

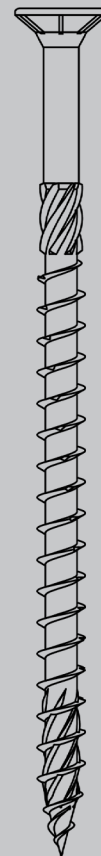
HDC-C COUNTERSUNK RIB HEAD ZINC CLEAR / STEEL

CERTIFICATION

TDS

ZP

Technical Data Sheet



For Install Support

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HDC-C

TIMBER CONSTRUCTION SCREW COUNTERSUNK RIB HEAD

Timber Construction Screw Countersunk Rib Head

Countersunk head construction screws with TX drive for structural connections of wooden members, including solid, bonded and wood-based panels.

- Solid Timbers
- Glued Laminated Timbers - CLT, KVH, BSH / GLT
- Laminated Veneer Lumber - LVL



EUROPEAN TECHNICAL
ASSESSMENT
ETA-18/0817

FEATURES



Cutting Ribs - Allow optimal and smooth countersink with aesthetic result.



Shank Ribs - Shank ribs reduces installation torque by reaming the hole.



High Torque - Allows screws to be installed without pre-drilling, even in hardwood substrates.



Wax Coating - Wax coating applied during the production process significantly reduces the torque.

SUBSTRATES



Solid Timbers



Glued Laminated Timbers
CLT, KVH, BSH / GLT

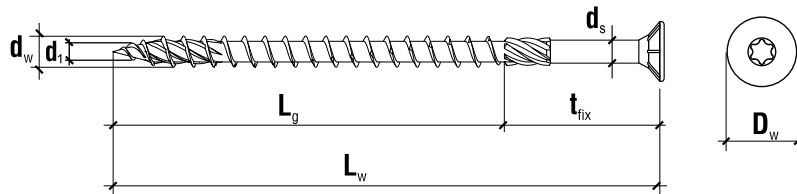


Laminated Veneer Lumber
LVL

HDC-C

TIMBER CONSTRUCTION SCREW COUNTERSUNK RIB HEAD

PRODUCT LIST



Codes and dimensions

	Product code	Dimensions	Thread Length	Max. Fixture Length	Type of Drive	Quantity
	Zinc - white	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
HDC-C 3						
Ø 3	3WKCSZ30030	3x30	17	13	TX 10	500
	3WKCSZ30035	3x35	17	18	TX 10	500
	3WKCSZ30040	3x40	22	18	TX 10	500
HDC-C 3.5						
Ø 3.5	3WKCSZ35030	3.5x30	17	13	TX 15	500
	3WKCSZ35035	3.5x35	17	18	TX 15	500
	3WKCSZ35040	3.5x40	22	18	TX 15	500
	3WKCSZ35050	3.5x50	30	20	TX 15	400
HDC-C 4						
Ø 4	3WKCSZ40030	4x30	17	13	TX 20	500
	3WKCSZ40035	4x35	17	18	TX 20	500
	3WKCSZ40040	4x40	22	18	TX 20	400
	3WKCSZ40045	4x45	30	15	TX 20	300
	3WKCSZ40050	4x50	30	20	TX 20	300
	3WKCSZ40060	4x60	40	20	TX 20	250
	3WKCSZ40070	4x70	40	30	TX 20	200
HDC-C 4.5						
Ø 4.5	3WKCSZ45040	4.5x40	22	18	TX 20	250
	3WKCSZ45050	4.5x50	30	20	TX 20	250
	3WKCSZ45060	4.5x60	40	20	TX 20	250
	3WKCSZ45070	4.5x70	40	30	TX 20	250
	3WKCSZ45080	4.5x80	50	30	TX 20	250
HDC-C 5						
Ø 5	3WKCSZ50040	5x40	22	18	TX 25	500
	3WKCSZ50050	5x50	30	20	TX 25	300
	3WKCSZ50060	5x60	40	20	TX 25	200
	3WKCSZ50070	5x70	40	30	TX 25	200
	3WKCSZ50080	5x80	50	30	TX 25	200
	3WKCSZ50090	5x90	50	40	TX 25	200
	3WKCSZ50100	5x100	60	40	TX 25	200
	3WKCSZ50120	5x120	60	60	TX 25	200

HDC-C

TIMBER CONSTRUCTION SCREW COUNTERSUNK RIB HEAD

Codes and dimensions						
	Product code	Dimensions	Thread Length	Max. Fixture Length	Type of Drive	Quantity
	Zinc - white	d _w x L _w [mm]	L _g [mm]	t _{fix} [mm]	[-]	[pcs]
HDC-C 6						
Ø 6	3WKCSZ60050	6x50	30	20	TX 30	200
	3WKCSZ60060	6x60	30	30	TX 30	100
	3WKCSZ60070	6x70	40	30	TX 30	100
	3WKCSZ60080	6x80	50	30	TX 30	100
	3WKCSZ60090	6x90	50	40	TX 30	100
	3WKCSZ60100	6x100	60	40	TX 30	100
	3WKCSZ60120	6x120	75	45	TX 30	100
	3WKCSZ60140	6x140	75	65	TX 30	100
	3WKCSZ60160	6x160	75	85	TX 30	100
	3WKCSZ60180	6x180	75	105	TX 30	100
	3WKCSZ60200	6x200	75	125	TX 30	100
	3WKCSZ60220	6x220	75	145	TX 30	100
	3WKCSZ60240	6x240	75	165	TX 30	100
	3WKCSZ60260	6x260	75	185	TX 30	100
	3WKCSZ60280	6x280	75	205	TX 30	100
	3WKCSZ60300	6x300	75	225	TX 30	100
HDC-C 6						
Ø 8	3WKCSZ08080	8x80	50	30	TX 40	50
	3WKCSZ08100	8x100	50	50	TX 40	50
	3WKCSZ08120	8x120	80	40	TX 40	50
	3WKCSZ08140	8x140	100	40	TX 40	50
	3WKCSZ08160	8x160	100	60	TX 40	50
	3WKCSZ08180	8x180	100	80	TX 40	50
	3WKCSZ08200	8x200	100	100	TX 40	50
	3WKCSZ08220	8x220	100	120	TX 40	50
	3WKCSZ08240	8x240	100	140	TX 40	50
	3WKCSZ08260	8x260	100	160	TX 40	50
	3WKCSZ08280	8x280	100	180	TX 40	50
	3WKCSZ08300	8x300	100	200	TX 40	50
	3WKCSZ08320	8x320	100	220	TX 40	50
	3WKCSZ08340	8x340	100	240	TX 40	50
	3WKCSZ08360	8x360	100	260	TX 40	50
	3WKCSZ08380	8x380	100	280	TX 40	50
	3WKCSZ08400	8x400	100	300	TX 40	50
	3WKCSZ08440	8x440	100	340	TX 40	50
	3WKCSZ08480	8x480	100	380	TX 40	50
	3WKCSZ08520	8x520	100	420	TX 40	50
	3WKCSZ08560	8x560	100	460	TX 40	50
	3WKCSZ08600	8x600	100	500	TX 40	50

HDC-C

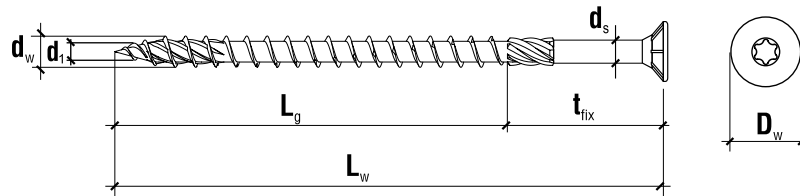
TIMBER CONSTRUCTION SCREW COUNTERSUNK RIB HEAD

Codes and dimensions						
	Product code	Dimensions	Thread Length	Max. Fixture Length	Type of Drive	Quantity
	Zinc - white	d _w x L _w [mm]	L _g [mm]	t _{fix} [mm]	[-]	[pcs]
HDC-C 10						
Ø 10	3WKCSZ10120	10x120	80	40	TX 40	50
	3WKCSZ10140	10x140	80	60	TX 40	50
	3WKCSZ10160	10x160	100	60	TX 40	25
	3WKCSZ10180	10x180	100	80	TX 40	25
	3WKCSZ10200	10x200	100	100	TX 40	25
	3WKCSZ10220	10x220	100	120	TX 40	25
	3WKCSZ10240	10x240	100	140	TX 40	25
	3WKCSZ10260	10x260	100	160	TX 40	25
	3WKCSZ10280	10x280	100	180	TX 40	25
	3WKCSZ10300	10x300	100	200	TX 40	25
	3WKCSZ10320	10x320	100	220	TX 40	25
	3WKCSZ10340	10x340	100	240	TX 40	25
	3WKCSZ10360	10x360	100	260	TX 40	25
	3WKCSZ10380	10x380	100	280	TX 40	25
	3WKCSZ10400	10x400	100	300	TX 40	25
	3WKCSZ10440	10x440	100	340	TX 40	25
	3WKCSZ10480	10x480	100	380	TX 40	25
	3WKCSZ10520	10x520	100	420	TX 40	25
	3WKCSZ10560	10x560	100	460	TX 40	25
	3WKCSZ10600	10x600	100	500	TX 40	25

HDC-C

TIMBER CONSTRUCTION SCREW COUNTERSUNK RIB HEAD

MECHANICAL CHARACTERISTICS



Geometry

Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Head diameter	Length range
	d_w [mm]	d_i [mm]	d_s [mm]	D_w [mm]	L_w [mm]
WKCS Ø3	3	2,00	2,20	6	30-40
WKCS Ø3,5	3,5	2,25	2,50	7	30-50
WKCS Ø4	4	2,55	2,87	8	30-70
WKCS Ø4,5	4,5	2,95	3,10	9	40-80
WKCS Ø5	5	3,15	3,50	10	40-120
WKCS Ø6	6	3,80	4,30	12	50-300
WKCS Ø8	8	5,50	5,78	14	80-600
WKCS Ø10	10	6,30	7,00	18	120-600

Mechanical characteristics

Product	Characteristic yield moment	Characteristic withdrawal resistance parameter - softwood	Characteristic withdrawal resistance parameter - LVL	Characteristic head-pull-through resistance parameter - softwood	Characteristic head-pull-through resistance parameter - LVL	Characteristic tensile strength	Characteristic torsional strength
	$M_{y,k}$ [N*m]	$f_{ax,k}$ [N/mm ²]	$f_{ax,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tork,k}$ [N*m]
WKCS Ø3	1,5	13	15	22,5	22,5	3,5	1,5
WKCS Ø3,5	2	13	15	20,8	20,8	4	2
WKCS Ø4	3,5	13	15	19,4	19,4	6	3,5
WKCS Ø4,5	5	13	15	18,3	18,3	8	4,5
WKCS Ø5	6	12	15	17,4	17,4	9	6
WKCS Ø6	10	12	13	15,9	15,9	13	10
WKCS Ø8	25	12	13	14,7	14,7	25	27
WKCS Ø10	43	11	13	13,0	13,0	36	45

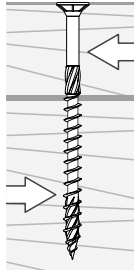
1. Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_s = 350 \text{ kg/m}^3$
2. Characteristic withdrawal and head-pull-through resistance based on reference density of LVL $\rho_a = 480 \text{ kg/m}^3$

INSTALLATION PARAMETERS

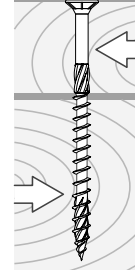
TIMBER

Minimum distances for laterally loaded screws - timber

Angle between force and fiber direction $\alpha = 0^\circ$



Angle between force and fiber direction $\alpha = 90^\circ$



WITHOUT PRE-DRILLED HOLE

d_w [mm]	Ø 3	Ø 3.5	Ø 4	Ø 4.5	Ø 5	Ø 6	Ø 8	Ø 10
a_1 [mm]	30	35	40	45	60	72	96	120
a_2 [mm]	15	18	20	23	25	30	40	50
$a_{3,t}$ [mm]	45	53	60	68	75	90	120	150
$a_{3,c}$ [mm]	30	35	40	45	50	60	80	100
$a_{4,t}$ [mm]	15	18	20	23	25	30	40	50
$a_{4,c}$ [mm]	15	18	20	23	25	30	40	50

WITHOUT PRE-DRILLED HOLE

d_w [mm]	Ø 3	Ø 3.5	Ø 4	Ø 4.5	Ø 5	Ø 6	Ø 8	Ø 10
a_1 [mm]	15	18	20	23	25	30	40	50
a_2 [mm]	15	18	20	23	25	30	40	50
$a_{3,t}$ [mm]	30	35	40	45	50	60	80	100
$a_{3,c}$ [mm]	30	35	40	45	50	60	80	100
$a_{4,t}$ [mm]	21	25	28	32	50	60	80	100
$a_{4,c}$ [mm]	15	18	20	23	25	30	40	50

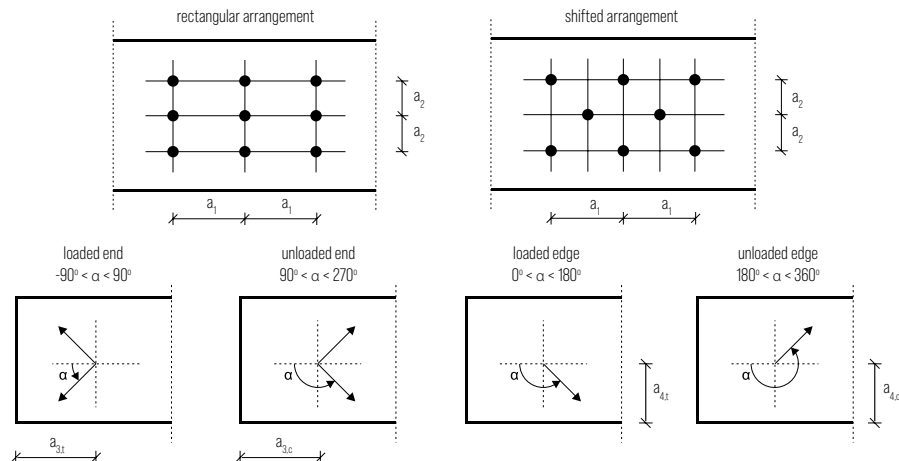
WITH PRE-DRILLED HOLE

d_w [mm]	Ø 3	Ø 3.5	Ø 4	Ø 4.5	Ø 5	Ø 6	Ø 8	Ø 10
d_0 [mm]	2	2	2.5	2.5	3	4	5	6
a_1 [mm]	15	18	20	23	25	30	40	50
a_2 [mm]	9	11	12	14	15	18	24	30
$a_{3,t}$ [mm]	36	42	48	54	60	72	96	120
$a_{3,c}$ [mm]	21	25	28	32	35	42	56	70
$a_{4,t}$ [mm]	9	11	12	14	15	18	24	30
$a_{4,c}$ [mm]	9	11	12	14	15	18	24	30

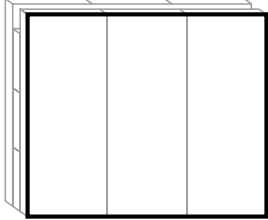
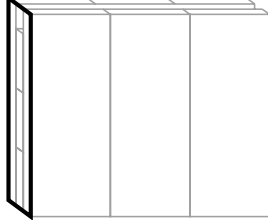
WITH PRE-DRILLED HOLE

d_w [mm]	Ø 3	Ø 3.5	Ø 4	Ø 4.5	Ø 5	Ø 6	Ø 8	Ø 10
d_0 [mm]	2	2	2.5	2.5	3	4	5	6
a_1 [mm]	12	14	16	18	20	24	32	40
a_2 [mm]	12	14	16	18	20	24	32	40
$a_{3,t}$ [mm]	21	25	28	32	35	42	56	70
$a_{3,c}$ [mm]	21	25	28	32	35	42	56	70
$a_{4,t}$ [mm]	15	18	20	23	35	42	56	70
$a_{4,c}$ [mm]	9	11	12	14	15	18	24	30

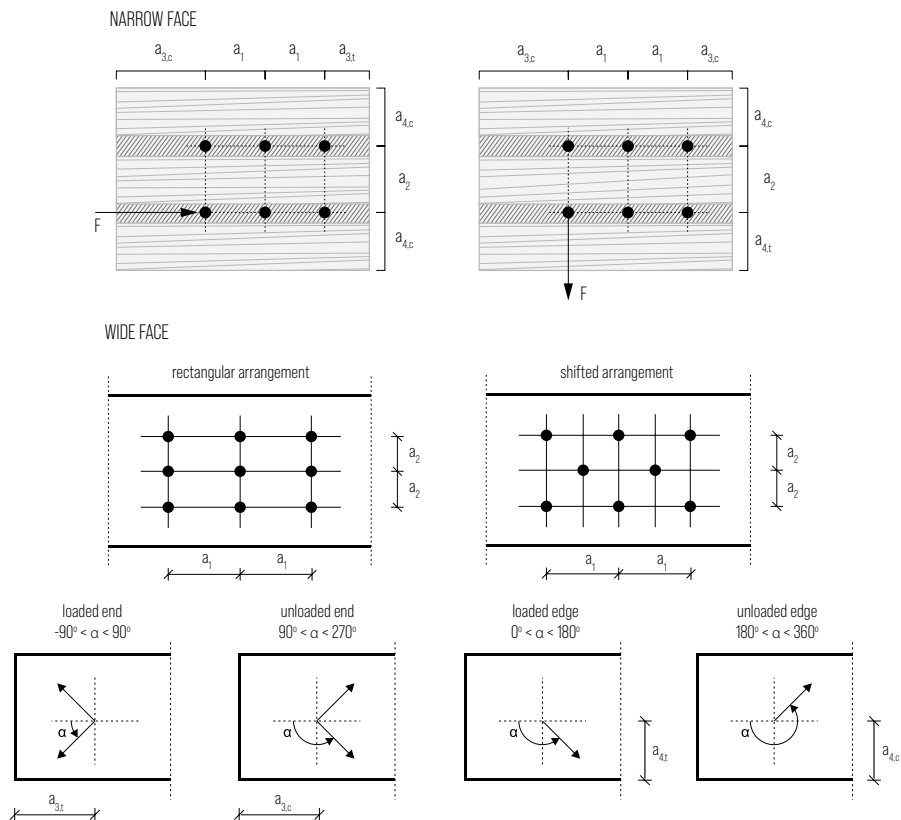
1. Minimum distances in accordance with EN 1995 and ETA-18/0817
2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$
3. In case of connection panel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,85
4. In case of connection steel-timber minimum distances (a_1, a_2) should be multiplied by a factor of 0,7
5. Hole diameter d_0 is valid for softwood



Minimum distances for laterally and/or axially loaded screws - CLT

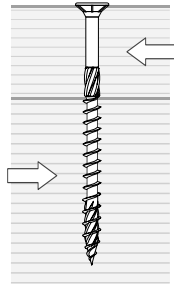
WIDE FACE				NARROW FACE			
							
WITHOUT PRE-DRILLED HOLE				WITHOUT PRE-DRILLED HOLE			
d_w [mm]	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 6	Ø 8	Ø 10
a_1 [mm]	24	32	40	a_1 [mm]	60	80	100
a_2 [mm]	15	20	25	a_2 [mm]	24	32	40
$a_{3,t}$ [mm]	36	48	60	$a_{3,t}$ [mm]	72	96	120
$a_{3,c}$ [mm]	36	48	60	$a_{3,c}$ [mm]	42	56	70
$a_{4,t}$ [mm]	36	48	60	$a_{4,t}$ [mm]	36	48	60
$a_{4,c}$ [mm]	15	20	25	$a_{4,c}$ [mm]	18	24	30

1. Minimum distances in accordance with ETA-18/0817

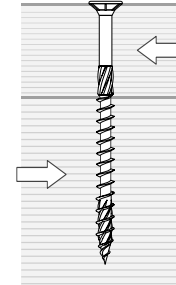
2. Minimum CLT thickness $t_{min} = 10d_w$ 3. Minimum penetration depth in CLT narrow face $l_{ef} = 10d_w$ 

Minimum distances for laterally loaded screws - LVL

Angle between force and fiber direction $\alpha = 0^\circ$



Angle between force and fiber direction $\alpha = 90^\circ$



WITHOUT PRE-DRILLED HOLE

WITHOUT PRE-DRILLED HOLE

d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
a_1 [mm]	75	90	120	150
a_2 [mm]	35	42	56	70
$a_{3,t}$ [mm]	100	120	160	200
$a_{3,c}$ [mm]	75	90	120	150
$a_{4,t}$ [mm]	35	42	56	70
$a_{4,c}$ [mm]	35	42	56	70

d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
a_1 [mm]	35	42	56	70
a_2 [mm]	35	42	56	70
$a_{3,t}$ [mm]	75	90	120	150
$a_{3,c}$ [mm]	75	90	120	150
$a_{4,t}$ [mm]	60	72	96	120
$a_{4,c}$ [mm]	35	42	56	70

WITH PRE-DRILLED HOLE

WITH PRE-DRILLED HOLE

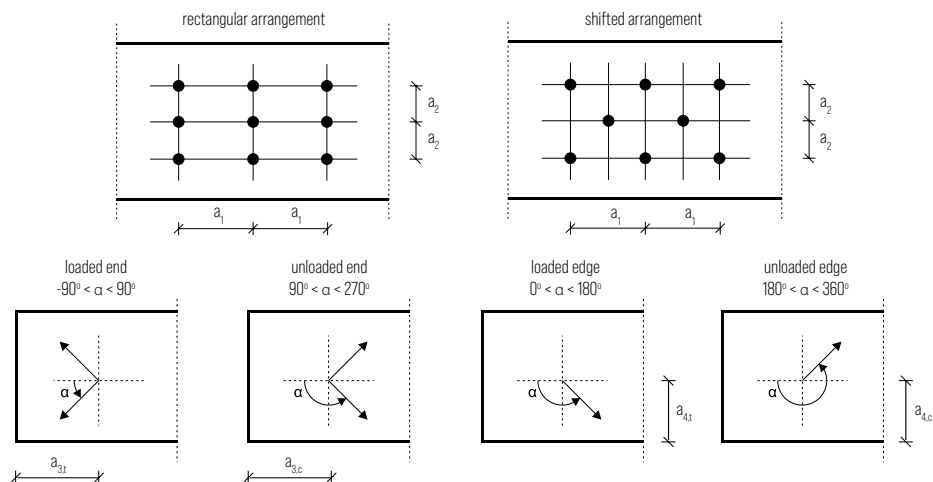
d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
d_0 [mm]	3	4	5	6
a_1 [mm]	25	30	40	50
a_2 [mm]	15	18	24	30
$a_{3,t}$ [mm]	60	72	96	120
$a_{3,c}$ [mm]	35	42	56	70
$a_{4,t}$ [mm]	15	18	24	30
$a_{4,c}$ [mm]	15	18	24	30

d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
d_0 [mm]	3	4	5	6
a_1 [mm]	20	24	32	40
a_2 [mm]	20	24	32	40
$a_{3,t}$ [mm]	35	42	56	70
$a_{3,c}$ [mm]	35	42	56	70
$a_{4,t}$ [mm]	35	42	56	70
$a_{4,c}$ [mm]	15	18	24	30

1. Minimum distances in accordance with EN 1995 and ETA-18/0817

2. Minimum distances is valid for LVL characteristic density in range of $420 \text{ kg/m}^3 < p_k \leq 500 \text{ kg/m}^3$

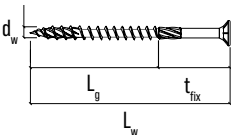
3. Hole diameter d_0 is valid for softwood LVL



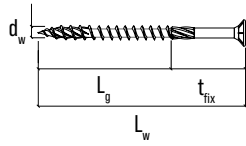
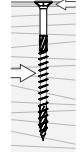
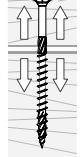
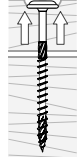
CHARACTERISTIC RESISTANCES

TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR					TENSION					
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)			
														
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]			
WKCS 3														
ø3	30	17	13	0,56	-	t = 9 mm	0,52	t = 1,5 mm	0,66	t = 3 mm	0,87	0,66	0,81	-
	35	17	18	0,61	-		0,52		0,66		0,87	0,66	0,81	-
	40	22	18	0,68	-		0,52		0,71		0,92	0,86	0,81	-
WKCS 3,5														
ø3,5	30	17	13	0,63	-	t = 9 mm	0,61	t = 1,75 mm	0,78	t = 3,5 mm	1,05	0,77	1,02	-
	35	17	18	0,69	-		0,61		0,80		1,05	0,77	1,02	-
	40	22	18	0,79	-		0,61		0,85		1,10	1,00	1,02	-
	50	30	20	0,84	-		0,61		0,95		1,20	1,37	1,02	-
WKCS 4														
ø4	30	17	13	0,70	-	t = 12 mm	0,73	t = 2 mm	0,85	t = 4 mm	1,22	0,88	1,24	-
	35	17	18	0,77	-		0,83		1,00		1,35	0,88	1,24	-
	40	22	18	0,92	-		0,85		1,12		1,47	1,14	1,24	-
	45	30	15	0,92	-		0,85		1,23		1,57	1,56	1,24	-
	50	30	20	1,01	-		0,85		1,23		1,57	1,56	1,24	-
	60	40	20	1,01	-		0,85		1,36		1,70	2,08	1,24	-
	70	40	30	1,15	-		0,85		1,36		1,70	2,08	1,24	-
WKCS 4,5														
ø4,5	40	22	18	1,01	-	t = 12 mm	1,00	t = 2,25 mm	1,24	t = 4,5 mm	1,73	1,29	1,49	-
	50	30	20	1,18	-		1,00		1,48		1,91	1,76	1,49	-
	60	40	20	1,18	-		1,00		1,63		2,06	2,34	1,49	-
	70	40	30	1,40	-		1,00		1,63		2,06	2,34	1,49	-
	80	50	30	1,40	-		1,00		1,77		2,21	2,93	1,49	-
WKCS 5														
ø5	40	22	18	1,07	-	t = 15 mm	1,11	t = 2,5 mm	1,33	t = 5 mm	1,85	1,32	1,74	-
	50	30	20	1,34	-		1,21		1,64		2,13	1,80	1,74	-
	60	40	20	1,34	-		1,21		1,79		2,28	2,40	1,74	-
	70	40	30	1,56	-		1,21		1,79		2,28	2,40	1,74	-
	80	50	30	1,56	-		1,21		1,94		2,43	3,00	1,74	-
	90	50	40	1,62	-		1,21		1,94		2,43	3,00	1,74	-
	100	60	40	1,62	-		1,21		2,09		2,58	3,60	1,74	-
	120	60	60	1,62	-		1,21		2,09		2,58	3,60	1,74	-

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR					TENSION				
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)		
													
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]		
WKCS 6													
ø6	50	30	20	1,62	1,62	t = 15 mm	1,55	t = 3 mm	2,69	2,16	2,29	6,35	
	60	30	30	1,79	1,79		1,55		2,17	2,85	2,16	2,29	6,35
	70	40	30	1,95	2,10		1,55		2,35	3,03	2,88	2,29	6,35
	80	50	30	1,95	2,28		1,55		2,53	3,21	3,60	2,29	6,35
	90	50	40	2,20	2,53		1,55		2,53	3,21	3,60	2,29	6,35
	100	60	40	2,20	2,71		1,55		2,71	3,39	4,32	2,29	6,35
	120	75	45	2,20	2,98		1,55		2,98	3,66	5,40	2,29	6,35
	140	75	65	2,20	2,98		1,55		2,98	3,66	5,40	2,29	6,35
	160	75	85	2,20	2,98		1,55		2,98	3,66	5,40	2,29	6,35
	180	75	105	2,20	2,98		1,55		2,98	3,66	5,40	2,29	6,35
	200	75	125	2,20	2,98		1,55		2,98	3,66	5,40	2,29	6,35
	220	75	145	2,20	2,98		1,55		2,98	3,66	5,40	2,29	6,35
	240	75	165	2,20	2,98		1,55		2,98	3,66	5,40	2,29	6,35
	260	75	185	2,20	2,98		1,55		2,98	3,66	5,40	2,29	6,35
	280	75	205	2,20	2,98		1,55		2,98	3,66	5,40	2,29	6,35
	300	75	225	2,20	2,98		1,55		2,98	3,66	5,40	2,29	6,35

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817
2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

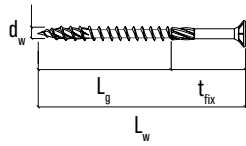
Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$
4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element
5. Characteristic shear resistances were calculated for connections without pre-drilled holes
6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] in accordance with EN 300
7. Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$
8. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$
9. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g
10. Characteristic head pull-through resistances were calculated for timber element

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR					TENSION		
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)
d_w [mm]	L_w [mm]	L_g [mm]	t_{fix} [mm]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]	$R_{head,k}$ [kN]
WKCS 8											
ø8	80	50	30	2,77	3,25	2,44	3,74	5,23	4,80	2,88	9,19
	100	50	50	3,27	3,75	2,44	4,05	5,23	4,80	2,88	9,19
	120	80	40	3,05	4,25	2,44	4,77	5,95	7,68	2,88	9,19
	140	100	40	3,05	4,62	2,44	5,25	6,43	9,60	2,88	9,19
	160	100	60	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	180	100	80	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	200	100	100	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	220	100	120	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	240	100	140	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	260	100	160	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	280	100	180	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	300	100	200	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	320	100	220	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	340	100	240	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	360	100	260	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	380	100	280	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	400	100	300	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	440	100	340	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	480	100	380	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	520	100	420	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	560	100	460	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19
	600	100	500	3,57	5,15	2,44	5,25	6,43	9,60	2,88	9,19

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR					TENSION					
Diameter	Length	Thread length	Usable length	timber-timber	timber-timber (with washer)	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Head pull-through (with washer)			
														
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]			
WKCS 10														
ø10	120	80	40	4,07	5,22	t = 22 mm	3,89	t = 5 mm	6,24	t = 10 mm	7,92	8,80	4,20	13,27
	140	80	60	4,78	5,93		3,89		6,24		7,92	8,80	4,20	13,27
	160	100	60	4,78	6,48		3,89		6,79		8,47	11,00	4,20	13,27
	180	100	80	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	200	100	100	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	220	100	120	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	240	100	140	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	260	100	160	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	280	100	180	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	300	100	200	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	320	100	220	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	340	100	240	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	360	100	260	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	380	100	280	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	400	100	300	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	440	100	340	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	480	100	380	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	520	100	420	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	560	100	460	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27
	600	100	500	5,09	6,79		3,89		6,79		8,47	11,00	4,20	13,27

NOTES:

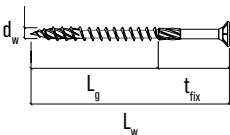
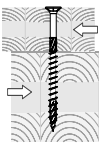
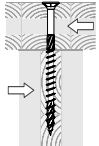
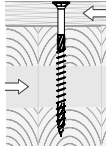
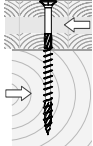
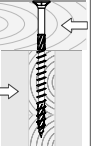
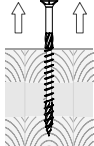
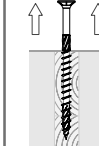
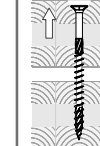
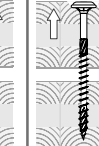
1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817
2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

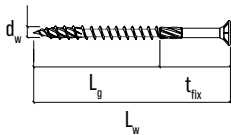
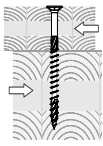
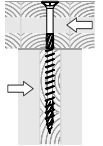
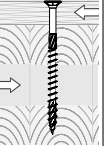
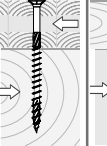
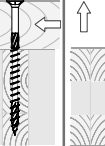
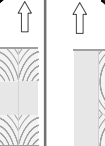
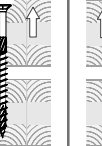
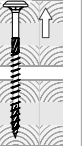
Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$
4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element
5. Characteristic shear resistances were calculated for connections without pre-drilled holes
6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] in accordance with EN 300
7. Characteristic shear resistances for steel-timber connections were calculated for thin steel plate with thickness $t \leq 0,5d_w$
8. Characteristic shear resistances for steel-timber connections were calculated for thick steel plate with thickness $t \geq d_w$
9. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g
10. Characteristic head pull-through resistances were calculated for timber element

Characteristic resistances for laterally and axially loaded screws - CLT

DIMENSIONS				SHEAR					TENSION				
Diameter	Length	Thread length	Usable length	CLT-CLT (wide face-wide face)	CLT-CLT (wide face-narrow face)	OSB-CLT (wide face)	CLT-timber (wide face)	timber-CLT (narrow face)	Withdrawal (wide face)	Withdrawal (narrow face)	Head pull-through	Head pull-through (with washer)	
													
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]	
WKCS 6													
ø6	50	30	20	1,62	-	t = 15 mm	1,55	1,62	-	2,16	-	2,29	6,35
	60	30	30	1,79	-		1,55	1,79	-	2,16	-	2,29	6,35
	70	40	30	1,95	-		1,55	1,95	-	2,88	-	2,29	6,35
	80	50	30	1,95	-		1,55	1,95	-	3,60	-	2,29	6,35
	90	50	40	2,20	-		1,55	2,20	-	3,60	-	2,29	6,35
	100	60	40	2,20	-		1,55	2,20	-	4,32	-	2,29	6,35
	120	75	45	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	140	75	65	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	160	75	85	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	180	75	105	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	200	75	125	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	220	75	145	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	240	75	165	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	260	75	185	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	280	75	205	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
	300	75	225	2,20	-		1,55	2,20	-	5,40	-	2,29	6,35
WKCS 8													
ø8	80	50	30	2,77	-	t = 18 mm	2,44	2,77	-	4,80	-	2,88	9,19
	100	50	50	3,27	-		2,44	3,27	-	4,80	-	2,88	9,19
	120	80	40	3,05	2,65		2,44	3,05	2,65	7,68	5,45	2,88	9,19
	140	100	40	3,05	2,66		2,44	3,05	2,66	9,60	6,66	2,88	9,19
	160	100	60	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	180	100	80	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	200	100	100	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	220	100	120	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	240	100	140	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	260	100	160	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	280	100	180	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	300	100	200	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	320	100	220	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	340	100	240	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	360	100	260	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	380	100	280	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	400	100	300	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	440	100	340	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	480	100	380	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	520	100	420	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	560	100	460	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19
	600	100	500	3,57	2,98		2,44	3,57	2,98	9,60	6,66	2,88	9,19

Characteristic resistances for laterally and axially loaded screws - CLT

DIMENSIONS				SHEAR					TENSION				
Diameter	Length	Thread length	Usable length	CLT-CLT (wide face-wide face)	CLT-CLT (wide face-narrow face)	OSB-CLT (wide face)	CLT-timber (wide face)	timber-CLT (narrow face)	Withdrawal (wide face)	Withdrawal (narrow face)	Head pull-through	Head pull-through (with washer)	
													
d _w [mm]	L _w [mm]	L _g [mm]	t _{fix} [mm]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{V,k} [kN]	R _{ax,k} [kN]	R _{ax,k} [kN]	R _{head,k} [kN]	R _{head,k} [kN]	
WKCS 10													
ø10	120	80	40	4,07	-	t = 22 mm	3,89	4,07	-	8,80	-	4,20	13,27
	140	80	60	4,78	-		3,89	4,78	-	8,80	-	4,20	13,27
	160	100	60	4,78	4,02		3,89	4,78	4,02	11,00	7,96	4,20	13,27
	180	100	80	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	200	100	100	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	220	100	120	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	240	100	140	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	260	100	160	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	280	100	180	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	300	100	200	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	320	100	220	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	340	100	240	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	360	100	260	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	380	100	280	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	400	100	300	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	440	100	340	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	480	100	380	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	520	100	420	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	560	100	460	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27
	600	100	500	5,09	4,02		3,89	5,09	4,02	11,00	7,96	4,20	13,27

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber and CLT $\rho_k = 350 \text{ kg/m}^3$

4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element

5. Characteristic shear resistances were calculated for connections without pre-drilled holes

6. Characteristic shear resistances for OSB-timber connections were calculated for OSB board with thickness t [mm] in accordance with EN 300

7. Characteristic withdrawal resistances of CLT wide face were calculated assuming an angle of 90° between screw and grain direction and for minimum penetration length equal L_g

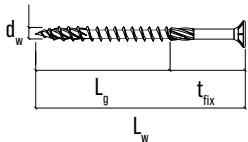
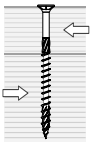
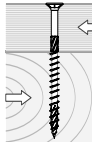
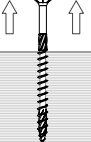
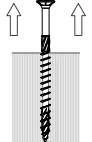
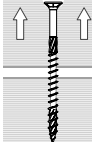
8. Characteristic withdrawal resistances of CLT narrow face were calculated for minimum thickness $t_{min} = 10d_w$ and for minimum penetration length equal $L_{ef} = 10d_w$

9. Characteristic head pull-through resistances were calculated for CLT

Characteristic resistances for laterally and axially loaded screws - LVL

DIMENSIONS				SHEAR			TENSION			
Diameter	Length	Thread length	Usable length	LVL-LVL	LVL-timber	timber-LVL	Withdrawal (wide face)	Withdrawal (edge face)	Head pull-through	Head pull-through (with washer)
d_w [mm]	L_w [mm]	L_g [mm]	t_{fix} [mm]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]	$R_{head,k}$ [kN]
WKCS 5										
ø5	40	22	18	-	-	-	1,65	1,10	1,74	-
	50	30	20	-	-	-	2,25	1,50	1,74	-
	60	40	20	-	-	-	3,00	2,00	1,74	-
	70	40	30	1,82	1,71	1,63	3,00	2,00	1,74	-
	80	50	30	1,82	1,71	1,63	3,75	2,50	1,74	-
	90	50	40	1,82	1,71	1,71	3,75	2,50	1,74	-
	100	60	40	1,82	1,71	1,71	4,50	3,00	1,74	-
	120	60	60	1,82	1,71	1,71	4,50	3,00	1,74	-
WKCS 6										
ø6	50	30	20	-	-	-	2,34	1,56	2,29	6,35
	60	30	30	2,29	2,00	2,03	2,34	1,56	2,29	6,35
	70	40	30	2,35	2,24	2,03	3,12	2,08	2,29	6,35
	80	50	30	2,35	2,24	2,03	3,90	2,60	2,29	6,35
	90	50	40	2,48	2,33	2,32	3,90	2,60	2,29	6,35
	100	60	40	2,48	2,33	2,32	4,68	3,12	2,29	6,35
	120	75	45	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	140	75	65	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	160	75	85	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	180	75	105	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	200	75	125	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	220	75	145	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	240	75	165	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	260	75	185	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	280	75	205	2,48	2,33	2,33	5,85	3,90	2,29	6,35
	300	75	225	2,48	2,33	2,33	5,85	3,90	2,29	6,35
WKCS 8										
ø8	80	50	30	3,28	3,10	2,90	5,20	3,47	2,88	9,19
	100	50	50	4,06	3,51	3,51	5,20	3,47	2,88	9,19
	120	80	40	3,70	3,51	3,18	8,32	5,55	2,88	9,19
	140	100	40	3,70	3,51	3,18	10,40	6,93	2,88	9,19
	160	100	60	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	180	100	80	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	200	100	100	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	220	100	120	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	240	100	140	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	260	100	160	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	280	100	180	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	300	100	200	4,06	3,79	3,79	10,40	6,93	2,88	9,19

Characteristic resistances for laterally and axially loaded screws - LVL

DIMENSIONS				SHEAR			TENSION			
Diameter	Length	Thread length	Usable length	LVL-LVL	LVL-timber	timber-LVL	Withdrawal (wide face)	Withdrawal (edge face)	Head pull-through	Head pull-through (with washer)
										
d_w [mm]	L_w [mm]	L_g [mm]	t_{fix} [mm]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{V,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]	$R_{head,k}$ [kN]
WKCS 8										
ø8	320	100	220	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	340	100	240	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	360	100	260	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	380	100	280	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	400	100	300	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	440	100	340	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	480	100	380	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	520	100	420	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	560	100	460	4,06	3,79	3,79	10,40	6,93	2,88	9,19
	600	100	500	4,06	3,79	3,79	10,40	6,93	2,88	9,19
WKCS 10										
ø10	120	80	40	4,84	4,60	4,25	10,40	6,93	4,20	13,27
	140	80	60	5,79	5,40	4,99	10,40	6,93	4,20	13,27
	160	100	60	5,79	5,40	4,99	13,00	8,67	4,20	13,27
	180	100	80	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	200	100	100	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	220	100	120	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	240	100	140	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	260	100	160	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	280	100	180	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	300	100	200	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	320	100	220	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	340	100	240	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	360	100	260	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	380	100	280	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	400	100	300	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	440	100	340	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	480	100	380	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	520	100	420	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	560	100	460	5,79	5,40	5,40	13,00	8,67	4,20	13,27
	600	100	500	5,79	5,40	5,40	13,00	8,67	4,20	13,27

NOTES:

1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817

2. In order to obtain a design resistance, use the following formula :

$$R_d = \frac{R_k * k_{mod}}{\gamma_M}$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995

3. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$ and LVL $\rho_k = 480 \text{ kg/m}^3$

4. Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element

5. Characteristic shear resistances were calculated for connections without pre-drilled holes

6. Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g

7. Characteristic head pull-through resistances were calculated for LVL

HDC-C

TIMBER CONSTRUCTION SCREW COUNTERSUNK RIB HEAD



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