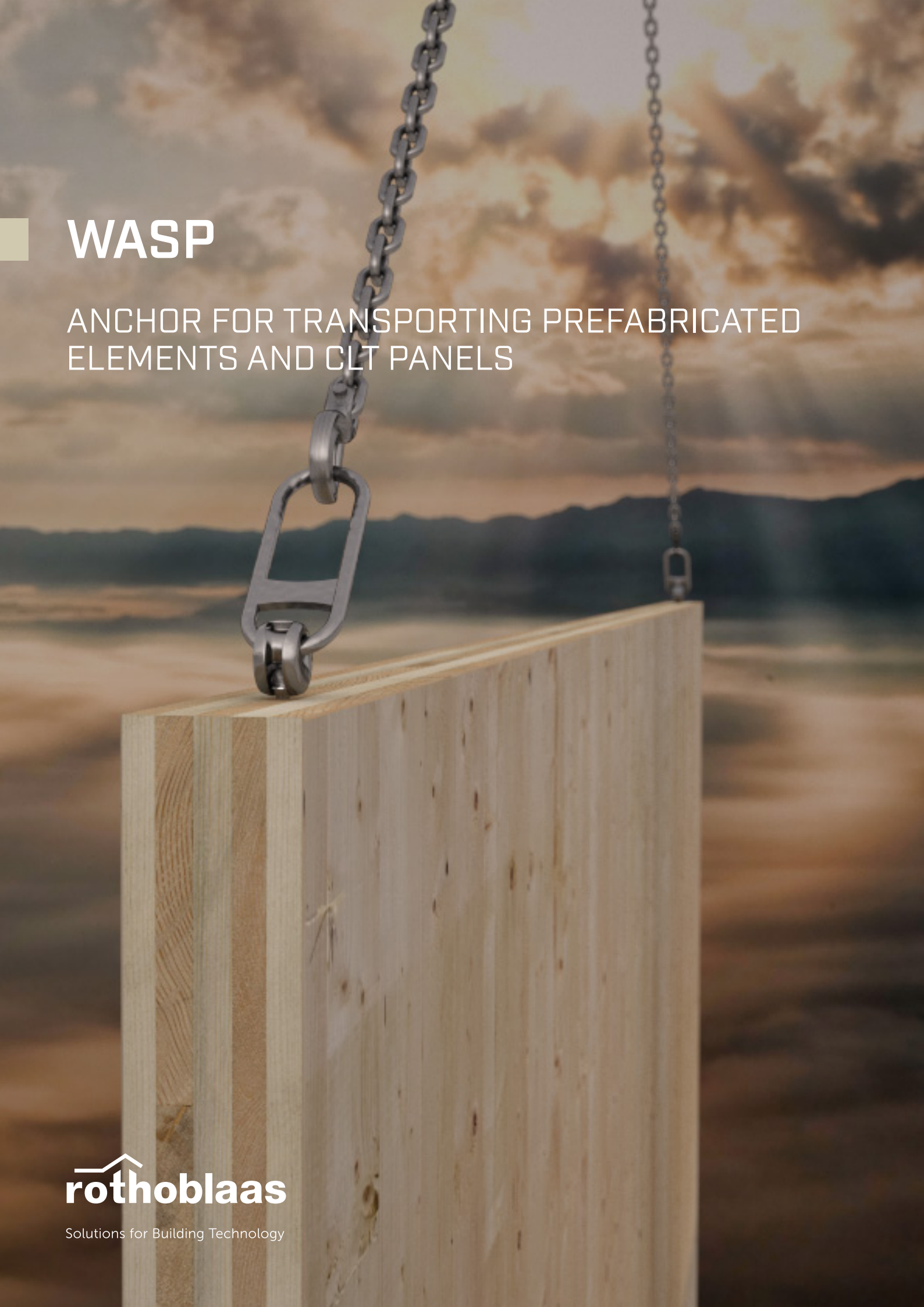




WASP

ANCHOR FOR TRANSPORTING PREFABRICATED
ELEMENTS AND CLT PANELS

**rothoblaas**

Solutions for Building Technology

ANCHOR FOR TRANSPORTING PREFABRICATED ELEMENTS AND CLT PANELS

STABLE

The built-in jaws hold down the screw head in the wall.

EFFECTIVE

Can be used for axial and transversal loads.

CERTIFICATE

Pursuant to the Directive 2006/42/EC on machinery.

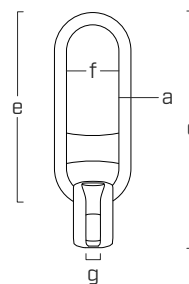


GEOMETRY

	a	d	e	f	g
[mm]	12	185	157	40	12

CODES AND DIMENSIONS

CODE	description	max. capacity [kg]	pcs
WASP	anchor	1300	2



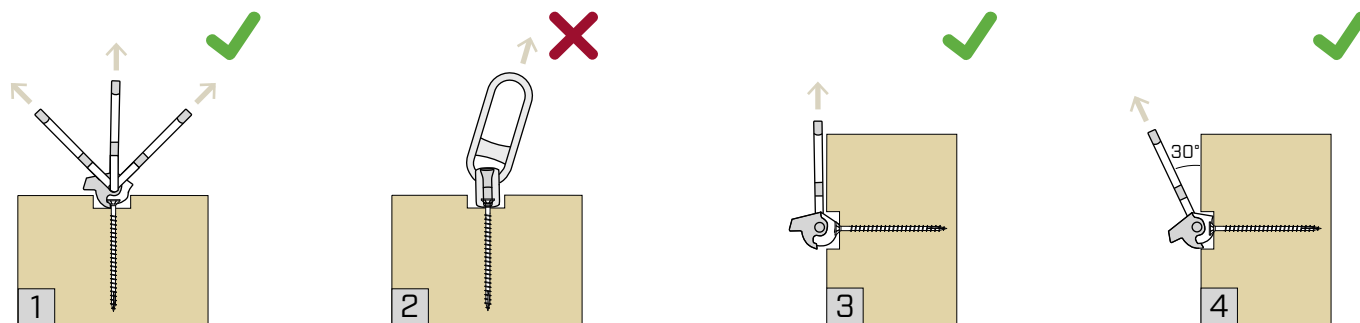
MATERIAL

Made of very high strength bright zinc plated carbon steel.

VERSATILITY

Various installation options with more types of screws for load conditions and different materials.

USE ALLOWED

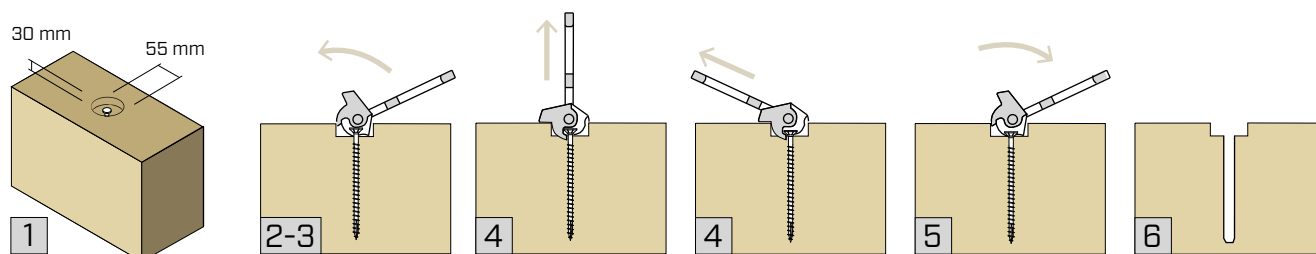


1. Lift in the direction of the connector axis or at an angle
2. Do not lift laterally to the connector's insertion opening

- 3-4. Lift at angles between 0° and 30°. For more information please contact the technical office

WASP INSTALLATION

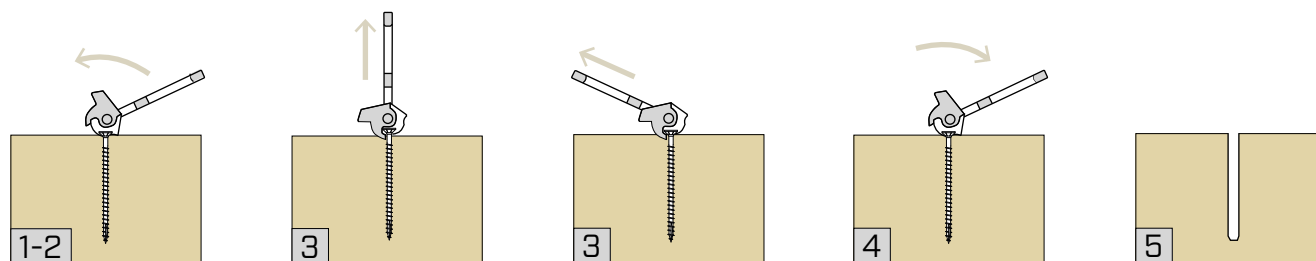
PERPENDICULAR INSTALLATION WITH SLOT



1. Drilling of slot for the WASP
2. Insertion of the screw into the timber element to be lifted
3. WASP positioning
4. Lifting of the structure (perpendicular or inclined force)

5. WASP removal (unhooking)
6. Removing the screw (optional)

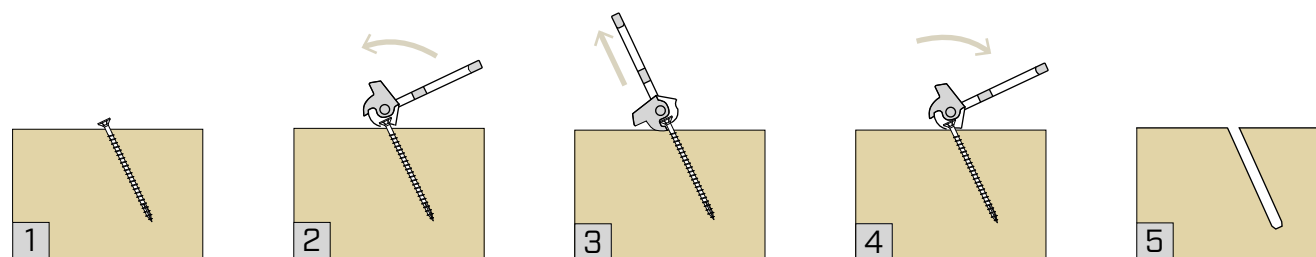
PERPENDICULAR INSTALLATION



1. Insertion of the screw into the timber element to be lifted
2. WASP positioning
3. Lifting of the structure (perpendicular or inclined force)

4. WASP removal (unhooking)
5. Removing the screw (optional)

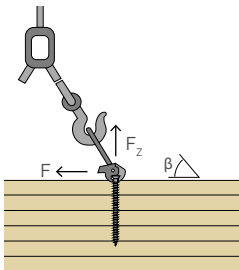
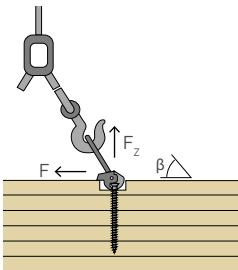
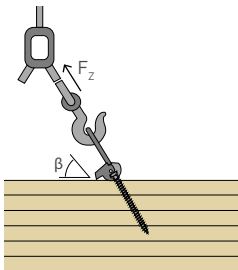
INCLINED INSTALLATION



1. Insertion of the screw into the timber element to be lifted
2. WASP positioning
3. Lifting of the structure (perpendicular or inclined force)

4. WASP removal (unhooking)
5. Removing the screw (optional)

WASP ANCHOR WITH VGS Ø11 - VERTICAL PANEL

					PERPENDICULAR			PERPENDICULAR WITH SLOT			INCLINED		
													
VGS SCREW	β	L_{MIN} [m]			R_k^*	$R_{d,EC5}^{(1)}$	$Q_{adm}^{(3)}$	R_k^*	$R_{d,EC5}^{(1)}$	$Q_{adm}^{(3)}$	R_k^*	$R_{d,EC5}^{(1)}$	$Q_{adm}^{(3)}$
[pcs - $\varnothing \times L$]	[°]	$L_{ROPE}=2$	$L_{ROPE}=4$	$L_{ROPE}=6$	[kN]	[kN]	[kg]	[kN]	[kN]	[kg]	[kN]	[kN]	[kg]
2 Ø11 x 100	30	3,8	7,3	10,7	5,27	2,25	229	11,64	4,97	393	6,63	2,83	344
	45	3,12	5,95	8,78	9,05	3,87	348	16,58	7,09	680	11,73	5,01	486
	60	2,25	4,25	6,25	10,49	4,48	469	13,27	5,67	688	11,49	4,91	595
	75	1,24	2,28	3,31	12,75	5,45	628	13,27	5,67	688	12,81	5,48	664
	90	0,26	0,26	0,26	13,20	5,64	688	13,27	5,67	688	13,27	5,67	688
2 Ø11 x 150	30	3,9	7,3	10,8	7,16	3,06	240	11,64	4,97	393	10,50	4,49	573
	45	3,19	6,02	8,85	12,91	5,52	395	20,16	8,62	680	18,57	7,94	810
	60	2,30	4,30	6,30	15,43	6,59	599	21,01	8,98	1146	18,19	7,78	992
	75	1,27	2,30	3,34	20,19	8,63	926	21,01	8,98	1146	20,29	8,67	1107
	90	0,26	0,26	0,26	20,98	8,97	1146	21,01	8,98	1146	21,01	8,98	1146
2 Ø11 x 200	30	4,0	7,4	10,9	8,31	3,55	243	11,64	4,97	393	14,22	6,08	802
	45	3,27	6,09	8,92	15,05	6,43	407	20,16	8,62	680	25,14	10,74	1134
	60	2,35	4,35	6,35	19,18	8,20	657	28,44	12,15	1178	24,63	10,53	1389
	75	1,29	2,33	3,36	27,34	11,68	1127	28,44	12,15	1604	27,47	11,74	1550
	90	0,26	0,26	0,26	28,40	12,14	1604	28,44	12,15	1604	28,44	12,15	1604
2 Ø11 x 250	30	4,1	7,5	11,0	8,92	3,81	245	11,64	4,97	393	17,83	7,62	1031
	45	3,34	6,16	8,99	15,58	6,66	412	20,16	8,62	680	31,52	13,47	1458
	60	2,40	4,40	6,40	21,81	9,32	686	34,92	14,92	1178	30,88	13,20	1786
	75	1,32	2,35	3,39	34,27	14,64	1264	35,66	15,24	2063	34,44	14,72	1992
	90	0,26	0,26	0,26	35,60	15,21	2063	35,66	15,24	2063	35,66	15,24	2063
2 Ø11 x 300	30	4,1	7,9	11,4	9,05	3,87	246	11,64	4,97	393	21,36	9,13	1083
	45	3,69	6,52	9,35	15,87	6,78	418	20,16	8,62	680	37,75	15,32	1532
	60	2,65	4,65	6,65	23,18	9,91	700	34,92	14,92	1178	36,99	15,81	1876
	75	1,45	2,48	3,52	41,05	17,54	1344	42,71	18,25	2093	41,26	17,63	2093
	90	0,26	0,26	0,26	42,70	18,25	2167	42,71	18,25	2167	42,71	18,25	2167

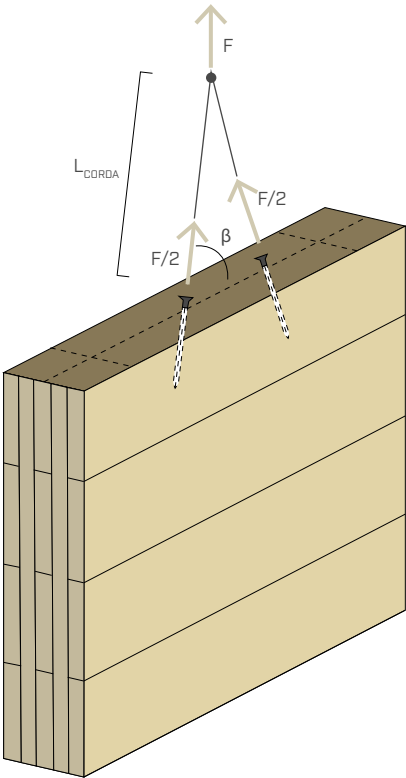
RECOMMENDED MINIMUM SOLUTION - VGS Ø11⁽⁵⁾

CLT PANEL WEIGHT				TYPE OF INSTALLATION ⁽⁶⁾						
t	h	L	weight ⁽⁷⁾	n _{SCREW}	perpendicular		perp. with slot		inclined	
[mm]	[m]	[m]	[kg]	[pcs]	β	L _{SCREW}	β	L _{SCREW}	β	L _{SCREW}
					[°]	[mm]	[°]	[mm]	[°]	[mm]
8	2,6	2	175	2	30	100	30	100	30	100
		6	524		75	100	60	100	45	100
		8	699		75	150	45	150	45	100
		10	874		75	200	60	150	45	100
		12	1048		75	200	60	200	45	100

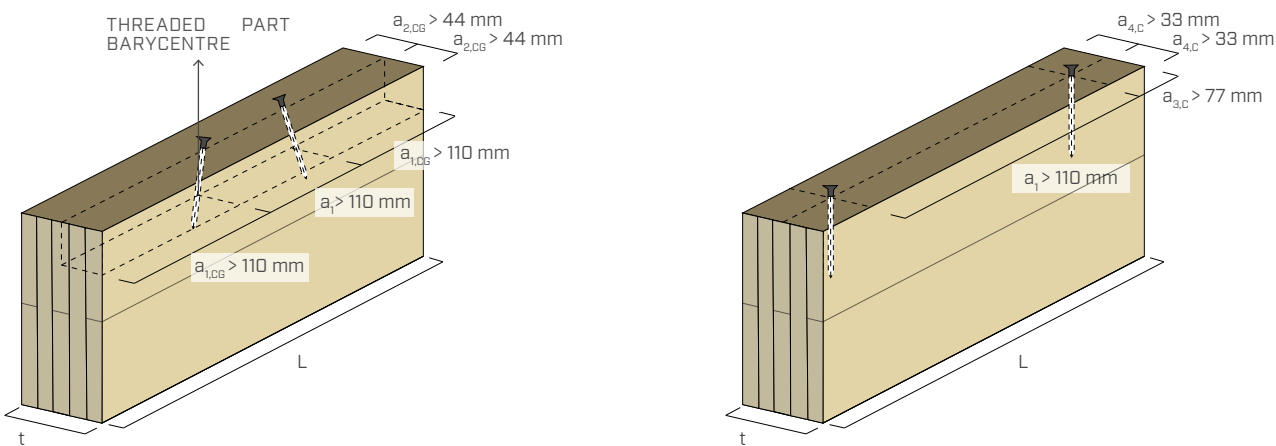
RECOMMENDED MINIMUM SOLUTION - VGS Ø11⁽⁵⁾

CLT PANEL WEIGHT				TYPE OF INSTALLATION ⁽⁶⁾					
t	h	L	weight ⁽⁷⁾	n _{SCREW}	perpendicular	perp. with slot	inclined		
[m]	[m]	[m]	[kg]	[pcs]	β	L _{SCREW}	β	L _{SCREW}	β
					[°]	[mm]	[°]	[mm]	[mm]
10	2,6	2	218	2	30	100	30	100	100
		6	655		45	100	30	100	100
		8	874		60	100	30	100	100
		10	1092		60	100	45	100	100
		12	1310		75	100	45	100	100
12	2,6	2	262	2	45	100	30	100	100
		6	786		75	150	45	200	200
		8	1048		75	200	60	200	200
		10	1310		75	250	60	300	300
		12	1572		75	300	60	300	300

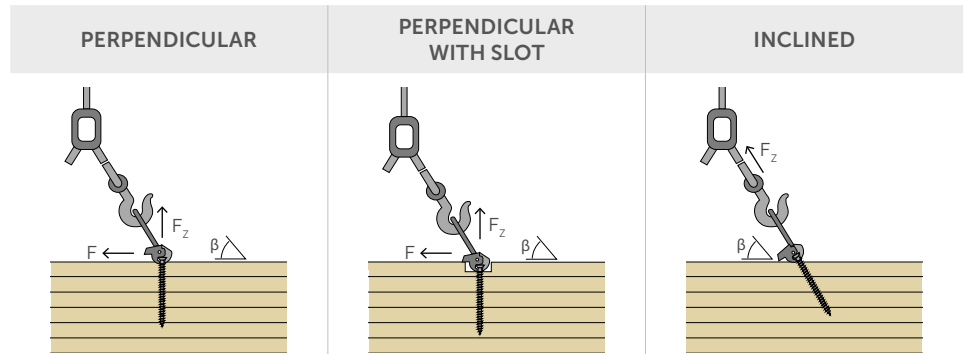
STATIC CONFIGURATION



MINIMUM DISTANCES



WASP ANCHOR WITH VGS Ø11 - HORIZONTAL PANEL - STATICALLY INDETERMINATE SYSTEM



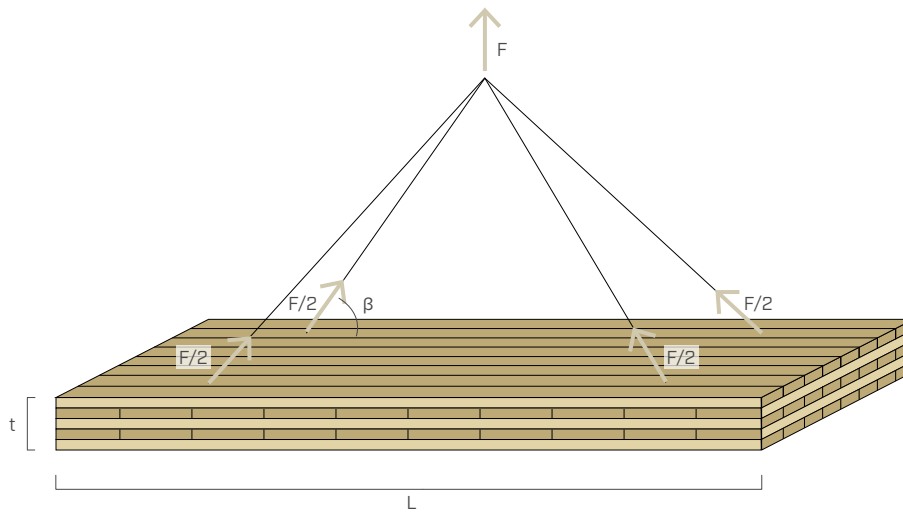
VGS SCREW [pcs - Ø x L]	t _{MIN} [mm]	β [°]	PERPENDICULAR			PERPENDICULAR WITH SLOT			INCLINED		
			R _k [kN]	R _{d,EC5} ⁽¹⁾ [kN]	Q _{adm} ⁽³⁾ [kg]	R _k [kN]	R _{d,EC5} ⁽¹⁾ [kN]	Q _{adm} ⁽³⁾ [kg]	R _k [kN]	R _{d,EC5} ⁽¹⁾ [kN]	Q _{adm} ⁽³⁾ [kg]
4 Ø11 x 100	100	30	5,50	2,35	229	11,64	4,97	393	8,39	3,59	344
		45	9,62	4,11	348	19,31	8,25	680	12,41	5,30	486
		60	12,85	5,49	469	19,31	8,25	688	15,92	6,80	595
		75	17,97	7,68	628	19,31	8,25	688	18,40	7,86	664
		90	19,31	8,25	688	19,31	8,25	688 ^[4]	19,31	8,25	688
4 Ø11 x 150	160	30	8,50	3,63	240	11,64	4,97	393	13,99	5,98	573
		45	14,92	6,38	395	20,16	8,62	680	20,68	8,84	810
		60	20,44	8,73	599	32,18	13,75	1146	26,54	11,34	992
		75	29,94	12,80	926	32,18	13,75	1146	30,67	13,11	1107
		90	32,18	13,75	1146	32,18	13,75	1146	32,18	13,75	1146
4 Ø11 x 200	200	30	9,05	3,87	243	11,64	4,97	393	19,58	8,37	802
		45	15,77	6,74	407	20,16	8,62	680	28,96	12,37	1134
		60	23,64	10,10	657	34,92	14,92	1178	37,15	15,88	1389
		75	41,92	17,92	1127	45,05	19,25	1604	42,93	18,35	1550
		90	45,05	19,25	1604	45,05	19,25	1604 ^[4]	45,05	19,25	1604
4 Ø11 x 250	260	30	9,10	3,89	245	11,64	4,97	393	25,18	10,76	1031
		45	16,12	6,89	412	20,16	8,62	680	37,23	15,32	1458
		60	25,03	10,70	686	34,92	14,92	1178	47,77	18,76	1786
		75	54,00	20,93	1264	57,92	20,93	2063	55,20	20,93	1992
		90	57,92	21,67	2063	57,92	21,67	2063	57,92	21,67	2063

⁽⁴⁾ The screw may protrude from the opposite side of the fastening with panel thickness of t_{MIN}

RECOMMENDED MINIMUM SOLUTION - VGS Ø11⁽⁵⁾

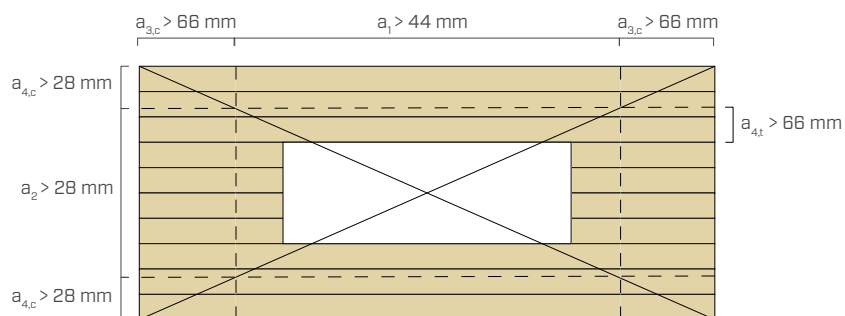
CLT PANEL WEIGHT				TYPE OF INSTALLATION ⁽⁶⁾						
t [mm]	h [m]	L [m]	weight ⁽⁷⁾ [kg]	n _{SCREW} [pcs]	perpendicular β [°]	L _{SCREW} [mm]	perp. with slot β [°]	L _{SCREW} [mm]	inclined β [°]	L _{SCREW} [mm]
8	2,6	2	175	4	-	-	-	-	30	100
		6	524		-	-	-	-	45	100
		8	699		-	-	-	-	75	100
		10	874		-	-	-	-	45	150
		12	1048		-	-	-	-	60	150
10	2,6	2	218	4	30	100	30	100	30	100
		6	655		75	100	45	100	60	100
		8	874		60	150	60	150	45	150
		10	1092		75	150	60	150	60	150
		12	1310		75	200	60	150	60	200
12	2,6	2	262	4	45	100	30	100	30	100
		6	786		60	150	45	100	75	100
		8	1048		75	150	60	150	60	150
		10	1310		75	200	60	150	75	150
		12	1572		75	200	75	200	60	200
20	2,6	2	437	4	60	100	30	100	45	100
		6	1310		75	200	60	150	60	150
		8	1747		75	250	75	200	90	200
24	2,6	2	524	4	60	100	45	100	45	100
		6	1572		75	200	75	200	60	200
		8	2097		90	250	90	250	90	250
32	2,6	2	699	4	75	100	45	100	75	100
		6	2097		90	250	90	250	90	250

STATIC CONFIGURATION

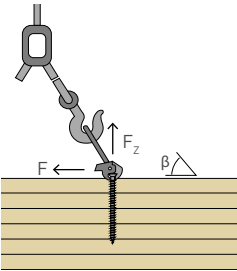
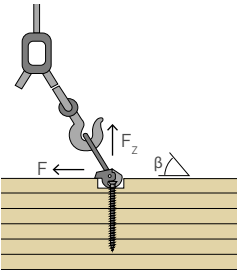
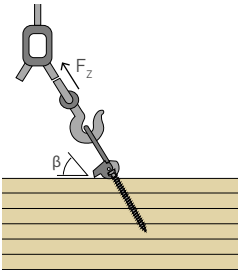


MINIMUM DISTANCES

SCREWS INSERTED WITHOUT PRE-DRILLING HOLE



■ WASP ANCHOR WITH VGS Ø11 - HORIZONTAL PANEL - STATICALLY DETERMINATE

			PERPENDICULAR			PERPENDICULAR WITH SLOT			INCLINED		
											
VGS SCREW	t	β	R _k	R _{d,EC5} ⁽¹⁾	Q _{adm} ⁽³⁾	R _k	R _{d,EC5} ⁽¹⁾	Q _{adm} ⁽³⁾	R _k	R _{d,EC5} ⁽¹⁾	Q _{adm} ⁽³⁾
[pcs - Ø x L]	[mm]	[°]	[kN]	[kN]	[kg]	[kN]	[kN]	[kg]	[kN]	[kN]	[kg]
4 Ø11 x 100	100	30	11,00	4,70	458	23,28	9,95	785	16,79	7,17	688
		45	19,23	8,22	695	38,61	16,50	1360	24,82	10,61	972
		60	25,70	10,98	938	38,61	16,50	1375	31,84	13,61	1191
		75	35,93	15,36	1256	38,61	16,50	1375	36,80	15,73	1328
		90	38,61	16,50	1375	38,61	16,50	1375 ⁽⁴⁾	38,61	16,50	1375
4 Ø11 x 150	160	30	17,00	7,26	480	23,28	9,95	785	27,98	11,96	1146
		45	29,84	12,75	790	40,32	17,23	1360	41,37	17,68	1620
		60	40,88	17,47	1198	64,35	27,50	2292	53,07	22,68	1985
		75	59,89	25,59	1851	64,35	27,50	2292	61,34	26,21	2214
		90	64,35	27,50	2292	64,35	27,50	2292	64,35	27,50	2292
4 Ø11 x 200	200	30	18,10	7,74	487	23,28	9,95	785	39,17	16,74	1604
		45	31,54	13,48	813	40,32	17,23	1360	57,91	24,75	2269
		60	47,28	20,21	1313	69,84	29,84	2356	74,30	31,75	2778
		75	83,84	35,83	2254	90,09	38,50	3208	85,87	36,70	3099
		90	90,09	38,50	3208	90,09	38,50	3208 ⁽⁴⁾	90,09	38,50	3208
4 Ø11 x 250	260	30	18,20	7,78	490	23,28	9,95	785	50,36	21,52	2063
		45	32,24	13,78	825	40,32	17,23	1360	74,46	30,64	2917
		60	50,06	21,39	1371	69,84	29,84	2356	95,53	37,53	3572
		75	107,99	41,86	2528	115,83	41,86	4125	110,40	41,86	3984
		90	115,83	43,33	4125	115,83	43,33	4125	115,83	43,33	4125

■ ⁽⁴⁾ The screw may protrude from the opposite side of the fastening with panel thickness of t_{MIN}

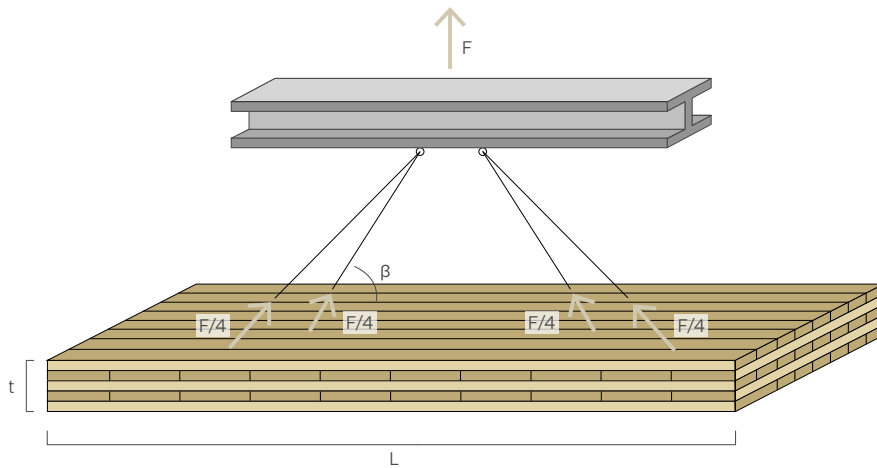
■ RECOMMENDED MINIMUM SOLUTION - VGS Ø11⁽⁵⁾

CLT PANEL WEIGHT				TYPE OF INSTALLATION ⁽⁶⁾						
t	h	L	weight ⁽⁷⁾	n _{SCREW}	perpendicular		perp. with slot		inclined	
[mm]	[m]	[m]	[kg]	[pcs]	β	L _{SCREW}	β	L _{SCREW}	β	L _{SCREW}
					[°]	[mm]	[°]	[mm]	[°]	[mm]
8	2,6	2	175	4	-	-	-	-	30	100
		6	524		-	-	-	-	30	100
		8	699		-	-	-	-	30	100
		10	874		-	-	-	-	45	100
		12	1048		-	-	-	-	45	100
10	2,6	2	218	4	30	100	30	100	30	100
		6	655		45	100	30	100	30	100
		8	874		60	100	30	100	45	100
		10	1092		60	100	45	100	60	100
		12	1310		75	100	45	100	60	100

RECOMMENDED MINIMUM SOLUTION - VGS Ø11⁽⁵⁾

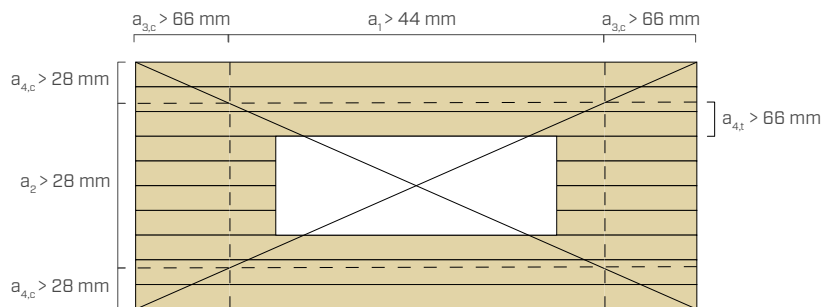
CLT PANEL WEIGHT				TYPE OF INSTALLATION ⁽⁶⁾						
t	h	L	weight ⁽⁷⁾	n _{SCREW} [pcs]	perpendicular		perp. with slot		inclined	
[mm]	[m]	[m]	[kg]		β	L _{SCREW} [mm]	β	L _{SCREW} [mm]	β	L _{SCREW} [mm]
12	2,6	2	262	4	30	100	30	100	30	100
		6	786		45	100	30	100	45	100
		8	1048		60	100	30	100	45	100
		10	1310		75	100	45	100	60	100
		12	1572		90	100	45	100	75	100
20	2,6	2	437	4	30	100	30	100	30	100
		6	1310		75	100	45	100	45	100
		8	1747		60	150	60	150	45	150
		10	2184		75	150	60	150	60	150
		12	2621		75	150	60	150	75	150
24	2,6	2	524	4	45	100	30	100	30	100
		6	1572		90	100	45	100	75	100
		8	2097		75	150	60	150	60	150
		10	2621		75	200	60	150	60	150
		12	3145		75	200	60	200	45	200
32	2,6	2	699	4	45	100	30	100	30	100
		6	2097		75	150	60	150	60	150
		8	2796		75	200	60	200	60	200
		10	3494		75	200	75	200	75	200
		12	4193		90	250	90	250	90	250

STATIC CONFIGURATION

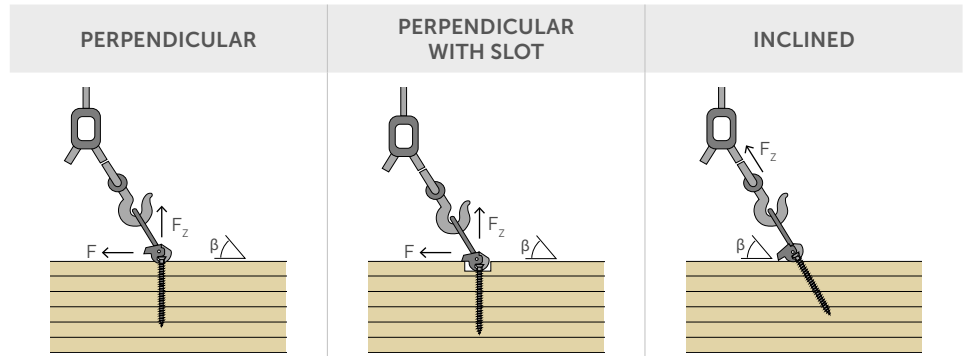


MINIMUM DISTANCES

SCREWS INSERTED WITHOUT PRE-DRILLING HOLE



WASP ANCHOR WITH VGS Ø11 - BEAM



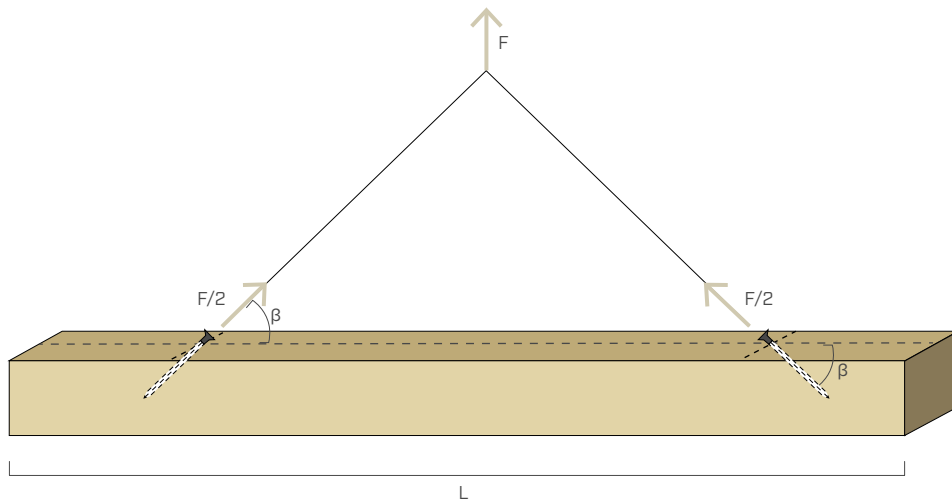
VGS SCREW [pcs - Ø x L]	H _{MIN} [mm]	β [°]	R _k [kN]	R _{d,EC5} ⁽¹⁾ [kN]	Q _{adm} ⁽³⁾ [kg]	R _k [kN]	R _{d,EC5} ⁽¹⁾ [kN]	Q _{adm} ⁽³⁾ [kg]	R _k [kN]	R _{d,EC5} ⁽¹⁾ [kN]	Q _{adm} ⁽³⁾ [kg]
2 Ø11 x 100	100	30	5,50	2,35	229	11,64	4,97	393	8,39	3,59	344
		45	9,62	4,11	348	19,31	8,25	680	12,41	5,30	486
		60	12,85	5,49	469	19,31	8,25	688	15,92	6,80	595
		75	17,97	7,68	628	19,31	8,25	688	18,40	7,86	664
		90	19,31	8,25	688	19,31	8,25	688 ^[4]	19,31	8,25	688
2 Ø11 x 150	160	30	8,50	3,63	240	11,64	4,97	393	13,99	5,98	573
		45	14,92	6,38	395	20,16	8,62	680	20,68	8,84	810
		60	20,44	8,73	599	32,18	13,75	1146	26,54	11,34	992
		75	29,94	12,80	926	32,18	13,75	1146	30,67	13,11	1107
		90	32,18	13,75	1146	32,18	13,75	1146 ^[4]	32,18	13,75	1146
2 Ø11 x 200	200	30	9,05	3,87	243	11,64	4,97	393	19,58	8,37	802
		45	15,77	6,74	407	20,16	8,62	680	28,96	12,37	1134
		60	23,64	10,10	657	34,92	14,92	1178	37,15	15,88	1389
		75	41,92	17,92	1127	45,05	19,25	1604	42,93	18,35	1550
		90	45,05	19,25	1604	45,05	19,25	1604 ^[4]	45,05	19,25	1604
2 Ø11 x 250	260	30	9,10	3,89	245	11,64	4,97	393	25,18	10,76	1031
		45	16,12	6,89	412	20,16	8,62	680	37,23	15,32	1458
		60	25,03	10,70	686	34,92	14,92	1178	47,77	18,76	1786
		75	54,00	20,93	1264	57,92	20,93	2063	55,20	20,93	1992
		90	57,92	21,67	2063	57,92	21,67	2063 ^[4]	57,92	21,67	2063

^[4] The screw may protrude from the opposite side of the fastening with beams height of H_{MIN}

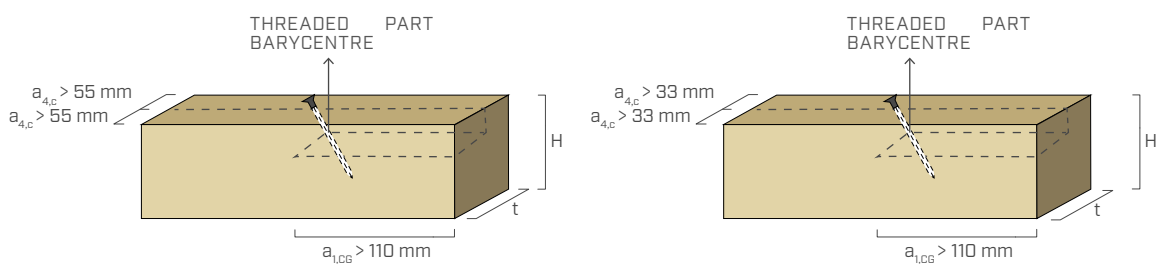
RECOMMENDED MINIMUM SOLUTION - VGS Ø11⁽⁵⁾

BEAM WEIGHT				TYPE OF INSTALLATION ⁽⁶⁾						
t	H	L	weight ⁽⁷⁾	n _{SCREW}	perpendicular	perp. with slot	inclined			
[mm]	[m]	[m]	[kg]	[pcs]	β	L _{SCREW}	β	L _{SCREW}	β	L _{SCREW}
					[°]	[mm]	[°]	[mm]	[°]	[mm]
12	0,24	3,5	42	2	30	100	30	100	30	100
		6	73		30	100	30	100	30	100
		8	97		30	100	30	100	30	100
		12	145		30	100	30	100	30	100
		18	218		30	100	30	100	30	100
16	0,28	3,5	66	2	30	100	30	100	30	100
		6	113		30	100	30	100	30	100
		8	151		30	100	30	100	30	100
		12	226		30	100	30	100	30	100
		18	339		45	100	30	100	30	100
20	0,4	3,5	118	2	30	100	30	100	30	100
		6	202		30	100	30	100	30	100
		8	269		45	100	30	100	30	100
		12	403		45	100	30	100	45	100
		18	605		75	100	30	100	60	100
24	2,6	2	524	2	45	100	30	100	30	100
		6	1572		60	100	45	100	45	100
		8	2097		75	100	45	100	75	100
		10	2621		75	150	60	150	60	150
		12	3145		75	200	75	200	60	200
32	2,6	2	699	2	60	100	30	100	45	100
		6	2097		75	100	45	100	75	100
		8	2796		75	150	60	150	60	150
		10	3494		75	200	60	200	60	200
		12	4193		90	250	90	250	90	250

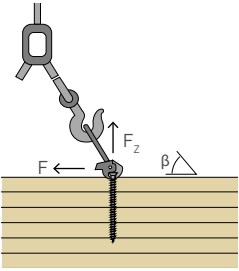
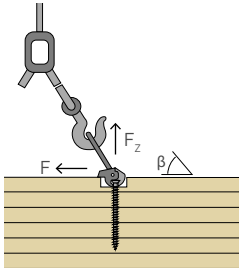
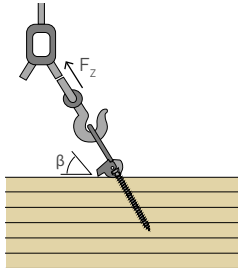
STATIC CONFIGURATION



MINIMUM DISTANCES



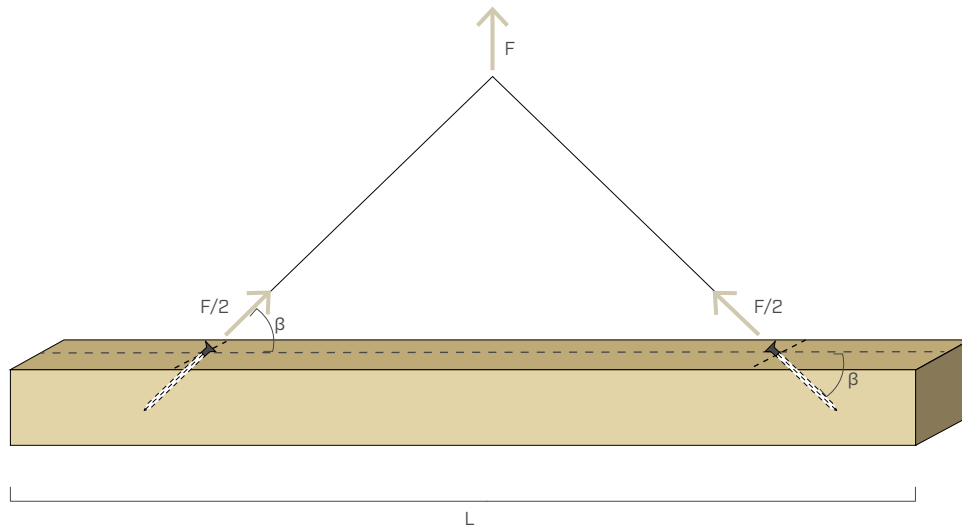
WASP ANCHOR WITH HBS Ø10 - BEAM

		PERPENDICULAR			PERPENDICULAR WITH SLOT			INCLINED		
										
HBS SCREW	β	R_k	$R_{d,EC5}^{(1)}$	$Q_{adm}^{(3)}$	R_k	$R_{d,EC5}^{(1)}$	$Q_{adm}^{(3)}$	R_k	$R_{d,EC5}^{(1)}$	$Q_{adm}^{(3)}$
[pcs - Ø x L]	[°]	[kN]	[kN]	[kg]	[kN]	[kN]	[kg]	[kN]	[kN]	[kg]
2 Ø10 x 80	30	4,15	1,77	171	11,64	4,97	393	5,29	2,26	217
	45	6,43	2,75	259	12,17	5,20	433	7,82	3,34	306
	60	8,92	3,81	339	12,17	5,20	433	10,04	4,29	375
	75	11,11	4,75	402	12,17	5,20	433	11,60	4,96	419
	90	12,17	5,20	433	12,17	5,20	433	12,17	5,20	433
2 Ø10 x 100	30	5,05	2,16	183	11,64	4,97	393	5,29	2,26	217
	45	7,57	3,23	271	12,17	5,20	433	7,82	3,34	306
	60	9,79	4,18	354	12,17	5,20	433	10,04	4,29	375
	75	11,49	4,91	411	12,17	5,20	433	11,60	4,96	419
	90	12,17	5,20	433	12,17	5,20	433	12,17	5,20	433
2 Ø10 x 120-140	30	5,55	2,37	188	11,64	4,97	393	6,10	2,61	250
	45	8,34	3,57	289	14,04	6,00	500	9,03	3,86	354
	60	11,09	4,74	382	14,04	6,00	500	11,58	4,95	433
	75	13,14	5,61	467	14,04	6,00	500	13,38	5,72	483
	90	14,04	6,00	500	14,04	6,00	500	14,04	6,00	500
2 Ø10 x 160-280	30	6,30	2,69	192	11,64	4,97	393	8,14	3,48	333
	45	9,83	4,20	312	18,38	7,86	667	12,03	5,14	471
	60	13,68	5,85	447	18,72	8,00	667	15,44	6,60	577
	75	17,19	7,35	588	18,72	8,00	667	17,84	7,63	644
	90	18,72	8,00	667	18,72	8,00	667	18,72	8,00	667
2 Ø10 x 300-400	30	7,05	3,01	196	11,64	4,97	393	10,17	4,35	417
	45	11,24	4,80	324	18,38	7,86	680	15,04	6,43	589
	60	16,11	6,88	491	22,52	9,62	833	19,30	8,25	722
	75	20,96	8,96	700	23,40	10,00	833	22,30	9,53	805
	90	23,40	10,00	833	23,40	10,00	833	23,40	10,00	833

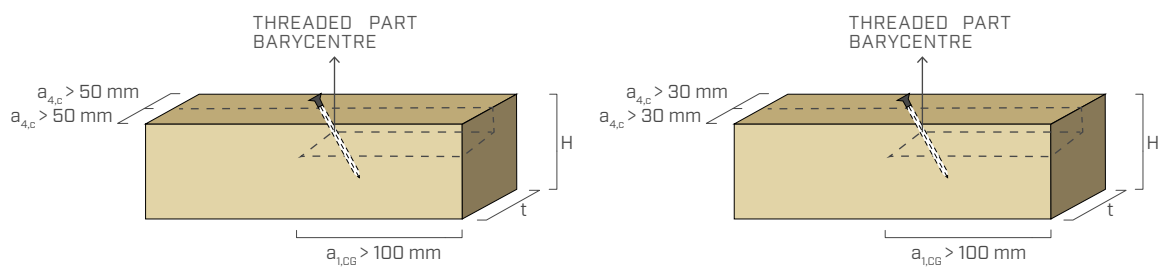
RECOMMENDED MINIMUM SOLUTION - HBS Ø10^[5]

BEAM WEIGHT				TYPE OF INSTALLATION ⁽⁶⁾						
t	h	L	weight ⁽⁷⁾	n _{SCREW}	perpendicular	perp. with slot	inclined			
[mm]	[m]	[m]	[kg]	[pcs]	β	L _{SCREW}	β	L _{SCREW}	β	L _{SCREW}
					[°]	[mm]	[°]	[mm]	[°]	[mm]
12	0,24	3,5	42	2	30	80	30	80	30	80
		6	73		30	80	30	80	30	80
		8	97		30	80	30	80	30	80
		12	145		30	80	30	80	30	80
		18	218		45	80	45	80	30	80
16	0,28	3,5	66	2	30	80	30	80	30	80
		6	113		30	80	30	80	30	80
		8	151		30	80	30	80	30	80
		12	226		45	80	45	80	45	80
		18	339		60	80	60	80	60	80
20	0,4	3,5	118	2	30	80	30	80	30	80
		6	202		45	80	45	80	45	80
		8	269		60	80	45	80	45	80
		12	403		75	80	75	80	60	80
		18	605		75	160-280	75	160-280	60	160-280
26	0,8	3,5	306	2	60	80	60	80	45	80
		6	524		75	120-140	75	120-140	75	120-140
		8	699		75	160-280	75	160-280	75	160-280
28	1	3,5	412	2	75	80	75	80	60	80
		6	706		75	300-400	45	160-280	75	160-280
		8	941		90	300-400	60	300-400	60	300-400

STATIC CONFIGURATION



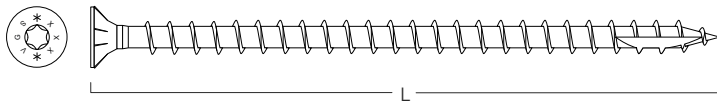
MINIMUM DISTANCES



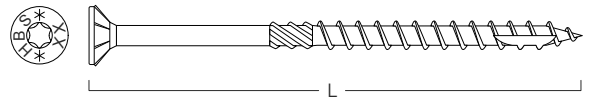
CONNECTORS



VGS



HBS

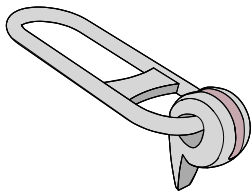


- VGS Ø 11 SCREW** - Full thread connector with countersunk head L = 100 - 400 mm*
- HBS Ø 10 SCREW - Partially threaded countersunk screw L = 80 - 400 mm*
- A pulse screw gun may be used to install the screws

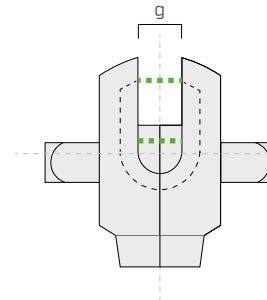
* The choice of fastener length is to be based each time on the dimensions of the wooden element, on the fastener's positioning, on the lift angle, on the weight of the load to be lifted and on the arrangement of the hooks

** VGS11100, VGS11150, VGS11200, VGS11250, VGS11300

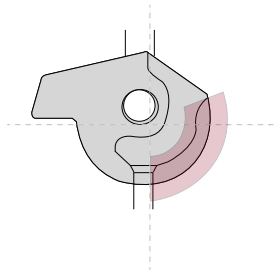
REPLACEMENT CRITERIA



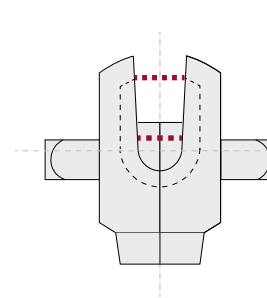
Isometric view of the WASP anchor. The part of the anchor that must be checked is highlighted in red.



Bottom view of the WASP anchor round head. The distance between the flanges corresponding to the closure of the eyelet is equal to that of the opening of the eyelet. Check passed.



Section view of the WASP anchor round head. The part of the eyelet subject to checking is highlighted in red.



Bottom view of the anchor round head. The distance between the flanges corresponding to the closure of the eyelet is equal to that of the opening of the eyelet. Check NOT passed.

MAINTENANCE

- Prior to the inspection, the anchor's round head should be cleaned;
- Even if, under normal conditions, the lifting anchor does not show signs of wear, it should still be checked annually by a qualified person. Damage due to wear must be verified. Plastic deformation (e.g. irreversible bending or crushing) and cracks will result in replacement of the anchor;
- If the g is higher than 12 mm the lifting anchor will need to be replaced immediately. However, if the g

is less than or equal to 12 mm, the anchor can be reused:

$$g \leq 12 \text{ mm}$$

- Anchor repairs, and in particular welding, are prohibited.

GENERAL CONSIDERATIONS

The following specifications must be observed:

- For safety reasons, the SCREWS may only be used once;
- It is important to respect the minimum timber thickness specified and the minimum distances between the SCREWS and the edge of the timber element. The minimum distance always refers to the barycentre of the threaded part of the timber;
- When lifting with more than 3 anchor points not positioned on the same line, each anchor system must be sized so that two hooks can support the entire load. Using appropriate measures (e.g. transversal compensation), fastenings with more than 3 attachment points can be considered a statically determinate system. For statically determinate systems, all anchor points can be considered when calculating the loads to be lifted;
- The anchor points must always be positioned so as to ensure the barycentre of the item to be transported is below the attachment point in a vertical axes. If using ropes of equal length, the force on the anchor point can be determined from the total weight of the component divided by the number of determinate anchor points. Otherwise, it is necessary to determine the force on each anchor point. When the suspension points are mounted on the face of the panel components, the anchor points and the barycentre must always be vertical;
- The dynamic coefficient ϕ_2 is determined using the relation between the type of lifting device used (according to the UNI EN 1991-3:2006 standard) and the lifting speed. The load capacity of the anchor points referred to in the load tables must be multiplied by the corresponding dynamic load coefficient. For further information, consult the calculation examples.

NOTES

- ⁽¹⁾ The characteristic load bearing capacity values have been calculated according to ETA 11/0030, according with EN 1995:2014 standard.
To move from the characteristic values to the project values the coefficients were applied:
 $K_{mod}=0,9$; $\gamma_m=1,3$; $\gamma_G=1,35$ and $\phi_2=1,2$
- ⁽³⁾ The admissible load bearing capacity values are calculated according to the DIN 1052:1998 standard
- ⁽⁴⁾ The screw may protrude from the opposite side of the fastening with panel thickness of H_{MIN} or with beams height of H_{MIN}
- ⁽⁵⁾ The suggested solutions do not consider any potential strain or disbandment of timber elements
- ⁽⁶⁾ Considering a coefficient $\gamma_m=1,30$ (EC5) and a dynamic coefficient $\phi_2=1,2$
- ⁽⁷⁾ Considering a mass density equal to $\rho_m=420\text{kg/m}^3$

GENERAL PRINCIPLES

Design values can be obtained from characteristic values as follows:

$$R_d = \min \left\{ \begin{array}{l} \frac{R_k \cdot K_{mod}}{\phi_2 \cdot \gamma_G \cdot \gamma_m} \\ 13000 \cdot x \cdot \sin(\beta) \quad [N] \end{array} \right.$$

- The load bearing capacity can be obtained as follows:

$$Q_{adm} = \min \left\{ \begin{array}{l} \frac{Q_{adm}}{\phi_2} \\ 13000 \cdot x \cdot \sin(\beta) \quad [N] \end{array} \right.$$

- The coefficients γ_m , K_{mod} and γ_m should be taken according to the current regulations used for the calculation:
 K_{mod} = correction coeff.
 γ_m = partial safety coeff.
 γ_G = load combination coeff.
 ϕ_2 = dynamic coefficient

- For values differing from ϕ_2 , carry out the following operation:

$$R_R \times \frac{1,2}{\phi_2}$$

- Typical ϕ_2 coefficient values as a function of the lifting speed and the hoisting class:

DYNAMIC LOAD COEFFICIENT ϕ_2

HOISTING CLASS	LIFTING SPEED. [m/min]		
	20	50	90
HC1	1,1	1,2	1,3
HC2	1,2	1,4	1,6
HC3	1,3	1,6	1,9
HC4	1,4	1,8	2,2

For the ϕ_2 calculation criteria and crane classification according to hoisting class, see EN 1991-3-2006;

- For hooks with more than three anchor points, which are not all in line, the anchor systems must be sized so that two anchors can support the entire load. Using appropriate measures (e.g. through stabilisation rods), fastenings with more than 3 attachment points can be considered as statically designed. For statically determinate hooks, all anchor points must be used for lifting loads;
- For the calculation process a timber density $\rho_k=350\text{kg/m}^3$ has been considered. Characteristic resistances can also be considered as valid for larger densities, for the purposes of safety;
- The values were calculated considering the threaded part as being completely inserted into the timber element;
- The shear characteristic resistances are calculated for SCREWS inserted without pre-drilled holes. In the case of SCREWS inserted with pre-drilled holes, greater resistance values can be obtained.

- FASTENING
- AIRTIGHTNESS AND WATERPROOFING
- SOUNDPROOFING
- FALL PROTECTION
- TOOLS AND MACHINES

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