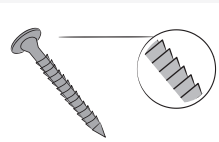
LBA - LBS

Threaded nail - Screw with cylindrical head for plates

White galvanized carbon steel

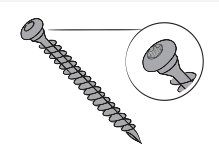
LBA - ANKER NAIL

Threaded annular ring nail for improved pullout strength



LBS - SCREW FOR PLATES

Screw with cylindrical underhead ideal for fastening of standard metal elements



CERTIFICATION

CE marking according to ETA to guarantee correct parameters for designing structural plates in accordance with the standard (Eurocode or other standards)

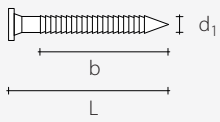
METAL PLATES

Geometry appositely designed for fastening metal plates and angle brackets. The underhead provides a fixed-end constraint that improves the joint static performance

CODES AND DIMENSIONS

CE

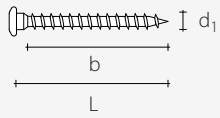
LBA - ANKER NAIL



code	type	d_1 [mm]	L [mm]	b [mm]	pcs/box
PF601440	**LBA440**	**4**	40	30	250
PF601450	**LBA450**		50	40	250
PF601460	**LBA460**		60	50	250
PF601475	**LBA475**		75	60	250
PF601410	**LBA4100**		100	80	250
PF601660	**LBA660**	**6**	60	50	250
PF601680	**LBA680**		80	70	250
PF601610	**LBA6100**		100	80	250

CE
ETA 11/0030

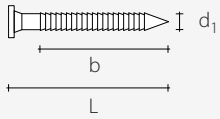
LBS - SCREW FOR PLATES



code	type	d_1 [mm]	L [mm]	b [mm]	pcs/box
PF603525	**LBS525**	**5** TX20	25	21	500
PF603540	**LBS540**		40	36	500
PF603550	**LBS550**		50	46	200
PF603560	**LBS560**		60	56	200
PF603570	**LBS570**		70	66	200

AISI 316
A4

LBAI - STAINLESS STEEL ANKER NAIL



code	type	d_1 [mm]	L [mm]	b [mm]	pcs/box
AI4050	**LBAI450**	**4**	50	40	250
AI6060	**LBAI660**	**6**	60	50	250

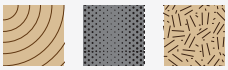
MATERIAL AND DURABILITY

LBA: galvanized carbon steel.
LBS: galvanized carbon steel.
To be used in Service class 1 and 2 (EN 1995:2008).

LBAI: A4 stainless steel (V4A).
To be used in Service class 1, 2 and 3 (EN 1995:2008).

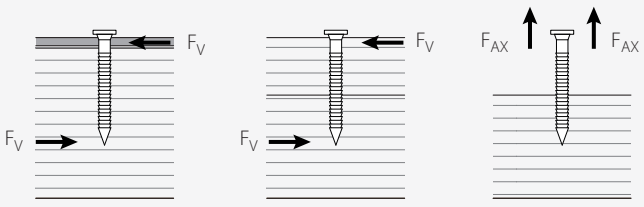
FIELD OF USE

Steel to timber joints
Timber to timber joints
OSB to timber joints

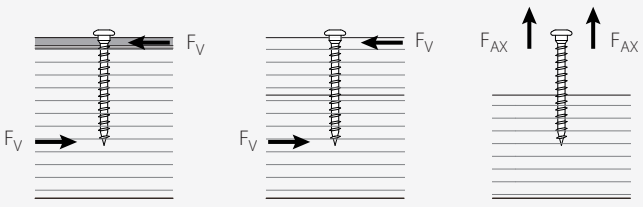


EXTERNAL LOADS

LBA

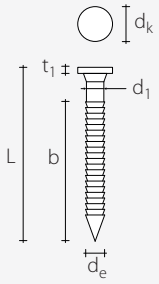


LBS

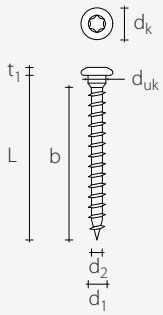


GEOMETRY AND MECHANICAL PROPERTIES

LBA



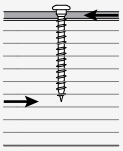
LBS

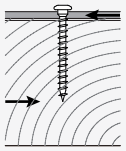


			LBA		LBS
Nominal diameter	d_1	[mm]	4	6	5
Head diameter	d_K	[mm]	8,00	12,00	7,80
Core diameter	d_2	[mm]	-	-	3,00
Underhead diameter	d_{UK}	[mm]	-	-	4,90
External diameter	d_e	[mm]	4,40	6,50	-
Head thickness	t_1	[mm]	1,40	2,00	2,40
Predrill diameter	d_v	[mm]	3,0	4,5	3,0
Characteristic moment of yield	$M_{y,k}$	[Nmm]	6500,0	19000,0	5417,2
Characteristic value of extraction strength	$f_{ax,k}$	[N/mm^2]	7,5	7,5	11,7
Characteristic head penetration strength	$f_{head,k}$	[N/mm^2]	-	-	10,5
Characteristic tensile strength	$f_{tens,k}$	[kN]	6,9	11,4	7,9

INSTALLATION

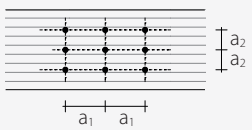
MINIMUM DISTANCES FOR NAILS / SCREWS UNDER SHEAR LOADING (STEEL-TO-TIMBER)

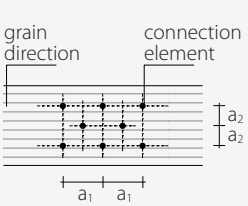


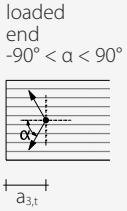


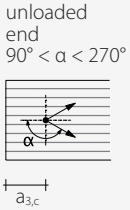
		SCREWS / NAILS INSERTED WITHOUT PREDRILL					
		Load angle to the grain α = 0°			Load angle to the grain α = 90°		
		LBA 4	LBS 5	LBA 6	LBA 4	LBS 5	LBA 6
a_1	[mm]	28	42	50	14	18	21
a_2	[mm]	14	18	21	14	18	21
$a_{3,t}$	[mm]	60	75	90	40	50	60
$a_{3,c}$	[mm]	40	50	60	40	50	60
$a_{4,t}$	[mm]	20	25	30	28	50	60
$a_{4,c}$	[mm]	20	25	30	20	25	30

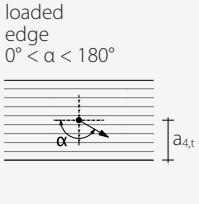
		SCREWS / NAILS INSERTED WITH PREDRILL					
		Load angle to the grain α = 0°			Load angle to the grain α = 90°		
		LBA 4	LBS 5	LBA 6	LBA 4	LBS 5	LBA 6
a_1	[mm]	14	18	21	11	14	17
a_2	[mm]	8	11	13	11	14	17
$a_{3,t}$	[mm]	48	60	72	28	35	42
$a_{3,c}$	[mm]	28	35	42	28	35	42
$a_{4,t}$	[mm]	12	15	18	20	35	42
$a_{4,c}$	[mm]	12	15	18	12	15	18

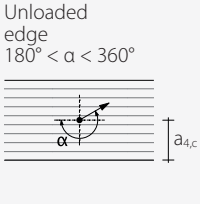










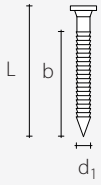


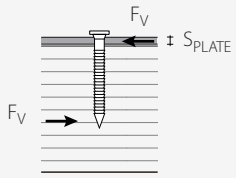
NOTES

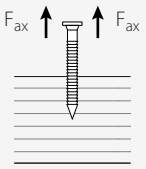
- Minimum distances consistent with EN 1995:2008 and in accordance with ETA,
- assuming a timber density $\rho_k \leq 420$ kg/m^3.
- For timber-to-timber joints, the minimum spacing (a_1, a_2) have to be multiplied by a coefficient equal to 1,5.

STATIC VALUES

LBA

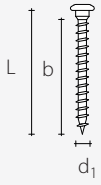


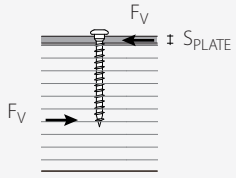


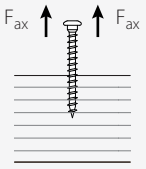


			CHARACTERISTIC VALUES (1)								ADMISSIBLE VALUES	
			SHEAR STEEL-TO-TIMBER $R_{V,k}$ [kN]							TENSION	SHEAR	TENSION
d_1 [mm]	L [mm]	b [mm]	S_{PLATE} 1,5 mm	S_{PLATE} 2 mm	S_{PLATE} 2,5 mm	S_{PLATE} 3 mm	S_{PLATE} 4 mm	S_{PLATE} 5 mm	S_{PLATE} 6 mm	$R_{ax,k}$ [kN]	V_{adm} [kg]	N_{adm} [kg]
4	40	30	2,02	2,01	2,00	1,98	1,95	1,93	1,90	0,96	71	38
	50	40	2,32	2,32	2,32	2,32	2,32	2,32	2,32	1,28	71	51
	60	50	2,48	2,48	2,48	2,48	2,48	2,48	2,48	1,60	71	64
	75	60	2,64	2,64	2,64	2,64	2,64	2,64	2,64	1,92	71	77
	100	80	2,96	2,96	2,96	2,96	2,96	2,96	2,96	2,56	71	102
6	60	50	2,56	2,53	3,39	4,24	4,20	4,16	4,13	2,40	141	96
	80	70	3,43	3,41	4,19	5,00	5,00	5,00	5,00	3,36	141	134
	100	80	4,27	4,27	4,75	5,24	5,24	5,24	5,24	3,84	141	154

LBS







			CHARACTERISTIC VALUES (2)								ADMISSIBLE VALUES	
			SHEAR STEEL-TO-TIMBER $R_{V,k}$ [kN]							TENSION	SHEAR	TENSION
d_1 [mm]	L [mm]	b [mm]	S_{PLATE} 1,5 mm	S_{PLATE} 2 mm	S_{PLATE} 2,5 mm	S_{PLATE} 3 mm	S_{PLATE} 4 mm	S_{PLATE} 5 mm	S_{PLATE} 6 mm	$R_{ax,k}$ [kN]	V_{adm} [kg]	N_{adm} [kg]
5	25	21	0,90	0,88	0,87	0,98	1,23	1,47	1,43	1,31	53	53
	40	36	1,48	1,46	1,44	1,58	1,88	2,15	2,11	2,25	53	90
	50	46	1,86	1,85	1,83	1,92	2,12	2,35	2,35	2,87	53	115
	60	56	2,05	2,05	2,05	2,15	2,34	2,52	2,50	3,50	53	140
	70	66	2,20	2,20	2,20	2,30	2,50	2,68	2,66	4,12	53	165

GENERAL PRINCIPLES

- Characteristic values are consistent with EN 1995:2008 and in accordance with ETA.
- Design values can be obtained from characteristic values as follows:

$$R_d = \frac{R_k \cdot k_{mod}}{\gamma_m}$$

Coefficients γ_m and k_{mod} must be taken according to the current Standard adopted for the design.
For calculations, a timber density ρ_k = 380 kg/m^3 has been considered.

- Dimensioning and verification of timber elements and metal plates must be carried out separately.
- Characteristic values of shear strength are evaluated for nails/screws inserted without predrill; in case of nails/screws inserted with predrill it is possible to obtain higher strength values.
- Admissible values are obtained according to DIN 1052:1988.

NOTES

(1) The characteristic shear-strength value for LBA Ø4 nails has been evaluated assuming a plate thickness = S_{PLATE}, always considering the case of thick plate according to ETA ($S_{PLATE} \geq$ 1,5 mm).
The characteristic shear-strength value for LBA Ø6 screws has been evaluated assuming a plate thickness = S_{PLATE}, and considering the thin ($S_{PLATE} \leq$ 2,0 mm), and thick-plate case scenarios (2,0 < S_{PLATE} < 3,0 mm) according to ETA ($S_{PLATE} \geq$ 3,0 mm).

(2) The characteristic shear-strength value for LBS Ø5 screws has been evaluated assuming a plate thickness = S_{PLATE}, and considering the thin ($S_{PLATE} \leq 0{,}5\ d_1$), intermediate ($0{,}5\ d_1 < S_{PLATE} < d_1$) and thick-plate case scenarios ($S_{PLATE} \geq d_1$).

(3) The pullout strength of the threaded part has been determined by considering an fastener angle to the grain of 90° and a penetration length equal to b.