

Metsä Wood trailer floor installation

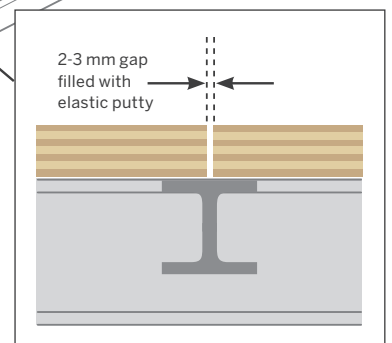
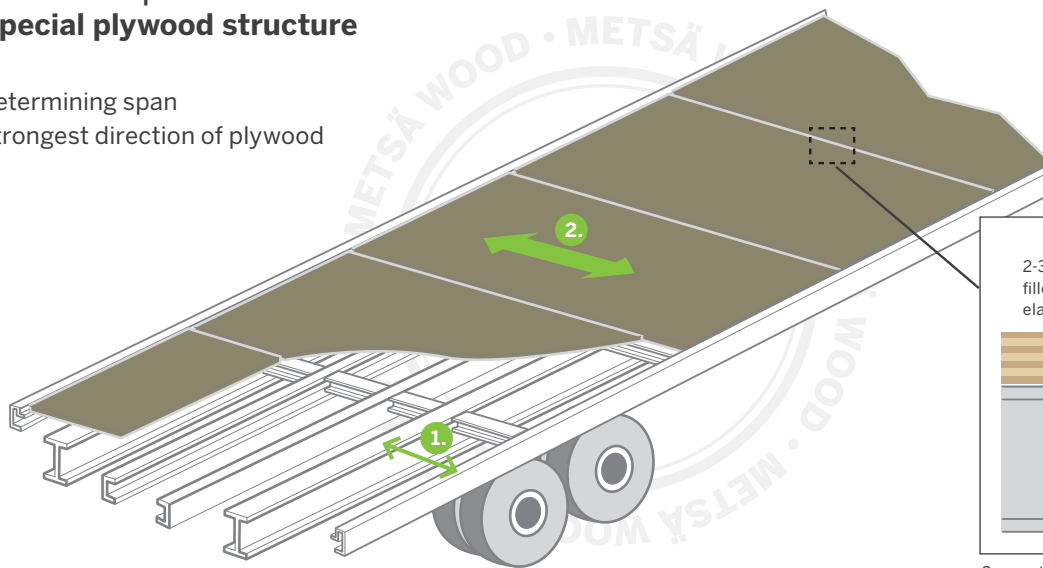


Metsä Wood plywood flooring panels are tailor-made components for demanding trailer floor structures. Panels are available in variety of sizes and overlays.

Guidelines for flooring installation, chassis examples

Chassis Example 1 with special plywood structure

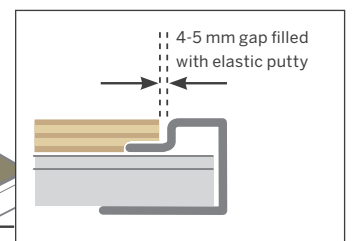
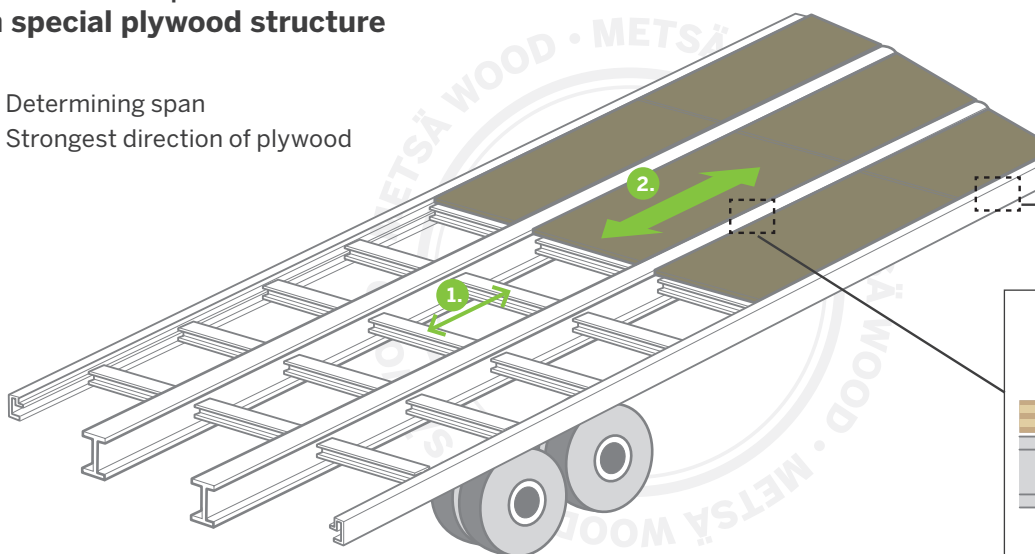
1. Determining span
2. Strongest direction of plywood



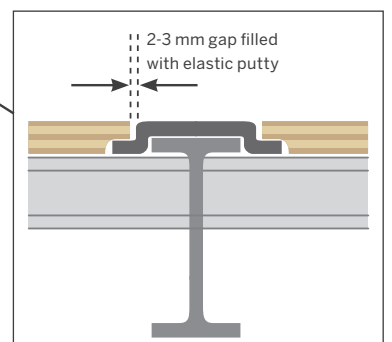
Supported panel joint

Chassis Example 2 with special plywood structure

1. Determining span
2. Strongest direction of plywood

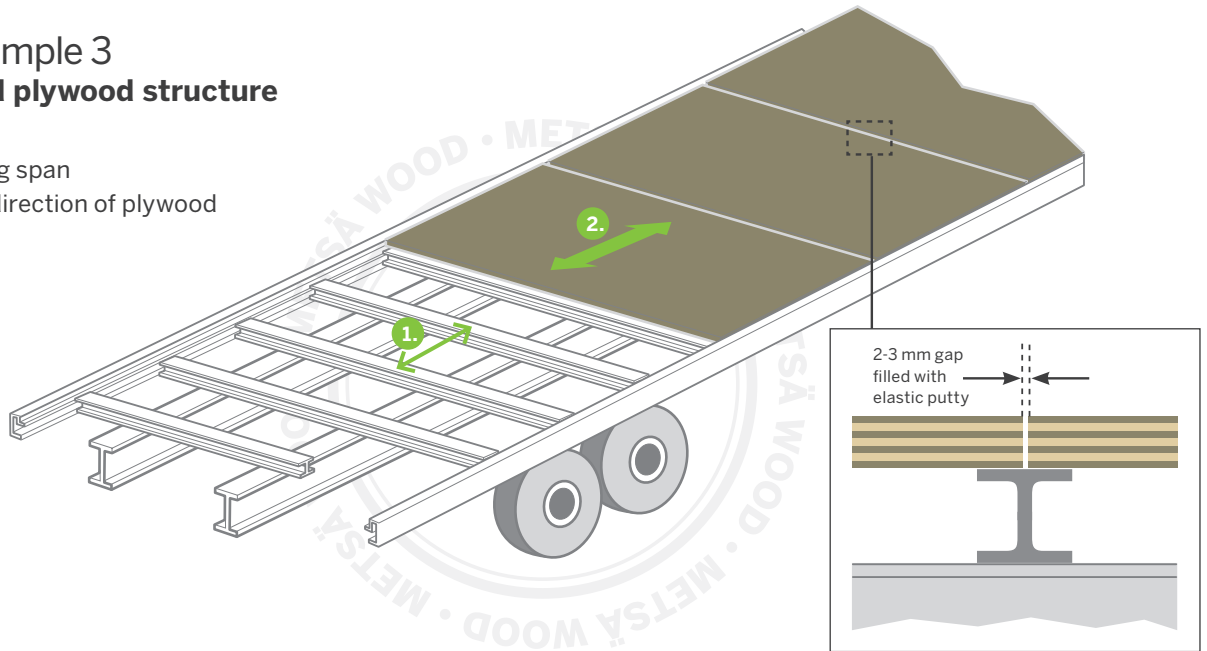


Plywood support along trailer side



Chassis Example 3 with standard plywood structure

1. Determining span
2. Strongest direction of plywood



Supported panel joint

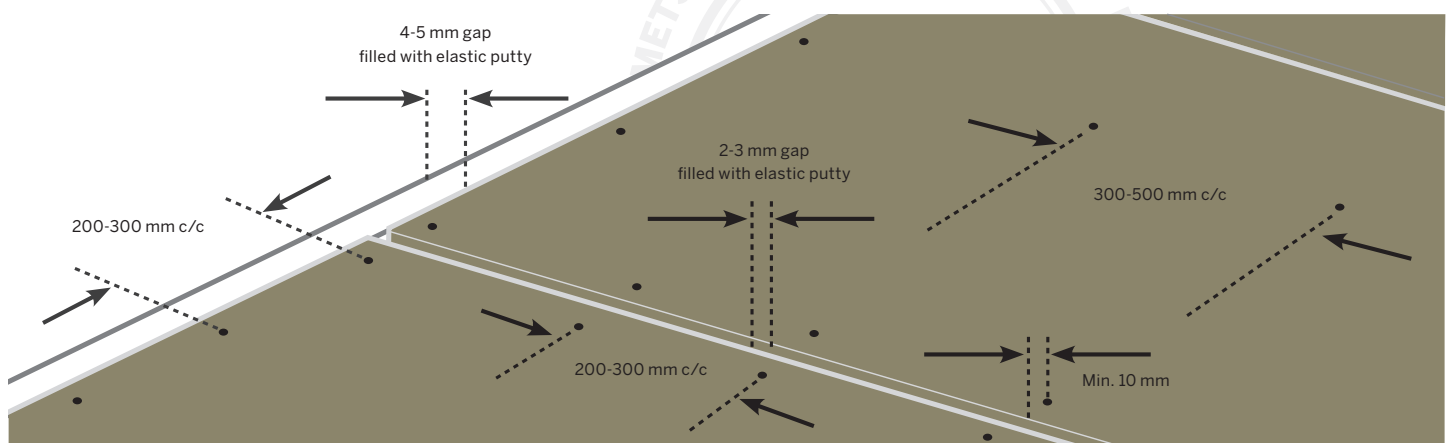
Fixing the panels

Fixing

- Use hot dip galvanized or stainless steel round head screws
- Pilot drilling is always recommended
- Gaps and fixing depressions should be filled with elastic putty or paint
- Recommended spacing of screws:
 - Along the edge of the panel 200-300 mm c/c
 - In the middle of the panel 300-500 mm c/c
 - The distance of the screw head to the panel edge should be no less than 10 mm

Installation

- Plywood panels must be supported on each four sides
- If the panels are machined, edge sealing paint should be applied on to the untreated surfaces (a minimum of two coats)
- 2-3 mm gap should be left between the plywood panels to allow moisture movements



This leaflet describes the basic plywood floor installation and design examples. For more detailed information and complex structures please contact Metsä Wood plywood sales team. Please refer to contact details on back cover.

Special Plywood Structures

Table 1. Loading table. Maximum wheel load F (kN/wheel) for birch plywood with special structure. Surface grain direction parallel to shorter edge of the panel. Strongest direction in direction of the longer panel dimension. Chassis construction: a rigid steel frame. Plate side ratio of 2.

Special structures: Thickness (mm) / Number of plies

Span mm	21/15		24/17		24/18		27/19		27/20	
	F	u	F	u	F	u	F	u	F	u
	kN	mm	kN	mm	kN	mm	kN	mm	kN	mm
300	19	4.2	24	3.6	27	3.4	30	3.2	33	3.0
400	16	6.8	21	5.9	23	5.6	26	5.2	29	5.0
500	15	10.0	19	8.6	21	8.2	23	7.6	26	7.3
600	14	13.6	17	11.8	20	11.2	22	10.4	24	9.9
800			16	19.2	18	18.2	19	17	21	16.1

Span mm	30/21		30/22		35/25		40/29	
	F	u	F	u	F	u	F	u
	kN	mm	kN	mm	kN	mm	kN	mm
300	37	2.9	39	2.7	45	2.1	52	1.5
400	31	4.7	35	4.5	44	3.9	52	2.9
500	28	6.8	31	6.5	40	5.7	52	4.7
600	26	9.3	29	8.9	37	7.7	49	6.5
800	23	15.2	26	14.5	33	12.6	44	10.7

F = Maximum wheel load (kN)

u = approximate deflection (mm)

Moisture Content 15%. An increase in moisture content will result in a decrease in strength, modulus of elasticity and shear modulus values.

Wheel contact area 80 mm x 180 mm.

Standard Plywood Structures

Table 2. Loading table. Maximum wheel load F(kN/wheel) for birch plywood with standard structure. Surface grain direction parallel to shorter edge of the panel. Strongest direction in direction of the shorter panel dimension. Chassis construction: a rigid steel frame. Plate side ratio 2.

Standard structures: Thickness (mm) / Number of plies

Span mm	21/15 std		24/17 std		27/19 std		30/21 std		35/25 std		40/29 std	
	F	u	F	u	F	u	F	u	F	u	F	u
	kN	mm	kN	mm	kN	mm	kN	mm	kN	mm	kN	mm
300	17	3.9	22	3.5	27	3.1	33	2.8	45	2.2	52	1.6
400	15	6.4	19	5.6	23	5	29	4.5	41	3.8	52	3.1
500	13	9.3	17	8.2	21	7.3	26	6.6	37	5.5	49	4.8
600	12	12.7	16	11.2	20	10	24	9	34	7.5	49	6.5
800			14	18.3	18	16.3	22	14.7	31	12.3	41	10.6

F = Maximum wheel load (kN)

u = approximate deflection (mm)

Moisture Content 15%. An increase in moisture content will result in a decrease in strength, modulus of elasticity and shear modulus values.

Wheel contact area 80 mm x 180 mm.

Example 1

Choosing the correct plywood panel structure for the example: Chassis Example 1.

Floor Requirements

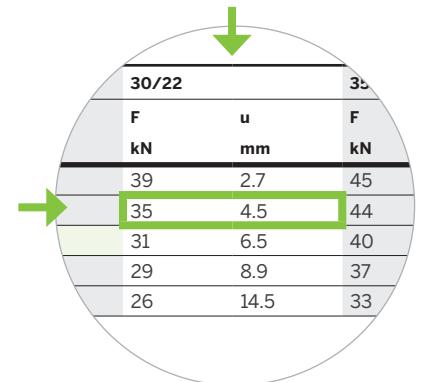
- Forklift axle load 7000 kg = 70,0 kN => wheel load 35,0 kN
- Determining span 400 mm

In the Chassis Example 1 the determining spans are along the long edge of the plywood panel. This defines the strongest direction of the plywood panel to be in the same direction. For these conditions panels with special structure (long edge = strong direction) shall be chosen.

Choose from the Table 1 (special structures) span length row of 400 mm and pick the panel thickness which has the wheel load F (kN) equal to or larger than the required wheel load capacity. In this example the wheel load capacity of the 30 mm 22 ply birch plywood special structure is 35 kN. Deflection u (mm) with the load 35 kN is 4.5 mm.

Answer: 30 mm 22 ply special birch plywood panels are suitable for your Chassis Example 1.

NOTE: Calculations are always indicative. Testing is the best way to define the true load capacity of the panel.



Example 2

Finding the maximum allowed forklift load for the panels in the example: Chassis Example 3.

Floor requirements:

- 27 mm birch plywood
- Determining span 300 mm

In the Chassis Example 3 the determining spans are along the short edge of the plywood panels. This defines the strongest direction of the panel to be in the same direction. For these conditions plywood panels with standard structure (short edge = strong direction) should be chosen.

Choose from the Table 2 (standard structures) the column of the panel thickness 27 mm and take the span length row of 300 mm. The maximal wheel load capacity for this structure is 27 kN and forklift axle load 54 kN = 5400 kg. With the maximal wheel load the deflection u (mm) of the panels is 3.1 mm.

Answer: Maximal forklift axle load for the 27 mm birch standard plywood panels, with 300 mm span, is 5400 kg.

NOTE: Calculations are always indicative. Testing is the best way to define the true load capacity of the panel.

27/19 std		30/21
F	u	F
kN	mm	kN
27	3.1	33
23	5	29
21	7.3	26
20	10	24
18	16.3	21

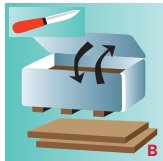
Handling and storage of plywood panels

Plywood products, like any other wood-based panels, must be properly handled and stored. Otherwise panel surfaces, edges and corners may be damaged and the panels may twist and warp.

Metsä Wood Plywood panels can be fastened, cut, shaped and drilled using woodworking tools and fasteners. Seal the resulting raw edges with water resistant paint. Panel surfaces can be repaired with water resistant fillers or patching materials.



- Plywood products should be stored under cover, in dry conditions and clear of ground contact. **(A)**



- Once the wrapping has been removed protect the panels from contact with water and direct sunlight by storing in a building or by covering with a suitable waterproof cover. Also avoid very dry and hot storage areas. **(A)**

- Panel packages should be opened manually, making sure the panel surfaces, edges and corners remain undamaged. **(B)**

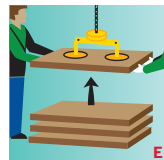


- You can also remove only a few plywood panels from the plastic wrapping. Please close the package top again after removing the panels. **(B)**

- Loose panels should not be moved further on site using mechanical handling equipment, as overlaid panels are extremely slippery. **(C)**



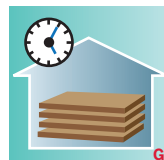
- Minor damage of the phenolic overlays can be easily repaired by first sanding and then painting over the damaged area with polyurethane paint. **(D)**



- Individual panels should always be moved by lifting and carrying them manually or automatically by vacuum lifting. They must not be pulled along the ground or the floor. **(E)**



- Plywood panels should always be stored horizontally. **(F)**



- Prior to installation and finishing plywood, panels should be preferably stored for a sufficient period of time in conditions corresponding to the chassis floor assembly line conditions. **(G)**



- At the end of their service life Metsä Wood plywood panels can be chipped and utilised in the bio mass energy production industry. **(H)**



- All Metsä Wood plywood packing material is recyclable. **(I)**

Further information
Plywood for Transport Industry brochure

METSÄ WOOD
 P.O. Box 50, 02020 Metsä, Finland
 Tel. +358 1046 05
metsagroup.com/metsawood



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