

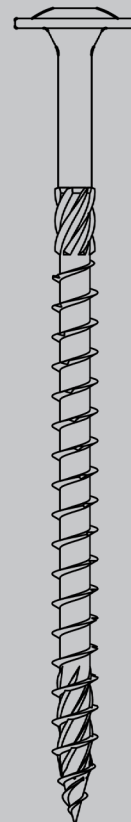
HDC-P PAN HEAD ZINC CLEAR / STEEL

CERTIFICATION

TDS

ZP

Technical Data Sheet



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HDC-P

TIMBER CONSTRUCTION SCREW PAN HEAD

Timber Construction Screw Pan Head

Flange head construction screws with Torx drive for structural connections of wood 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



Flange Head - Flange head increases the bearing area and provides tight connection as well as resistance to prevent head pull-through.



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.

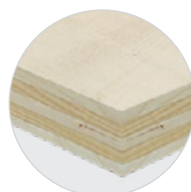


Wax Coating - Wax coating applied during the production process significantly reduces the torque.

SUBSTRATES



Solid Timbers

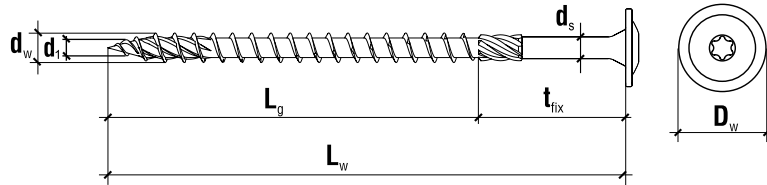


Glued Laminated Timbers
CLT, KVH, BSH / GLT



Laminated Veneer Lumber
LVL

PRODUCT LIST



Codes and dimensions

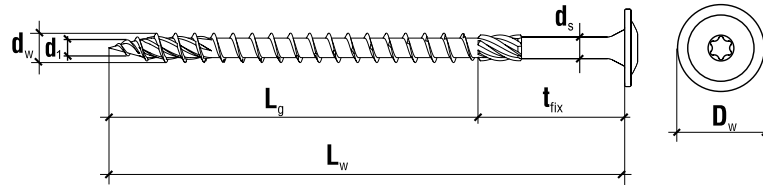
	Product code	Dimensions	Thread Length	Max. Fixture Length	Type of Drive	Quantity
	Zinc - white	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
HDC-P 5						
Ø 5	3WKCPZ05040	5x40	22	18	TX 25	500
	3WKCPZ05050	5x50	30	20	TX 25	300
	3WKCPZ05060	5x60	40	20	TX 25	200
	3WKCPZ05070	5x70	40	30	TX 25	200
	3WKCPZ05080	5x80	50	30	TX 25	200
	3WKCPZ05090	5x90	50	40	TX 25	200
	3WKCPZ05100	5x100	60	40	TX 25	200
	3WKCPZ05120	5x120	60	60	TX 25	200
HDC-P 6						
Ø 6	3WKCPZ06050	6x50	30	20	TX 30	100
	3WKCPZ06060	6x60	30	30	TX 30	100
	3WKCPZ06070	6x70	40	30	TX 30	100
	3WKCPZ06080	6x80	50	30	TX 30	100
	3WKCPZ06090	6x90	50	40	TX 30	100
	3WKCPZ06100	6x100	60	40	TX 30	100
	3WKCPZ06120	6x120	75	45	TX 30	100
	3WKCPZ06140	6x140	75	65	TX 30	100
	3WKCPZ06160	6x160	75	85	TX 30	100
	3WKCPZ06180	6x180	75	105	TX 30	100
	3WKCPZ06200	6x200	75	125	TX 30	100
	3WKCPZ06220	6x220	75	145	TX 30	100
	3WKCPZ06240	6x240	75	165	TX 30	100
	3WKCPZ06260	6x260	75	185	TX 30	100
	3WKCPZ06280	6x280	75	205	TX 30	100
	3WKCPZ06300	6x300	75	225	TX 30	100
HDC-P 8						
Ø 8	3WKCPZ08040	8x40	35	5	TX 40	50
	3WKCPZ08050	8x50	45	5	TX 40	50
	3WKCPZ08060	8x60	50	10	TX 40	50
	3WKCPZ08080	8x80	50	30	TX 40	50
	3WKCPZ08100	8x100	50	50	TX 40	50
	3WKCPZ08120	8x120	80	40	TX 40	50

HDC-P

TIMBER CONSTRUCTION SCREW PAN 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-P 8						
Ø 8	3WKCPZ08140	8x140	100	40	TX 40	25
	3WKCPZ08160	8x160	100	60	TX 40	25
	3WKCPZ08180	8x180	100	80	TX 40	50
	3WKCPZ08200	8x200	100	100	TX 40	50
	3WKCPZ08220	8x220	100	120	TX 40	50
	3WKCPZ08240	8x240	100	140	TX 40	50
	3WKCPZ08260	8x260	100	160	TX 40	50
	3WKCPZ08280	8x280	100	180	TX 40	50
	3WKCPZ08300	8x300	100	200	TX 40	50
	3WKCPZ08320	8x320	100	220	TX 40	50
	3WKCPZ08340	8x340	100	240	TX 40	50
	3WKCPZ08360	8x360	100	260	TX 40	50
	3WKCPZ08380	8x380	100	280	TX 40	50
	3WKCPZ08400	8x400	100	300	TX 40	50
	3WKCPZ08440	8x440	100	340	TX 40	50
	3WKCPZ08480	8x480	100	380	TX 40	50
	3WKCPZ08520	8x520	100	420	TX 40	50
	3WKCPZ08560	8x560	100	460	TX 40	50
	3WKCPZ08600	8x600	100	500	TX 40	50
HDC-P 10						
Ø 10	3WKCPZ10120	10x120	80	40	TX 40	25
	3WKCPZ10140	10x140	80	60	TX 40	25
	3WKCPZ10160	10x160	100	60	TX 40	25
	3WKCPZ10180	10x180	100	80	TX 40	25
	3WKCPZ10200	10x200	100	100	TX 40	25
	3WKCPZ10220	10x220	100	120	TX 40	25
	3WKCPZ10240	10x240	100	140	TX 40	25
	3WKCPZ10260	10x260	100	160	TX 40	25
	3WKCPZ10280	10x280	100	180	TX 40	25
	3WKCPZ10300	10x300	100	200	TX 40	25
	3WKCPZ10320	10x320	100	220	TX 40	25
	3WKCPZ10340	10x340	100	240	TX 40	25
	3WKCPZ10360	10x360	100	260	TX 40	25
	3WKCPZ10380	10x380	100	280	TX 40	25
	3WKCPZ10400	10x400	100	300	TX 40	25
	3WKCPZ10440	10x440	100	340	TX 40	25
	3WKCPZ10480	10x480	100	380	TX 40	25
	3WKCPZ10520	10x520	100	420	TX 40	25
	3WKCPZ10560	10x560	100	460	TX 40	25
	3WKCPZ10600	10x600	100	500	TX 40	25

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]
HDC-P ø5	5	3,15	3,50	12	40-120
HDC-P ø6	6	3,80	4,30	14	50-300
HDC-P ø8	8	5,50	5,78	21	40-600
HDC-P ø10	10	6,30	7,00	25	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]	$f_{tor,k}$ [N*m]
HDC-P ø5	6	12	15	15,9	15,9	9	6
HDC-P ø6	10	12	13	14,7	14,7	13	10
HDC-P ø8	25	12	13	12	12	25	27
HDC-P ø10	43	11	13	11	11	36	45

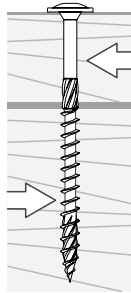
1. Characteristic withdrawal and head-pull-through resistance based on reference density of timber $\rho_a = 350 \text{ kg/m}^3$

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

WITHOUT PRE-DRILLED HOLE

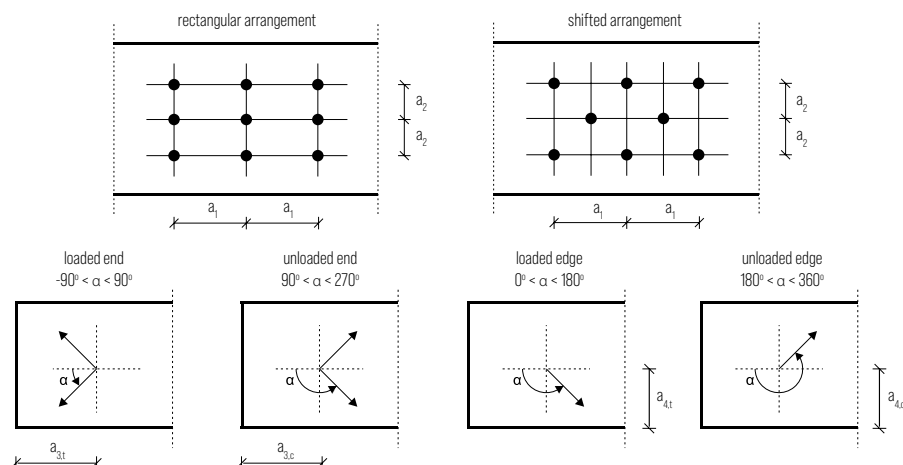
d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
a_1 [mm]	60	72	96	120	a_1 [mm]	25	30	40	50
a_2 [mm]	25	30	40	50	a_2 [mm]	25	30	40	50
$a_{3,t}$ [mm]	75	90	120	150	$a_{3,t}$ [mm]	50	60	80	100
$a_{3,c}$ [mm]	50	60	80	100	$a_{3,c}$ [mm]	50	60	80	100
$a_{4,t}$ [mm]	25	30	40	50	$a_{4,t}$ [mm]	50	60	80	100
$a_{4,c}$ [mm]	25	30	40	50	$a_{4,c}$ [mm]	25	30	40	50

d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10	d_w [mm]	Ø 5	Ø 6	Ø 8	Ø 10
d_0 [mm]	3	4	5	6	d_0 [mm]	3	4	5	6
a_1 [mm]	25	30	40	50	a_1 [mm]	20	24	32	40
a_2 [mm]	15	18	24	30	a_2 [mm]	20	24	32	40
$a_{3,t}$ [mm]	60	72	96	120	$a_{3,t}$ [mm]	35	42	56	70
$a_{3,c}$ [mm]	35	42	56	70	$a_{3,c}$ [mm]	35	42	56	70
$a_{4,t}$ [mm]	15	18	24	30	$a_{4,t}$ [mm]	35	42	56	70
$a_{4,c}$ [mm]	15	18	24	30	$a_{4,c}$ [mm]	15	18	24	30

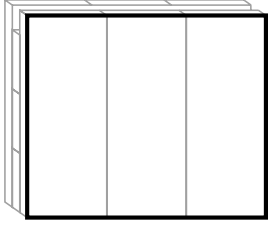
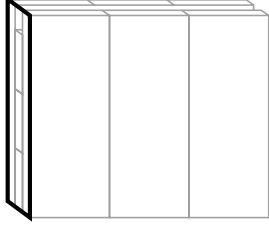
WITH PRE-DRILLED HOLE

WITH PRE-DRILLED HOLE

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



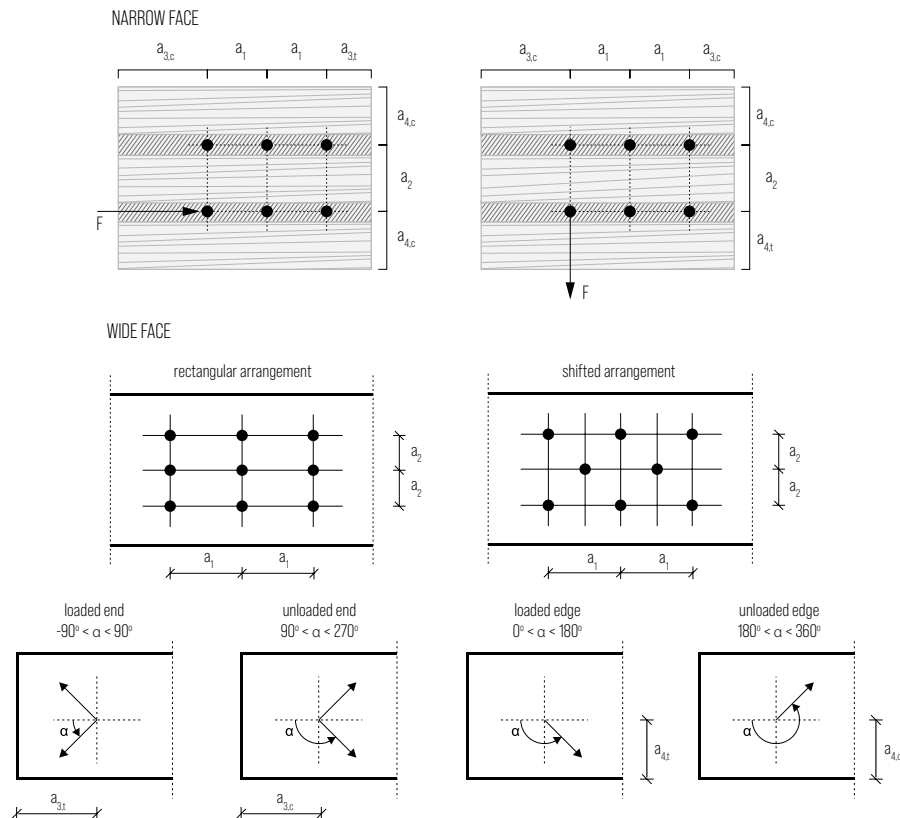
Minimum distances for laterally and/or axially loaded screws - CLT

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

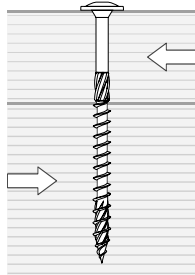
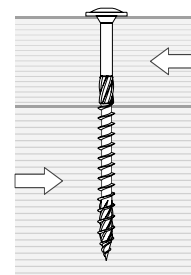
1. Minimum distances in accordance with ETA-18/0817

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

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

WITHOUT PRE-DRILLED HOLE

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

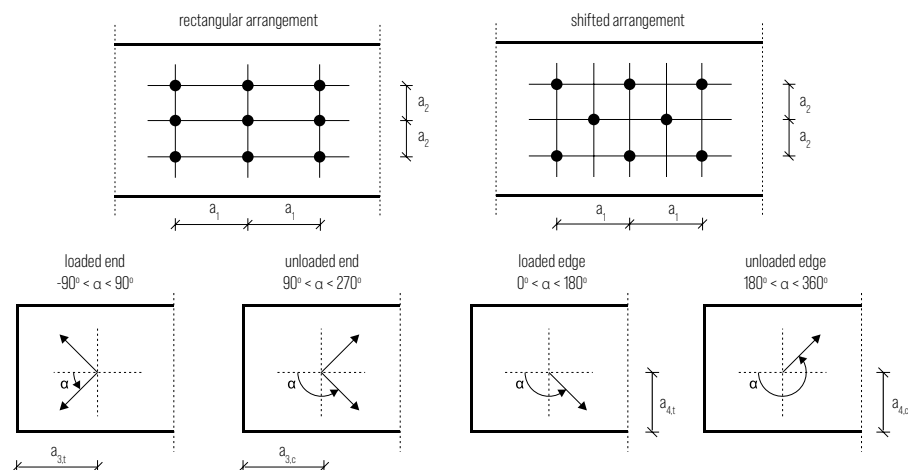
WITH PRE-DRILLED HOLE

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

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]	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

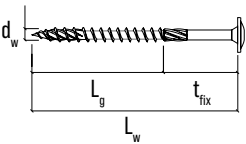
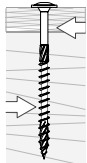
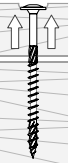
1. Minimum distances in accordance with EN 1995 and ETA-18/0817

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	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through			
												
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 _{ax,k} [kN]	R _{head,k} [kN]			
HDC-P 5												
ø5	40	22	18	1,07	t = 15 mm	1,20	t = 2,5mm	1,33	t = 5 mm	1,85	1,32	2,29
	50	30	20	1,35		1,30		1,64		2,13	1,80	2,29
	60	40	20	1,47		1,30		1,79		2,28	2,40	2,29
	70	40	30	1,70		1,30		1,79		2,28	2,40	2,29
	80	50	30	1,70		1,30		1,94		2,43	3,00	2,29
	90	50	40	1,76		1,30		1,94		2,43	3,00	2,29
	100	60	40	1,76		1,30		2,09		2,58	3,60	2,29
	120	60	60	1,76		1,30		2,09		2,58	3,60	2,29
HDC-P 6												
ø6	50	30	20	1,62	t = 15 mm	1,66	t = 3 mm	1,89	t = 6 mm	2,69	2,16	2,88
	60	30	30	1,79		1,66		2,17		2,85	2,16	2,88
	70	40	30	2,10		1,66		2,35		3,03	2,88	2,88
	80	50	30	2,10		1,66		2,53		3,21	3,60	2,88
	90	50	40	2,35		1,66		2,53		3,21	3,60	2,88
	100	60	40	2,35		1,66		2,71		3,39	4,32	2,88
	120	75	45	2,35		1,66		2,98		3,66	5,40	2,88
	140	75	65	2,35		1,66		2,98		3,66	5,40	2,88
	160	75	85	2,35		1,66		2,98		3,66	5,40	2,88
	180	75	105	2,35		1,66		2,98		3,66	5,40	2,88
	200	75	125	2,35		1,66		2,98		3,66	5,40	2,88
	220	75	145	2,35		1,66		2,98		3,66	5,40	2,88
	240	75	165	2,35		1,66		2,98		3,66	5,40	2,88
	260	75	185	2,35		1,66		2,98		3,66	5,40	2,88
	280	75	205	2,35		1,66		2,98		3,66	5,40	2,88
	300	75	225	2,35		1,66		2,98		3,66	5,40	2,88
HDC-P 8												
ø8	40	35	5	0,62	t = 18 mm	1,69	t = 4 mm	1,77	t = 8 mm	3,41	3,36	5,29
	50	45	5	0,62		2,24		2,26		3,95	4,32	5,29
	60	50	10	1,23		2,78		2,76		4,51	4,80	5,29
	80	50	30	3,25		2,92		3,74		5,23	4,80	5,29
	100	50	50	3,75		2,92		4,05		5,23	4,80	5,29
	120	80	40	3,65		2,92		4,77		5,95	7,68	5,29
	140	100	40	3,65		2,92		5,25		6,43	9,60	5,29
	160	100	60	4,18		2,92		5,25		6,43	9,60	5,29
	180	100	80	4,18		2,92		5,25		6,43	9,60	5,29
	200	100	100	4,18		2,92		5,25		6,43	9,60	5,29
	220	100	120	4,18		2,92		5,25		6,43	9,60	5,29
	240	100	140	4,18		2,92		5,25		6,43	9,60	5,29
	260	100	160	4,18		2,92		5,25		6,43	9,60	5,29
	280	100	180	4,18		2,92		5,25		6,43	9,60	5,29
	300	100	200	4,18		2,92		5,25		6,43	9,60	5,29
	320	100	220	4,18		2,92		5,25		6,43	9,60	5,29

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR				TENSION	
Diameter	Length	Thread length	Usable length	timber-timber	OSB-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through
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]	$R_{ax,k}$ [kN]	$R_{head,k}$ [kN]
HDC-P 8									
ø8	340	100	240	4,18	2,92	5,25	6,43	9,60	5,29
	360	100	260	4,18	2,92	5,25	6,43	9,60	5,29
	380	100	280	4,18	2,92	5,25	6,43	9,60	5,29
	400	100	300	4,18	2,92	5,25	6,43	9,60	5,29
	440	100	340	4,18	2,92	5,25	6,43	9,60	5,29
	480	100	380	4,18	2,92	5,25	6,43	9,60	5,29
	520	100	420	4,18	2,92	5,25	6,43	9,60	5,29
	560	100	460	4,18	2,92	5,25	6,43	9,60	5,29
	600	100	500	4,18	2,92	5,25	6,43	9,60	5,29
HDC-P 10									
ø10	120	80	40	4,74	3,89	6,24	7,92	8,80	6,88
	140	80	60	5,45	3,89	6,24	7,92	8,80	6,88
	160	100	60	5,45	3,89	6,79	8,47	11,00	6,88
	180	100	80	5,76	3,89	6,79	8,47	11,00	6,88
	200	100	100	5,76	3,89	6,79	8,47	11,00	6,88
	220	100	120	5,76	3,89	6,79	8,47	11,00	6,88
	240	100	140	5,76	3,89	6,79	8,47	11,00	6,88
	260	100	160	5,76	3,89	6,79	8,47	11,00	6,88
	280	100	180	5,76	3,89	6,79	8,47	11,00	6,88
	300	100	200	5,76	3,89	6,79	8,47	11,00	6,88
	320	100	220	5,76	3,89	6,79	8,47	11,00	6,88
	340	100	240	5,76	3,89	6,79	8,47	11,00	6,88
	360	100	260	5,76	3,89	6,79	8,47	11,00	6,88
	380	100	280	5,76	3,89	6,79	8,47	11,00	6,88
	400	100	300	5,76	3,89	6,79	8,47	11,00	6,88
	440	100	340	5,76	3,89	6,79	8,47	11,00	6,88
	480	100	380	5,76	3,89	6,79	8,47	11,00	6,88
	520	100	420	5,76	3,89	6,79	8,47	11,00	6,88
	560	100	460	5,76	3,89	6,79	8,47	11,00	6,88
	600	100	500	5,76	3,89	6,79	8,47	11,00	6,88

NOTES:

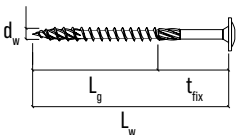
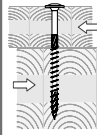
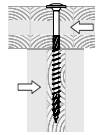
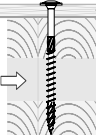
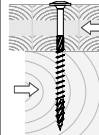
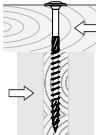
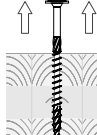
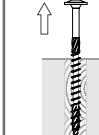
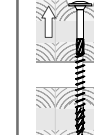
1. Characteristic resistances in accordance with EN 1995 and ETA-18/0817
2. In order to obtain a design resistance, use the following formula :

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

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	
												
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]	
HDC-P 6												
ø6	50	30	20	1,62	-	t = 15 mm	1,66	1,62	-	2,16	-	2,88
	60	30	30	1,79	-		1,66	1,79	-	2,16	-	2,88
	70	40	30	2,10	-		1,66	2,10	-	2,88	-	2,88
	80	50	30	2,10	-		1,66	2,10	-	3,60	-	2,88
	90	50	40	2,35	-		1,66	2,35	-	3,60	-	2,88
	100	60	40	2,35	-		1,66	2,35	-	4,32	-	2,88
	120	75	45	2,35	-		1,66	2,35	-	5,40	-	2,88
	140	75	65	2,35	-		1,66	2,35	-	5,40	-	2,88
	160	75	85	2,35	-		1,66	2,35	-	5,40	-	2,88
	180	75	105	2,35	-		1,66	2,35	-	5,40	-	2,88
	200	75	125	2,35	-		1,66	2,35	-	5,40	-	2,88
	220	75	145	2,35	-		1,66	2,35	-	5,40	-	2,88
	240	75	165	2,35	-		1,66	2,35	-	5,40	-	2,88
	260	75	185	2,35	-		1,66	2,35	-	5,40	-	2,88
280	75	205	2,35	-	1,66	2,35	-	5,40	-	2,88		
300	75	225	2,35	-	1,66	2,35	-	5,40	-	2,88		
HDC-P 8												
ø8	40	35	5	0,62	-	t = 18 mm	-	0,62	-	3,36	-	5,29
	50	45	5	0,62	-		2,24	0,62	-	4,32	-	5,29
	60	50	10	1,23	-		2,78	1,23	-	4,80	-	5,29
	80	50	30	3,25	-		2,92	3,25	-	4,80	-	5,29
	100	50	50	3,75	-		2,92	3,75	-	4,80	-	5,29
	120	80	40	3,65	3,25		2,92	3,65	3,25	7,68	5,45	5,29
	140	100	40	3,65	3,27		2,92	3,65	3,27	9,60	6,66	5,29
	160	100	60	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	180	100	80	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	200	100	100	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	220	100	120	3,25	-		2,92	4,18	3,59	9,60	6,66	5,29
	240	100	140	3,75	-		2,92	4,18	3,59	9,60	6,66	5,29
	260	100	160	3,65	3,25		2,92	4,18	3,59	9,60	6,66	5,29
	280	100	180	3,65	3,27		2,92	4,18	3,59	9,60	6,66	5,29
	300	100	200	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	320	100	220	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	340	100	240	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29

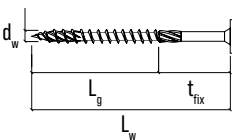
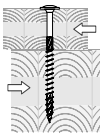
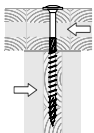
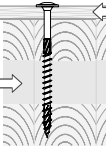
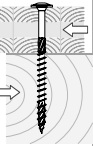
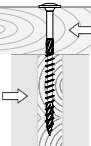
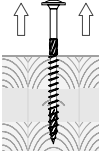
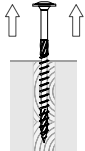
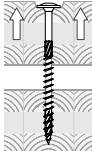
HDC-P

TIMBER CONSTRUCTION SCREW PAN HEAD



CLT

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	
												
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]	
HDC-P 8												
ø8	360	100	260	4,18	3,59	t = 18 mm	2,92	4,18	3,59	9,60	6,66	5,29
	380	100	280	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	400	100	300	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	440	100	340	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	480	100	380	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	520	100	420	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	560	100	460	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
	600	100	500	4,18	3,59		2,92	4,18	3,59	9,60	6,66	5,29
HDC-P 10												
ø10	120	80	40	4,74	-	t = 22 mm	3,89	4,74	-	8,80	-	6,88
	140	80	60	5,45	-		3,89	5,45	-	8,80	-	6,88
	160	100	60	5,45	4,69		3,89	5,45	4,69	11,00	7,96	6,88
	180	100	80	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	200	100	100	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	220	100	120	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	240	100	140	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	260	100	160	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	280	100	180	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	300	100	200	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	320	100	220	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	340	100	240	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	360	100	260	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	380	100	280	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	400	100	300	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	440	100	340	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	480	100	380	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	520	100	420	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	560	100	460	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88
	600	100	500	5,76	4,69		3,89	5,76	4,69	11,00	7,96	6,88

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 19953. 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 3007. 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 $L_{ef} = 10d_w$

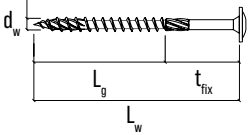
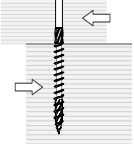
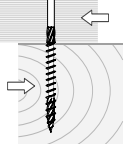
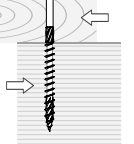
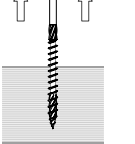
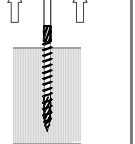
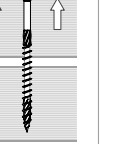
9. Characteristic head pull-through resistances were calculated for CLT

HDC-P

TIMBER CONSTRUCTION SCREW PAN HEAD

LVL

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
									
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]
HDC-P 5									
ø5	40	22	18	-	-	-	1,65	1,10	2,29
	50	30	20	-	-	-	2,25	1,50	2,29
	60	40	20	-	-	-	3,00	2,00	2,29
	70	40	30	1,96	1,85	1,76	3,00	2,00	2,29
	80	50	30	1,96	1,85	1,76	3,75	2,50	2,29
	90	50	40	1,96	1,85	1,85	3,75	2,50	2,29
	100	60	40	1,96	1,85	1,85	4,50	3,00	2,29
	120	60	60	1,96	1,85	1,85	4,50	3,00	2,29
HDC-P 6									
ø6	50	30	20	-	-	-	2,34	1,56	2,88
	60	30	30	2,30	2,00	2,04	2,34	1,56	2,88
	70	40	30	2,50	2,39	2,18	3,12	2,08	2,88
	80	50	30	2,50	2,39	2,18	3,90	2,60	2,88
	90	50	40	2,63	2,47	2,47	3,90	2,60	2,88
	100	60	40	2,63	2,47	2,47	4,68	3,12	2,88
	120	75	45	2,63	2,47	2,47	5,85	3,90	2,88
	140	75	65	2,63	2,47	2,47	5,85	3,90	2,88
	160	75	85	2,63	2,47	2,47	5,85	3,90	2,88
	180	75	105	2,63	2,47	2,47	5,85	3,90	2,88
	200	75	125	2,63	2,47	2,47	5,85	3,90	2,88
	220	75	145	2,63	2,47	2,47	5,85	3,90	2,88
	240	75	165	2,63	2,47	2,47	5,85	3,90	2,88
	260	75	185	2,63	2,47	2,47	5,85	3,90	2,88
	280	75	205	2,63	2,47	2,47	5,85	3,90	2,88
	300	75	225	2,63	2,47	2,47	5,85	3,90	2,88
HDC-P 8									
ø8	40	35	5	-	-	-	3,64	2,43	5,29
	50	45	5	-	-	-	4,68	3,12	5,29
	60	50	10	-	-	-	5,20	3,47	5,29
	80	50	30	3,86	3,58	3,48	5,20	3,47	5,29
	100	50	50	4,64	3,99	4,09	5,20	3,47	5,29
	120	80	40	4,30	4,12	3,78	8,32	5,55	5,29
	140	100	40	4,30	4,12	3,78	10,40	6,93	5,29
	160	100	60	4,66	4,39	4,39	10,40	6,93	5,29
	180	100	80	4,66	4,39	4,39	10,40	6,93	5,29
	200	100	100	4,66	4,39	4,39	10,40	6,93	5,29
	220	100	120	4,66	4,39	4,39	10,40	6,93	5,29
	240	100	140	4,66	4,39	4,39	10,40	6,93	5,29
	260	100	160	4,66	4,39	4,39	10,40	6,93	5,29
	280	100	180	4,66	4,39	4,39	10,40	6,93	5,29
	300	100	200	4,66	4,39	4,39	10,40	6,93	5,29
	320	100	220	4,66	4,39	4,39	10,40	6,93	5,29

HDC-P

TIMBER CONSTRUCTION SCREW PAN HEAD



LVL

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
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]
HDC-P 8									
ø8	340	100	240	4,66	4,39	4,39	10,40	6,93	5,29
	360	100	260	4,66	4,39	4,39	10,40	6,93	5,29
	380	100	280	4,66	4,39	4,39	10,40	6,93	5,29
	400	100	300	4,66	4,39	4,39	10,40	6,93	5,29
	440	100	340	4,66	4,39	4,39	10,40	6,93	5,29
	480	100	380	4,66	4,39	4,39	10,40	6,93	5,29
	520	100	420	4,66	4,39	4,39	10,40	6,93	5,29
	560	100	460	4,66	4,39	4,39	10,40	6,93	5,29
	600	100	500	4,66	4,39	4,39	10,40	6,93	5,29
HDC-P 10									
ø10	120	80	40	5,51	5,27	4,92	10,40	6,93	6,88
	140	80	60	6,46	6,07	5,65	10,40	6,93	6,88
	160	100	60	6,46	6,07	5,65	13,00	8,67	6,88
	180	100	80	6,46	6,07	6,07	13,00	8,67	6,88
	200	100	100	6,46	6,07	6,07	13,00	8,67	6,88
	220	100	120	6,46	6,07	6,07	13,00	8,67	6,88
	240	100	140	6,46	6,07	6,07	13,00	8,67	6,88
	260	100	160	6,46	6,07	6,07	13,00	8,67	6,88
	280	100	180	6,46	6,07	6,07	13,00	8,67	6,88
	300	100	200	6,46	6,07	6,07	13,00	8,67	6,88
	320	100	220	6,46	6,07	6,07	13,00	8,67	6,88
	340	100	240	6,46	6,07	6,07	13,00	8,67	6,88
	360	100	260	6,46	6,07	6,07	13,00	8,67	6,88
	380	100	280	6,46	6,07	6,07	13,00	8,67	6,88
	400	100	300	6,46	6,07	6,07	13,00	8,67	6,88
	440	100	340	6,46	6,07	6,07	13,00	8,67	6,88
	480	100	380	6,46	6,07	6,07	13,00	8,67	6,88
	520	100	420	6,46	6,07	6,07	13,00	8,67	6,88
	560	100	460	6,46	6,07	6,07	13,00	8,67	6,88
	600	100	500	6,46	6,07	6,07	13,00	8,67	6,88

NOTES:

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

- Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$ and LVL $\rho_k = 480 \text{ kg/m}^3$
- Characteristic resistances were calculated considering that the threaded part of the screw is fully inserted into timber element
- Characteristic shear resistances were calculated for connections without pre-drilled holes
- Characteristic withdrawal resistances were calculated assuming an angle of 90° between screw and grain direction and for penetration length equal L_g
- Characteristic head pull-through resistances were calculated for LVL



HDC-P
TIMBER CONSTRUCTION SCREW PAN HEAD

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