4-LT-3-5,5xL - KD16,
JT6-LT-3-5,5xL - KD16, JT9-LT-3-5,5xL - KD16
with pan head with Torx®-drive

Annex 138

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <p>Component II: S235 – EN 10025-1 S280GD to S350GD – EN 10346</p>
	<p>Drilling capacity: $\Sigma t \leq 4,50 \text{ mm}$</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	1,50	2,00	2,50	
$M_{t,nom}$	5 Nm			
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,68 —	0,68 —	0,68 —
	0,60	0,80 —	0,82 —	0,82 —
	0,70	0,85 —	0,95 —	0,95 —
	0,80	0,91 —	1,08 —	1,09 —
	0,90	0,99 —	1,14 —	1,23 —
	1,00	1,09 —	1,22 —	1,35 —
	1,20	1,32 —	1,42 —	1,52 —
	1,50	1,71 —	1,83 —	1,89 —
	2,00	1,71 —	2,65 —	2,72 —
$N_{R,II,k}$ [kN] =	2,00	2,90	3,90	

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw JT3-LT-3-5,5xL - KD16, JT6-LT-3-5,5xL - KD16
with pan head with Torx®-drive

Annex 139

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: S235 – EN 10025-1 S280GD to S350GD – EN 10346</p>
	<p>Drilling capacity: $\Sigma t_i \leq 4,50 \text{ mm}$</p>
	<p>Timber substructures: no performance determined</p>

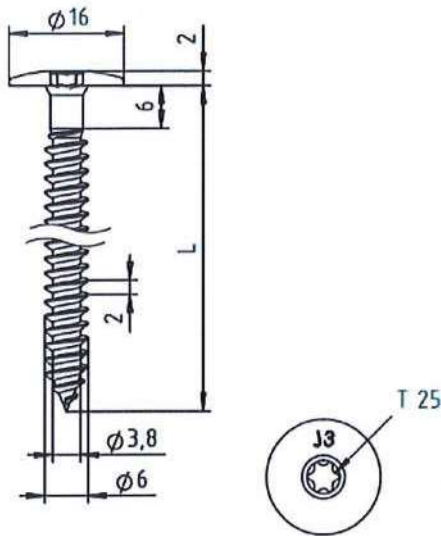
$t_{N,II}$ [mm]	1,50	2,00	2,50
$M_{t,nom}$	5 Nm		
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,89 —	0,89 —
	0,60	1,04 —	1,06 —
	0,70	1,10 —	1,24 —
	0,80	1,19 —	1,40 —
	0,90	1,29 —	1,48 —
	1,00	1,42 —	1,59 —
	1,20	1,73 —	1,86 —
	1,50	2,22 —	2,39 —
	2,00	2,22 —	3,46 —
$N_{R,II,k}$ [kN] =	2,00	2,90	3,90

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw JT3-LT-3-5,5xL - KD16, JT6-LT-3-5,5xL - KD16
with pan head with Torx®-drive

Annex 140



Materials:

Fastener: stainless steel (A2) – EN ISO 3506

Washer: none

Component I: aluminium alloy
with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573

Component II: timber – EN 14081

Pre-drill diameter: see table

Timber substructures:

performance determined with

$M_{y,k} = 7,911 \text{ Nm}$

$f_{ax,k} = 8,575 \text{ N/mm}^2$ for $l_{ef} \geq 24,0 \text{ mm}$

$f_{ax,k} = 9,800 \text{ N/mm}^2$ for $l_{ef} \geq 28,0 \text{ mm}$

$l_g =$	24	29	34	39	44	49	≥ 54	
$d_{pd} \text{ [mm]}$	$\phi 3,6$							
$V_{R,k} \text{ [kN]}$ for $t_{N,j} =$	0,29	0,29	0,29	0,29	0,29	0,29	0,29	0,29
0,40	0,81	0,81	0,81	0,81	0,81	0,81	0,81	0,81
0,50	0,85	0,85	0,85	0,85	0,85	0,85	0,85	0,85
0,60	0,89	0,89	0,89	0,89	0,89	0,89	0,89	0,89
0,70	0,92	0,92	0,92	0,92	0,92	0,92	0,92	0,92
0,80	0,97	0,97	0,97	0,97	0,97	0,97	0,97	0,97
0,90	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
1,00	1,24	1,24	1,24	1,24	1,24	1,24	1,24	1,24
1,20	1,59	1,59	1,59	1,59	1,59	1,59	1,59	1,59
1,50								
$N_{R,II,k} \text{ [kN]} =$	1,11	1,34	1,80	2,06	2,33	2,59	2,86	failure of component III see chapter 4.2.2

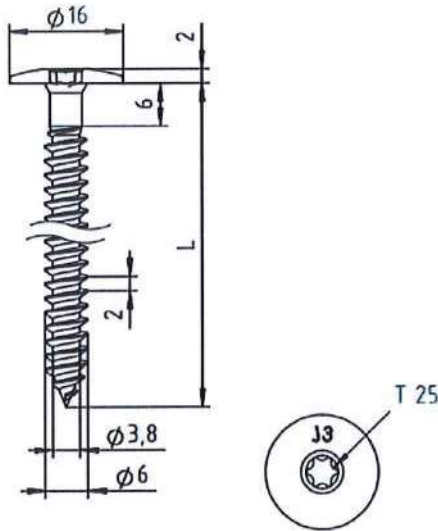
bearing resistance of component I

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.
- For other areas of application see national technical approval Z-14.4-426.
- The values indicated above, depending on the screw depth l_g shall apply to $k_{mod} = 0,90$ and the timber strength class C24 ($\rho_k = 350 \text{ kg/m}^3$). For other values of k_{mod} and strength classes see chapter 4.2.2.

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JA3-LT-6,0xL - KD16
with pan head with Torx®-drive

Annex 141



Materials:

Fastener: stainless steel (A2) – EN ISO 3506

Washer: none

Component I: aluminium alloy
with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573

Component II: timber – EN 14081

Pre-drill diameter: see table

Timber substructures:

performance determined with

$M_{y,k} = 7,911 \text{ Nm}$
 $f_{ax,k} = 8,575 \text{ N/mm}^2$ for $l_{ef} \geq 24,0 \text{ mm}$
 $f_{ax,k} = 9,800 \text{ N/mm}^2$ for $l_{ef} \geq 28,0 \text{ mm}$

$l_g =$	24	29	34	39	44	49	≥ 54	
$d_{pd} [\text{mm}]$	$\text{Ø } 3,6$							
$V_{R,k} [\text{kN}]$ for $t_{N,I} =$	0,38	0,38	0,38	0,38	0,38	0,38	0,38	bearing resistance of component I
0,50	1,05	1,05	1,05	1,05	1,05	1,05	1,05	
0,60	1,10	1,10	1,10	1,10	1,10	1,10	1,10	
0,70	1,15	1,15	1,15	1,15	1,15	1,15	1,15	
0,80	1,20	1,20	1,20	1,20	1,20	1,20	1,20	
0,90	1,25	1,25	1,25	1,25	1,25	1,25	1,25	
1,00	1,30	1,30	1,30	1,30	1,30	1,30	1,30	
1,20	1,61	1,61	1,61	1,61	1,61	1,61	1,61	
1,50	1,67	1,73	1,85	1,91	1,98	2,04	2,08	2,08
$N_{R,II,k} [\text{kN}] =$	1,11	1,34	1,80	2,06	2,33	2,59	2,86	failure of component II see chapter 4.2.2

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.
- For other areas of application see national technical approval Z-14.4-426.
- The values indicated above, depending on the screw depth l_g shall apply to $k_{mod} = 0,90$ and the timber strength class C24 ($\rho_k = 350 \text{ kg/m}^3$). For other values of k_{mod} and strength classes see chapter 4.2.2.

Fastening screws JA, JB, JT, JZ and JF

Self-tapping screw JA3-LT-6,0xL - KD16
with pan head with Torx®-drive

Annex 142

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: S280GD to S350GD – EN 10346 Component II: S280GD to S350GD – EN 10346</p>
	<p>Drilling capacity: $\Sigma t \leq 2 \times 1,00 \text{ mm}$</p>
	<p>Timber substructures:</p> <p>no performance determined</p>

$t_{N,II}$ [mm]	0,40	0,50	0,55	0,63	0,75	0,88	1,00
$M_{t,nom}$	2 Nm						
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,79	0,79	0,79	0,79	0,79	0,79
	0,55	0,79	1,18	1,27	1,42	1,65	1,65
	0,63	0,79	1,18	1,41	1,56	1,79	1,79
	0,75	0,79	1,18	1,41	1,77	2,00	2,00
	0,88	0,79	1,18	1,41	1,77	2,35	2,35
	1,00	0,79	1,18	1,41	1,77	2,35	2,84
$N_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,60	0,82	0,94	1,14	1,38	1,38
	0,55	0,60	0,82	0,94	1,14	1,44	1,77
	0,63	0,60	0,82	0,94	1,14	1,44	1,80
	0,75	0,60	0,82	0,94	1,14	1,44	1,80
	0,88	0,60	0,82	0,94	1,14	1,44	1,80
	1,00	0,60	0,82	0,94	1,14	1,44	1,80

– If both components I and II are made of S320GD or S350GD the values may be increased by 8,3%.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-LT-2-5,5xL - KD16, JF6-LT-2-5,5xL - KD16
with pan head with Torx®-drive

Annex 143

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p>
	<p>Drilling capacity: $\Sigma t \leq 1,00 \text{ mm} + 2,00 \text{ mm}$</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,20	1,50	2,00
$M_{t,nom}$	2 Nm									
$V_{R,k}$ [kN] for $t_{N,I} =$	0,24	0,29	0,34	0,39	0,44	0,49	0,54	0,54	0,54	0,54
0,50	0,24	0,34	0,39	0,43	0,48	0,52	0,57	0,66	0,68	0,68
0,60	0,24	0,34	0,45	0,49	0,53	0,57	0,61	0,69	0,82	0,82
0,70	0,24	0,34	0,45	0,57	0,60	0,64	0,68	0,75	0,86	0,95
0,80	0,24	0,34	0,45	0,57	0,69	0,73	0,76	0,82	0,92	1,09
0,90	0,24	0,34	0,45	0,57	0,69	0,83	0,86	0,91	1,00	1,15
1,00	0,24	0,34	0,45	0,57	0,69	0,83	0,86	0,91	1,00	1,15
$N_{R,II,k}$ [kN] =	0,24	0,35	0,45	0,58	0,69	0,80	0,91	1,13	1,63	1,63

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-LT-2-5,5xL - KD16, JF6-LT-2-5,5xL - KD16
with pan head with Torx®-drive

Annex 144

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p>
	<p>Drilling capacity: $\Sigma t_i \leq 1,00 \text{ mm} + 2,00 \text{ mm}$</p>
<p>Timber substructures: no performance determined</p>	

$t_{N,II}$ [mm]	0,40	0,50	0,60	0,70	0,80	0,90	1,00	1,20	1,50	2,00
$M_{t,nom}$	2 Nm									
$V_{R,k}$ [kN] for $t_{N,I}$ =	0,32	0,38	0,45	0,51	0,58	0,64	0,71	0,71	0,71	0,71
0,50	0,32	0,45	0,50	0,56	0,62	0,68	0,74	0,86	0,89	0,89
0,60	0,32	0,45	0,59	0,64	0,69	0,75	0,80	0,90	1,06	1,06
0,70	0,32	0,45	0,59	0,74	0,79	0,83	0,88	0,98	1,12	1,24
0,80	0,32	0,45	0,59	0,74	0,90	0,95	0,99	1,07	1,20	1,42
0,90	0,32	0,45	0,59	0,74	0,90	1,08	1,11	1,19	1,31	1,50
1,00	0,32	0,45	0,59	0,74	0,90	1,08	1,11	1,19	1,31	1,50
$N_{R,II,k}$ [kN] =	0,31	0,46	0,60	0,75	0,89	1,04	1,18	1,47	2,12	2,12

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw (chipless) JF3-LT-2-5,5xL - KD16, JF6-LT-2-5,5xL - KD16
with pan head with Torx®-drive

Annex 145

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p>
	<p>Drilling capacity: $\Sigma t \leq 4,50 \text{ mm}$</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	2,00	2,50	3,00
$M_{t,nom}$	2 Nm		
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,60	0,70
	0,67 ac	0,87 ac	1,06 ac
	0,70	0,80	0,90
	1,06 ac	1,37 —	1,67 —
	0,80	0,90	1,00
	1,37 —	1,67 —	1,98 —
	0,90	1,00	1,10
	1,67 —	1,98 —	2,21 —
	1,00	1,10	1,20
	1,98 —	2,41 —	2,60 a
	1,10	1,20	1,30
	2,56 —	3,04 —	3,52 a
	1,20	1,30	1,40
	— —	— —	— —
$N_{R,II,k}$ [kN] =	1,40	1,90	2,39

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.
- Component I and II of aluminium with a tensile strength of $R_m \geq 245 \text{ N/mm}^2$: For $R_m \geq 215 \text{ N/mm}^2$ the indicated values of shear force resistance $V_{R,k}$ can be increased by 14%.
- Component II of aluminium with a tensile strength of $R_m \geq 245 \text{ N/mm}^2$: For $R_m \geq 215 \text{ N/mm}^2$ the indicated values of pull-out resistance $N_{R,II,k}$ can be increased by 14%.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw JT4-(FR-)4-4,8xL, JT9-(FR-)4-4,8xL
with hexagon head or round head with Torx® drive system

Annex 146

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p>
	<p>Drilling capacity: $\Sigma t_i \leq 4,50 \text{ mm}$</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	2,00	2,50	3,00
$M_{t,nom}$	2 Nm		
$V_{R,k}$ [kN] for $t_{N,I} =$	0,87 ac	0,87 ac	0,87 ac
0,60	1,13 ac	1,13 ac	1,13 ac
0,70	1,38 ac	1,38 ac	1,38 ac
0,80	1,78 —	1,78 —	1,78 ac
0,90	2,18 —	2,18 —	2,18 a
1,00	2,58 —	2,58 —	2,58 a
1,20	2,88 —	3,14 —	3,39 a
1,50	3,33 —	3,96 —	4,59 a
2,00	— —	— —	— —
$N_{R,II,k}$ [kN] =	1,83	2,48	3,12

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.
- Component I and II of aluminium with a tensile strength of $R_m \geq 245 \text{ N/mm}^2$: For $R_m \geq 215 \text{ N/mm}^2$ the indicated values of shear force resistance $V_{R,k}$ can be increased by 14%.
- Component II of aluminium with a tensile strength of $R_m \geq 245 \text{ N/mm}^2$: For $R_m \geq 215 \text{ N/mm}^2$ the indicated values of pull-out resistance $N_{R,II,k}$ can be increased by 14%.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw JT4-(FR-)4-4,8xL, JT9-(FR-)4-4,8xL
with hexagon head or round head with Torx® drive system

Annex 147

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 165 \text{ N/mm}^2$ – EN 573</p>
	<p>Drilling capacity: $\Sigma t \leq 6,50 \text{ mm}$</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	2,00	2,50	3,00	4,00	5,00	
$M_{t,nom}$	2 Nm					
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,71 ac	0,71 ac	0,71 ac	0,71 ac	0,71 ac
	0,60	0,94 ac	0,94 ac	0,94 ac	0,94 ac	0,94 ac
	0,70	1,17 ac	1,17 ac	1,17 ac	1,17 ac	1,17 ac
	0,80	1,40 —	1,40 —	1,40 ac	1,40 ac	1,40 a
	0,90	1,62 —	1,62 —	1,62 ac	1,62 ac	1,62 a
	1,00	1,84 —	1,84 —	1,84 ac	1,84 ac	1,84 a
	1,20	2,16 —	2,21 —	2,26 —	2,35 —	2,44 a
	1,50	2,65 —	2,76 —	2,88 —	3,11 —	3,34 a
	2,00	2,65 —	2,76 —	2,88 —	3,11 —	— —
$N_{R,II,k}$ [kN] =	1,36	1,77	2,16	3,43	4,70	

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.
- Component I and II of aluminium with a tensile strength of $R_m \geq 245 \text{ N/mm}^2$: For $R_m \geq 215 \text{ N/mm}^2$ the indicated values of shear force resistance $V_{R,k}$ can be increased by 14%.
- Component II of aluminium with a tensile strength of $R_m \geq 245 \text{ N/mm}^2$: For $R_m \geq 215 \text{ N/mm}^2$ the indicated values of pull-out resistance $N_{R,II,k}$ can be increased by 14%.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw JT4-6-5,5xL, JT9-6-5,5xL
with hexagon head

Annex 148

	<p>Materials:</p> <p>Fastener: stainless steel (A2) – EN ISO 3506 stainless steel (A4) – EN ISO 3506</p> <p>Washer: none</p> <p>Component I: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p> <p>Component II: aluminium alloy with $R_{m,min} = 215 \text{ N/mm}^2$ – EN 573</p>
	<p>Drilling capacity: $\Sigma t_i \leq 6,50 \text{ mm}$</p>
	<p>Timber substructures: no performance determined</p>

$t_{N,II}$ [mm]	2,00	2,50	3,00	4,00	5,00	
$M_{t,nom}$	2 Nm					
$V_{R,k}$ [kN] for $t_{N,I} =$	0,50	0,93 ac	0,93 ac	0,93 ac	0,93 ac	0,93 ac
	0,60	1,23 ac	1,23 ac	1,23 ac	1,23 ac	1,23 ac
	0,70	1,53 ac	1,53 ac	1,53 ac	1,53 ac	1,53 ac
	0,80	1,82 —	1,82 —	1,82 ac	1,82 ac	1,82 a
	0,90	2,11 —	2,11 —	2,11 ac	2,11 ac	2,11 a
	1,00	2,40 —	2,40 —	2,40 ac	2,40 ac	2,40 a
	1,20	2,82 —	2,88 —	2,94 —	3,06 —	3,18 a
	1,50	3,45 —	3,60 —	3,75 —	4,05 —	4,35 a
2,00	3,45 —	3,60 —	3,75 —	4,05 —	— —	
$N_{R,II,k}$ [kN] =	1,77	2,30	2,82	4,47	6,12	

- Pull-through resistance of component I according to EN 1999-1-4, chapter 8.3.3.1 or specifications of the manufacturer of the aluminium structural sheeting.
- Component I and II of aluminium with a tensile strength of $R_m \geq 245 \text{ N/mm}^2$: For $R_m \geq 215 \text{ N/mm}^2$ the indicated values of shear force resistance $V_{R,k}$ can be increased by 14%.
- Component II of aluminium with a tensile strength of $R_m \geq 245 \text{ N/mm}^2$: For $R_m \geq 215 \text{ N/mm}^2$ the indicated values of pull-out resistance $N_{R,II,k}$ can be increased by 14%.

Fastening screws JA, JB, JT, JZ and JF

Self-drilling screw JT4-6-5,5xL, JT9-6-5,5xL
with hexagon head

Annex 149