

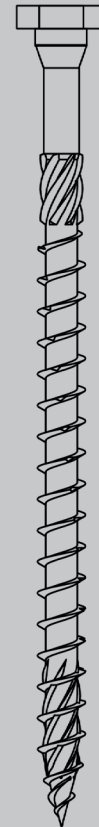
HDC-H HEXAGONAL HEAD ZINC CLEAR / STEEL

CERTIFICATION

TDS

ZP

Technical Data Sheet



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HDC-H

TIMBER CONSTRUCTION SCREW HEXAGONAL HEAD

Timber Construction Screw Hexagonal Head

Hexagonal 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



Hexagonal Head - Hex head improves pull-through resistance of joint and allows steel-wood applications.

Underhead Reinforcement - Wider screw diameter under the head improves shear strength of the screw.



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.

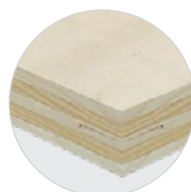


Wax Coating - Wax coating applied during the production process significantly reduces the torque.

SUBSTRATES



Solid Timbers



Glued Laminated Timbers
CLT, KVH, BSH / GLT

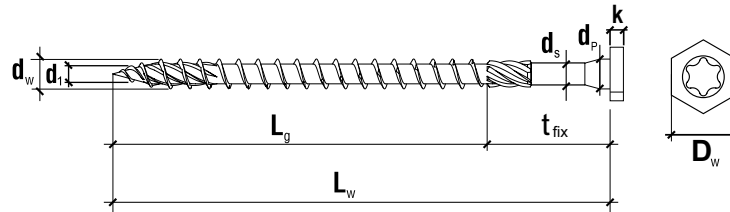


Laminated Veneer Lumber
LVL

HDC-H

TIMBER CONSTRUCTION SCREW HEXAGONAL HEAD

PRODUCT LIST



Codes and dimensions

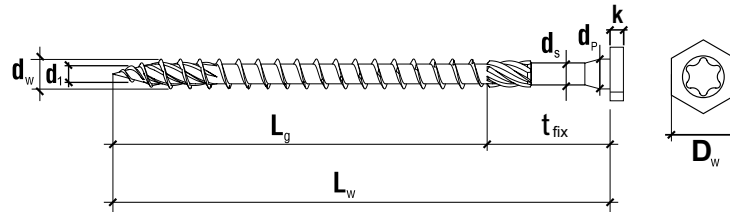
	Product code	Dimensions	Thread Length	Max. Fixture Length	Type of Drive	Quantity
	Zinc - white	$d_w \times L_w$ [mm]	L_g [mm]	t_{fix} [mm]	[-]	[pcs]
HDC-H 6						
Ø 6	3WKCHZ06050	6x50	30	20	TX 30	100
	3WKCHZ06060	6x60	30	30	TX 30	100
	3WKCHZ06070	6x70	40	30	TX 30	100
	3WKCHZ06080	6x80	50	30	TX 30	100
	3WKCHZ06100	6x100	60	40	TX 30	100
HDC-H 8						
Ø 8	3WKCHZ08040	8x40	35	5	TX 40	50
	3WKCHZ08050	8x50	45	5	TX 40	50
	3WKCHZ08060	8x60	50	10	TX 40	50
	3WKCHZ08070	8x70	50	20	TX 40	50
	3WKCHZ08080	8x80	50	30	TX 40	50
	3WKCHZ08100	8x100	50	50	TX 40	50
	3WKCHZ08120	8x120	80	40	TX 40	50
	3WKCHZ08140	8x140	100	40	TX 40	50
	3WKCHZ08160	8x160	100	60	TX 40	50
	3WKCHZ08180	8x180	100	80	TX 40	50
	3WKCHZ08200	8x200	100	100	TX 40	50
	3WKCHZ08220	8x220	100	120	TX 40	50
	3WKCHZ08240	8x240	100	140	TX 40	50
	3WKCHZ08260	8x260	100	160	TX 40	50
	3WKCHZ08280	8x280	100	180	TX 40	50
	3WKCHZ08300	8x300	100	200	TX 40	50

HDC-H

TIMBER CONSTRUCTION SCREW HEXAGONAL HEAD

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-H 10						
Ø 10	3WKCHZ10060	10x60	50	10	TX 40	50
	3WKCHZ10070	10x70	50	20	TX 40	50
	3WKCHZ10080	10x80	50	30	TX 40	50
	3WKCHZ10100	10x100	50	50	TX 40	50
	3WKCHZ10120	10x120	80	40	TX 40	25
	3WKCHZ10140	10x140	80	60	TX 40	25
	3WKCHZ10160	10x160	100	60	TX 40	25
	3WKCHZ10180	10x180	100	80	TX 40	25
	3WKCHZ10200	10x200	100	100	TX 40	25
	3WKCHZ10220	10x220	100	120	TX 40	25
	3WKCHZ10240	10x240	100	140	TX 40	25
	3WKCHZ10260	10x260	100	160	TX 40	25
	3WKCHZ10280	10x280	100	180	TX 40	25
	3WKCHZ10300	10x300	100	200	TX 40	25
	3WKCHZ10320	10x320	100	220	TX 40	25
	3WKCHZ10340	10x340	100	240	TX 40	25
	3WKCHZ10360	10x360	100	260	TX 40	25
	3WKCHZ10380	10x380	100	280	TX 40	25
	3WKCHZ10400	10x400	100	300	TX 40	25

MECHANICAL CHARACTERISTICS



Geometry

Product	Outer thread diameter	Inner thread diameter	Unthreaded part diameter	Underhead diameter	Head diameter	Head thickness	Length range
	d_w [mm]	d_i [mm]	d_s [mm]	d_p [mm]	D_w [mm]	k [mm]	L_w [mm]
WKCH $\varnothing 6$	6	3,80	4,30	5,80	10,00	4,00	50-100
WKCH $\varnothing 8$	8	5,50	5,78	7,80	13,00	5,50	40-300
WKCH $\varnothing 10$	10	6,30	7,00	9,80	15,00	6,15	60-400

Mechanical characteristics

Product	Characteristic yield moment	Characteristic withdrawal resistance parameter	Characteristic head-pull-through resistance parameter	Characteristic tensile strength	Characteristic torsional strength
	$M_{y,k}$ [N*m]	$f_{ax,k}$ [N/mm ²]	$f_{head,k}$ [N/mm ²]	$f_{tens,k}$ [kN]	$f_{tor,k}$ [N*m]
WKCH $\varnothing 6$	10,0	12	17,4	13,0	10,0
WKCH $\varnothing 8$	25	12	15,3	25,0	27,0
WKCH $\varnothing 10$	43	11	14,2	36,0	45,0

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

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]	$\varnothing 6$	$\varnothing 8$	$\varnothing 10$	d_w [mm]	$\varnothing 6$	$\varnothing 8$	$\varnothing 10$
a_1 [mm]	50	67	84	a_1 [mm]	21	28	35
a_2 [mm]	21	28	35	a_2 [mm]	21	28	35
$a_{3,t}$ [mm]	90	120	150	$a_{3,t}$ [mm]	60	80	100
$a_{3,c}$ [mm]	60	80	100	$a_{3,c}$ [mm]	60	80	100
$a_{4,t}$ [mm]	30	40	50	$a_{4,t}$ [mm]	60	80	100
$a_{4,c}$ [mm]	30	40	50	$a_{4,c}$ [mm]	30	40	50
WITH PRE-DRILLED HOLE				WITH PRE-DRILLED HOLE			
d_w [mm]	$\varnothing 6$	$\varnothing 8$	$\varnothing 10$	d_w [mm]	$\varnothing 6$	$\varnothing 8$	$\varnothing 10$
d_0 [mm]	4	5	6	d_0 [mm]	4	5	6
$d_{0,steel}$ [mm]	7	9	11	$d_{0,steel}$ [mm]	7	9	11
a_1 [mm]	21	28	35	a_1 [mm]	17	22	28
a_2 [mm]	13	17	21	a_2 [mm]	17	22	28
$a_{3,t}$ [mm]	72	96	120	$a_{3,t}$ [mm]	42	56	70
$a_{3,c}$ [mm]	42	56	70	$a_{3,c}$ [mm]	42	56	70
$a_{4,t}$ [mm]	18	24	30	$a_{4,t}$ [mm]	42	56	70
$a_{4,c}$ [mm]	18	24	30	$a_{4,c}$ [mm]	18	24	30

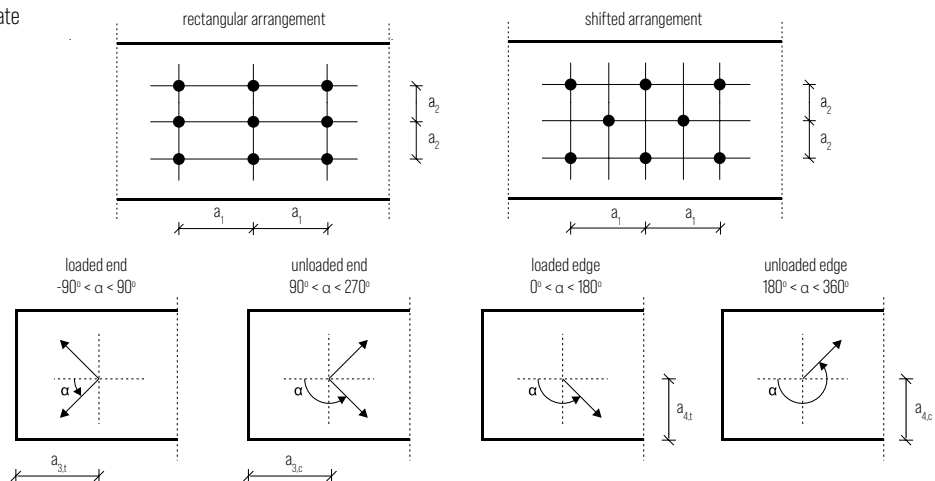
1. Minimum distances in accordance with EN 1995 and ETA-18/0817

2. Minimum distances is valid for timber characteristic density of $\rho_k \leq 420 \text{ kg/m}^3$

3. In case of connection timber-timber minimum distances $\{a_1, a_2\}$ should be multiplied by a factor of 1,45

4. Hole diameter d_0 is valid for softwood

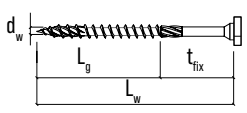

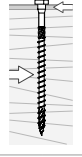



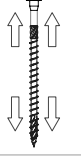
5. Hole diameter $d_{0,steel}$ is valid for steel plate



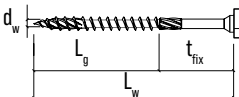


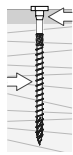


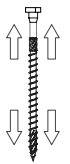
CHARACTERISTIC RESISTANCES

TIMBER

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR			TENSION				
Diameter	Length	Thread length	Usable length	timber-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Tension		
											
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 _{head,k} [kN]	R _{tens,k} [kN]		
WKCH 6											
ø6	50	30	20	1,51	t = 3 mm	1,89	t = 6 mm	2,69	2,16	1,74	13,00
	60	30	30	1,68		2,17		2,85	2,16	1,74	13,00
	70	40	30	1,82		2,35		3,03	2,88	1,74	13,00
	80	50	30	1,82		2,53		3,21	3,60	1,74	13,00
	100	60	40	2,07		2,71		3,39	4,32	1,74	13,00
WKCH 8											
ø8	40	35	5	0,62	t = 4 mm	1,77	t = 8 mm	3,41	3,36	2,58	25,00
	50	45	5	0,62		2,26		3,95	4,32	2,58	25,00
	60	50	10	1,23		2,76		4,51	4,80	2,58	25,00
	70	50	20	2,46		3,25		4,92	4,80	2,58	25,00
	80	50	30	2,70		3,74		5,23	4,80	2,58	25,00
	100	50	50	3,19		4,05		5,23	4,80	2,58	25,00
	120	80	40	2,97		4,77		5,95	7,68	2,58	25,00
	140	100	40	2,97		5,25		6,43	9,60	2,58	25,00
	160	100	60	3,50		5,25		6,43	9,60	2,58	25,00
	180	100	80	3,50		5,25		6,43	9,60	2,58	25,00
	200	100	100	3,50		5,25		6,43	9,60	2,58	25,00
	220	100	120	3,50		5,25		6,43	9,60	2,58	25,00
	240	100	140	3,50		5,25		6,43	9,60	2,58	25,00
	260	100	160	3,50		5,25		6,43	9,60	2,58	25,00
	280	100	180	3,50		5,25		6,43	9,60	2,58	25,00
	300	100	200	3,50		5,25		6,43	9,60	2,58	25,00

Characteristic resistances for laterally and axially loaded screws - timber

DIMENSIONS				SHEAR			TENSION				
Diameter	Length	Thread length	Usable length	timber-timber	steel-timber (thin plate)	steel-timber (thick plate)	Withdrawal	Head pull-through	Tension		
											
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 _{head,k} [kN]	R _{tens,k} [kN]		
WKCH 10											
ø10	60	50	10	1,44	t = 5 mm	3,16	t = 10 mm	5,51	5,50	3,20	36,00
	70	50	20	2,88		3,74		5,92	5,50	3,20	36,00
	80	50	30	3,31		4,32		6,39	5,50	3,20	36,00
	100	50	50	3,78		5,42		7,10	5,50	3,20	36,00
	120	80	40	3,82		6,24		7,92	8,80	3,20	36,00
	140	80	60	4,53		6,24		7,92	8,80	3,20	36,00
	160	100	60	4,53		6,79		8,47	11,00	3,20	36,00
	180	100	80	4,84		6,79		8,47	11,00	3,20	36,00
	200	100	100	4,84		6,79		8,47	11,00	3,20	36,00
	220	100	120	4,84		6,79		8,47	11,00	3,20	36,00
	240	100	140	4,84		6,79		8,47	11,00	3,20	36,00
	260	100	160	4,84		6,79		8,47	11,00	3,20	36,00
	280	100	180	4,84		6,79		8,47	11,00	3,20	36,00
	300	100	200	4,84		6,79		8,47	11,00	3,20	36,00
	320	100	220	4,84		6,79		8,47	11,00	3,20	36,00
	340	100	240	4,84		6,79		8,47	11,00	3,20	36,00
	360	100	260	4,84		6,79		8,47	11,00	3,20	36,00
	380	100	280	4,84		6,79		8,47	11,00	3,20	36,00
	400	100	300	4,84		6,79		8,47	11,00	3,20	36,00

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. Design resistance for tension is smaller value of the following :

$$R_{ax,d} = \min \left\{ \begin{array}{l} \frac{R_{ax,k} * k_{mod}}{\gamma_M} \\ \frac{R_{tens,k}}{\gamma_{M2}} \end{array} \right.$$

Factors γ_M and k_{mod} should be taken in accordance with EN 1995. Factor γ_{M2} should be taken in accordance with EN 19934. Characteristic resistances were calculated for a characteristic density of timber $\rho_k = 350 \text{ kg/m}^3$

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

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

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



HDC-H

TIMBER CONSTRUCTION SCREW HEXAGONAL HEAD

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Important Note: Whilst all reasonable care is taken in compiling technical data on the Company's products, all information, recommendations, or suggestions regarding the use of such products are made without guarantee, since the conditions of use are beyond the control of the Company. It is the customer's responsibility to satisfy himself that each product is fit for the purpose for which he intends to use it, that the actual conditions of use are suitable, and that in the light of our continual research and development programme the information relating to each product has not been superseded. Allfasteners, its agencies and employees, disclaim any and all liability in respect of anything or the consequences of anything done or omitted to be done in reliance upon the whole or any part of this document.

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