Product advice Heco Topix wood construction screws

Heco Topix professional wood construction screws have been designed specifically for use in softwood and hardwood without pre-drilling. They are available in both Carbon Steel and Stainless Steel to maximise suitability across a broad range of applications.

There are however some instances where it is advisable to either pre-drill or use Stainless Steel instead of carbon steel fixings.

This is because of the natural variations that occur in hardwoods dependent on species, age, humidity. In addition application loads and uniformity of joint can vary considerably.

As a result of all these variables, it is important that careful consideration is given to each application prior to selecting a particular product for a particular job. If in doubt, seek advice from a competent source.

We would also recommend that spot tests in similar material are carried out prior to full installation.

Due to the high levels of naturally occurring acids within certain timbers it is advisable to use stainless steel fixings in the following materials:

Unprocessed European Oak
Western Red Cedar
Sweet Chestnut
Douglas Fir

The above list is by no means exhaustive and is provided as guidance only.

July 2008

APTUS
FASTENER SYSTEMS
innovations in fastenings and fixings

Aptus Fastener Systems Ltd
Salterwood Drive
Denby Hall Business Park
Denby, Derbyshire
DE5 8JY
UK
t : +44 (0) 1773 740 410
f : +44 (0) 1773 740 417

HECO SCHRAUBEN

HECO-Schrauben GmbH & Co. KG
Dr.-Kurt-Steim-Straße 28 · D-78713 Schramberg
Tel.: +49 (0)74 22 / 9 89-0 · Fax: +49 (0)74 22 / 9 89-200
Mail: info@heco-schrauben.de · www.heco-schrauben.de

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General

This publication is intended to provide assistance in selecting the right screw for the job and to provide useful information on the permissible tensile and lateral/shear load bearing capacities of HECO-TOPIX screws and HECO-FIX-plus universal screws. All specified loads are based on the approval Z-9.1-453, Section 3.2.

If not otherwise specified in the following, the Standard DIN 1052-1 to 3:1998-04 shall apply to the dimensioning of wood constructions using HECO-FIX-plus universal screws and HECO-TOPIX screws. Wherever applicable, compliance with the general building regulation approvals shall be required for wood components.

Screw-in depths $s_g < 4^* d_1$ (d_1 = outer diameter of thread) should not be included in the calculation.

Load-bearing joints with HECO-FIX-plus universal screws and HECO-TOPIX screws must have at least 4 shear planes.

In accordance with the approval Z-9.1-453, the screws may be used for connecting and joining the following wood material boards:

- Plywood in accordance with DIN EN 13 986 (DIN EN 636) and DIN V 20 000-1 or conforming to the general building regulation approval
- Resin-bonded chipboards in accordance with DIN EN 13 986 (DIN EN 312) and DIN V 20 000-1 or conforming to the general building regulation approval
- OSB boards (Oriented Strand Board) of type OSB/3 and OSB/4 in accordance with DIN EN 13 986 (DIN EN 300) and DIN V 20 000-1 or OSB boards conforming to the general building regulation approval
- Fibre boards in accordance with DIN EN 13 986 (DIN EN 622-2 and 622-3) and DIN V 20 000-1 or conforming to the general building regulation approval, minimum bulk density 650 kg/m^3
- Cement-bonded chipboards conforming to the general building regulation approval

The wood material boards must be at least $1.2 * d_1$ thick (d_1 = outer diameter of thread).

In addition, the board thickness must be at least 6 mm for plywood and fibre boards and 8 mm for resin-bonded chipboards, OSB boards and cement-bonded chipboards.

Pull-out load (tension loading)

The permissible tension loading in load case H with screws screwed in at an angle between $45° \leq \alpha \leq 90°$ (α = angle between screw axis and direction of wood grain) under temporary or continuous pull-out load may be calculated at

$$\text{permissible } N_z = 5.0 * s_g * d_1 \text{ (in N)} \qquad (1)$$

Where d_1 is the outer diameter of the screw and s_g the screw-in depth.

Screw-in depths > the thread lengths in accordance with Annexes 1 – 28 of the approval as well as $< 4 * d_1$ are not permitted.

With respect to pulling through the head, the maximum permissible screw load may be

$$\text{permissible } N_z = 5.0 * d_k^2 \text{ (in N)} \quad (2)$$

and for connecting wood components with thicknesses from > 12 to < 20 mm maximum

$$\text{permissible } N_z = 4.0 * d_k^2 \quad (3)$$

Where d_k = screw head diameter or outer diameter of washer. Washer diameters > 35 mm may be included in the calculation.

When joining wood material boards at board thicknesses < 12 mm a maximum of 200 N may be included in the calculation.

The head pull-through data (equations 2 and 3) are not definitive for steel sheet – wood joints.

Please refer to the following tables for detailed load data.

Load at right angles with respect to screw axis (lateral/shear load)

The permissible screw load in load case H, with load at right angles with respect to the screw axis, may be included in the calculation with

$$\text{permissible } N = 4.0 * a_1 * d_1 < 17 * d_1^2 \text{ (in N)} \quad (4)$$

and for screwing down steel parts onto wood with

$$\text{permissible } N = 1.25 * 17 * d_1^2 \text{ (in N)} \quad (5)$$

Where d_1 is the outer diameter of the thread and a1 the thickness of the wood or wood material to be joined.

If the screw-in depth s is not at least $8.0 * d_1$, the permissible load is to be reduced in the ratio of the screw-in depth s to the target depth $8.0 * d_1$

Please refer to the following tables for detailed load data.

Combined load

The following interaction equation is used for combined loads:

$$\left(\frac{N_z}{\text{zul } N_z}\right)^2 + \left(\frac{N}{\text{zul } N}\right)^2 \leq 1$$

We hope that this manual offers helpful guidance in the use of our products.
If you have any comments or queries please contact our local partners or directly to ourselves, here in Schramberg.

Schramberg, August 2006

Andreas Hettich

Head of PM/Technical Service

General details

Admissible screw-load at loading case H screwed in at an angle of 45° ≤ α ≤ 90° *)
according to DIN 1052-1 to -3:1988-04 corresponding to approval Z-9.1-453

head-type		countersunk, raised countersunk and pan-head							flangehead		hex-head
diameter d_1	[mm]	3,5	4	4,5	5	6	8	10	8	10	10
min. s_g 1)	[mm]	14	16	18	20	24	32	40	32	40	40
theor. max. s_g 2)	[mm]	46	54	60	60	60	100	100	100	100	100
max. tension load Nz without considering the pull through of the head ($N_Z = 5 * d_1 * s_g$)											
max. N_Z	[N]	805	1080	1350	1500	1800	4000	5000	4000	5000	5000
max. tension load Nz taking into account the pull through of the head ($N_Z = 5 * dk^2$)											
max. charge before pull through of the head 3)	[N]	245	320	405	470	696	1095	1711	1531	2531	1125
head-diameter d_k	[mm]	7	8	9	9,7	11,8	14,8	18,5	17,5	22,5	15
required embedment s_g 1)	[mm]	14	16	18	20	24	32	40	32	40	40
max. tension load N_Z with HECO-Washers or washer according to DIN 4)											
max. charge before pull through of the head with washer	[N]	405	405	500	500	2000	3125	4500	3920	5000	5000
washer-diameter d_a 4)	[mm]	9	9	10	10	20	25	30	28	34	34
required embedment s_g	[mm]	23	20	22	20	67	78	90	98	100	100

*) α = angle between screw-axis and direction of wood fibre

1) embedments < 4 * d_1 are not admissible

2) max. s_g = 12 * d_1 and LV \ LT corresponding to approval Z-9.1-453, annex 1 - 28 respectively

3) for mounted parts with fixture thickness of min. 12 to incl. 20 mm maximum 4 * d_k^2 (in N)

4) for $d_1 \leq 5$ washers according to DIN 125, for $d_1 > 5$ HECO-Washers, for flange- and hexagon-head washers according to DIN 440

Edge distances and spacing

Conditions of use		not predrilled [1]	
Spacing	II	$10 * d_1$ $12 * d_1$ [2]	centre distance parallel to the grain
	⊥	$5 * d_1$	centre distance across the grain
Edge distance to the stressed edge	II	$15 * d_1$	edge distance parallel to the grain
	⊥	$7 * d_1$ $10 * d_1$ [2]	edge distance across the grain
Edge distance to the non-stressed edge	II	$7 * d_1$ $10 * d_1$ [2]	edge distance parallel to the grain
	⊥	$5 * d_1$	edge distance across the grain

1) Contrary to DIN 1052, pre-drilling is essential with all screw diameters when using Douglas Fir

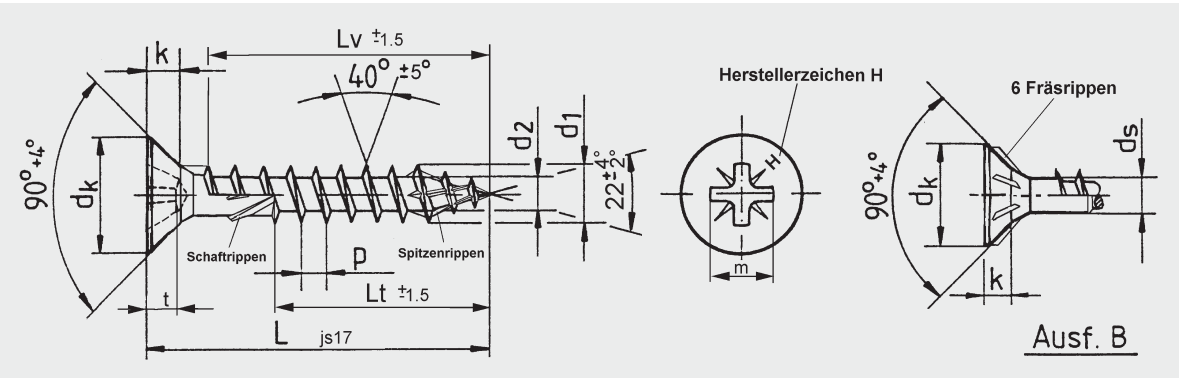
2) when $d_1 > 4,2$

d_1 = screw diameter

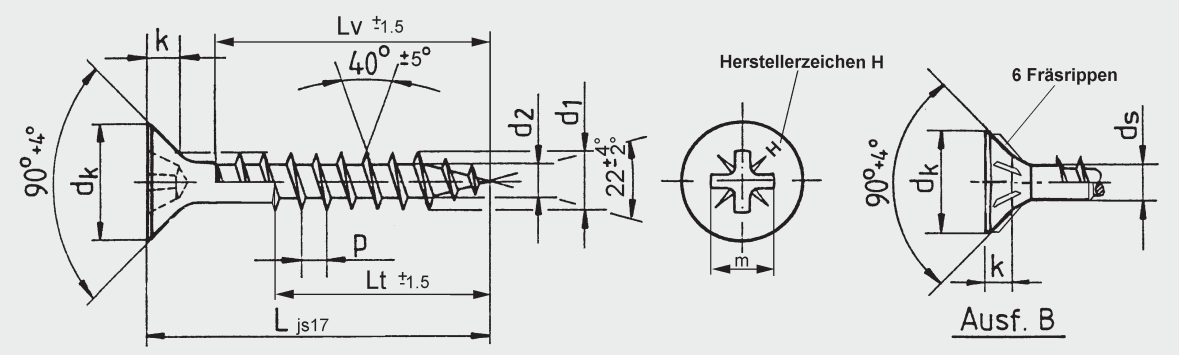
II edge distance / centre distance parallal to the grain

⊥ edge distance / centre distance across the grain

HECO-TOPIX®



HECO-FIX-plus®



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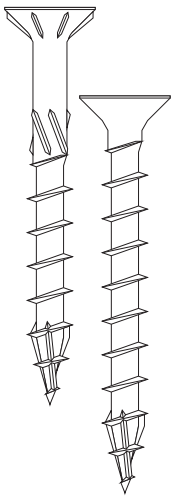
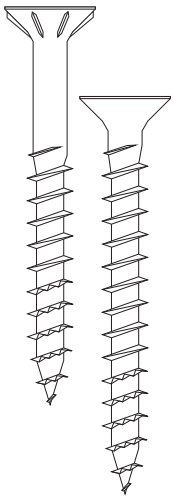
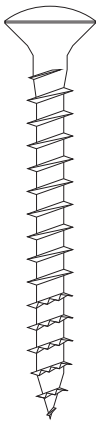
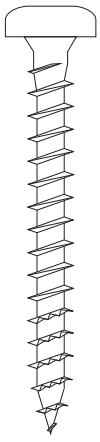
Admissible screw-load according to DIN 1052-1 to -3:1988-04 for HECO screws corresponding to approval Z-9.1-453.









HECO-TOPIX Wood-Construction screws
Ø 3,5 mm / countersunk, raised countersunk and pan-head

tension loads N_Z for screws, screwed in at an angle of 45° ≤ α ≤ 90° [1] depending on embedment depth s_g

s_g	max. N_Z		
	wood - wood	wood - wood with washer DIN 125	sheet steel - wood
14	245	245	245
16	245	280	280
18	245	315	315
20	245	350	350
22	245	385	385
25	245	405	437
30	245	405	525
35	245	405	612
40	245	405	700
46	245	405	805

transmittable shear-load V of wood conections depending on embedment depth sg and thickness of the mounted part a1

d_1 = 3,5 mm

V_{max} = 208 N (= 17 * d_1^2)

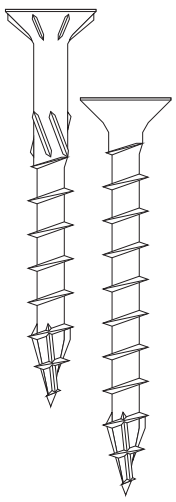
mounted part thickness a_1 (min - max)	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	14	**17,5**	**21**	**24,5**	**28**
8	56	70	84	98	112
10	70	88	105	123	140
12	84	105	126	147	168
14	98	123	147	172	196
16	112	140	168	196	208
18	126	158	189	208	208
19	133	166	200	208	208
20	140	175	208	208	208
22	154	193	208	208	208
24	168	208	208	208	208
26	182	208	208	208	208
28	196	208	208	208	208
30	208	208	208	208	208
36	208	208	208	208	208

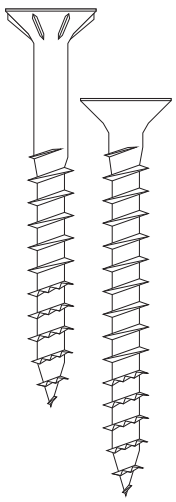
transmittable shear-load V when mounting steel-parts to wood

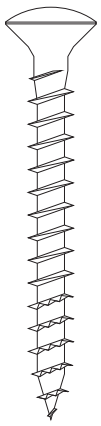
screw-diameter d_1	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	14	**17,5**	**21**	**24,5**	**28**
3,5 mm	130	163	195	228	260

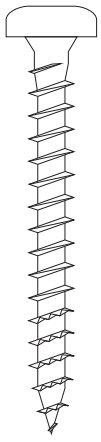
1) α = angle between screw-axis and direction of wood fibre

Admissible screw-load according to DIN 1052-1 to -3:1988-04 for HECO screws corresponding to approval Z-9.1-453.









HECO-TOPIX Wood-Construction screws
Ø 4 mm / countersunk, raised countersunk and pan-head

tension loads N_Z for screws, screwed in at an angle of 45° ≤ α ≤ 90° [1] depending on embedment depth s_g

s_g	max. N_Z		
	wood - wood	wood - wood with washer DIN 125	sheet steel - wood
16	320	320	320
18	320	360	360
20	320	400	400
20	320	400	400
25	320	405	500
30	320	405	600
35	320	405	700
40	320	405	800
47	320	405	940
54	320	405	1080

transmittable shear-load V of wood conections depending on embedment depth sg and thickness of the mounted part a1

d_1 = 4 mm

V_{max} = 272 N (= 17 * d_1^2)

mounted part thickness a_1 (min - max)	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	16	**20**	**24**	**28**	**32**
8	64	80	96	112	128
10	80	100	120	140	160
12	96	120	144	168	192
16	128	160	192	224	256
19	152	190	228	266	272
20	160	200	240	272	272
22	176	220	264	272	272
24	192	240	272	272	272
26	208	260	272	272	272
28	224	272	272	272	272
30	240	272	272	272	272
32	256	272	272	272	272
34	272	272	272	272	272
54	272	272	272	272	272

transmittable shear-load V when mounting steel-parts to wood

screw-diameter d_1	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	16	**20**	**24**	**28**	**32**
4 mm	170	213	255	298	340

1) α = angle between screw-axis and direction of wood fibre

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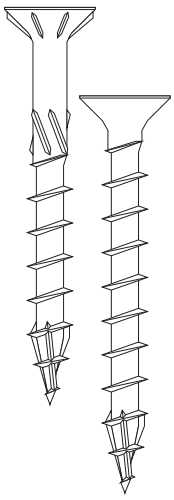
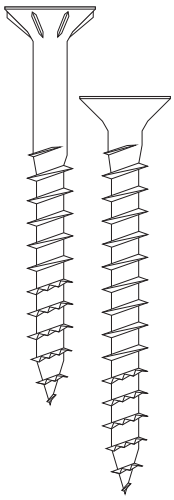
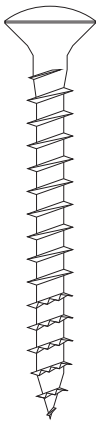
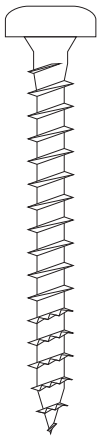
Admissible screw-load according to DIN 1052-1 to -3:1988-04 for HECO screws corresponding to approval Z-9.1-453.









HECO-TOPIX Wood-Construction screws
Ø 4,5 mm / countersunk, raised countersunk and pan-head

tension loads N_Z for screws, screwed in at an angle of 45° ≤ α ≤ 90° [1] depending on embedment depth s_g

s_g	max. N_Z		
	wood - wood	wood - wood with washer DIN 125	sheet steel - wood
18	405	405	405
20	405	450	450
22	405	495	495
25	405	500	562
30	405	500	675
35	405	500	787
40	405	500	900
45	405	500	1012
50	405	500	1125
60	405	500	1350

transmittable shear-load V of wood conections depending on embedment depth sg and thickness of the mounted part a1

d_1 = 4,5 mm
V_{max} = 344 N (= 17 * d_1^2)

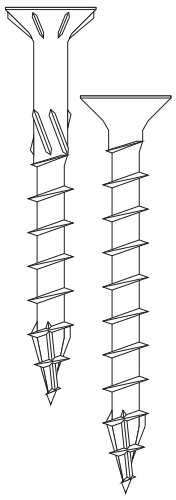
mounted part thickness a_1 (min - max)	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	18	**22,5**	**27**	**31,5**	**36**
8	72	90	108	126	144
10	90	113	135	158	180
12	108	135	162	189	216
16	144	180	216	252	288
19	171	214	257	299	342
22	198	248	297	344	344
24	216	270	324	344	344
26	234	293	344	344	344
28	252	315	344	344	344
30	270	338	344	344	344
32	288	344	344	344	344
35	315	344	344	344	344
40	344	344	344	344	344
62	344	344	344	344	344

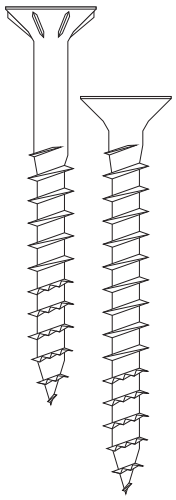
transmittable shear-load V when mounting steel-parts to wood

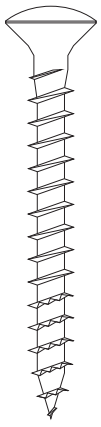
screw-diameter d_1	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	18	**22,5**	**27**	**31,5**	**36**
4,5 mm	215	269	323	377	430

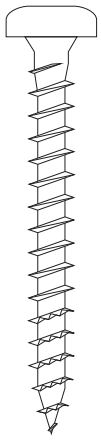
1) α = angle between screw-axis and direction of wood fibre

Admissible screw-load according to DIN 1052-1 to -3:1988-04 for HECO screws corresponding to approval Z-9.1-453.









HECO-TOPIX Wood-Construction screws
Ø 5 mm / countersunk, raised countersunk and pan-head

tension loads N_Z for screws, screwed in at an angle of 45° ≤ α ≤ 90° [1] depending on embedment depth s_g			
s_g	max. N_Z		
	wood - wood	wood - wood with washer DIN 125	sheet steel - wood
20	470	500	500
22	470	500	550
25	470	500	625
27	470	500	675
30	470	500	750
35	470	500	875
40	470	500	1000
45	470	500	1125
50	470	500	1250
60	470	500	1500

transmittable shear-load V of wood conections depending on embedment depth sg and thickness of the mounted part a1

d_1 = 5 mm

V_{max} = 425 N (= 17 * d_1^2)

mounted part thickness a_1 (min - max)	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	20	**25**	**30**	**35**	**40**
8	80	100	120	140	160
10	100	125	150	175	200
12	120	150	180	210	240
16	160	200	240	280	320
19	190	238	285	333	380
22	220	275	330	385	425
24	240	300	360	420	425
26	260	325	390	425	425
28	280	350	420	425	425
30	300	375	425	425	425
34	340	425	425	425	425
40	400	425	425	425	425
45	425	425	425	425	425
100	425	425	425	425	425

transmittable shear-load V when mounting steel-parts to wood

screw-diameter d_1	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	20	**25**	**30**	**35**	**40**
5 mm	266	332	398	465	531

1) α = angle between screw-axis and direction of wood fibre

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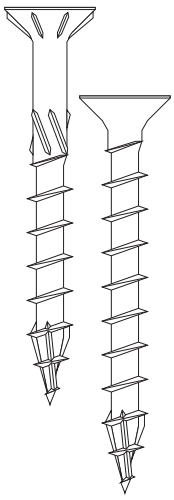
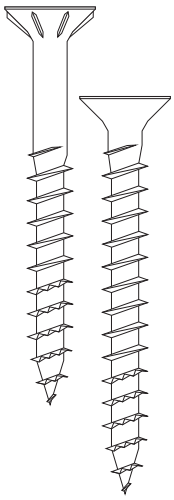
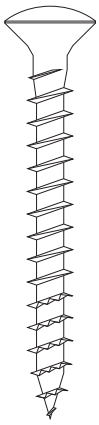
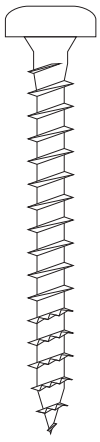
Admissible screw-load according to DIN 1052-1 to -3:1988-04 for HECO screws corresponding to approval Z-9.1-453.









HECO-TOPIX Wood-Construction screws
Ø 6 mm / countersunk, raised countersunk and pan-head

tension loads N_Z for screws, screwed in at an angle of 45° ≤ α ≤ 90° [1] depending on embedment depth s_g

s_g	max. N_Z		
	wood - wood	wood - wood HECO-Washer Z-9.1-453	sheet steel - wood
24	696	720	720
26	696	780	780
28	696	840	840
30	696	900	900
33	696	990	990
37	696	1110	1110
40	696	1200	1200
45	696	1350	1350
50	696	1500	1500
60	696	1800	1800

transmittable shear-load V of wood conections depending on embedment depth sg and thickness of the mounted part a1

d_1 = 6 mm
V_{max} = 612 N (= 17 * d_1^2)

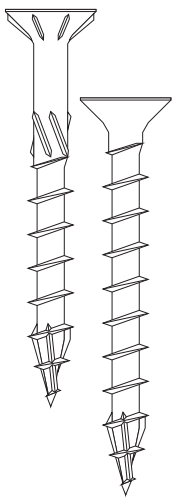
mounted part thickness a_1 (min - max)	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	24	**30**	**36**	**42**	**48**
8	96	120	144	168	192
10	120	150	180	210	240
12	144	180	216	252	288
16	192	240	288	336	384
19	228	285	342	399	456
22	264	330	396	462	528
24	288	360	432	504	576
30	360	450	540	612	612
35	420	525	612	612	612
40	480	600	612	612	612
45	540	612	612	612	612
50	600	612	612	612	612
55	612	612	612	612	612
276	612	612	612	612	612

transmittable shear-load V when mounting steel-parts to wood

screw-diameter d_1	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	24	**30**	**36**	**42**	**48**
6 mm	383	478	574	669	765

1) α = angle between screw-axis and direction of wood fibre

Admissible screw-load according to DIN 1052-1 to -3:1988-04 for HECO screws corresponding to approval Z-9.1-453.



HECO-TOPIX Wood-Construction screws
Ø 8 mm / countersunk, raised countersunk and pan-head

tension loads N_Z for screws, screwed in at an angle of 45° ≤ α ≤ 90° [1] depending on embedment depth s_g

s_g	max. N_Z		
	wood - wood	wood - wood HECO-Washer Z-9.1-453	sheet steel - wood
32	1095	1280	1280
34	1095	1360	1360
36	1095	1440	1440
40	1095	1600	1600
50	1095	2000	2000
60	1095	2400	2400
70	1095	2800	2800
80	1095	3125	3200
90	1095	3125	3600
100	1095	3125	4000

transmittable shear-load V of wood conections depending on embedment depth sg and thickness of the mounted part a1

d_1 = 8 mm
V_{max} = 1088 N (= 17 * d_1^2)

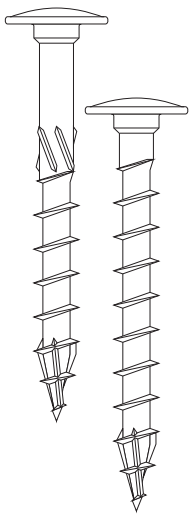
mounted part thickness a_1 (min - max)	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	32	**40**	**48**	**56**	**64**
10	160	200	240	280	320
12	192	240	288	336	384
14	224	280	336	392	448
16	256	320	384	448	512
19	304	380	456	532	608
22	352	440	528	616	704
24	384	480	576	672	768
30	480	600	720	840	960
35	560	700	840	980	1.088
40	640	800	960	1.088	1.088
50	800	1.000	1.088	1.088	1.088
60	960	1.088	1.088	1.088	1.088
70	1.088	1.088	1.088	1.088	1.088
468	1.088	1.088	1.088	1.088	1.088

transmittable shear-load V when mounting steel-parts to wood

screw-diameter d_1	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	32	**40**	**48**	**56**	**64**
8 mm	680	850	1020	1190	1360

1) α = angle between screw-axis and direction of wood fibre

Admissible screw-load according to DIN 1052-1 to -3:1988-04 for HECO screws corresponding to approval Z-9.1-453.



HECO-TOPIX Wood-Construction screws Ø 8 mm / flange head

tension loads N_Z for screws, screwed in at an angle of 45° ≤ α ≤ 90° [1] depending on embedment depth s_g

s_g	max. N_Z		
	wood - wood	wood - wood with washer DIN 440	sheet steel - wood
32	1280	1280	1280
34	1360	1360	1360
36	1440	1440	1440
40	1531	1600	1600
50	1531	2000	2000
60	1531	2400	2400
70	1531	2800	2800
80	1531	3200	3200
90	1531	3600	3600
100	1531	3920	4000

transmittable shear-load V of wood conections depending on embedment depth sg and thickness of the mounted part a1

d_1 = 8 mm
V_{max} = 1088 N (= 17 * d_1^2)

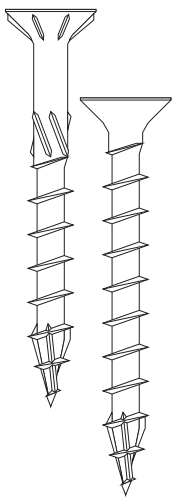
mounted part thickness a_1 (min - max)	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	32	**40**	**48**	**56**	**64**
10	160	200	240	280	320
12	192	240	288	336	384
14	224	280	336	392	448
16	256	320	384	448	512
19	304	380	456	532	608
22	352	440	528	616	704
24	384	480	576	672	768
30	480	600	720	840	960
35	560	700	840	980	1.088
40	640	800	960	1.088	1.088
50	800	1.000	1.088	1.088	1.088
60	960	1.088	1.088	1.088	1.088
70	1.088	1.088	1.088	1.088	1.088
368	1.088	1.088	1.088	1.088	1.088

transmittable shear-load V when mounting steel-parts to wood

screw-diameter d_1	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	32	**40**	**48**	**56**	**64**
8 mm	680	850	1020	1190	1360

1) α = angle between screw-axis and direction of wood fibre

Admissible screw-load according to DIN 1052-1 to -3:1988-04 for HECO screws corresponding to approval Z-9.1-453.



HECO-TOPIX Wood-Construction screws
Ø 10 mm / countersunk, raised countersunk and pan-head

tension loads N_Z for screws, screwed in at an angle of 45° ≤ α ≤ 90° [1] depending on embedment depth s_g

s_g	max. N_Z		
	wood - wood	wood - wood HECO-Washer Z-9.1-453	sheet steel - wood
40	1711	2000	2000
42	1711	2100	2100
44	1711	2200	2200
46	1711	2300	2300
50	1711	2500	2500
60	1711	3000	3000
70	1711	3500	3500
80	1711	4000	4000
90	1711	4500	4500
100	1711	4500	5000

transmittable shear-load V of wood conections depending on embedment depth sg and thickness of the mounted part a1

d_1 = 10 mm
V_{max} = 1700 N (= 17 * d_1^2)

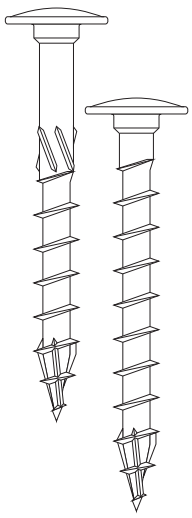
mounted part thickness a_1 (min - max)	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	40	**50**	**60**	**70**	**80**
12	240	300	360	420	480
14	280	350	420	490	560
16	320	400	480	560	640
18	360	450	540	630	720
19	380	475	570	665	760
22	440	550	660	770	880
24	480	600	720	840	960
30	600	750	900	1.050	1.200
40	800	1.000	1.200	1.400	1.600
50	1.000	1.250	1.500	1.700	1.700
60	1.200	1.500	1.700	1.700	1.700
70	1.400	1.700	1.700	1.700	1.700
85	1.700	1.700	1.700	1.700	1.700
460	1.700	1.700	1.700	1.700	1.700

transmittable shear-load V when mounting steel-parts to wood

screw-diameter d_1	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	40	**50**	**60**	**70**	**80**
10 mm	1063	1328	1594	1859	2125

1) α = angle between screw-axis and direction of wood fibre

Admissible screw-load according to DIN 1052-1 to -3:1988-04 for HECO screws corresponding to approval Z-9.1-453.



HECO-TOPIX Wood-Construction screws Ø 10 mm / flange head

tension loads N_Z for screws, screwed in at an angle of 45° ≤ α ≤ 90° [1] depending on embedment depth s_g

s_g	max. N_Z		
	wood - wood	wood - wood with washer DIN 440	sheet steel - wood
40	2000	2000	2000
42	2100	2100	2100
44	2200	2200	2200
46	2300	2300	2300
50	2500	2500	2500
60	2531	3000	3000
70	2531	3500	3500
80	2531	4000	4000
90	2531	4500	4500
100	2531	5000	5000

transmittable shear-load V of wood conections depending on embedment depth sg and thickness of the mounted part a1

d_1 = 10 mm
V_{max} = 1700 N (= 17 * d_1^2)

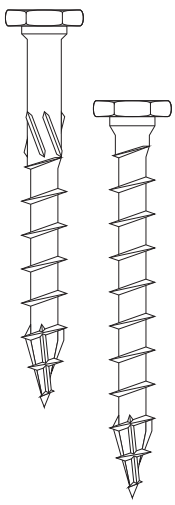
mounted part thickness a_1 (min - max)	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	40	**50**	**60**	**70**	**80**
12	240	300	360	420	480
14	280	350	420	490	560
16	320	400	480	560	640
18	360	450	540	630	720
19	380	475	570	665	760
22	440	550	660	770	880
24	480	600	720	840	960
30	600	750	900	1.050	1.200
40	800	1.000	1.200	1.400	1.600
50	1.000	1.250	1.500	1.700	1.700
60	1.200	1.500	1.700	1.700	1.700
70	1.400	1.700	1.700	1.700	1.700
85	1.700	1.700	1.700	1.700	1.700
360	1.700	1.700	1.700	1.700	1.700

transmittable shear-load V when mounting steel-parts to wood

screw-diameter d_1	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	40	**50**	**60**	**70**	**80**
10 mm	1063	1328	1594	1859	2125

1) α = angle between screw-axis and direction of wood fibre

Admissible screw-load according to DIN 1052-1 to -3:1988-04 for HECO screws corresponding to approval Z-9.1-453.



HECO-TOPIX Wood-Construction screws Ø 10 mm / hexagon-head

tension loads N_Z for screws, screwed in at an angle of 45° ≤ α ≤ 90° [1] depending on embedment depth s_g

s_g	max. N_Z		
	wood - wood	wood - wood with washer DIN 440	sheet steel - wood
40	1125	2000	2000
42	1125	2100	2100
44	1125	2200	2200
46	1125	2300	2300
50	1125	2500	2500
60	1125	3000	3000
70	1125	3500	3500
80	1125	4000	4000
90	1125	4500	4500
100	1125	4500	5000

transmittable shear-load V of wood conections depending on embedment depth sg and thickness of the mounted part a1

d_1 = 10 mm
V_{max} = 1700 N (= 17 * d_1^2)

mounted part thickness a_1 (min - max)	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	40	**50**	**60**	**70**	**80**
12	240	300	360	420	480
14	280	350	420	490	560
16	320	400	480	560	640
18	360	450	540	630	720
19	380	475	570	665	760
22	440	550	660	770	880
24	480	600	720	840	960
30	600	750	900	1.050	1.200
40	800	1.000	1.200	1.400	1.600
50	1.000	1.250	1.500	1.700	1.700
60	1.200	1.500	1.700	1.700	1.700
70	1.400	1.700	1.700	1.700	1.700
85	1.700	1.700	1.700	1.700	1.700
360	1.700	1.700	1.700	1.700	1.700

transmittable shear-load V when mounting steel-parts to wood

screw-diameter d_1	embedment depth s_g				
	4 * d_1	5 * d_1	6 * d_1	7 * d_1	8 * d_1
	40	**50**	**60**	**70**	**80**
10 mm	1063	1328	1594	1859	2125

1) α = angle between screw-axis and direction of wood fibre