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Technical leaflet

Static Design Guideline for EGGER OSB and EGGER DHF

The following static design guideline applies to EGGER OSB and EGGER DHF boards.

It is a useful tool for planners, builders and end-users, as it provides competent guidance on how to select the right product thickness for a specific building application, in full compliance with the static requirements of EN 1995-1-1 (Eurocode 5).

The guideline addresses the use of EGGER DHF and of different types of EGGER OSB, in each structural application (walls, floors and roofs), but also gives a recommendation on how to choose the right panel thickness when using EGGER OSB for shelving.

The following tables are an aid to pre-dimensioning the required slab thicknesses. However, they do not replace the necessary structural analysis by an authorized structural engineer.

For each intended application (purpose), the following tables shall be used in the static design of the element:

- Table 1: for shelves, built with EGGER OSB 2 or EGGER OSB 3
- Table 2A: for wall sheathing, using EGGER OSB 3 or EGGER OSB 4 TOP
- Table 2B: for external walls sheathing, using EGGER DHF
- Table 3A: for structural floors on joists, using EGGER OSB 2 or EGGER OSB 3
- Table 3B: for structural floors on joists, using EGGER OSB 4 TOP
- Table 3C: for structural floors on joists, installed as double-span beam using EGGER OSB 2 / OSB 3
- Table 3D for structural floors on joists, installed as double-span beam using EGGER OSB 4 TOP
- Table 4A: for roof decking, using EGGER OSB 3
- Table 4B: for roof decking, using EGGER OSB 4 TOP
- Table 4C: for roof decking, using EGGER DHF

For the static design of pitched-roofs built with EGGER Roofing Board decking, please consult the “Panel Selection Guideline for EGGER Roofing Board”.

Shelves

Table 1: Weight load values in kg/m2 for horizontal planking (eg. shelves) as two-span beams made of EGGER OSB 2 or EGGER OSB 3
Design conditions: deflection limit l / 300

Double-span beam, one-side loaded

Span l in mm	Panel thickness d in mm						
	8	10	12	15	18	22	25
500	56	113	199	393	684	982	1.270
550	41	83	147	293	511	809	1.047
600	---	63	112	224	391	678	877
625	---	55	98	197	345	624	807
650	---	48	86	174	305	564	745
700	---	37	68	137	242	449	640
750	---	---	54	110	195	362	536
800	---	---	43	89	159	296	439
833	---	---	37	78	139	261	387
850	---	---	35	73	131	245	364
900	---	---	---	60	108	204	304
950	---	---	---	50	90	172	256
1.000	---	---	---	41	76	145	218
1.100	---	---	---	---	54	106	160
1.200	---	---	---	---	---	79	120

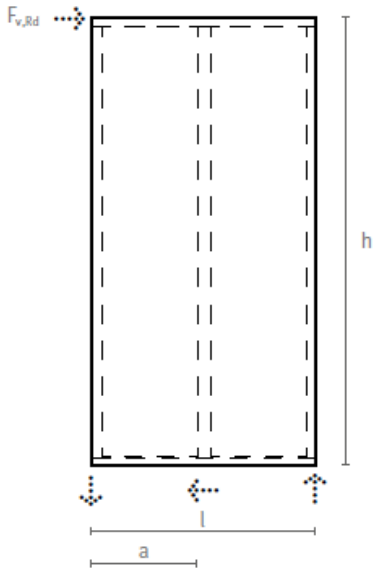
Double-span beam, fully loaded

Span l in mm	Panel thickness d in mm						
	8	10	12	15	18	22	25
500	99	186	245	385	556	751	972
550	73	146	201	316	458	618	800
600	55	111	168	264	383	517	670
625	---	98	154	243	352	476	616
650	---	86	142	224	325	439	569
700	---	68	121	192	278	377	488
750	---	54	97	166	241	326	424
800	---	---	78	145	211	285	370
833	---	---	69	133	193	262	340
850	---	---	64	127	185	251	326
900	---	---	53	108	164	223	290
950	---	---	---	91	146	198	258
1.000	---	---	---	77	131	178	232
1.100	---	---	---	55	100	145	189
1.200	---	---	---	---	75	119	156

Wall sheathing

Table 2A: Pre-dimensioning static design table of 1.250 mm (long) x 2.500 / 3.000 mm (tall) wall diaphragm, sheathed on one side with EGGER OSB 3 or EGGER 4 TOP, under horizontal wind loads (based on EC5 / EN 1995-1-1)

Design conditions: service class 2 (humid conditions), load application duration class: short term, timber frame-work 60x120 mm, studs spacing 625 mm, panel width = min. wall height / 4, no horizontal panel joints, long panel edges parallel to studs, all panel joints lying on studs



Fasteners type: galvanized groove nails (or equivalent) acc. DIN EN 14592/A1, d = 2,8 mm, l = 55 mm, $M_{y,k}$ = 2.430 Nmm

Panel thickness in mm	Design value of horizontal load bearing capacity $F_{v,Rd}$ (kN) depending on fasteners spacing in mm and wall height h in mm							
	125		100		125		50	
	2.500	3.000	2.500	3.000	2.500	3.000	2.500	3.000
12	3,5	2,9	4,4	3,6	6,0	5,0	9,0	7,5
15	4,1	3,3	5,1	4,2	6,8	5,7	10,4	8,6

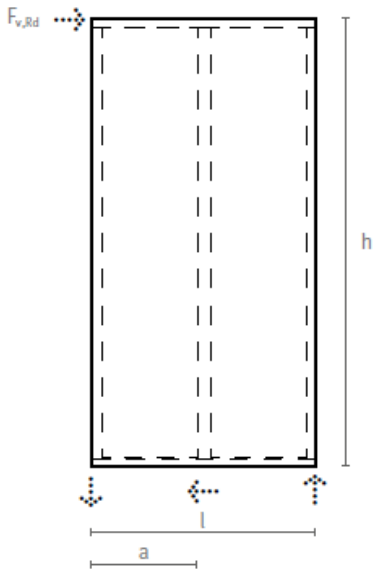
Fasteners type: galvanized clamps acc. DIN EN 14592/A1, d = 1,8 mm, l = 55 mm, b = 11,2 mm, $M_{y,k}$ = 1.040 Nmm

Panel thickness in mm		Design value of horizontal load bearing capacity $F_{v,Rd}$ (kN) depending on fasteners spacing in mm and wall height h in mm							
		125		100		75		50	
		2.500	3.000	2.500	3.000	2.500	3.000	2.500	3.000
12		5,1	4,2	6,5	5,4	8,7	7,2	13,2	11,0
15		5,3	4,4	6,6	5,6	8,9	7,4	13,4	11,1

Remark:
for wall elements sheathed on both sides, the design values of horizontal load bearing capacity $F_{v,Rd}$ (KN) must be doubled.

Table 2B: Pre-dimensioning static design table of 1.250 mm (long) x 2.500 mm (tall) wall diaphragm, externally one-side sheathed with EGGER DHF, under horizontal wind loads (based on EC5 / EN 1995-1-1)

Design conditions: service class 2 (humid conditions), load application duration class: short term, timber frame-work 60x120 mm, studs spacing 625 mm, panel width = min. wall height / 4, no horizontal panel joints, long panel edges parallel to studs, all panel joints lying on studs



Panel thickness in mm	Design value of wall shear strength $F_{iv,Rd}$ (kN) depending on fasteners spacing in mm			
	125	100	75	50
15	3,1	3,9	5,2	6,1*

Fasteners type: galvanized groove nails (or equivalent) acc. DIN EN 14592/A1, d = 2,8 mm, l = 55 mm, $M_{y,k}$ = 2.430 Nmm
* Failure criterion: shear buckling of the board

Panel thickness in mm	Design value of wall shear strength $F_{iv,Rd}$ (kN) depending on fasteners spacing in mm			
	125	100	75	50
15	3,8	4,8	6,1*	6,1*

Fasteners type: galvanized clamps acc. DIN EN 14592/A1, d = 1,8 mm, l = 55 mm, b = 11,2 mm, $M_{y,k}$ = 1.040 Nmm
* Failure criterion: shear buckling of the board

Structural floors on joists *

Boundary conditions (*) for tables 3A to 3D:

- Design method acc. EN 1995-1-1 (Eurocode 5)
- Design conditions: service class 1 (dry conditions),
- Deflection limit l / 300,
- Load application duration class: long term, k_{def} = 1,5 / k_{mod} = 0,5
- Panels laid in the direction of their main axis
- Short panel edge joint must take place on the substructure. No flying joints!
- Panel offset at least one field
- Gluing of the tongue and groove joints is not necessary, but recommended.
- For the point loads it is assumed that they are not applied directly to the OSB, but via a load-distributing level, e.g a screed.

Abbreviations:

- g_k = dead load (uniformly distributed)
  0,50 kN/m² typical for floors with light dry screed
  1,25 kN/m² typical for floors with wet screed

Recommended panel thicknesses for load-bearing OSB floors installed as single-span beam *

Table 3A: EGGER OSB 3 / OSB 2 *

load categories and usage examples acc. EN 1991-1-1		live load q_k kN/m²	point load Q_k kN	dead load g_k kN/m²	Support spacing in mm				
					415	500	625	833	1.000
A	Attics not for residential purposes	1,0	2,0	0,50	15	15	18	22	25
				1,25	15	15	22	25	2 x 22
A / B	Living spaces without lateral load distribution / Office and working areas Practice room, Ward room	2,0	3,0	0,50	15	15	22	25	2 x 22
				1,25	15	18	22	25	2 x 22
A	Living spaces with additional load for changeable partition walls	2,8	3,0	0,50	15	18	22	2 x 22	2 x 25
				1,25	15	18	22	25	2 x 22
B / C1	Office and Working areas Hospital, Hotel, Kitchen // with people congregation; areas with table, etc. e.g. schools, cafes, restaurants, reading rooms	3,0	3,0	0,50	15	18	22	2 x 22	2 x 25
				1,25	15	18	22	2 x 22	2 x 25
B	Office and Working areas with partition walls	3,8	3,0	0,50	15	18	22	2 x 22	2 x 25
				1,25	15	18	22	2 x 22	2 x 25
C2	Areas where people may congregate areas with fixed seats, e.g. churches, cinemas, conference rooms	4,0	3,0	0,50	15	18	22	2 x 22	2 x 25
				1,25	15	18	22	2 x 22	2 x 25
C3 / C4	Areas where people may congregate museums / exhibition rooms / access areas in public administration buildings, hotels, hospitals / dance halls, gymnastic rooms, stages	5,0	3,0	0,50	18	18	25	2 x 22	2 x 25
				1,25	18	22	25	2 x 25	-

Table 3 B: EGGER OSB 4 TOP *

load categories and usage examples acc. EN 1991-1-1		live load q_k kN/m²	point load Q_k kN	dead load g_k kN/m²	Support spacing in mm					
					415	500	625	833	1000	1.250
A	Attics not for residential purposes	1,0	2,0	0,50	15	15	15	18	22	30
				1,25	15	15	15	22	25	30
A / B	Living spaces without lateral load distribution / Office and working areas Practice room, Ward room	2,0	3,0	0,50	15	15	18	22	25	30
				1,25	15	15	18	22	30	2 x 30
A	Living spaces with additional load for changeable partition walls	2,8	3,0	0,50	15	15	18	22	30	2 x 30
				1,25	15	15	18	25	30	2 x 30
B / C1	Office and Working areas Hospital, Hotel, Kitchen // Areas with people congregation areas with table, etc. e.g. schools, cafes, restaurants, reading rooms	3,0	3,0	0,50	15	15	18	25	30	2 x 30
				1,25	15	15	18	25	30	2 x 30
B	Office and Working areas with partition walls	3,8	3,0	0,50	15	15	18	25	30	2 x 30
				1,25	15	18	22	30	30	-
C2	Areas with people congregation areas with fixed seats, e.g. churches, cinemas, conference rooms	4,0	3,0	0,50	15	15	22	25	30	2 x 30
				1,25	15	18	22	30	2 x 25	-
C3 / C4	Areas with people congregation museums / exhibition rooms / access areas in public administration buildings, hotels, hospitals / dance halls, gymnastic rooms, stages	5,0	3,0	0,50	15	18	22	30	2 x 25	-
				1,25	18	18	22	30	2 x 30	-

Recommended panel thicknesses for load-bearing OSB floors installed as double-span beam *
(single side loaded as worst case)

Table 3C: EGGER OSB 3 / OSB 2 *

load categories and usage examples acc. EN 1991-1-1		live load q_k kN/m²	point load Q_k kN	dead load g_k kN/m²	Support spacing in mm				
					415	500	625	833	1.000
A	Attics not for residential purposes	1,0	2,0	0,50	15	15	15	18	22
				1,25	15	15	18	22	25
A / B	Living spaces without lateral load distribution / Office and working areas Practice room, Ward room	2,0	3,0	0,50	15	15	18	22	25
				1,25	15	15	18	22	2 x 22
A	Living spaces with additional load for changeable partition walls	2,8	3,0	0,50	15	15	22	22	25
				1,25	15	18	22	25	2 x 22
B / C1	Office and Working areas Hospital, Hotel, Kitchen // Areas with people congregation areas with table, etc. e.g. schools, cafes, restaurants, reading rooms	3,0	3,0	0,50	15	15	22	25	25
				1,25	15	15	22	25	2 x 22
B	Office and Working areas with partition walls	3,8	3,0	0,50	15	15	18	25	2 x 22
				1,25	15	15	18	25	2 x 22
C2	Areas with people congregation areas with fixed seats, e.g. churches, cinemas, conference rooms	4,0	3,0	0,50	15	15	22	25	2 x 22
				1,25	15	15	22	25	2 x 22
C3 / C4	Areas with people congregation museums / exhibition rooms / access areas in public administration buildings, hotels, hospitals / dance halls, gymnastic rooms, stages	5,0	3,0	0,50	15	15	22	25	2 x 22
				1,25	15	15	22	25	2 x 22

Table 3D: EGGER OSB 4 TOP *

load categories and usage examples acc. EN 1991-1-1		live load q_k kN/m²	point load Q_k kN	dead load g_k kN/m²	Support spacing in mm					
					415	500	625	833	1000	1.250
A	Attics not for residential purposes	1,0	2,0	0,50	15	15	15	15	18	22
				1,25	15	15	15	18	22	25
A / B	Living spaces without lateral load distribution / Office and working areas Practice room, Ward room	2,0	3,0	0,50	15	15	15	18	22	30
				1,25	15	15	15	22	25	30
A	Living spaces with additional load for changeable partition walls	2,8	3,0	0,50	15	15	15	22	25	30
				1,25	15	15	18	22	25	30
B / C1	Office and Working areas Hospital, Hotel, Kitchen // Areas with people congregation areas with table, etc. e.g. schools, cafes, restaurants, reading rooms	3,0	3,0	0,50	15	15	15	22	25	30
				1,25	15	15	18	22	25	2 x 22
B	Office and Working areas with partition walls	3,8	3,0	0,50	15	15	18	22	30	2 x 22
				1,25	15	15	18	22	30	2 x 25
C2	Areas with people congregation areas with fixed seats, e.g. churches, cinemas, conference rooms	4,0	3,0	0,50	15	15	18	22	30	2 x 25
				1,25	15	15	18	25	30	2 x 25
C3 / C4	Areas with people congregation museums / exhibition rooms / access areas in public administration buildings, hotels, hospitals / dance halls, gymnastic rooms, stages	5,0	3,0	0,50	15	15	18	25	30	2 x 25
				1,25	18	18	22	30	30	2 x 25

Roofing

Roofing with EGGER OSB

Pre-dimensioning static design stable for roof decking, using EGGER OSB (based on Eurocode EC 5 / EN 1995-1-1)

Design conditions:

- service class 2 (humid conditions),
- deflection limit l / 400,
- long panel edges parallel to eaves,
- all panel joints lying on rafters

Abbreviations:

- g k = dead weight
- s k = snow load

I = Single-span loaded beam

II = Double-span beam, one-side loaded

Table 4A: Pre-dimensioning static design stable for roof decking, using EGGER OSB 3

Rafters spacing a in mm	Roof pitch α in °	Required panel thickness d in mm g k (kN/m² roof surface)															
		s k = 0,85 kN/m²								s k = 1,25 kN/m²							
		0,25		0,50		1,00		1,25		0,25		0,50		1,00		1,25	
		I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II
625	0	15	15	15	15	18	15	18	18	15	15	18	15	18	15	22	18
	15	15	15	15	15	18	15	18	15	15	15	18	15	18	15	18	15
	30	15	12	15	15	15	15	18	15	15	12	15	12	18	15	18	15
	45	15	12	15	12	15	12	18	12	12	12	15	12	15	12	18	12
833	0	18	15	18	15	18	15	22	18	18	15	18	15	18	15	22	18
	15	15	15	18	15	18	15	22	18	15	15	15	15	18	15	22	18
	30	15	12	15	15	15	15	18	18	15	15	15	15	18	15	18	18
	45	15	12	15	15	15	15	18	15	15	12	15	15	15	15	18	15
1.000	0	18	15	22	18	22	18	25	22	18	15	22	18	25	18	25	22
	15	18	15	22	18	22	18	25	18	18	15	22	18	22	18	25	22
	30	15	15	18	18	22	18	22	18	15	15	18	18	22	18	22	22
	45	15	15	18	15	18	18	22	18	15	15	18	15	18	18	22	18
1.250	0	22	18	25	22	25	22	---	25	25	22	25	22	---	25	---	25
	15	22	18	25	22	25	22	---	25	25	22	25	22	---	25	---	25
	30	22	18	22	22	25	22	25	25	22	22	25	22	25	25	---	25
	45	22	18	22	22	22	22	25	25	22	18	22	22	25	25	25	25

Table 4B: Pre-dimensioning static design stable for roof decking, using EGGER OSB 4 TOP

Rafters spacing a in mm	Roof pitch α in °	Required panel thickness d in mm g k (kN/m² roof surface)															
		s k = 0,85 kN/m²								s k = 1,25 kN/m²							
		0,25		0,50		1,00		1,25		0,25		0,50		1,00		1,25	
		I	II	I	II	I	II	I	II	I	II	I	II	I	II	I	II
625	0	15	12	15	15	18	15	18	15	15	15	15	15	18	15	18	15
	15	15	12	15	15	18	15	18	15	15	15	15	15	15	15	18	15
	30	15	12	15	12	15	15	15	15	15	12	15	12	15	15	15	15
	45	15	12	15	12	15	15	15	15	12	12	15	12	15	12	15	12
833	0	15	15	18	15	18	15	22	18	15	15	18	15	18	15	22	18
	15	15	15	15	15	18	15	18	18	15	15	15	15	18	15	18	18
	30	15	12	15	15	15	15	18	15	15	15	15	15	15	15	18	18
	45	15	12	15	15	15	15	18	15	15	12	15	15	15	15	18	15
1.000	0	18	15	22	18	22	18	25	22	18	15	22	18	22	18	30	22
	15	18	15	22	18	22	18	22	18	15	15	18	18	22	18	30	22
	30	15	15	18	18	18	18	22	18	15	15	18	15	22	18	25	18
	45	15	15	18	15	18	18	18	18	15	15	18	15	18	18	25	18
1.250	0	22	18	22	22	25	22	30	25	22	22	25	22	30	25	40	25
	15	22	18	22	22	22	22	25	25	22	22	25	22	25	25	40	25
	30	18	18	22	18	22	22	25	22	22	18	22	22	25	22	25	22
	45	18	18	18	18	25	22	22	22	18	18	22	18	22	22	25	22

Roofing with EGGER DHF

Table 4C: Pre-dimensioning static design stable for roof decking, using EGGER DHF (based on EC5 / EN 1995-1-1)
Design conditions: service class 2 (humid conditions), load application duration class: short term, k_{def} = 4,0 / k_{mod} = 0,6, long panel edges parallel to eaves, all panel joints lying on rafters

Fasteners type: galvanized groove nails (or equivalent) acc. DIN EN 14592/A1, d = 2,8 mm, l = 55 mm, $M_{y,k}$ = 2.430 Nmm

Maximum admissible uniformly-distributed horizontal wind load, in kN/m	Total roof length (maximum 12,5 m) in m	Fasteners spacing in mm at a total roof height (rafters length between ridge and eave purlins) in m						
		2,5	3,75	5,0	6,25	7,5	8,75	10,0
≤ 5,0	5,0	50	80	110	130	150**	150**	150**
	7,5	---*	50	70	90	110	120	140
	10,0	---*	---*	50	60	80	90	110
	12,5	---*	---*	---*	50	60	70	80

* Failure criterion: shear buckling of the board; smaller nail distance, therefore unsuitable
* *Maximum admissible fastener spacing (≤ 150 mm) critical

Fasteners type: galvanized clamps acc. DIN EN 14592/A1, d = 1,8 mm, l = 55 mm, b = 11,2 mm, $M_{y,k}$ = 1.040 Nmm

Maximum admissible uniformly-distributed horizontal wind load, in kN/m	Total roof length (maximum 12,5 m) in m	Fasteners spacing in mm at a total roof height (rafters length between ridge and eave purlins) in m						
		2,5	3,75	5,0	6,25	7,5	8,75	10,0
≤ 5,0	5,0	70	110	140	150**	150**	150**	150**
	7,5	---*	70	90	120	150**	150**	150**
	10,0	---*	---*	70	90	110	120	140
	12,5	---*	---*	50	70	80	100	110

* Failure criterion: shear buckling of the board
* *Maximum admissible fastener spacing (≤ 150 mm) critical

General note

Failure to comply with any of the recommendations explicitly described in this guideline will exempt EGGER from any liability or claim resulted from product damage or people injury.

Quality Characteristics / Technical Data of EGGER OSB and EGGER DHF products per type and thickness range are to be found in the corresponding Declaration of Performance available on www.egger.com.

Additional documents

CE Declarations of Performance EGGER OSB, Declaration of Performance EGGER DHF, Thickness Application Guideline for EGGER OSB and EGGER DHF, Panel Selection Guideline for EGGER Roofing Board