

**Load tables for a transport anchor system
with Würth ASSY® 4 Combi T
transport anchor self-tapping screws
d = 10 mm as defined under ETA-11/0190:2018
Threaded length $l_g = 60$ mm**



Transport anchor system with the ASSY 4 Combi T self-tapping screw and DEHA universal coupling, load group 1-1.3

General information

The load tables are nonbinding design aids. The load values must be reduced for shorter screw-in depths and threaded lengths.

The specifications in the European Technical Approval and in the expertise must be observed. The load bearing capacity of the transport system depends on many factors, e.g. hoist, fastening type, and properties of the transported element.

The DEHA universal coupling, load group 1-1.3, or the BGW ball head lifter can be used as the load bearing equipment. The operating instructions issued by the manufacturers must be observed. When subjected to inclined loads, the wood can be provided with a cutout that serves to reroute the horizontal components of the force directly into the wood. The screws can be driven into both undrilled and drilled wood components. In the latter case, the diameter of the drilled hole must correspond to the specifications in the ETA.

The wood components must be at least 40 mm thick.

The minimum distances of the screws, specifically from the edges of the wood, must be observed.

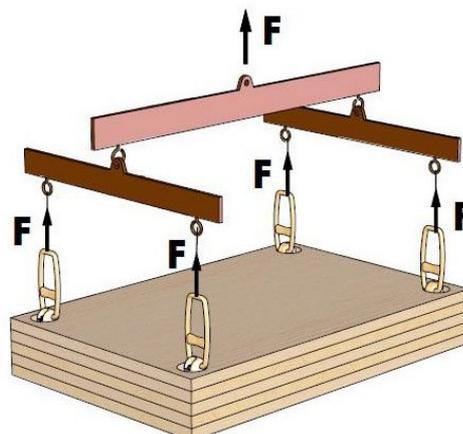
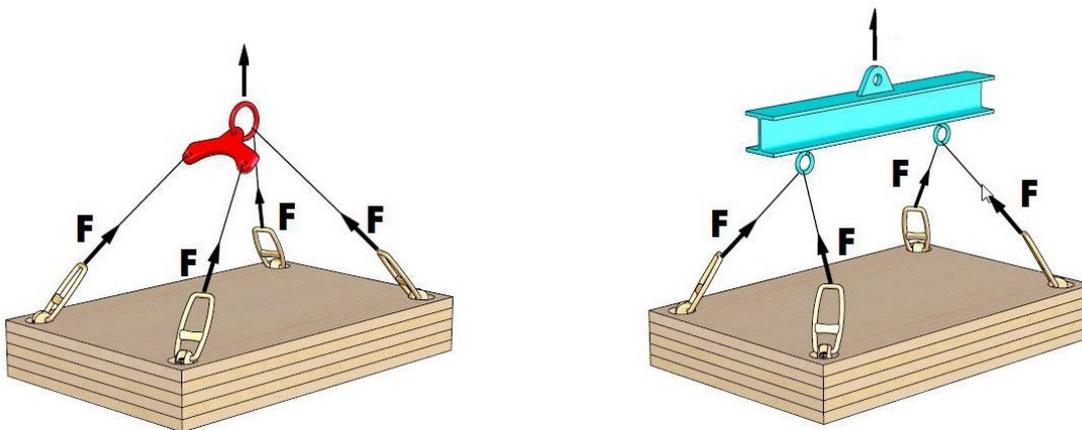
These loads, however, can swing when suspended from a crane. It is recommended to multiply the forces acting on the transport anchor system by the specified dynamic coefficients φ .

Recommended coefficients φ

Lifting device	Lifting speed	Dynamic coefficient φ
Stationary crane, rotary crane Rail crane	< 90 m/min	1.10
Stationary crane, rotary crane Rail crane	≥ 90 m/min	1.30
Lifting and transporting on level ground		1.65
Lifting and transporting on		2.00

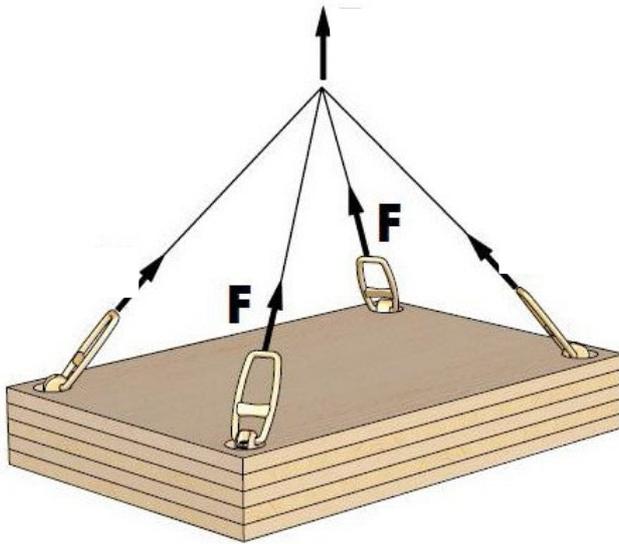
The number of anchors n defines the suspension gear used. Suspension gear consisting of more than three lines is always statically undefined when suitable measures do not distribute the load uniformly over all three.

The whole component should be secured with at least two self-tapping screws. However, it must be ensured that the screws are not driven into shrinkage cracks or similar.



Spreader beam ($n = 4$)

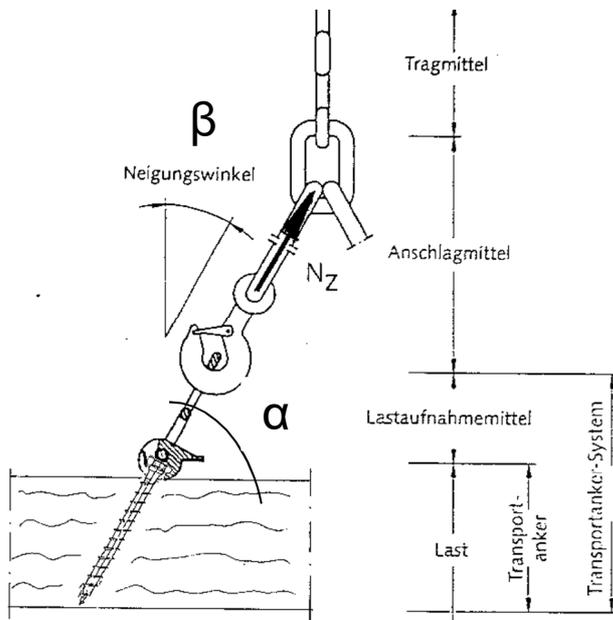
In the case of statically undefined suspension gear, BGR 500 (Section 2.8) stipulates that the anchors' dimensions must allow two of them to carry the entire load. The loads at the anchor sites must be calculated from the triangle of forces. For safety reasons, the screws may only be used **once**.



Statically undefined suspension gear ($n = 2$)

Fastening variant 1

Axial loading on the screw



Transport anchor under axial tensile load

Fastening variant “axial loading on screw”

Würth ASSY® 4 Combi T d = 10 mm, threaded length 60 mm

Attached to **solid structural timber, glued laminated timber or to the side of cross-laminated timber**

α °	$F_{ax,Rk}$ in kN	N_z in kN	Load per attachment point				
			kg				
			$\varphi = 1.0$	$\varphi = 1.10$	$\varphi = 1.30$	$\varphi = 1.65$	$\varphi = 2.00$
90	6.0	3.08	308	280	237	186	154
85	6.0	3.08	307	279	236	186	153
80	6.0	3.08	303	275	233	184	152
75	6.0	3.08	297	270	229	180	149
70	6.0	3.08	289	263	222	175	145
65	6.0	3.08	279	254	215	169	139
60	6.0	3.08	266	242	205	161	133
55	6.0	3.08	252	229	194	153	126
50	6.0	3.08	236	214	181	143	118
45	6.0	3.08	218	198	167	132	109
40	5.5	2.84	182	166	140	111	91
35	5.1	2.60	149	135	115	90	75
30	4.6	2.36	118	107	91	71	59

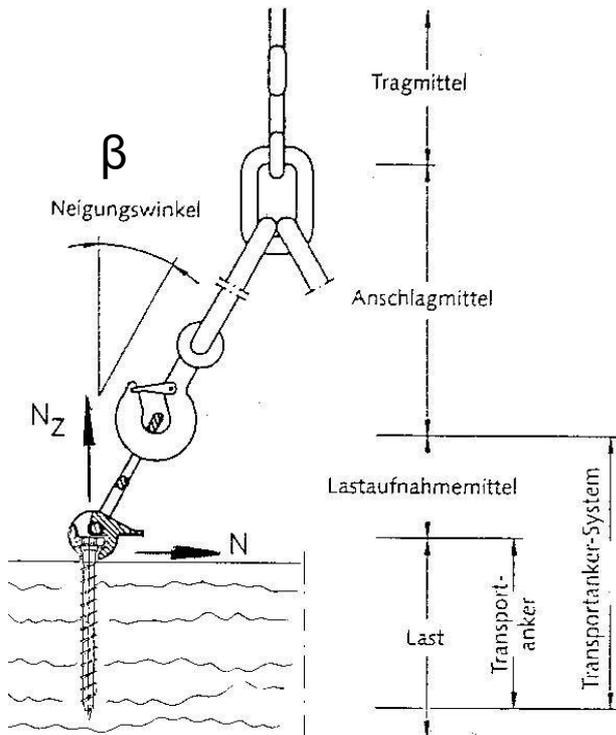
Assumptions: Characteristic density $\rho_k = 350 \text{ kg/m}^3$

The thread is anchored completely in the wood, without gaps in the component

The screws' anchoring depth in the face of cross-laminated timber must be at least 100 mm.

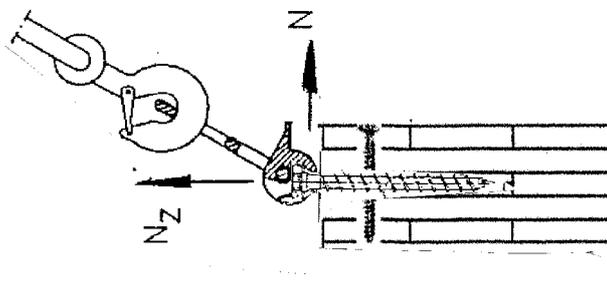
Fastening variant 2

Inclined loading on the screw



Transport anchor under inclined load

A force component acting perpendicular to the side may promote lateral tensile failure. Lateral tensile failure must be prevented by means of a reinforcement secured parallel to the face with full thread screws (see Figure below).



Full thread screws preventing lateral tensile failure in a cross-laminated timber element

Fastening variant “inclined tensile loading on screw”

Würth ASSY[®] 4 Combi T d = 10 mm, threaded length 60 mm (10x90/60)

Anchoring depth of the screw in the timber $t_1 = 80$ mm

Attached to solid structural timber, glued laminated timber, laminated veneer lumber, or to the side of cross-laminated timber

(angle between screw axis and direction of grain $\alpha = 90^\circ$)

β °	F_{Ed} in kN	N_{SZ} in kN	Load per attachment point				
			kg				
			$\varphi = 1.00$	$\varphi = 1.10$	$\varphi = 1.30$	$\varphi = 1.65$	$\varphi = 2.00$
0	4.15	3.08	308	280	237	186	154
5	4.14	3.07	306	278	235	185	153
10	4.11	3.04	300	273	231	182	150
15	4.06	3.01	290	264	223	176	145
20	3.99	2.96	278	253	214	168	139
25	3.92	2.90	263	239	202	159	131
30	3.83	2.84	246	224	189	149	123
35	3.75	2.77	227	207	175	138	114
40	3.66	2.71	208	189	160	126	104
45	3.58	2.65	187	170	144	114	94
50	3.50	2.59	167	151	128	101	83
55	3.43	2.54	146	132	112	88	73
60	3.36	2.49	125	113	96	76	62

Assumptions: Characteristic density $\rho_k = 350$ kg/m³

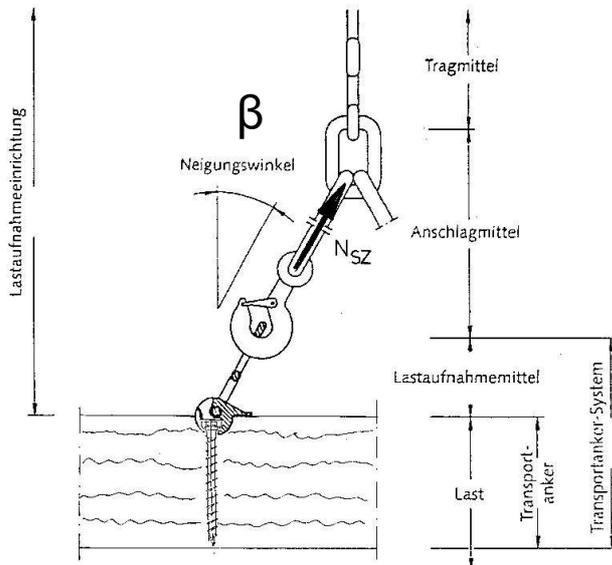
**The thread is anchored completely in the wood, without gaps in the component
Screws arranged at the center of a layer in the faces**

The screws' anchoring depth in the face of cross-laminated timber must be at least 100 mm.

Fastening variant 3

Inclined loading on the screw with coupling head precision-fitted in cutout

When the coupling head of the load bearing equipment is **precision-fitted** in a cutout, it reroutes the horizontal force component of the inclined tensile load directly into the wood.



Transport anchor under inclined tensile load-coupling head of the load bearing equipment precision-fitted in a cutout

Fastening variant “inclined tensile loading on the screw with precision-fitted cutout”

Würth ASSY[®] 4 Combi T d = 10 mm, threaded length 60 mm

Attached to **solid structural timber, glued laminated timber, or to the side of cross-laminated timber**

(angle between screw axis and direction of grain $\alpha = 90^\circ$)

β °	$F_{ax,Rd}$ in kN	N_z in kN	Load per attachment point				
			kg				
			$\varphi=1.00$	$\varphi = 1.10$	$\varphi = 1.30$	$\varphi = 1.65$	$\varphi = 2.00$
0 ÷ 60	4.15	3.08	308	280	237	186	154

Assumptions: Characteristic density $\rho_k = 350 \text{ kg/m}^3$

The thread is anchored completely in the wood, without gaps in the component

The screws' anchoring depth in the face of cross-laminated timber must be at least 100 mm.