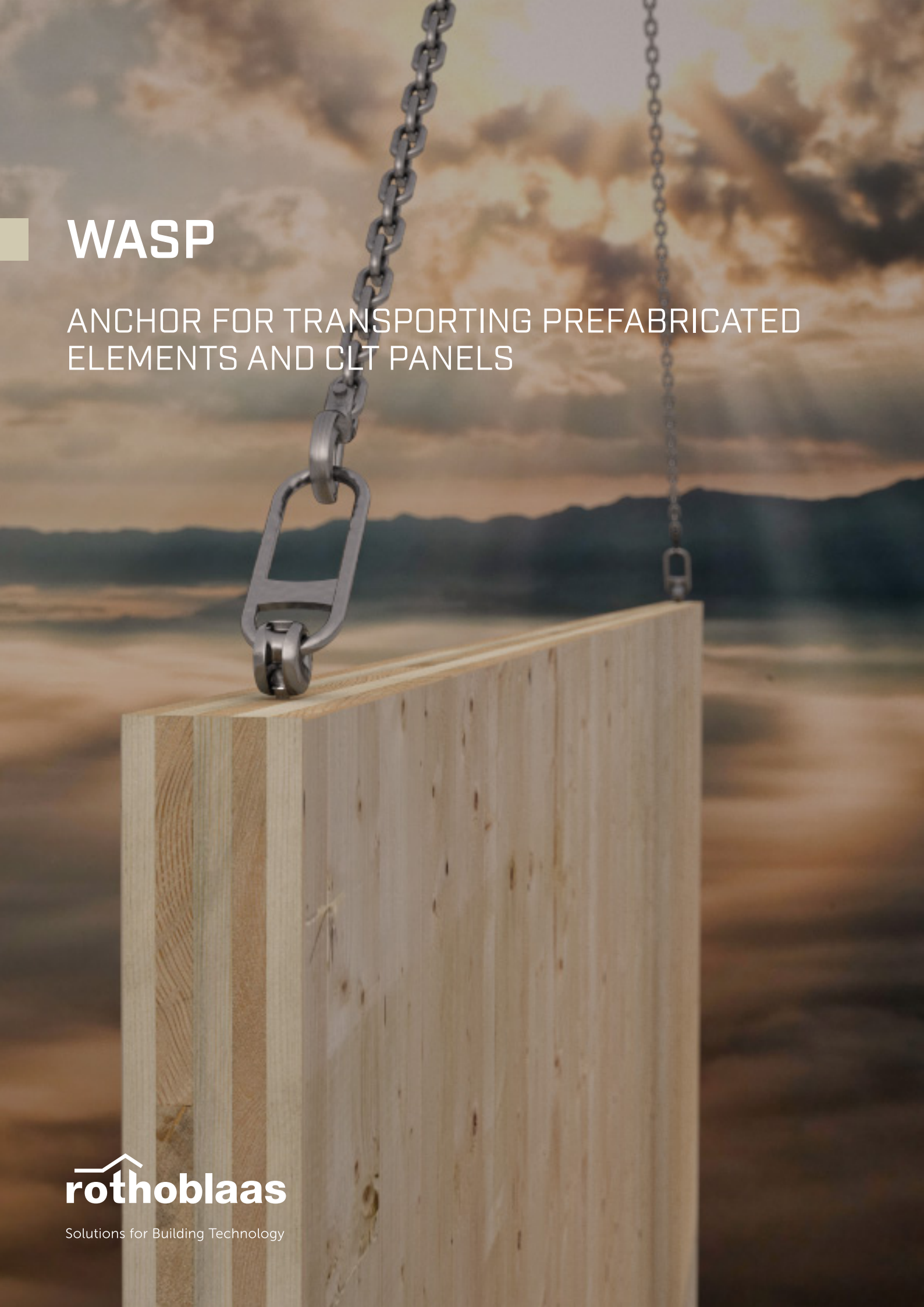


WASP

ANCHOR FOR TRANSPORTING PREFABRICATED ELEMENTS AND CLT PANELS

rothoblaas

Solutions for Building Technology

WASP

CE
DM 2006/42/CE

ANCHOR FOR TRANSPORTING PREFABRICATED ELEMENTS AND CLT PANELS

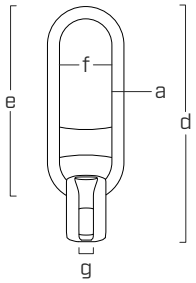
STABLE
The built-in jaws hold down the screw head in the wall.

EFFECTIVE
Can be used for axial and transversal loads.

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

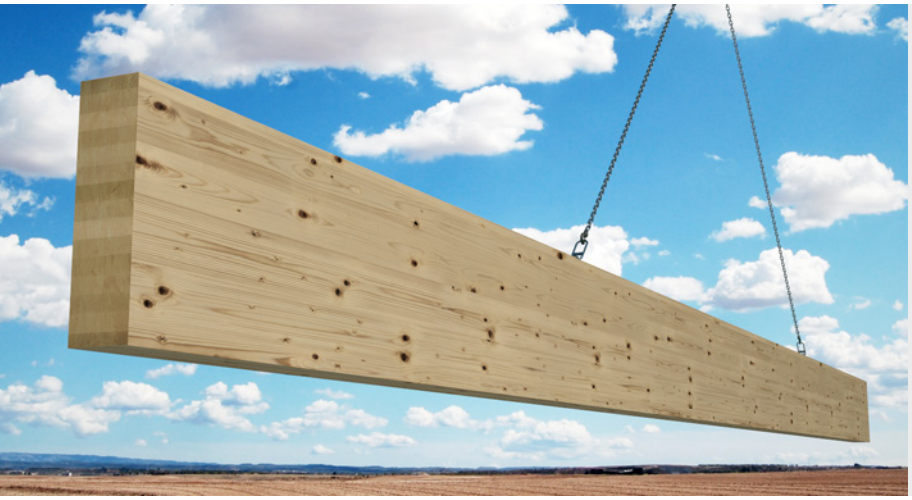
GEOMETRY

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



CODES AND DIMENSIONS

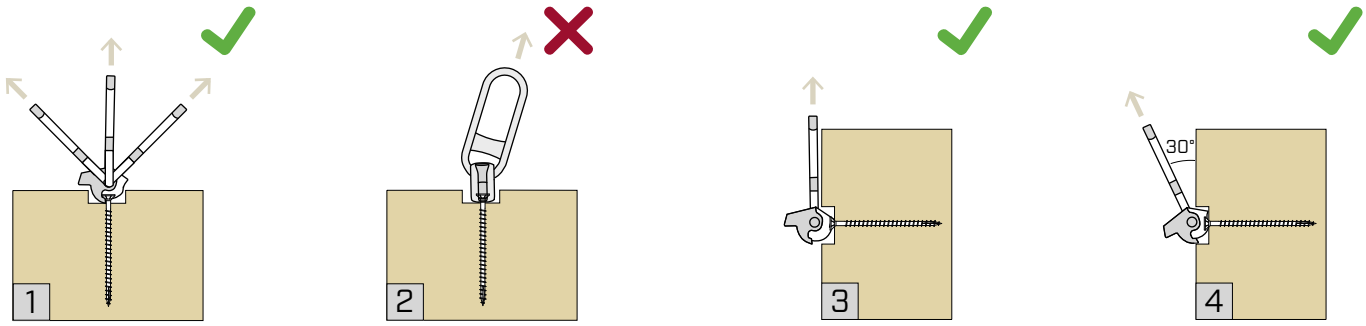
CODE	description	max. capacity [kg]	pcs
WASP	anchor	1300	2



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

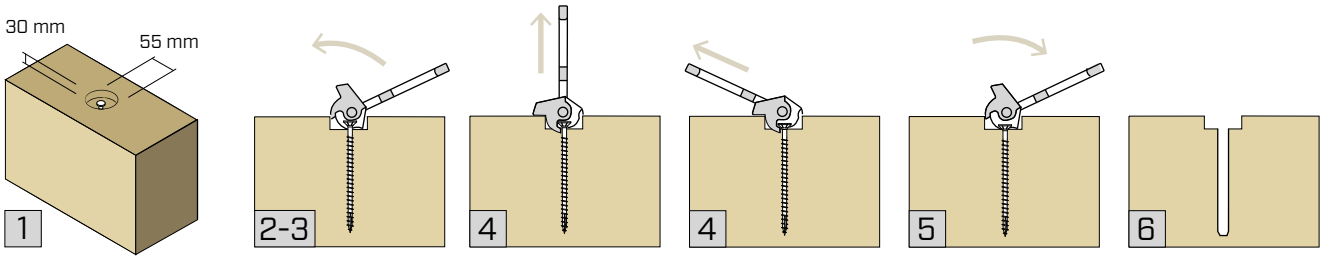


1. Lift in the direction of the connector axis or at an angle
2. Do not lift laterally to the connector's insertion opening

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

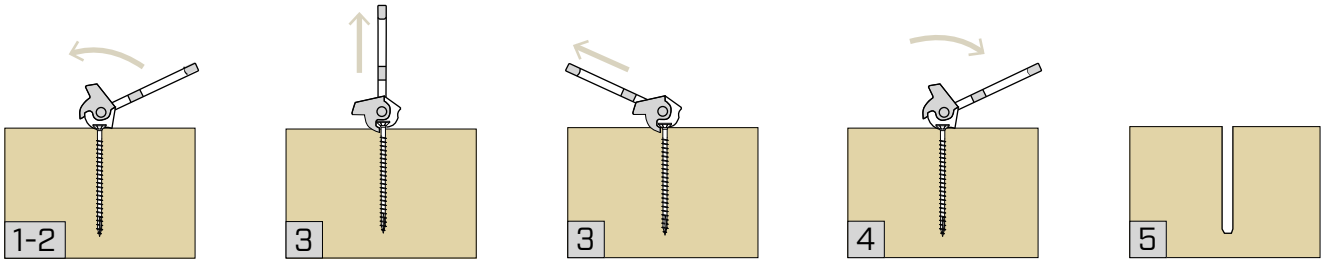
WASP INSTALLATION

PERPENDICULAR INSTALLATION WITH SLOT



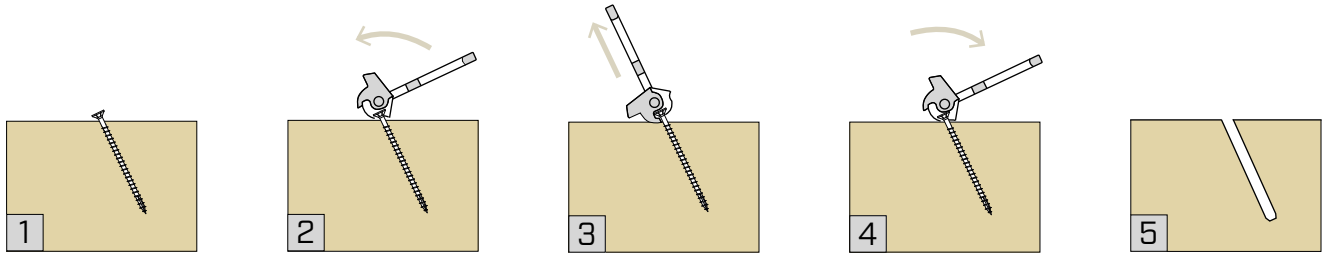
1. Drilling of slot for the WASP
2. Insertion of the screw into the timber element to be lifted
3. WASP positioning
4. Lifting of the structure (perpendicular or inclined force)
5. WASP removal (unhooking)
6. Removing the screw (optional)

PERPENDICULAR INSTALLATION



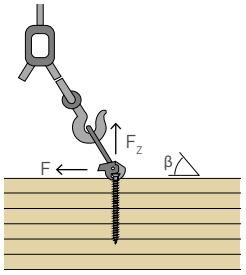
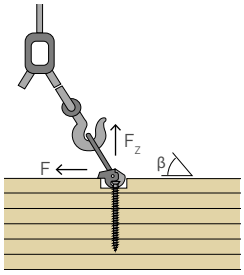
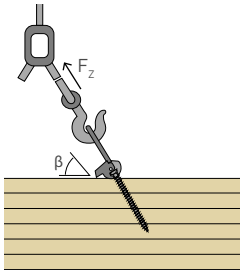
1. Insertion of the screw into the timber element to be lifted
2. WASP positioning
3. Lifting of the structure (perpendicular or inclined force)
4. WASP removal (unhooking)
5. Removing the screw (optional)

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 - Ø x 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*

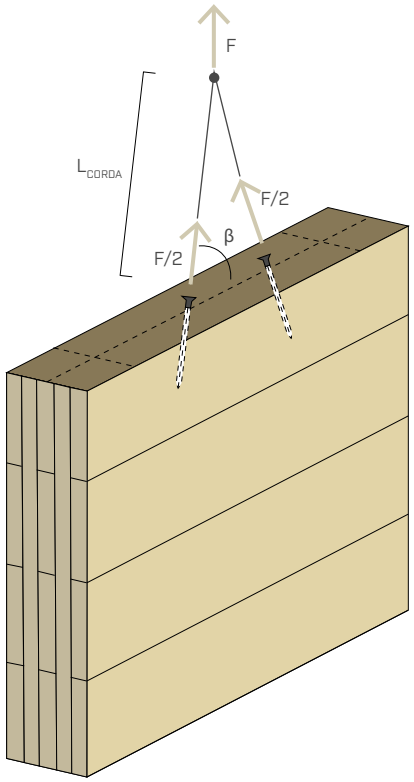
RECOMMENDED MINIMUM SOLUTION - VGS Ø11 (5)

CLT PANEL WEIGHT					TYPE OF INSTALLATION (6)					
					perpendicular		perp. with slot		inclined	
t	h	L	weight (7)	n_{SCREW}	β	L_{SCREW}	β	L_{SCREW}	β	L_{SCREW}
[mm]	[m]	[m]	[kg]	[pcs]	[°]	[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**

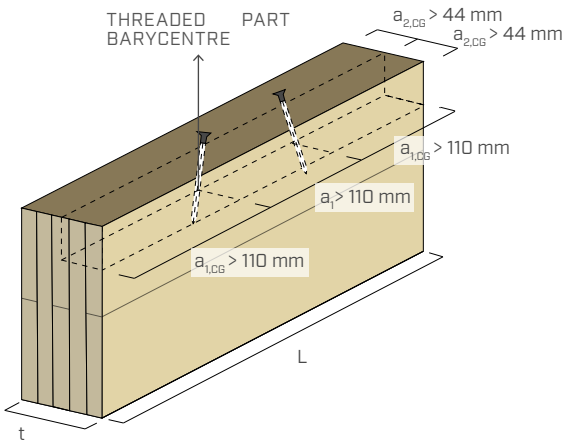
RECOMMENDED MINIMUM SOLUTION - VGS Ø11[5]

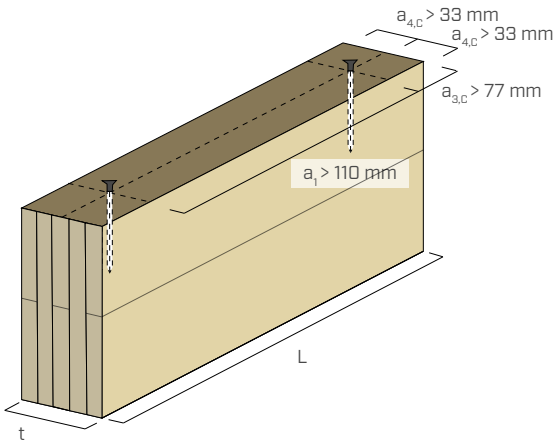
CLT PANEL WEIGHT				TYPE OF INSTALLATION[6]							
					perpendicular		perp. with slot		inclined	
t	h	L	weight[7]	n_{SCREW}	β	L_{SCREW}	β	L_{SCREW}	β	L_{SCREW}
[mm]	[m]	[m]	[kg]	[pcs]	[°]	[mm]	[°]	[mm]	[°]	[mm]
10	2,6	2	**218**	**2**	30	**100**	30	**100**	30	**100**
		6	**655**		45	**100**	30	**100**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

STATIC CONFIGURATION

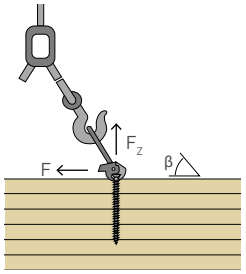
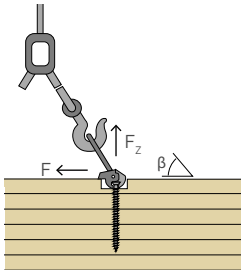
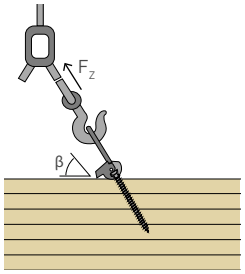


MINIMUM DISTANCES





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

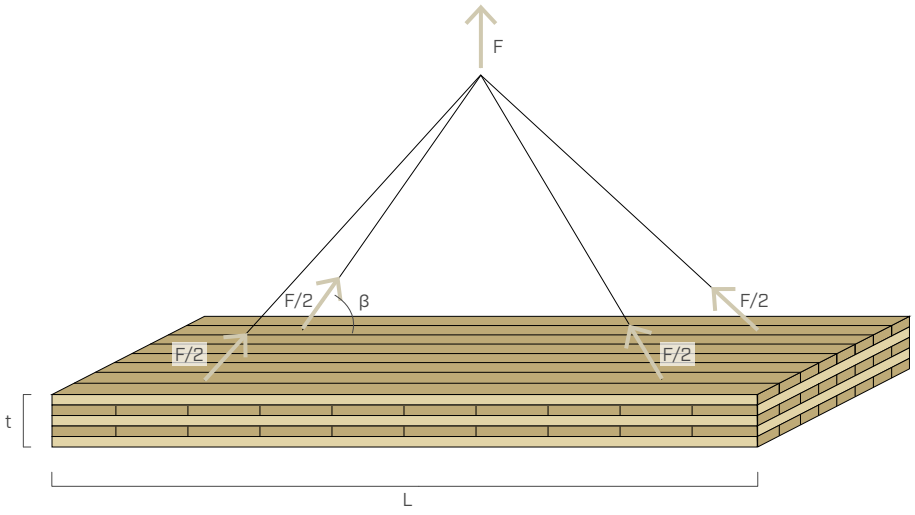
			PERPENDICULAR			PERPENDICULAR WITH SLOT			INCLINED		
											
VGS SCREW	t_{MIN}	β	R_k	$R_{d,EC5}$ (1)	Q_{adm} (3)	R_k	$R_{d,EC5}$ (1)	Q_{adm} (3)	R_k	$R_{d,EC5}$ (1)	Q_{adm} (3)
[pcs - Ø x L]	[mm]	[°]	[kN]	[kN]	[kg]	[kN]	[kN]	[kg]	[kN]	[kN]	[kg]
4 Ø11 x 100	100	30	5,50	**2,35**	*229*	11,64	**4,97**	*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]

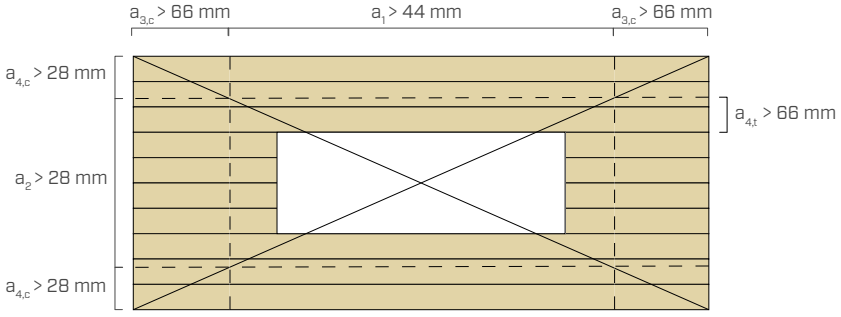
CLT PANEL WEIGHT					TYPE OF INSTALLATION[6]					
					perpendicular		perp. with slot		inclined	
t	h	L	weight[7]	n_{SCREW}	β	L_{SCREW}	β	L_{SCREW}	β	L_{SCREW}
[mm]	[m]	[m]	[kg]	[pcs]	[°]	[mm]	[°]	[mm]	[°]	[mm]
8	2,6	2	**175**	4	-	-	-	-	30	**100**
		6	**524**		-	-	-	-	45	**100**
		8	**699**		-	-	-	-	75	**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

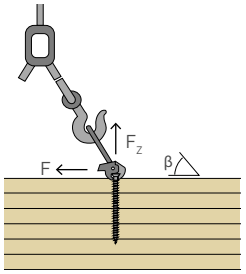
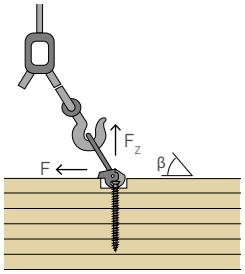
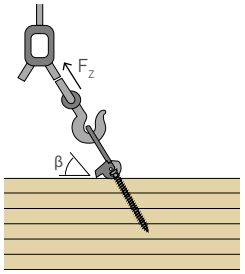


MINIMUM DISTANCES

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}

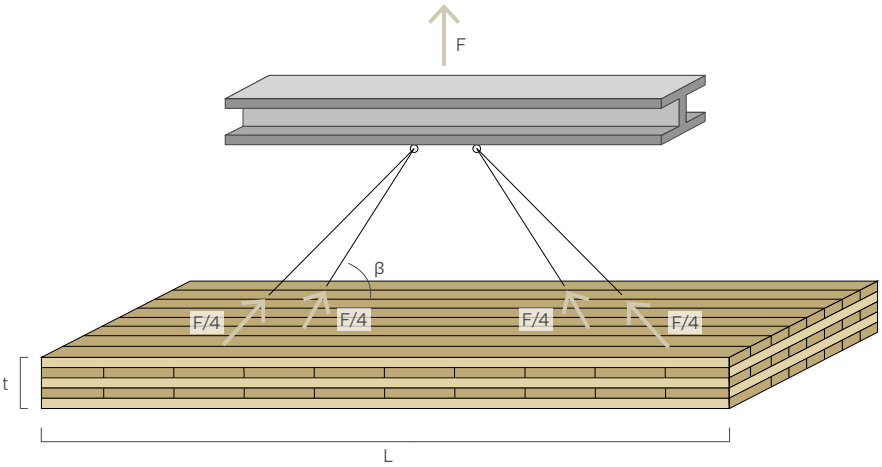
RECOMMENDED MINIMUM SOLUTION - VGS Ø11[5]

CLT PANEL WEIGHT				TYPE OF INSTALLATION[6]							
					perpendicular		perp. with slot		inclined		
t	h	L	weight[7]	n_{SCREW}	β	L_{SCREW}	β	L_{SCREW}	β	L_{SCREW}	
[mm]	[m]	[m]	[kg]	[pcs]	[°]	[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]

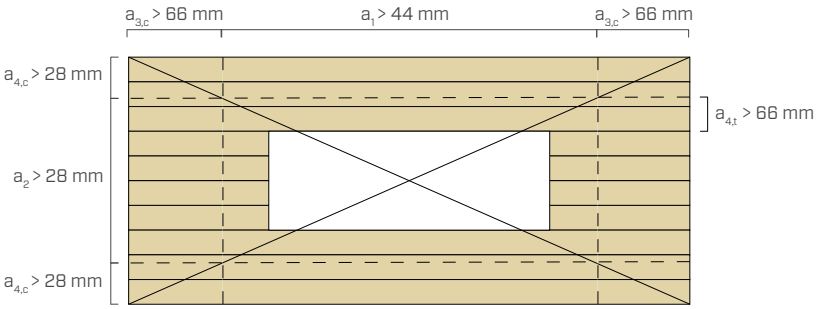
CLT PANEL WEIGHT				TYPE OF INSTALLATION[6]							
					perpendicular		perp. with slot		inclined	
t	h	L	weight[7]	n_{SCREW}	β	L_{SCREW}	β	L_{SCREW}	β	L_{SCREW}
[mm]	[m]	[m]	[kg]	[pcs]	[°]	[mm]	[°]	[mm]	[°]	[mm]
12	2,6	2	**262**	**4**	30	**100**	30	**100**	30	**100**
		6	**786**		45	**100**	30	**100**	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

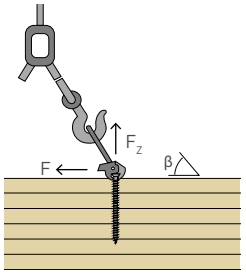
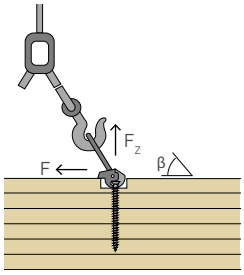
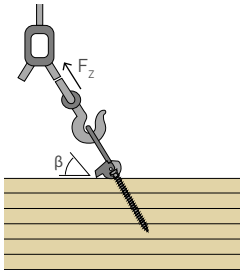


MINIMUM DISTANCES

SCREWS INSERTED WITHOUT PRE-DRILLING HOLE



WASP ANCHOR WITH VGS Ø11 - BEAM

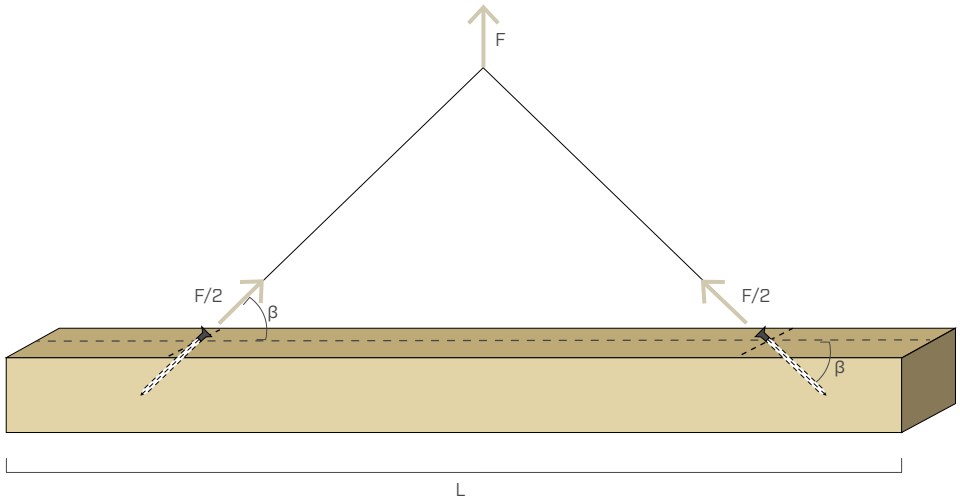
			PERPENDICULAR			PERPENDICULAR WITH SLOT			INCLINED		
											
VGS SCREW	H_{MIN}	β	R_k	$R_{d,EC5}$ (1)	Q_{adm} (3)	R_k	$R_{d,EC5}$ (1)	Q_{adm} (3)	R_k	$R_{d,EC5}$ (1)	Q_{adm} (3)
[pcs - Ø x L]	[mm]	[°]	[kN]	[kN]	[kg]	[kN]	[kN]	[kg]	[kN]	[kN]	[kg]
2 Ø11 x 100	**100**	30	5,50	**2,35**	*229*	11,64	**4,97**	*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}

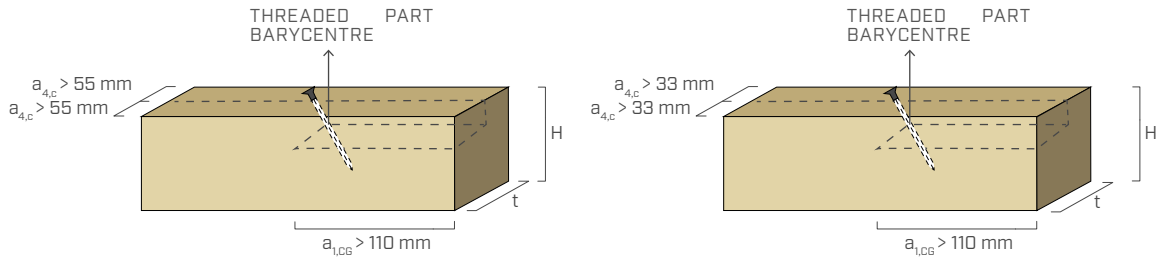
RECOMMENDED MINIMUM SOLUTION - VGS Ø11[5]

BEAM WEIGHT					TYPE OF INSTALLATION[6]					
					perpendicular		perp. with slot		inclined	
t	H	L	weight[7]	n_{SCREW}	β	L_{SCREW}	β	L_{SCREW}	β	L_{SCREW}
[mm]	[m]	[m]	[kg]	[pcs]	[°]	[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	**10 0**	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**

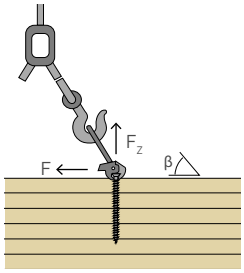
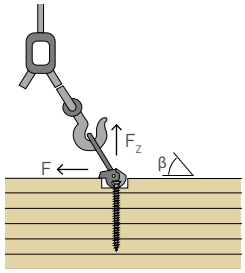
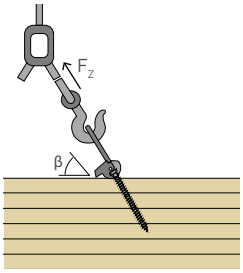
STATIC CONFIGURATION



MINIMUM DISTANCES



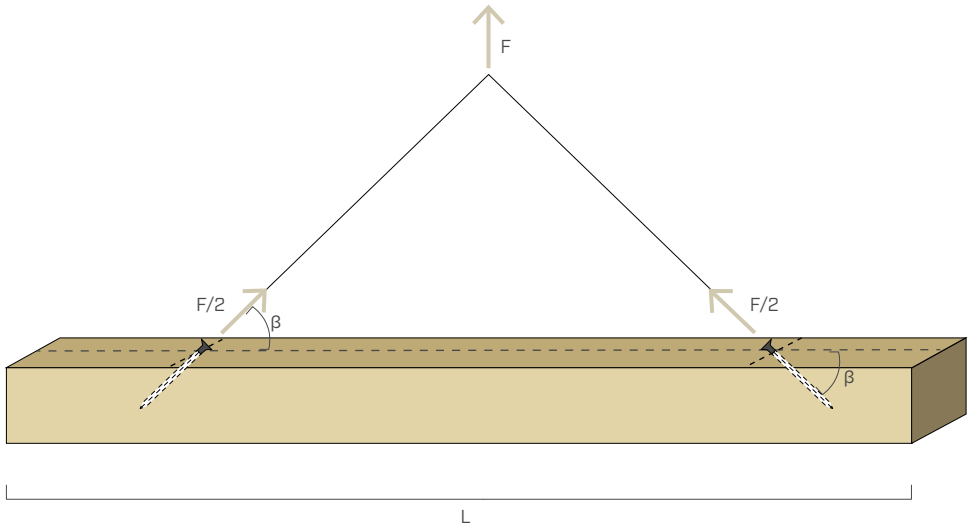
WASP ANCHOR WITH HBS Ø10 - BEAM

	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*

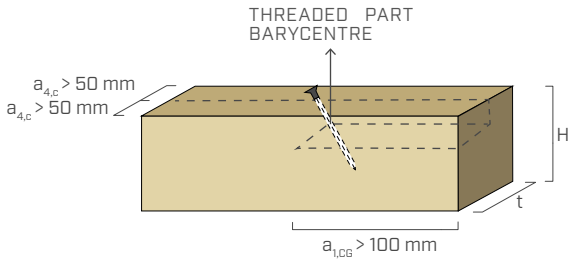
RECOMMENDED MINIMUM SOLUTION - HBS Ø10[5]

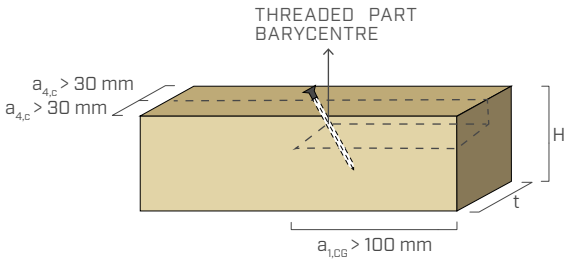
BEAM WEIGHT					TYPE OF INSTALLATION[6]					
					perpendicular		perp. with slot		inclined	
t	h	L	weight[7]	n_{SCREW}	β	L_{SCREW}	β	L_{SCREW}	β	L_{SCREW}
[mm]	[m]	[m]	[kg]	[pcs]	[°]	[mm]	[°]	[mm]	[°]	[mm]
12	0,24	3,5	**42**	2	30	**80**	30	**80**	30	**80**
		6	**73**		30	**80**	30	**80**	30	**80**
		8	**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

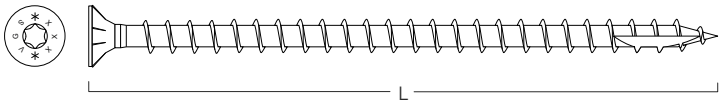




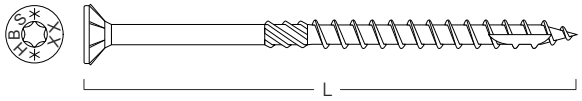
CONNECTORS

CE
ETA 11/0030

VGS



HBS

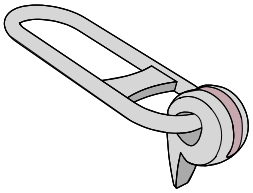


- VGS Ø 11 SCREW** - Full thread connector with countersunk head L = 100 - 400 mm*
- HBS Ø 10 SCREW - Partially threaded countersunk screw L = 80 - 400 mm*
- A pulse screw gun may be used to install the screws

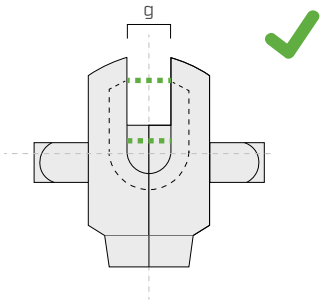
* The choice of fastener length is to be based each time on the dimensions of the wooden element, on the fastener's positioning, on the lift angle, on the weight of the load to be lifted and on the arrangement of the hooks

** VGS11100, VGS11150, VGS11200, VGS11250, VGS11300

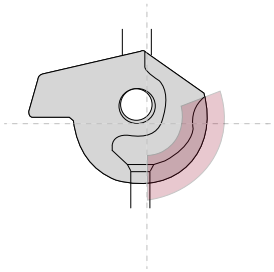
REPLACEMENT CRITERIA



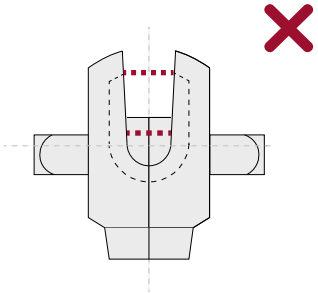
Isometric view of the WASP anchor. The part of the anchor that must be checked is highlighted in red.



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:

  $g \leq 12\ mm$

- 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 ration 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; γ_m=1,3; γ_G=1,35 and φ_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 γ_m=1,30 (EC5) and a dynamic coefficient φ_2=1,2

(7) Considering a mass density equal to ρ_m=420kg/m^3

GENERAL PRINCIPLES

Design values can be obtained from characteristic values as follows:

$$R_d = min \begin{cases} \dfrac{R_k \cdot k_{mod}}{\varphi_2 \cdot \gamma_G \cdot \gamma_m} \\ 13000\ xsen(\beta) \quad [N] \end{cases}$$

- The load bearing capacity can be obtained as follows:

$$Q_{adm} = min \begin{cases} \dfrac{Q_{adm}}{\varphi_2} \\ 13000\ xsen(\beta) \quad [N] \end{cases}$$

- 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:

$$R_R \ x \ \frac{1,2}{\varphi_2}$$

- 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 ρ_k=350kg/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.

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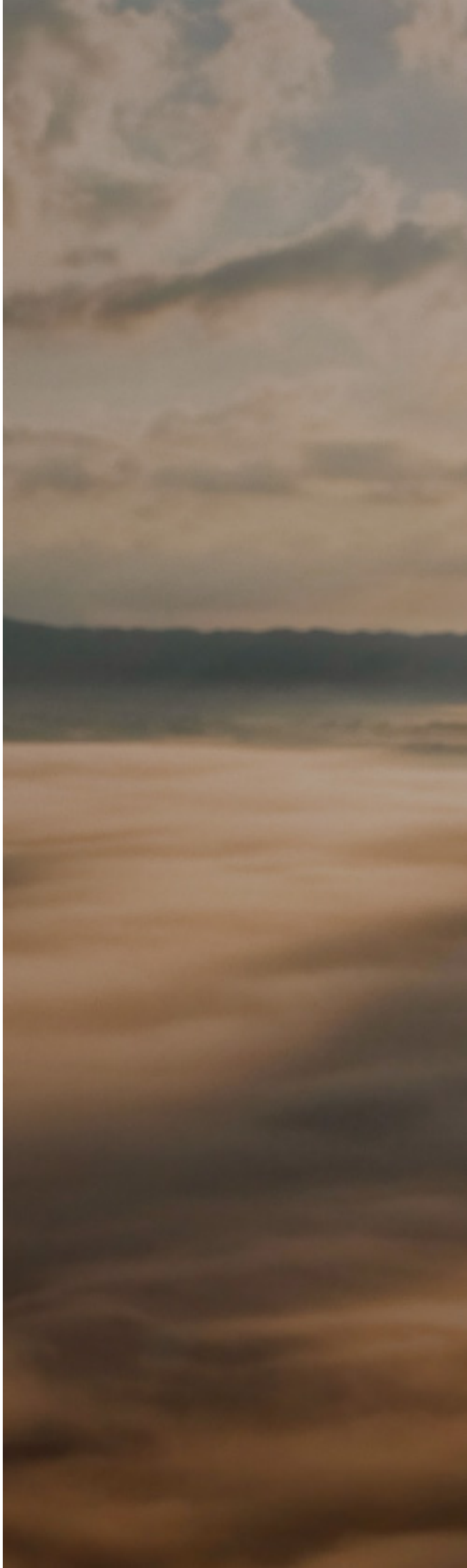

Rotho Blaas Srl

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Via dell'Adige N.2/1 | 39040, Cortaccia (BZ) | Italia
Tel: +39 0471 81 84 00 | Fax: +39 0471 81 84 84
info@rothoblaas.com | www.rothoblaas.com