

RAPTOR

RIGGING DEVICE FOR TIMBER ELEMENTS

OSHA
1926.753(e)(2)
COMPLIANT

ASME
BTH-1-2023
COMPLIANT

REUSABLE

CE
2006/42/CE

UNIVERSAL

RAPTOR can be installed with configurations that make it suitable for the most common applications on the construction site:

- 6 screws: maximum strength and capacity
 - 4 or 2 screws: for lifting and transporting lighter panels
- Screws must be installed symmetrically.

VERSATILE

The device is suitable for many different handling configurations. It can be used to work with any inclination of the chain, working effectively in both tension and shear, but also in intermediate configurations.

CERTIFIED

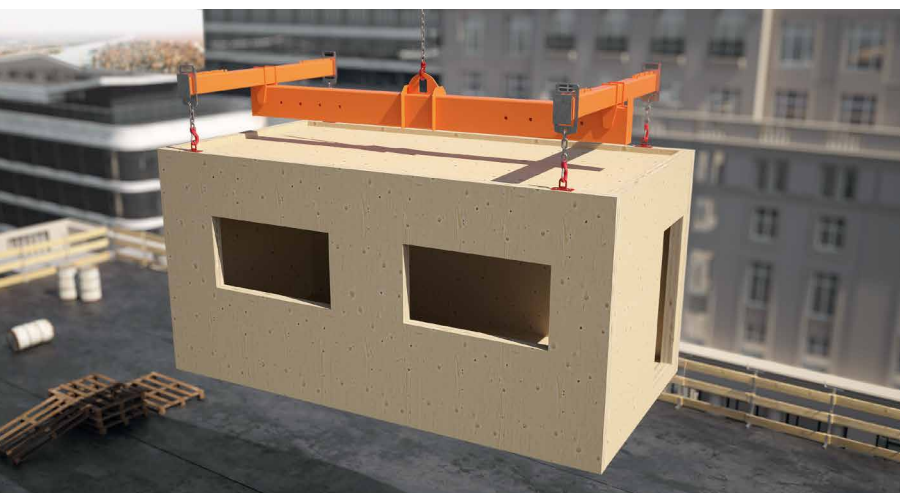
The plate is compliant to OSHA Section 1926.753(e)(2) and ASME BTH01-2023 and certified according to the EU Machinery Directive 2006/42/EC for lifts weights exceeding 3 tons (6600 lb).

USE AS A TEMPORARY ANCHOR POINT

One product – two functions. The plate can be used either as a lifting device to transport timber elements, or as a temporary fall protection anchor point.

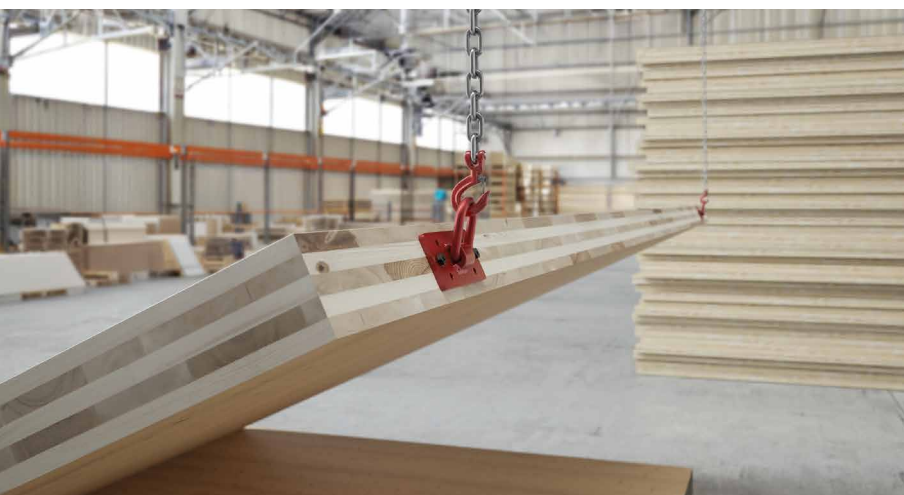
REUSABLE SCREWS

Thanks to compatibility with the innovative VGSP, the lifting system allows the fasteners to be reused even after handling. This reduces waste and project costs while maintaining high safety standards.



FIELDS OF USE

- CLT panels for floor or wall
- Solid timber or glulam beams
- Prefabricated timber frame walls
- Ribbed structural elements
- Prefabricated modular structures
- Special structures
- Temporary fall protection anchor point



MATERIAL

The sturdy steel plate and lifting hook ensure safe lifting; the red coating improves visibility and protection on site, enhancing overall site safety.

CONFIGURATIONS

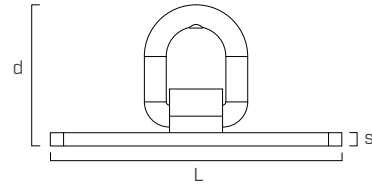
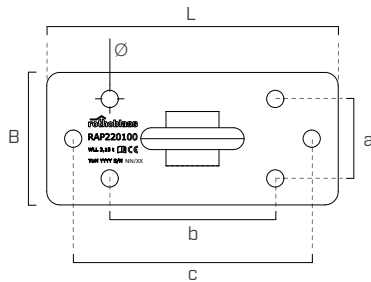
The 6 holes provide 3 fastener configurations with different screws, ensuring optimal installation for various lifting conditions and materials.

CODE

CODE	plate sizes		max. capacity		suitable screws	pcs
	[mm]	[in]	[mm]	[lb]		
RAP220100	100 x 220	4 x 8 5/8	3150	6945	VGS PLATE Ø11 mm 0.44 in HBS PLATE/HBS PLATE EVO Ø10 mm 0.40 in VGS Ø11 mm 0.44 in (+ HUS10)	1

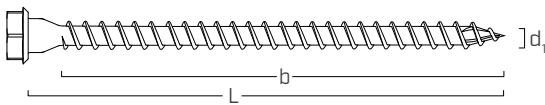
DIMENSIONS

CODE	B		L		s		Ø		a		b		c		d	
	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]	[mm]	[in]
RAP220100	100	4	220	8 5/8	10	3/8	13	1/2	60	2 3/8	125	4 15/16	180	7 1/8	107	4 3/16



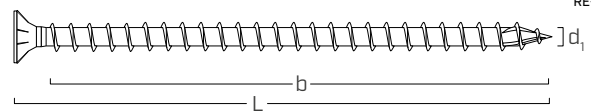
COMPATIBLE SCREWS

VGS PLATE
pan head screw for lifting



d ₁	CODE	L		b		pcs
[mm] [in]		[mm]	[in]	[mm]	[in]	
11 0.44 SW 17 TX 50	VGSPL1160	60	2 3/8	50	1 15/16	25
	VGSPL1180	80	3 1/8	70	2 3/4	25
	VGSPL11100	100	4	90	3 1/2	25
	VGSPL11120	120	4 3/4	110	4 3/8	25
	VGSPL11140	140	5 1/2	130	5 1/8	25
	VGSPL11160	160	6 1/4	150	6	25
	VGSPL11180	180	7 1/8	170	6 3/4	25
	VGSPL11200	200	8	190	7 1/2	25
	VGSPL11240	240	9 1/2	230	9 1/16	25
	VGSPL11280	280	11	270	10 5/8	25

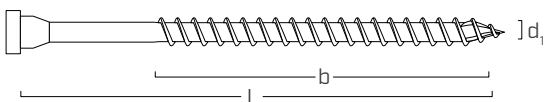
VGS
full thread screw with countersunk head



d ₁	CODE	L		b		pcs
[mm] [in]		[mm]	[in]	[mm]	[in]	
11 0.44 TX 50	VGS1180	80	3 1/8	70	2 3/4	25
	VGS11100	100	4	90	3 1/2	25
	VGS11125	125	4 15/16	115	4 1/2	25
	VGS11150	150	6	140	5 1/2	25
	VGS11175	175	6 7/8	165	6 1/2	25
	VGS11200	200	8	190	7 1/2	25
	VGS11225	225	8 7/8	215	8 7/16	25
	VGS11250	250	10	240	9 1/2	25
	VGS11275	275	10 7/8	265	10 7/16	25
	VGS11300	300	11 3/4	290	11 7/16	25
	VGS11325	325	12 3/4	315	12 3/8	25
	VGS11350	350	13 3/4	340	13 3/8	25
	VGS11375	375	14 3/4	365	14 3/8	25
	VGS11400	400	15 3/4	390	15 3/8	25

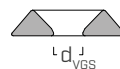
The VGS screw can only be installed in combination with HUS washer.

HBS PLATE - HBS PLATE EVO
pan head screw for plates



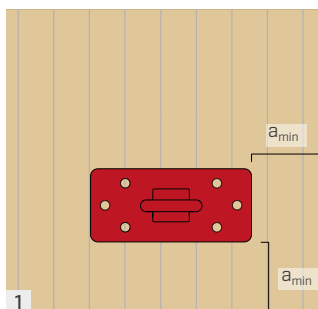
d ₁	CODE	L		b		pcs
[mm] [in]		[mm]	[in]	[mm]	[in]	
10 0.4 TX 40	HBSPLEVO1060	60	2 3/8	52	1 15/16	50
	HBSPL1080	80	3 1/8	60	2 3/8	50
	HBSPL10100	100	4	75	2 15/16	50
	HBSPL10120	120	4 3/4	95	3 3/4	50
	HBSPL10140	140	5 1/2	110	4 3/8	50
	HBSPL10160	160	6 1/4	130	5 1/8	50
	HBSPL10180	180	7 1/8	150	6	50

HUS - turned washer



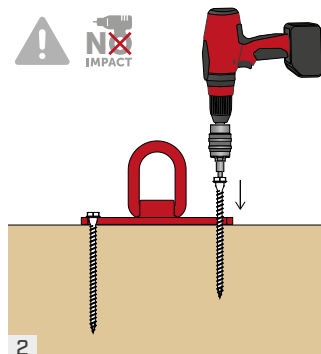
CODE	d _{VGS}		pcs
	[mm]	[in]	
HUS10	11	0.44	50

RAPTOR INSTALLATION

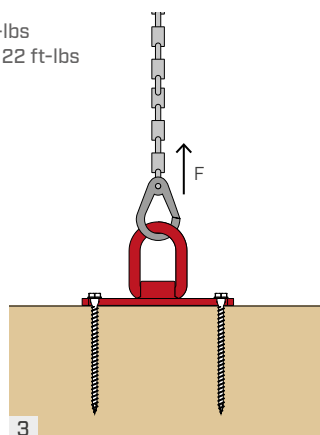


1 Read the instructions for use carefully and follow the directions regarding minimum recommended distances, lifting directions and angles, and maximum load capacity.

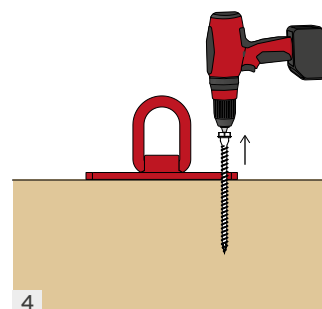
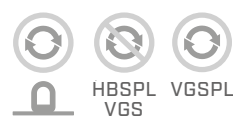
HBSPS Ø10 $M_{ins,max} = 35 \text{ Nm} \mid 25 \text{ ft-lbs}$
VGS $\mid$ VGSPL Ø11 $M_{ins,max} = 30 \text{ Nm} \mid 22 \text{ ft-lbs}$



2 Length and quantity of screws depend on the application and the weight of the element. Ensure correct tightening torque is applied, following the torque values specified in the corresponding installation instructions.

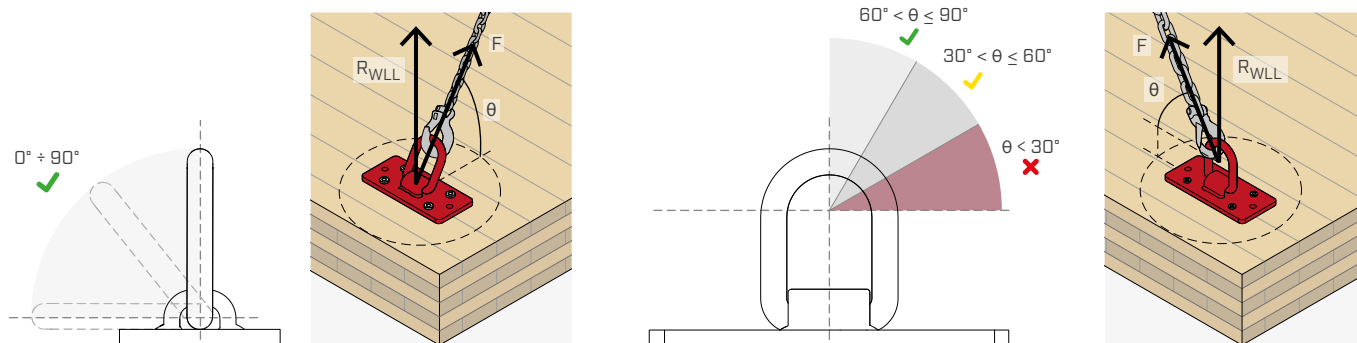


3 Connect the crane hook and carefully lift the element. Pay attention to the permitted lifting angles and directions, as well as the corresponding maximum load capacities.

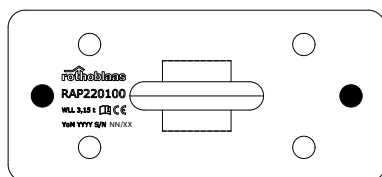


4 When lifting is complete, remove the screws and dispose of them. They can be used for a single lifting operation, except the VGS PL, which is reusable for transport under specific conditions. See the instructions.

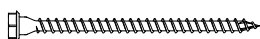
LOAD DIRECTIONS ALLOWED



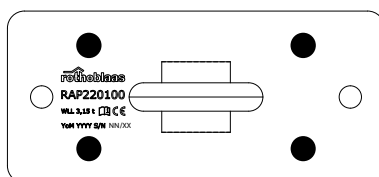
POSSIBLE LAYOUT OF SCREWS



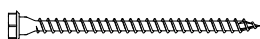
VGS PLATE



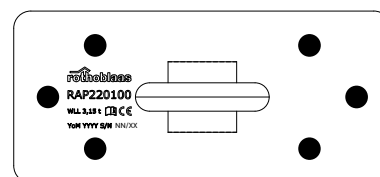
x2 VGS PLATE



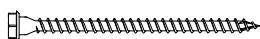
HBS PLATE - HBS PLATE EVO



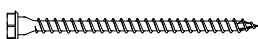
x2 HBS PLATE



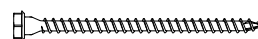
VGS + HUS



x2 VGS + x2 HUS



x4 VGS + x4 HUS



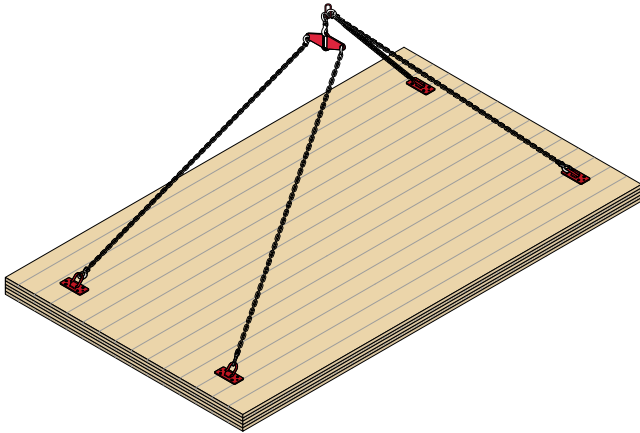
x6 VGS + x6 HUS

NOTES:

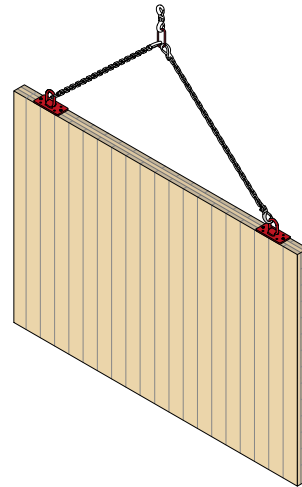
- The RAPTOR plate must be fixed with homogeneous connectors, same type (HBS PLATE, VGS PLATE or VGS) of the same length. The same configuration must be replicated on all plates used on the element to be moved.

APPLICATION EXAMPLES

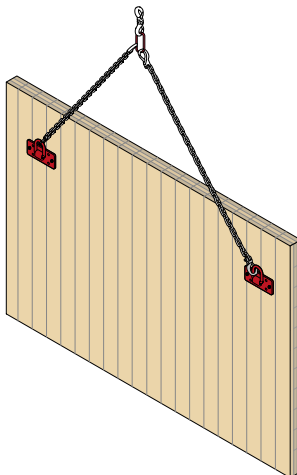
HORIZONTAL CLT PANEL



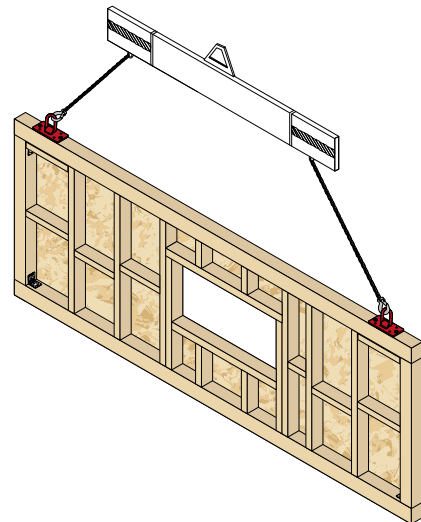
VERTICAL CLT PANEL - NARROW FACE



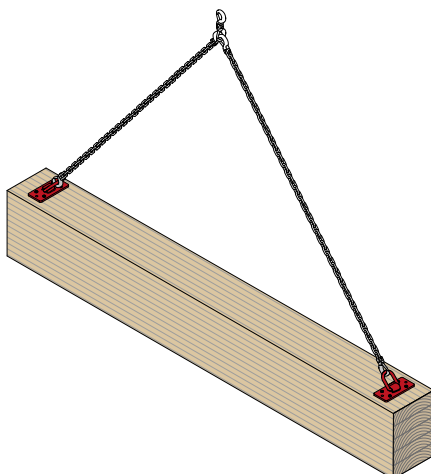
VERTICAL CLT PANEL - LATERAL FACE



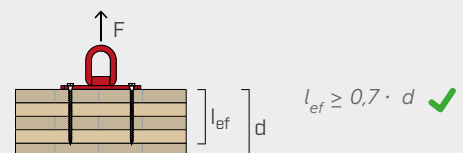
FRAME WALL



HORIZONTAL BEAM

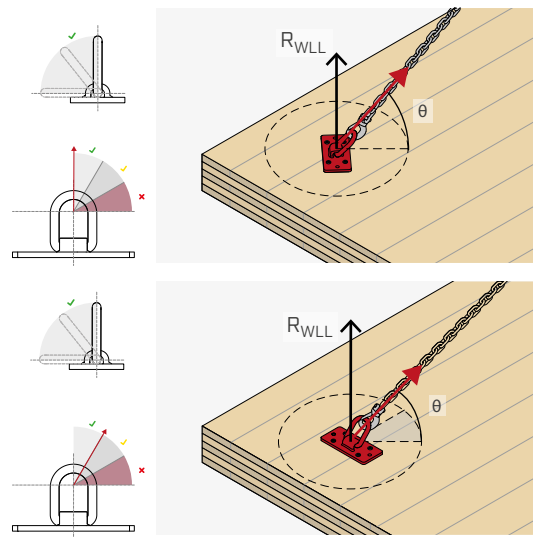
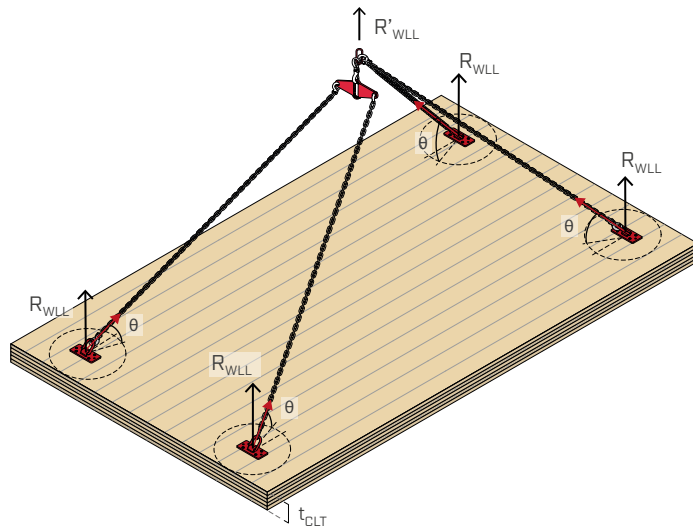


INFLUENCE OF THE RATIO OF SCREW LENGTH TO THE ELEMENT THICKNESS



For lifting applications with the load component perpendicular to the timber grain, in order to reach the maximum capacity of the lifting system, it is recommended to use screws longer than $0.7 \cdot d$ (d = depth of the timber element) to avoid cracking. In the event that the ratio is not fulfilled, critical shear and deflection checks can be carried out according to AWC-NDS Chapters 3 & 5.

RIGGING CAPACITY | HORIZONTAL CLT PANEL

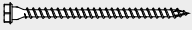


TOTAL RIGGING CAPACITY CALCULATION

$$R'_{WLL} = R_{WLL} \cdot n$$

R'_{WLL} = total system rigging capacity.
 R_{WLL} = reference rigging capacity for a single anchor system (provided in the tables).
 n = number of completely load-bearing anchor systems.

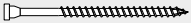
MAXIMUM CAPACITY PER ANCHOR POINT WITH VGS PLATE SCREWS [G=0.42]

VGS PLATE screw		no. of screws 	capacity R_{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 90^\circ$ 	$90^\circ \geq \theta > 60^\circ$ 	$60^\circ \geq \theta > 45^\circ$ 	$45^\circ \geq \theta > 30^\circ$ 
VGSPL1160	11 x 60 0.44 x 2 3/8	2 	672	551	430	287
		4 	1257	1036	816	562
		6 	1808	1510	1190	816
VGSPL1180	11 x 80 0.44 x 3 1/8	2 	937	750	573	373
		4 	1753	1433	1102	739
		6 	2535	2072	1609	1091
VGSPL11100	11 x 100 0.44 x 4	2 	1213	948	705	422
		4 	2260	1797	1367	845
		6 	3263	2612	2006	1267
VGSPL11120	11 x 120 0.44 x 4 3/4	2 	1477	1113	763	432
		4 	2767	2116	1526	865
		6 	3979	3086	2289	1297
VGSPL11140	11 x 140 0.44 x 5 1/2	2 	1753	1268	795	439
		4 	3263	2414	1590	879
		6 	4707	3527	2385	1318
VGSPL11160	11 x 160 0.44 x 6 1/4	2 	2017	1411	820	445
		4 	3770	2701	1640	890
		6 	5434	3957	2461	1334
VGSPL11180	11 x 180 0.44 x 7 1/8	2 	2293	1533	843	449
		4 	4277	2976	1686	899
		6 	6162	4354	2529	1348
VGSPL11200	11 x 200 0.44 x 8	2 	2557	1609	861	453
		4 	4773	3218	1723	906
		6 	6889	4751	2584	1359
VGSPL11240	11 x 240 0.44 x 9 1/2	2 	3097	1715	885	458
		4 	5787	3429	1770	915
		6 	6945	5049	2656	1373
VGSPL11280	11 x 280 0.44 x 11	2 	3638	1798	903	461
		4 	6790	3596	1806	922
		6 	6945	5280	2708	1383

θ = lifting angle

RIGGING CAPACITY | HORIZONTAL CLT PANEL

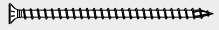
MAXIMUM CAPACITY PER ANCHOR POINT WITH **HBS PLATE** SCREWS [G=0.42]

HBS PLATE/HBS PLATE EVO screw		no. of screws 	capacity R _{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 90^\circ$ 	$90^\circ \geq \theta > 60^\circ$ 	$60^\circ \geq \theta > 45^\circ$ 	$45^\circ \geq \theta > 30^\circ$ 
HBSPLEVO1060	10 x 60 0.4 x 2 3/8	2 	606	507	397	276
		4 	1135	948	750	518
		6 	1642	1378	1091	750
HBSPL1080	10 x 80 0.4 x 3 1/8	2 	728	606	474	320
		4 	1367	1146	904	617
		6 	1973	1664	1323	904
HBSPL10100	10 x 100 0.4 x 4	2 	915	750	584	386
		4 	1709	1411	1113	750
		6 	2469	2050	1620	1102
HBSPL10120	10 x 120 0.4 x 4 3/4	2 	1157	904	683	417
		4 	2172	1731	1312	834
		6 	3131	2513	1918	1251
HBSPL10140	10 x 140 0.4 x 5 1/2	2 	1345	1025	740	426
		4 	2513	1940	1444	851
		6 	3627	2833	2127	1277
HBSPL10160	10 x 160 0.4 x 6 1/4	2 	1587	1157	773	433
		4 	2965	2227	1546	866
		6 	4277	3241	2320	1299
HBSPL10180	10 x 180 0.4 x 7 1/8	2 	1830	1301	803	440
		4 	3428	2491	1606	879
		6 	4938	3638	2409	1319

θ = lifting angle

RIGGING CAPACITY | HORIZONTAL CLT PANEL

MAXIMUM CAPACITY PER ANCHOR POINT WITH VGS SCREWS [G=0.42]

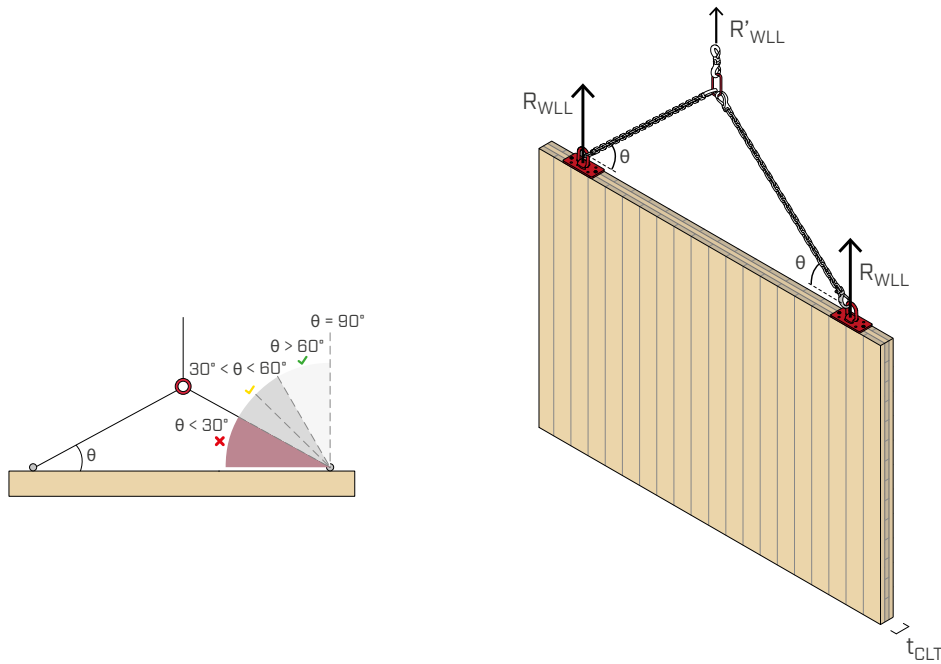
VGS screw + HUS10		no. of screws 	capacity R_{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 90^\circ$ 	$90^\circ \geq \theta > 60^\circ$ 	$60^\circ \geq \theta > 45^\circ$ 	$45^\circ \geq \theta > 30^\circ$ 
VGS1180	11 x 80 0.44 x 3 1/8	2 	827	672	518	342
		4 	1554	1279	992	661
		6 	2238	1852	1444	981
VGS11100	11 x 100 0.44 x 4	2 	1102	871	661	418
		4 	2061	1664	1279	836
		6 	2965	2414	1863	1246
VGS11125	11 x 125 0.44 x 4 15/16	2 	1433	1091	760	432
		4 	2690	2072	1519	863
		6 	3880	3020	2260	1295
VGS11150	11 x 150 0.44 x 6	2 	1775	1279	804	441
		4 	3318	2447	1608	883
		6 	4784	3571	2412	1324
VGS11175	11 x 175 0.44 x 6 7/8	2 	2116	1455	831	447
		4 	3946	2800	1661	894
		6 	5688	4101	2492	1341
VGS11200	11 x 200 0.44 x 8	2 	2447	1588	856	452
		4 	4575	3142	1713	904
		6 	6592	4597	2569	1356
VGS11225	11 x 225 0.44 x 8 7/8	2 	2789	1656	872	455
		4 	5203	3312	1744	910
		6 	6945	4894	2616	1366
VGS11250	11 x 250 0.44 x 10	2 	3120	1729	888	458
		4 	5831	3459	1777	917
		6 	6945	5060	2665	1375
VGS11275	11 x 275 0.44 x 10 7/8	2 	3461	1778	899	460
		4 	6471	3557	1798	920
		6 	6945	5203	2696	1381
VGS11300	11 x 300 0.44 x 11 3/4	2 	3803	1821	908	462
		4 	6945	3643	1815	924
		6 	6945	5335	2723	1386
VGS11325	11 x 325 0.44 x 12 3/4	2 	3979	1865	916	463
		4 	6945	3730	1833	927
		6 	6945	5335	2749	1390
VGS11350	11 x 350 0.44 x 13 3/4	2 	3979	1867	917	464
		4 	6945	3735	1834	927
		6 	6945	5335	2751	1391
VGS11375	11 x 375 0.44 x 14 3/4	2 	3979	1867	917	464
		4 	6945	3735	1834	927
		6 	6945	5335	2751	1391
VGS11400	11 x 400 0.44 x 15 3/4	2 	3979	1867	917	464
		4 	6945	3735	1834	927
		6 	6945	5335	2751	1391

θ = lifting angle

NOTES:

- When transporting horizontal CLT panels, the ratio of timber thickness to screw length can affect the load-bearing capacity.
- The load-bearing capacity values given are per single anchorage point.
- In order to consider all fastening points as fully load-bearing, it is necessary to ensure that the load is evenly distributed over all fastening points by means of suitable compensating systems.
- Minimum wall thickness: $t_{CLT} \geq 100 \text{ mm}$ | 4 in.
- For conversion to other Specific Gravities, see GENERAL PRINCIPLES below.

RIGGING CAPACITY | VERTICAL CLT PANEL - NARROW FACE

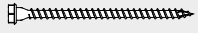


TOTAL RIGGING CAPACITY CALCULATION

$$R'_{WLL} = R_{WLL} \cdot n$$

R'_{WLL} = total system rigging capacity.
 R_{WLL} = reference rigging capacity for a single anchor system (provided in the tables).
 n = number of completely load-bearing anchor systems.

MAXIMUM CAPACITY PER ANCHOR POINT WITH VGS PLATE SCREWS [G=0.42]

VGS PLATE screw		no. of screws 	capacity R_{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 90^\circ$ 	$90^\circ \geq \theta > 60^\circ$ 	$60^\circ \geq \theta > 45^\circ$ 	$45^\circ \geq \theta > 30^\circ$ 
VGSP1160	11 x 60 0.44 x 2 3/8	2 	474	375	276	176
VGSP1180	11 x 80 0.44 x 3 1/8	2 	650	496	364	243
VGSP11100	11 x 100 0.44 x 4	2 	816	606	441	283
VGSP11120	11 x 120 0.44 x 4 3/4	2 	981	728	511	290
VGSP11140	11 x 140 0.44 x 5 1/2	2 	1135	838	533	294
VGSP11160	11 x 160 0.44 x 6 1/4	2 	1290	915	550	298
VGSP11180	11 x 180 0.44 x 7 1/8	2 	1444	1003	565	301
VGSP11200	11 x 200 0.44 x 8	2 	1598	1078	577	304
VGSP11240	11 x 240 0.44 x 9 1/2	2 	1896	1149	593	307
VGSP11280	11 x 280 0.44 x 11	2 	2194*	1205	605	309

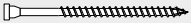
θ = lifting angle

NOTES:

- Minimum wall thickness: $t_{CLT} \geq 100 \text{ mm} \mid 4 \text{ in.}$
- The load-bearing capacity values given are per single anchorage point. No dowel embedment length reduction was applied, as shear was conservatively assumed perpendicular to grain.
- Screws must not be inserted into the glue line of the CLT panel.
- An end-grain factor $C_{eg} = 0.67$ according to NDS was assumed, shear assumed to act perpendicular to grain.
- For conversion to other Specific Gravities, see GENERAL PRINCIPLES below.

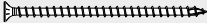
RIGGING CAPACITY | VERTICAL CLT PANEL - NARROW FACE

MAXIMUM CAPACITY PER ANCHOR POINT WITH **HBS PLATE** SCREWS [G=0.42]

HBS PLATE/HBS PLATE EVO screw		no. of screws 	capacity R _{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 90^\circ$ 	$90^\circ \geq \theta > 60^\circ$ 	$60^\circ \geq \theta > 45^\circ$ 	$45^\circ \geq \theta > 30^\circ$ 
HBSPLEVO1060	10 x 60 0.4 x 2 3/8	2 	441	342	254	165
HBSPL1080	10 x 80 0.4 x 3 1/8	2 	518	419	320	209
HBSPL10100	10 x 100 0.4 x 4	2 	639	496	375	243
HBSPL10120	10 x 120 0.4 x 4 3/4	2 	794	606	452	279
HBSPL10140	10 x 140 0.4 x 5 1/2	2 	904	694	496	285
HBSPL10160	10 x 160 0.4 x 6 1/4	2 	1047	783	518	290
HBSPL10180	10 x 180 0.4 x 7 1/8	2 	1202	860	538	295

Angle of Lifting/Loading

MAXIMUM CAPACITY PER ANCHOR POINT WITH **VGS** SCREWS [G=0.42]

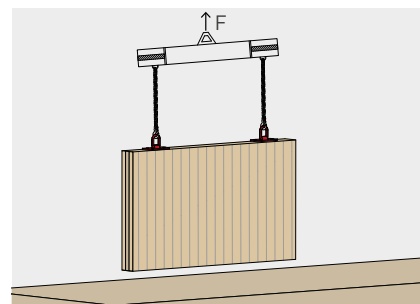
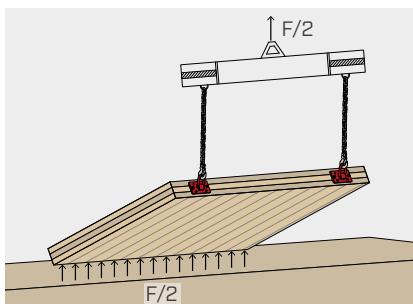
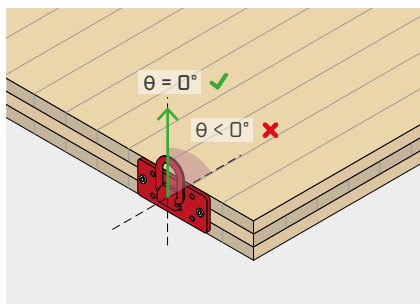
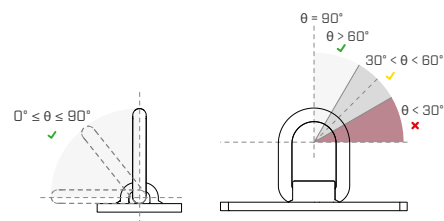
VGS screw + HUS10		no. of screws 	capacity R _{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 90^\circ$ 	$90^\circ \geq \theta > 60^\circ$ 	$60^\circ \geq \theta > 45^\circ$ 	$45^\circ \geq \theta > 30^\circ$ 
VGS1180	11 x 80 0.44 x 3 1/8	2 	584	452	342	220
VGS11100	11 x 100 0.44 x 4	2 	750	562	419	265
VGS11125	11 x 125 0.44 x 4 15/16	2 	948	705	507	289
VGS11150	11 x 150 0.44 x 6	2 	1146	838	539	296
VGS11175	11 x 175 0.44 x 6 7/8	2 	1345	948	556	299
VGS11200	11 x 200 0.44 x 8	2 	1543	1047	574	303
VGS11225	11 x 225 0.44 x 8 7/8	2 	1731	1109	584	305
VGS11250	11 x 250 0.44 x 10	2 	1918*	1159	595	307
VGS11275	11 x 275 0.44 x 10 7/8	2 	2105*	1192	602	308
VGS11300	11 x 300 0.44 x 11 3/4	2 	2282*	1220	608	309
VGS11325	11 x 325 0.44 x 12 3/4	2 	2469*	1249	614	310
VGS11350	11 x 350 0.44 x 13 3/4	2 	2646*	1275	619	311
VGS11375	11 x 375 0.44 x 14 3/4	2 	2822*	1298	623	312
VGS11400	11 x 400 0.44 x 15 3/4	2 	3009*	1318	627	313

θ = lifting angle

(*) In the case of lifting from a horizontal position, the strength during "tilting" becomes governed. In this case, the strength must be reduced by applying a reduction coefficient of 0.8.

RIGGING CAPACITY | LIFTING PANEL/CLT WALL FROM A HORIZONTAL POSITION.

For lifting CLT walls from a horizontal to a vertical position, the load capacities indicated in the table above apply (VERTICAL CLT PANEL - NARROW FACE), applying the reduction coefficient where necessary. During the "tipping" phase, however, the fixed support of the underside of the wall must be ensured so that half of the load is transferred to the ground.



Lifting range

Solutions engineered for the safe lifting and handling of timber elements.

The product range includes devices designed to accommodate different load configurations and on-site handling requirements.



RAPTOR MINI



RAPTOR



RAPTOR MAXI



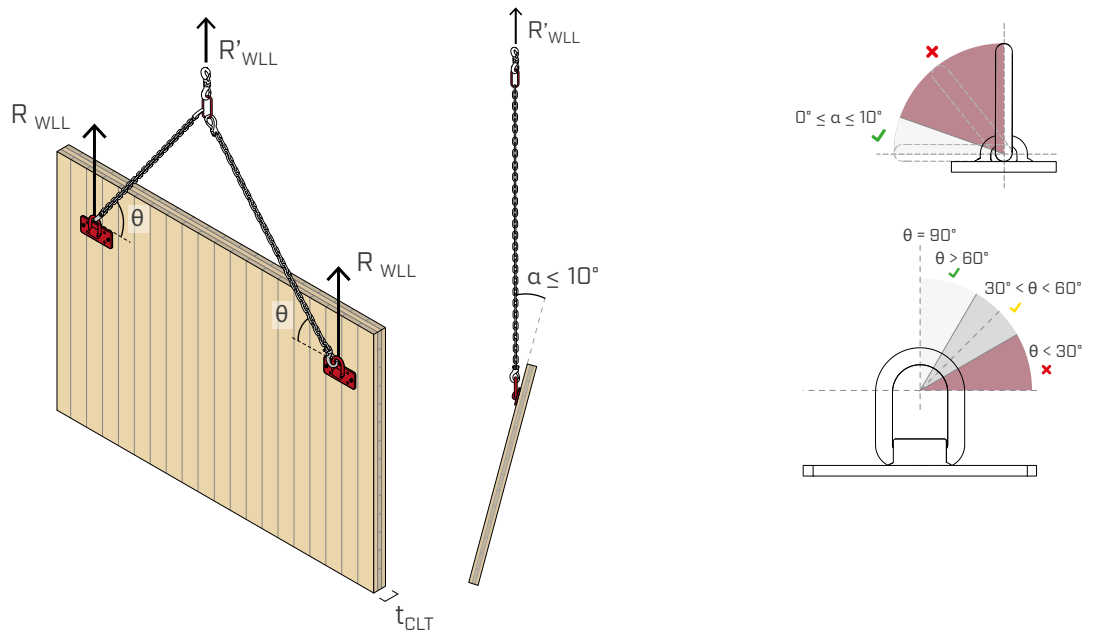
WASP

The comprehensive technical documentation is available at www.rothoblaas.com



rothoblaas.it

RIGGING CAPACITY | VERTICAL CLT PANEL - LATERAL FACE



TOTAL RIGGING CAPACITY CALCULATION

$$R'_{WLL} = R_{WLL} \cdot n$$

R'_{WLL} = total system rigging capacity.
 R_{WLL} = reference rigging capacity for a single anchor system (provided in the tables).
 n = number of completely load-bearing anchor systems.

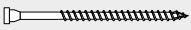
MAXIMUM CAPACITY PER ANCHOR POINT WITH VGS PLATE SCREWS [G=0.42]

VGS PLATE screw		no. of screws	capacity R_{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 90^\circ$	$90^\circ \geq \theta > 60^\circ$	$60^\circ \geq \theta > 45^\circ$	$45^\circ \geq \theta > 30^\circ$
VGSPL1160	11 x 60 0.44 x 2 3/8	2	342	287	231	165
		4	672	573	463	320
		6	992	849	683	474
VGSPL1180	11 x 80 0.44 x 3 1/8	2	452	386	309	220
		4	893	761	617	430
		6	1312	1124	904	628
VGSPL11100	11 x 100 0.44 x 4	2	529	463	375	254
		4	1058	904	728	507
		6	1554	1334	1080	761
VGSPL11120	11 x 120 0.44 x 4 3/4	2	628	529	430	298
		4	1235	1058	849	595
		6	1819	1565	1268	882
VGSPL11140	11 x 140 0.44 x 5 1/2	2	685	594	485	342
		4	1371	1187	969	683
		6	2056	1775	1444	1014
VGSPL11160	11 x 160 0.44 x 6 1/4	2	685	594	485	343
		4	1371	1187	969	685
		6	2056	1781	1454	1028
VGSPL11180	11 x 180 0.44 x 7 1/8	2	685	594	485	343
		4	1371	1187	969	685
		6	2056	1781	1454	1028
VGSPL11200	11 x 200 0.44 x 8	2	685	594	485	343
		4	1371	1187	969	685
		6	2056	1781	1454	1028
VGSPL11240	11 x 240 0.44 x 9 1/2	2	685	594	485	343
		4	1371	1187	969	685
		6	2056	1781	1454	1028
VGSPL11280	11 x 280 0.44 x 11	2	685	594	485	343
		4	1371	1187	969	685
		6	2056	1781	1454	1028

θ = lifting angle

RIGGING CAPACITY | VERTICAL CLT PANEL - LATERAL FACE

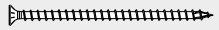
MAXIMUM CAPACITY PER ANCHOR POINT WITH **HBS PLATE** SCREWS [G=0.42]

HBS PLATE/HBS PLATE EVO screw		no. of screws 	capacity R _{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 90^\circ$ 	$90^\circ \geq \theta > 60^\circ$ 	$60^\circ \geq \theta > 45^\circ$ 	$45^\circ \geq \theta > 30^\circ$ 
HBSPLEVO1060	10 x 60 0.4 x 2 3/8	2 	320	276	220	154
		4 	639	540	441	309
		6 	937	805	650	452
HBSPL1080	10 x 80 0.4 x 3 1/8	2 	397	342	276	187
		4 	794	672	540	375
		6 	1157	992	794	551
HBSPL10100	10 x 100 0.4 x 4	2 	474	397	320	220
		4 	926	794	639	441
		6 	1356	1157	937	650
HBSPL10120	10 x 120 0.4 x 4 3/4	2 	551	474	386	265
		4 	1091	937	750	529
		6 	1609	1378	1113	783
HBSPL10140	10 x 140 0.4 x 5 1/2	2 	628	540	430	298
		4 	1235	1058	860	595
		6 	1819	1565	1257	882
HBSPL10160	10 x 160 0.4 x 6 1/4	2 	672	573	463	320
		4 	1334	1135	926	639
		6 	1962	1687	1367	959
HBSPL10180	10 x 180 0.4 x 7 1/8	2 	681	590	482	341
		4 	1363	1180	963	681
		6 	2044	1770	1445	1022

θ = lifting angle

RIGGING CAPACITY | VERTICAL CLT PANEL - LATERAL FACE

MAXIMUM CAPACITY PER ANCHOR POINT WITH **VGS** SCREWS [G=0.42]

VGS screw + HUS10		no. of screws 	capacity R_{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 90^\circ$ 	$90^\circ \geq \theta > 60^\circ$ 	$60^\circ \geq \theta > 45^\circ$ 	$45^\circ \geq \theta > 30^\circ$ 
VGS1180	11 x 80 0.44 x 3 1/8	2 	419	353	287	198
		4 	827	705	573	397
		6 	1213	1036	838	584
VGS11100	11 x 100 0.44 x 4	2 	496	430	342	243
		4 	992	849	683	474
		6 	1455	1246	1014	705
VGS11125	11 x 125 0.44 x 4 15/16	2 	606	518	419	298
		4 	1202	1036	838	584
		6 	1775	1521	1235	871
VGS11150	11 x 150 0.44 x 6	2 	685	594	485	342
		4 	1371	1187	969	683
		6 	2056	1781	1454	1014
VGS11175	11 x 175 0.44 x 6 7/8	2 	685	594	485	343
		4 	1371	1187	969	685
		6 	2056	1781	1454	1028
VGS11200	11 x 200 0.44 x 8	2 	685	594	485	343
		4 	1371	1187	969	685
		6 	2056	1781	1454	1028
VGS11225	11 x 225 0.44 x 8 7/8	2 	685	594	485	343
		4 	1371	1187	969	685
		6 	2056	1781	1454	1028
VGS11250	11 x 250 0.44 x 10	2 	685	594	485	343
		4 	1371	1187	969	685
		6 	2056	1781	1454	1028

θ = lifting angle

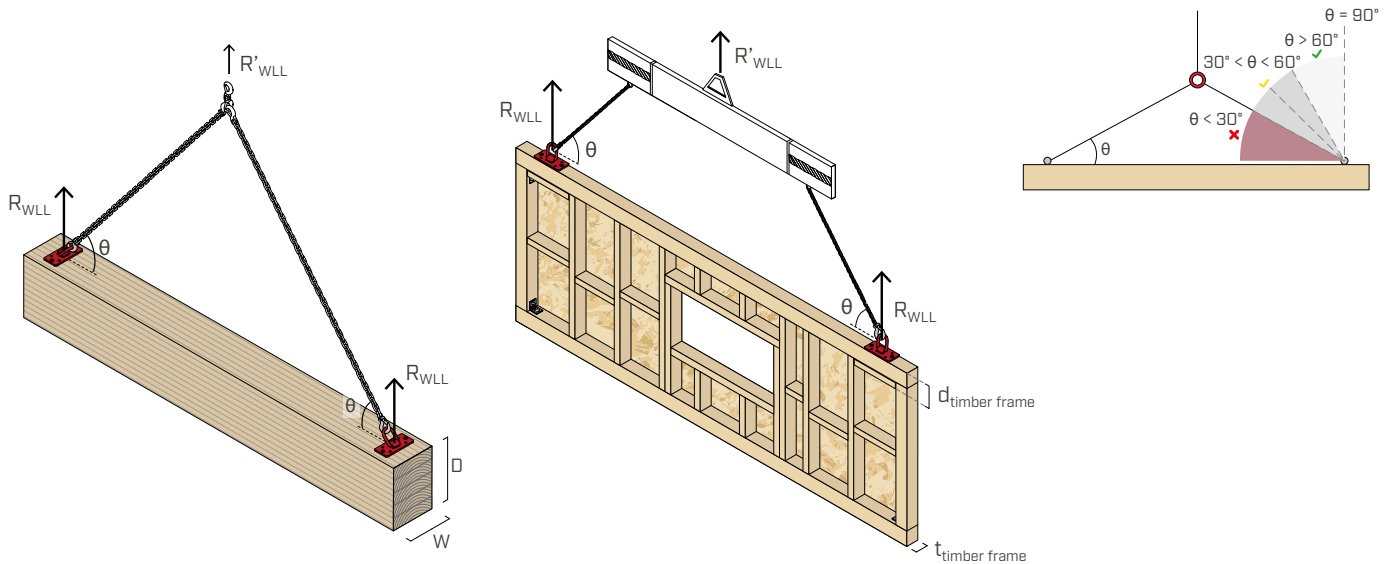
NOTES:

- The load-bearing capacity values given are per single anchorage point.
- Minimum wall thickness: $t_{CLT} \geq 80 \text{ mm} \mid 3 \frac{1}{8} \text{ in.}$
- Due to the single-sided fastening, the wall will tilt slightly. It is advisable to

fix the transport plates as high as possible, maintaining minimum distances from the ends, in order to limit this phenomenon. It is suggested to limit the tilt angle within 10° of the vertical.

- For conversion to other Specific Gravities, see GENERAL PRINCIPLES below.

LOAD VALUES | HORIZONTAL BEAM AND FRAME WALL



TOTAL RIGGING CAPACITY CALCULATION

$$R'_{WLL} = R_{WLL} \cdot n$$

R'_{WLL} = total system rigging capacity.
 R_{WLL} = reference rigging capacity for a single anchor system (provided in the tables).
 n = number of completely load-bearing anchor systems.

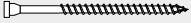
MAXIMUM CAPACITY PER ANCHOR POINT WITH VGS PLATE SCREWS [G=0.42]

VGS PLATE screw		no. of screws	capacity R_{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 0^\circ$	$0^\circ < \theta \leq 30^\circ$	$30^\circ < \theta \leq 45^\circ$	$45^\circ < \theta \leq 60^\circ$
VGSPL1160	11 x 60 0.44 x 2 3/8	2	728	595	463	309
		4	1356	1124	882	595
		6	1951	1631	1290	882
VGSPL1180	11 x 80 0.44 x 3 1/8	2	1014	816	617	408
		4	1896	1543	1190	805
		6	2734	2238	1742	1179
VGSPL11100	11 x 100 0.44 x 4	2	1301	1014	761	496
		4	2436	1929	1466	970
		6	3516	2811	2138	1422
VGSPL11120	11 x 120 0.44 x 4 3/4	2	1598	1190	871	551
		4	2987	2271	1676	1091
		6	4299	3318	2458	1609
VGSPL11140	11 x 140 0.44 x 5 1/2	2	1885	1356	959	606
		4	3527	2590	1874	1202
		6	5082	3792	2756	1775
VGSPL11160	11 x 160 0.44 x 6 1/4	2	2183	1510	1058	626
		4	4068	2899	2061	1252
		6	5864	4244	3031	1878
VGSPL11180	11 x 180 0.44 x 7 1/8	2	2469	1653	1137	635
		4	4619	3197	2238	1271
		6	6647	4674	3296	1906
VGSPL11200	11 x 200 0.44 x 8	2	2767	1808	1171	643
		4	5159	3472	2342	1285
		6	6945	4927	3494	1928
VGSPL11240	11 x 240 0.44 x 9 1/2	2	3340	2083	1215	652
		4	6239	4023	2430	1304
		6	6945	5203	3646	1955
VGSPL11280	11 x 280 0.44 x 11	2	3924	2320	1249	658
		4	6945	4464	2497	1317
		6	6945	5335	3746	1975

θ = lifting angle

LOAD VALUES | HORIZONTAL BEAM AND FRAME WALL

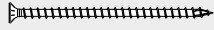
MAXIMUM CAPACITY PER ANCHOR POINT WITH **HBS PLATE** SCREWS [G=0.42]

HBS PLATE/HBS PLATE EVO screw		no. of screws 	capacity R _{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 90^\circ$ 	$90^\circ \geq \theta > 60^\circ$ 	$60^\circ \geq \theta > 45^\circ$ 	$45^\circ \geq \theta > 30^\circ$ 
HBSPLEVO1060	10 x 60 0.4 x 2 3/8	2 	661	551	441	298
		4 	1235	1047	838	584
		6 	1775	1510	1213	849
HBSPL1080	10 x 80 0.40 x 3 1/8	2 	794	661	529	364
		4 	1477	1257	1014	705
		6 	2127	1510	1466	1025
HBSPL10100	10 x 100 0.40 x 4	2 	992	816	639	441
		4 	1852	1554	1235	849
		6 	2668	2249	1786	1224
HBSPL10120	10 x 120 0.40 x 4 3/4	2 	1257	992	750	496
		4 	2337	1885	1444	970
		6 	3373	2734	2105	1411
HBSPL10140	10 x 140 0.40 x 5 1/2	2 	1455	1113	827	529
		4 	2712	2127	1598	1047
		6 	3913	3086	2326	1532
HBSPL10160	10 x 160 0.40 x 6 1/4	2 	1720	1268	904	584
		4 	3186	2425	1775	1146
		6 	4619	3527	2601	1687
HBSPL10180	10 x 180 0.40 x 7 1/8	2 	1984	1411	1003	617
		4 	3704	2712	1951	1234
		6 	5335	3946	2855	1830

θ = lifting angle

LOAD VALUES | HORIZONTAL BEAM AND FRAME WALL

MAXIMUM CAPACITY PER ANCHOR POINT WITH **VGS** SCREWS [G=0.42]

VGS screw + HUS10		no. of screws 	capacity R _{WLL} [lbs]			
CODE	d x L [mm] [in]		$\theta = 90^\circ$ 	$90^\circ \geq \theta > 60^\circ$ 	$60^\circ \geq \theta > 45^\circ$ 	$45^\circ \geq \theta > 30^\circ$ 
VGS1180	11 x 80 0.44 x 3 1/8	2 	893	728	573	375
		4 	1676	1378	1102	717
		6 	2425	1995	1598	1058
VGS11100	11 x 100 0.44 x 4	2 	1190	948	739	474
		4 	2227	1786	1422	915
		6 	3208	2601	2061	1345
VGS11125	11 x 125 0.44 x 4 15/16	2 	1554	1168	871	551
		4 	2899	2227	1687	1069
		6 	4178	3241	2469	1576
VGS11150	11 x 150 0.44 x 6	2 	1918	1367	992	617
		4 	3583	2624	1940	1213
		6 	5159	3836	2833	1786
VGS11175	11 x 175 0.44 x 6 7/8	2 	2282	1565	1102	630
		4 	4266	2998	2161	1260
		6 	6140	4398	3186	1891
VGS11200	11 x 200 0.44 x 8	2 	2646	1742	1162	641
		4 	4938	3362	2323	1281
		6 	6945	4872	3483	1922
VGS11225	11 x 225 0.44 x 8 7/8	2 	3009	1918	1191	647
		4 	5622	3715	2382	1294
		6 	6945	5049	3572	1940
VGS11250	11 x 250 0.44 x 10	2 	3373	2094	1221	653
		4 	6294	4057	2443	1306
		6 	6945	5214	3664	1959
VGS11275	11 x 275 0.44 x 10 7/8	2 	3737	2260	1241	657
		4 	6945	4376	2482	1314
		6 	6945	5335	3723	1971
VGS11300	11 x 300 0.44 x 11 3/4	2 	3979	2360	1258	660
		4 	6945	4486	2516	1321
		6 	6945	5335	3774	1981
VGS11325	11 x 325 0.44 x 12 3/4	2 	3979	2370	1275	664
		4 	6945	4486	2549	1327
		6 	6945	5335	3824	1991
VGS11350	11 x 350 0.44 x 13 3/4	2 	3979	2370	1276	664
		4 	6945	4486	2551	1327
		6 	6945	5335	3827	1991
VGS11375	11 x 375 0.44 x 14 3/4	2 	3979	2370	1276	664
		4 	6945	4486	2551	1327
		6 	6945	5335	3827	1991
VGS11400	11 x 400 0.44 x 15 3/4	2 	3979	2370	1276	664
		4 	6945	4486	2551	1327
		6 	6945	5335	3827	1991

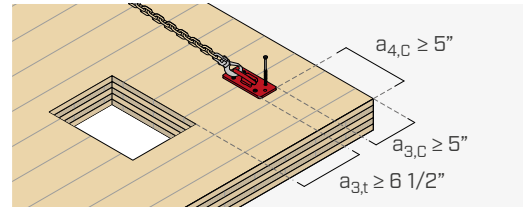
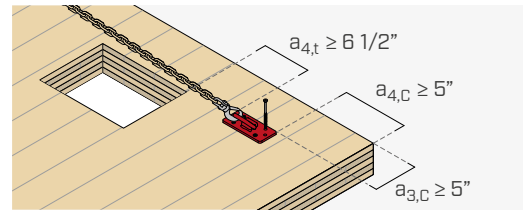
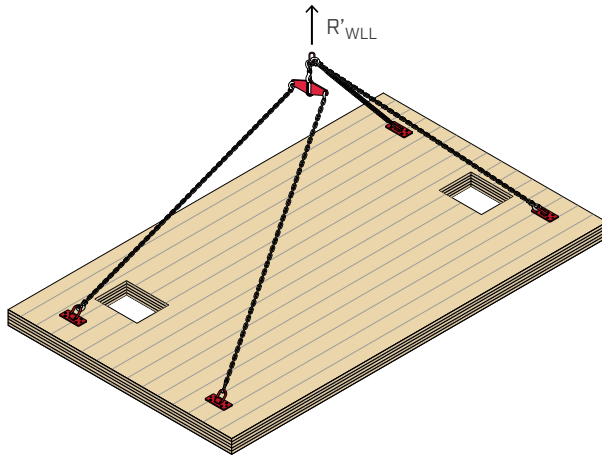
θ = lifting angle

NOTES:

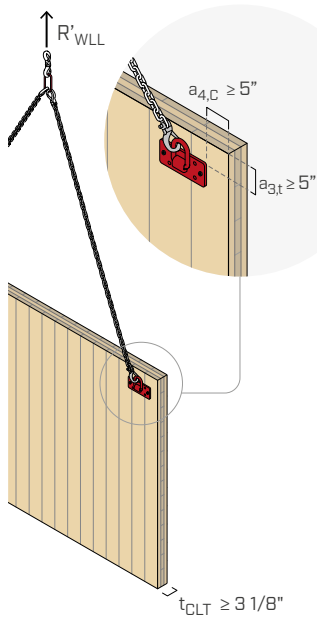
- The load-bearing capacity values given are per single anchorage point.
- Minimum beam base W $\geq$ 240 mm | 9 1/2 in.
- Minimum beam base D $\geq$ 80 mm | 3 1/8 in.
- Minimum width of Timber Frame structure $t_{\text{timber frame}} \geq$ 100 mm | 4 in.
- Minimum thickness of Timber Frame structure $d_{\text{timber frame}} \geq$ 80 mm | 3 1/8 in.
- For conversion to other Specific Gravities, see GENERAL PRINCIPLES below.

MINIMUM DISTANCES

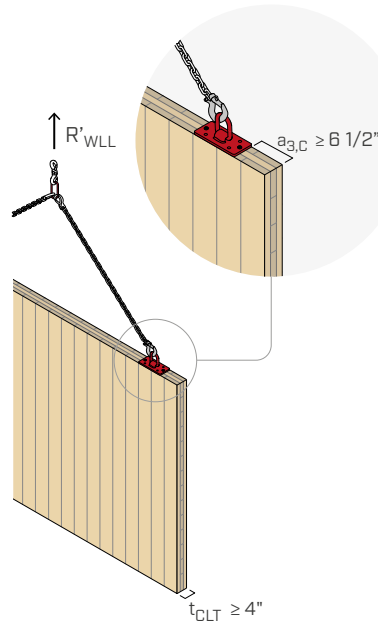
CLT FLOOR



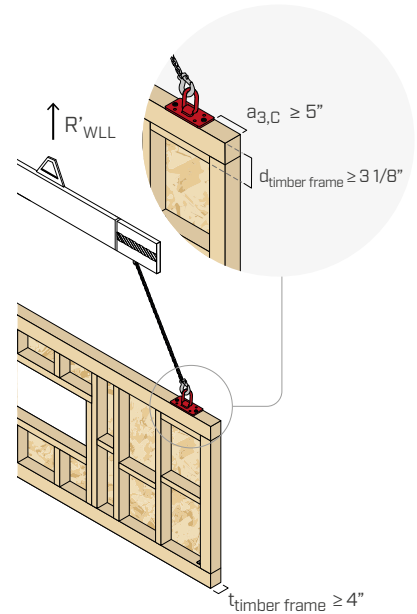
VERTICAL CLT WALL LATERAL FACE



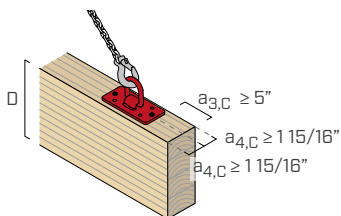
VERTICAL CLT WALL NARROW FACE



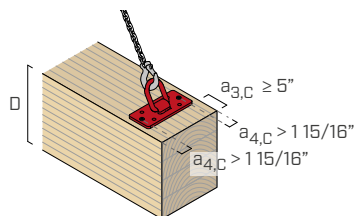
FRAME WALL



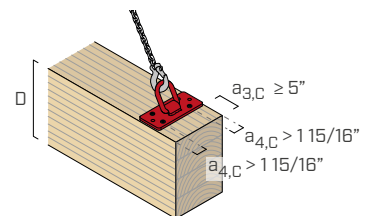
HORIZONTAL BEAM - 0° 2 SCREW FASTENING



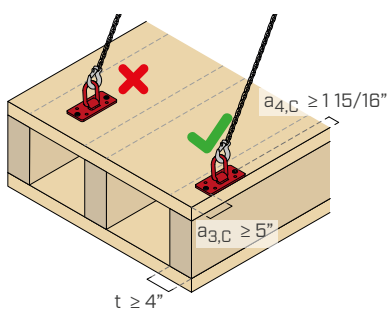
HORIZONTAL BEAM - 90° 2 & 6 SCREW FASTENING



HORIZONTAL BEAM - 90° 4 SCREW FASTENING



RIBBED FLOORS



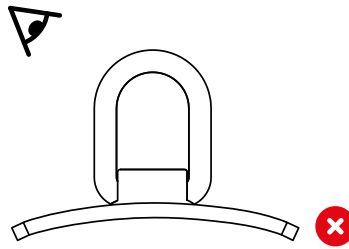
NOTES:

- (1) For beams of reduced thickness, consider inserting a reinforcing timber element such that the minimum thickness of fixture is achieved.
- Minimum Distance in accordance with ICC Evaluation Report ESR-4645.
- The minimum distances shown are valid for screws inserted without pre-drilling hole. Minimum distances must be adjusted for wood species with a specific gravity exceeding 0.50

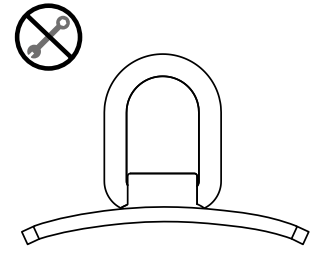
MAINTENANCE



Always follow the instructions in the manual.



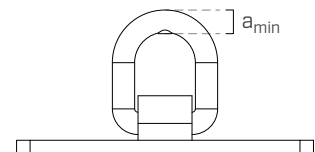
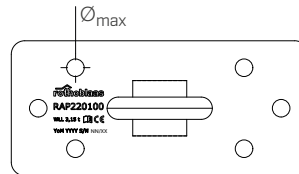
Visual inspection before each use. If there are any defects, the product must not be used again.



Repairs are not permitted!

DIMENSIONS TO BE CHECKED

CODE	$\varnothing_{\max}$		$a_{\min}$	
	[mm]	[in]	[mm]	[in]
RAP220100	13,5	0.53	16,0	0.63



GENERAL PRINCIPLES:

- The choice of fastener length is to be based each time on the dimensions of the wooden element, on the fastener's positioning, on the lift angle, on the weight of the load to be lifted and the arrangement of the lifting plate. In all cases, it is recommended that the connectors have greater length than the minimum required, but such that the tip does not protrude from the element to be lifted.
- The rigging capacity values (WLL) provided are based on calculations made according to ICC-ES Evaluation Report ESR-4645, the AWC-NDS 2018, AWC Technical Report 12, and the results of tests performed. Values provided in accordance with OSHA section 1926.753(e)(2), design values in accordance with OSHA section 1910.253(c)(26), with a safety factor meeting or exceeding 5.0 to maintain consistency across design approaches.
- A Specific Gravity of $G = 0.42$ was considered in the calculation. For application with different timber species and Specific Gravity the conversion table with the modification factors shall be used. The calculated value must never exceed the maximum capacity of the plate of 6945lb.

Specific Gravity [G]	Modification Factor
0.35	0.80
0.42	1.00
0.49	1.10
0.55	1.20

- All values of screw capacity are adjusted by a dynamic acceleration factor of 1/1.1, a load duration factor $CD = 1.25$, temperature factor $Ct = 1.0$, and wet service factor $CM = 1.0$, and assume screws are installed on-site directly prior to lifting.
- Checks for potential reductions in strength due to possible brittle failure related to the geometry of the lifted element must be conducted separately in accordance with AWC-NDS, particularly in scenarios where less than 70% of the lifted element depth is engaged by the fastener.
- All CLT calculations assume a load-to-grain angle of 90° , regardless of orientation, with no dowel length reductions considered for edge-grain lifting.

- For lifting plate rigging capacity calculation in installation configurations other than those indicated here, contact Rothoblaas Technical Department.
- To conform with the fatigue limits of Service Class 0 of ASME BTH01-2023, no RAPTOR lifting device may be used for more than 20,000 load cycles.
- For lifting plate rigging capacity calculation in installation configurations other than those indicated here, contact Rothoblaas Technical Department.
- Fasteners must be installed in accordance with their relevant installation instruction to avoid damage and maintain full performance in accordance to their design strength parameters.
- The use of pulse screw guns/impact wrenches is not permitted. Respect the insertion angle with the help of a pilot hole and/or installation template. Avoid bending. Ensure correct tightening. We recommend the use of torque-controlled screwdrivers, e.g. with TORQUE LIMITER. Alternatively, tighten with a torque wrench.
- The values indicated in the data sheet for the transport plate fixed with HBS PLATE screws have been calculated considering the geometry and mechanical parameters of the HBS PL version. For the load-bearing capacities of the transport plate fixed with the HBS P screw, contact the Technical Office for further support.
- HBS PLATE and VGS screws may only be used once. Once tightened and loaded, the screws must not be loosened and used a second time to secure the transport plate. As soon as the timber element to be transported has been lifted to its final position and the transport plate is no longer needed for this purpose, the screws must be unscrewed and disposed of properly.
- The VGS PLATE is the only fastener eligible for reuse. Refer to the technical data sheets and instruction manuals for VGS PLATE and the corresponding JIG REUSE when using either with the RAPTOR device.
- The lifting plate may only be used by qualified personnel. The user manual (supplied as a QR code on the product and available at www.rothoblaas.com) must be read and understood before use. The information and instructions contained therein must be followed. If in doubt, contact the Rothoblaas Technical Department before use.