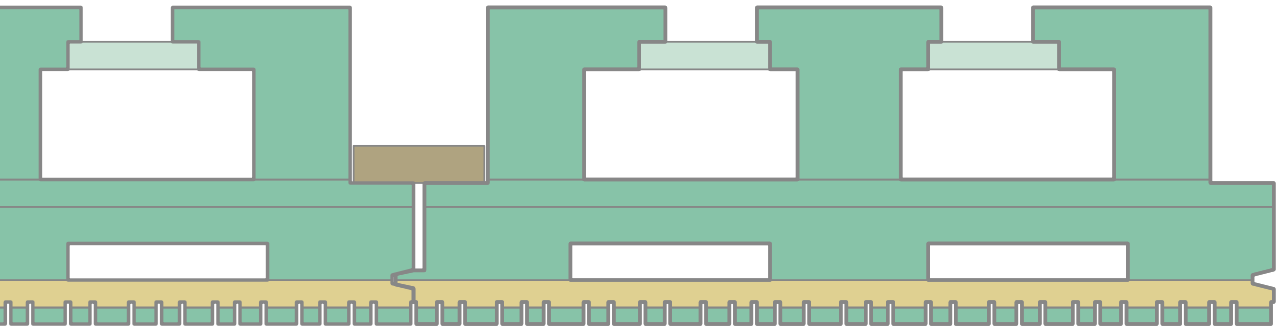
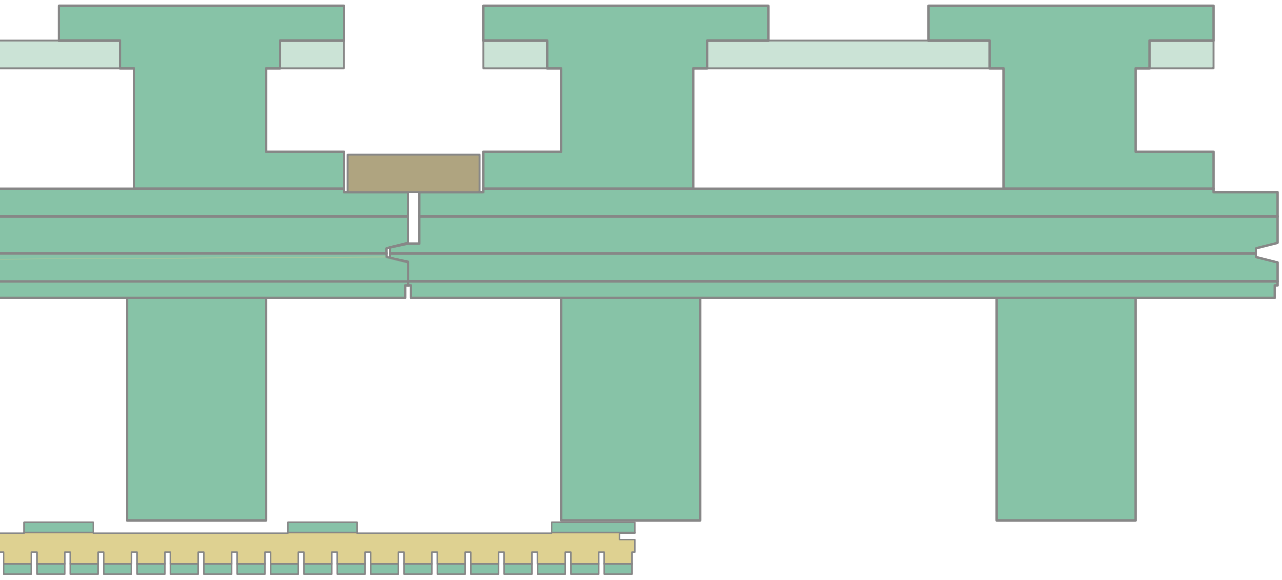
LIGNO® Rippe-x

Technical data



Configurable cross-laminated timber web element
for sound-insulating structural ceiling components



Configurable cross-laminated timber web element
for widespan floor components with flexible transverse
and longitudinal installation routing

LIGNO®
Configurable Cross-Laminated Timber

Table of contents

PEFC/04-31-2893

LIGNO TREND®
For sustainable building in timber.

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Date 01/03/2023,
Subject to alternations.

Components with LIGNO® Rippe-x Introduction

In the latest generation of Lignotrend structural ceiling elements too, a static load-bearing effect is combined with a high-quality, factory-finished visible surface in real wood, optionally with acoustic profile.

Element and visible surface are even more dimensionally stable: a **second transverse layer in the lower chord** and the so-called cross-laminated timber layer in the upper chord make the element even more tolerant to structurally related timber humidity changes. With **acoustic profiles the joint pattern is homogeneous like never** before:
The showing-through of element joints under unfavourable conditions is now also consigned to the past.

As a cross-laminated timber web element, LIGNO Rippe-x utilises the timber efficiently without sacrificing the solidity. It is now fully **flexibly configurable for individual requirements** – be it as a ceiling for a detached house or as a highly sound-insulating ceiling for multi-storey buildings with fire resistance up to F90-B as well as with longitudinal and transverse channels for routing cables and pipes.

Noise protection

Due to their characteristics with regard to impact sound and airborne sound insulation, separating ceilings of almost any kind are possible, e.g. in multi-storey buildings, schools, offices, etc. Their use is also widespread in high-quality detached house construction, because they create a special quality of quietness due to sound insulation in the low frequency area. Disturbing, loud rumbling noises from the upper floor are minimised by following the **predefined, tested superstructures** **▶ page 26**

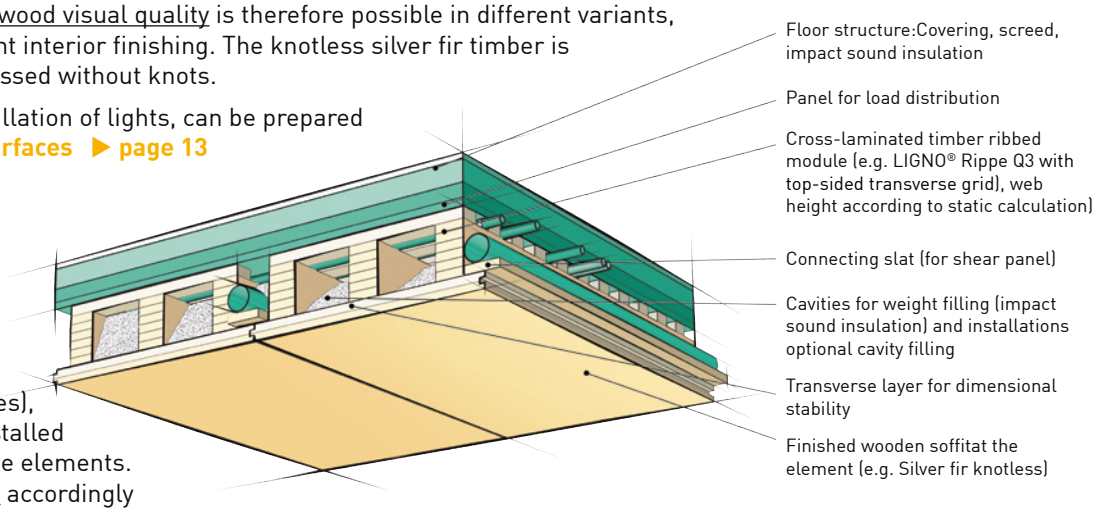
Visible surface

The noise protection described requires no cladding of the soffit. The production of the ceiling elements with real wood visual quality is therefore possible in different variants, which saves the subsequent interior finishing. The knotless silver fir timber is unique, because it is processed without knots.

Openings, e.g. for the installation of lights, can be prepared in the factory if desired. **Surfaces** **▶ page 13**

Room acoustics

In case of requirements for a reduction of noise level and reverberation (e.g. in the construction of schools or offices, but also in modern living spaces), an acoustic absorber is installed during the production of the elements. The visible layer is profiled accordingly with slats. **Acoustic profiles** **▶ from page 12**



Span widths

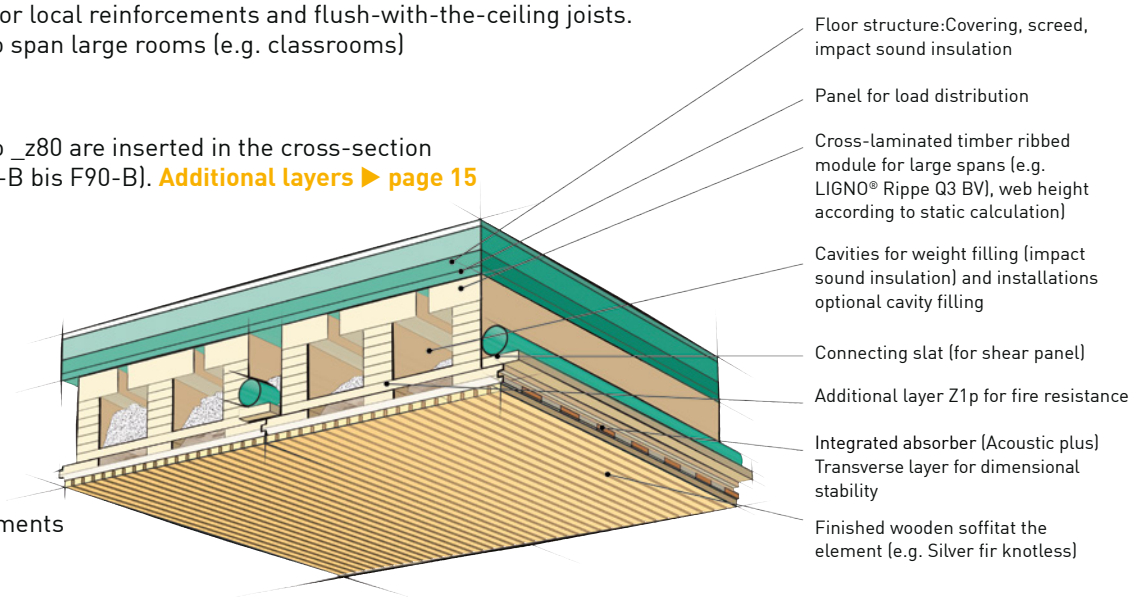
Freedom of design in the floor plan is made possible by free span widths. Elements can be prepared in the factory for local reinforcements and flush-with-the-ceiling joists.
BV elements are used to span large rooms (e.g. classrooms)

Fire resistance

Additional layers _z26 to _z80 are inserted in the cross-section for fire resistances (F30-B bis F90-B). **Additional layers** **▶ page 15**

Construction biology

The harmlessness to health of the bonding is certified by the natureplus® certificate no. 0211-0606-014-1, which is based on stringent tests. The soft wood fibre material installed in acoustic elements is likewise certified.



Configuration procedure LIGNO® Rippe Q3-x

Phase 1

Based on your requirements, preselect the component features:

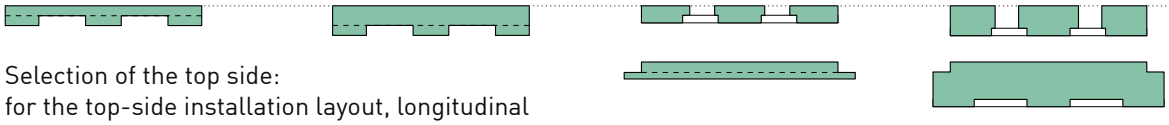
▶ from page 26

Sound and thermal insulation

Selection of the component structure: Tested superstructures, e.g. for increased noise protection, including low frequency, and for thermal insulation if applicable.

▶ page 8

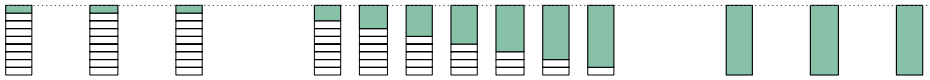
Implementation as a web or box element



Selection of the top side:
for the top-side installation layout, longitudinal and / or transverse on the ceiling, or as a level surface for the roof superstructure.

▶ page 9

Statics



Definition of the approximate bar height (pre-dimensioning with Lignotrend LTB-x dimensioning program and DC Statik): From normal to large span widths, with vibration verification.

▶ page 10

Fire resistance

Arrangement of the so-called additional layer for fire protection F0-B to F90-B, bulkhead solutions for cable/pipe feed-throughs.

▶ page 10

Installation space / additional absorber

If necessary: selection of the so-called plus layer.
Additional channels for cables/pipes/built-in components underneath the fire-protection layer.

▶ from page 11

Surface and room acoustics

Definition of the component soffit: Various types of timber including knotless, closed surfaces, acoustic slats / board profiles, integrated acoustic absorbers.

Phase 2

To determine the cross-sectional height, static dimensioning is carried out with the LTB dimensioning program and DC-Statik ▶ page 9.

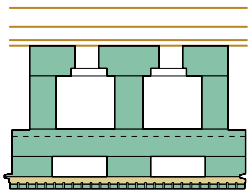
Your Lignotrend consultant will be glad to do that for you.

LIGNO®
Configurable Cross-Laminated Timber

Example ceiling configuration for large span width	**Example ceiling configuration for normal span width**	**Example ceiling configuration for normal span width**	**Example roof configuration for normal span width**
R_w to 75 dB / $L_{n,w}$ to 37 dB	R_w to 75 dB / $L_{n,w}$ to 37 dB	R_w to 75 dB / $L_{n,w}$ to 37 dB	R_w to 64 dB / flexible U-value
High upper chord with longitudinal channel **LIGNO® Rippe Q3_bv**	Upper chord with longitudinal channel **LIGNO® Rippe Q3**	Upper chord with transverse grid, longitudinal channel underneath **LIGNO® Rippe Q3-r25**	Closed upper chord **LIGNO® Block Q3**
High bars for large span width or high load	Medium-height bars for medium span width or moderate load	Medium-height bars for medium span width or moderate load	Low bars for small/medium span width or low load
F60-B with additional layer **_z53**	F60-B with additional layer **_z53**	F30-B with additional layer **_z26**	F0-B without additional layer **_z0**
_p53 53 mm-high installation space	**_p26** 26 mm-high installation space	**_p0** no additional installation space	**_p0** no additional installation space
_a50g Acoustic absorber **_625-20-4** Slat profile **_WTL** Silver fir, patterned **_b0** untreated	**_a0** without absorber **_625-20-4** Slat profile **_WTE** Silver fir, economy **_buv** Light protection	**_a50g** Acoustic absorber **_625-621-4** Closed soffit **_EI** Knotless oak **_buv** Light protection	**_a50g** Acoustic absorber **_625-12n25-4:3D** Slat profile **_WTL** Silver fir, patterned **_b0** untreated

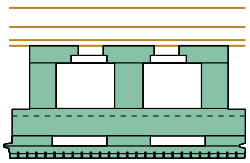
Ceiling component
for large span width

LIGNO® Rippe Q3-x



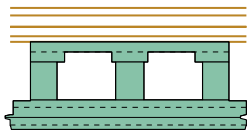
Ceiling component
for normal span width

LIGNO® Rippe Q3-x



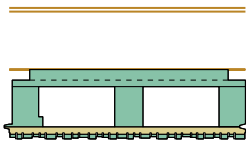
Ceiling component
for normal span width

LIGNO® Rippe Q3-x



Flat roof component
with warm roof structure

LIGNO® Block Q3-x



Configuration procedure LIGNO® Rippe Q2i-x

Phase 1

Based on your requirements, preselect the component features:

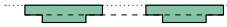
▶ from page 26

Sound and thermal insulation

Selection of the component structure: Tested superstructures, e.g. for increased noise protection, including low frequency, and for thermal insulation if applicable..

▶ page 8

Implementation as a web element



Top side:
for the top-side installation layout, longitudinal on the ceiling
LIGNO® Rippe Q2i-x is basically manufactured as a single-span beam.

▶ page 9

Statics

Definition of the approximate bar height (pre-dimensioning with Lignotrend LTB-x dimensioning program and DC Statik): From normal to large span widths, with vibration verification.

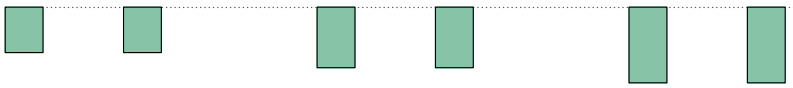
▶ page 10

Fire resistance

Arrangement of the so-called additional layer
for fire protection F0-B to F90-B, bulkhead solutions for cable/pipe feed-throughs.

▶ page 10

Installation space



Selection of installation layer, definition of transverse installation zones in the support area.
Additional channels for large cables/pipes/built-in components underneath the fire-protection layer.

▶ from page 11

Surface and room acoustics

Definition of the component soffit LIGNO® Acoustic light: Various types of timber including knotless, closed surfaces, acoustic slats profiles, integrated acoustic absorbers. ▶ TD LIGNO® Acoustic light

Phase 2

To determine the cross-sectional height, static dimensioning is carried out with the LTB dimensioning program and DC-Statik ▶ page 9.

Your Lignotrend consultant will be glad to do that for you.

LIGNO®
Configurable Cross-Laminated Timber

Example ceiling configuration for normal span width

R_w to 75 dB / $L_{n,w}$ to 37 dB

Upper chord
with longitudinal channel
LIGNO® Rippe Q2i

Medium-height bars
for medium span width
or moderate load

F60-B
with additional layer **_z53**

+i120 120 mm-high installation space

_a50g Acoustic absorber
_625-12-4 Slat profile
_WTL Silver fir, patterned
_bl-t Lacquer transparent

Example ceiling configuration for large span width

R_w to 75 dB / $L_{n,w}$ to 37 dB

Upper chord
with longitudinal channel
LIGNO® Rippe Q2i

High bars
for large span width
or high load

F90-B
with additional layer **_z80**

+i160 160 mm-high installation space

_a50g Acoustic absorber
_625-20-4 Slat profile
_BU Knotless beech
_buv Light protection

Example ceiling configuration for normal span width

R_w to 75 dB / $L_{n,w}$ to 37 dB

Upper chord
with longitudinal channel
LIGNO® Rippe Q2i

Medium-height bars
for medium span width
or moderate load

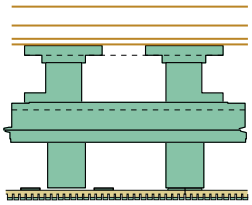
F30-B
with additional layer **_z26**

+i200 200 mm-high installation space

_a50g Acoustic absorber
_625-12n25-4:3D Slat profile
_EI Knotless oak
_b0 Light protection

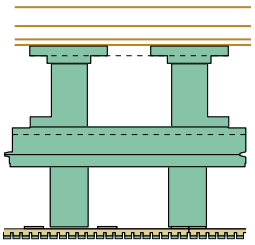
Ceiling component
for normal span width

LIGNO® Rippe Q2i-x



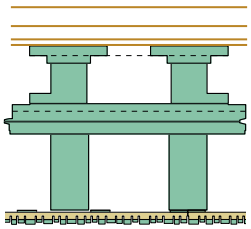
Ceiling component
for large span width

LIGNO® Rippe Q2i-x



Ceiling component
for normal span width

LIGNO® Rippe Q2i-x

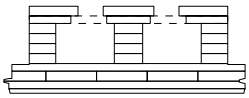


Configuration of the element top side
Optional installation grid

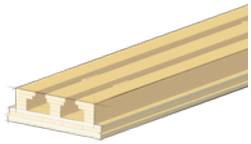
Transverse grid

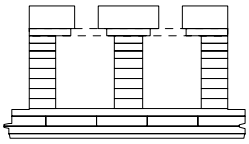
A simple room-sided layout of small cable/pipe cross-sections (electrical, heating, fresh water) is possible on the top side of the element if it is configured with a transverse grid. Elaborate cutting to size of insulating panels for the floor structure becomes superfluous.

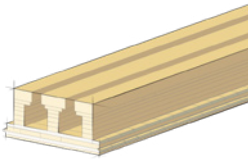
_r0



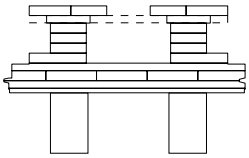
Top side with longitudinal channels,
no transverse grid





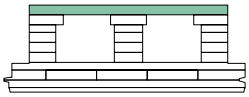


only for
Rippe Q2i



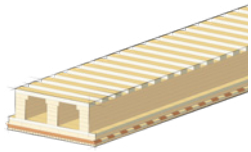
_r25

only for
Rippe Q3



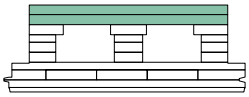
Top side with grid for transverse installation.
The gaps in the grid are 25 mm high
and approx. 62 mm wide.

up to element height 290



_r50

only for
Rippe Q3



Top side with grid for transverse installation.
The gaps in the grid are 50 mm high
and approx. 62 mm wide.

up to element height 290

Configuration of the bar/element height
Pre-dimensioning and static dimensioning

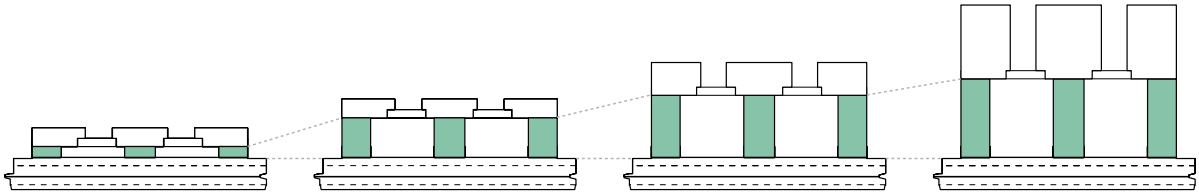
Element height (pre-dimensioning)

During the configuration, the element height is initially estimated.
The bar height results from the selection of the remaining configuration options, see tables ▶ from page 14.

low load	small span width					medium span width						large span width				
high load		small span width					medium span width					large span width				
			small span width with vibration verification					medium span width with vibration verification					large span width with vibration verification			

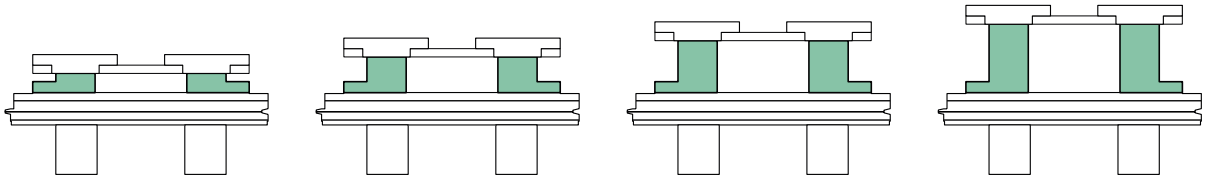
Rippe Q3

Element height	150	170	190	210	230	250	270	290	310	330	350	370	390	410	410	450



Rippe Q2i

Element height	170		190		210			230			250			270			290		
Installation height top	120	160	120	160	120	160	200	120	160	200	120	160	200	120	160	200	120	160	200



Element height (direct load-capacity verification)

With the free **LTB-x dimensioning software and DC-Statik,** a configuration can be created with realistic pre-dimensioning and a verifiable proof. Download from ▶ **www.lignotrend.com/downloads**

For the LTB-x, the so called „**hot dimensioning**" (fire resistances F30-B, F60-B und F90-B) a second, **separate verification** is to be carried out in which the theoretical residual cross-section is to be taken into account.

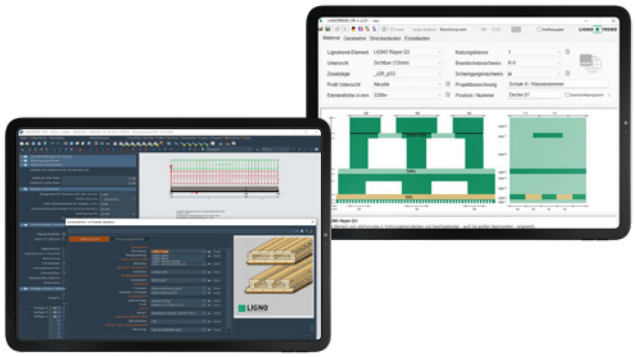


Plate load capacity

The **statically effective plate** is formed by coupling the element strips with butt boards. **Multi-ply butt boards** (cross- section 95 mm x 26,5 mm) are delivered as standard. These are fastened on site, for example with clamps. Additional stiffening boards or diagonals are not usually necessary!

A static verification of the plate is necessary.

▶ **Characteristic values from page 33**

Configuration of the fire resistance
Configuration of the lower installation area

Additional layers for fire resistance

For a calculable behaviour in case of fire, closed timber layers of different thicknesses are located above the soffit. They isolate at Rippe Q3 the upper area from the soffit with acoustic absorber respectively at RippeQ2i from the lower installation area.

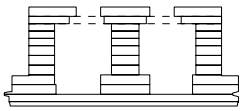
Plus layers for lower installation area

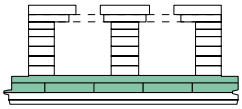
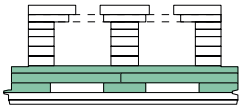
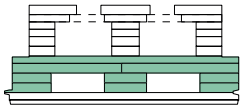
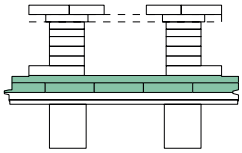
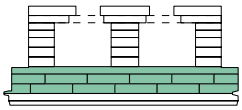
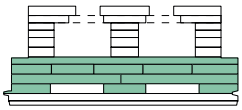
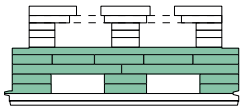
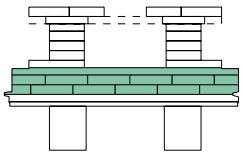
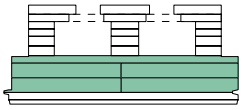
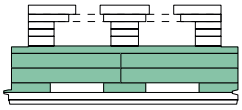
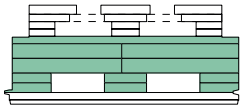
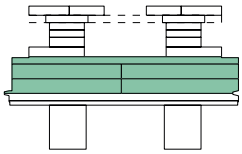
The lowering of the soffit using so-called plus layers enables the flexible layout of cables/pipes without having to penetrate the fire protection level. They increase the sound absorption capacity and allow the installation of spots. With Rippe Q2i, a large area is created for transverse and longitudinal cable routing.

_z0

Unmodified base body

LIGNO® Rippe



	Rippe Q3	Rippe Q3	Rippe Q3	Rippe Q2i
	_p0 no plus layer	**_p26** Plus layer for 26 mm installation space underneath the fire protection layer	**_p53** Plus layer for 53 mm installation space underneath the fire protection layer	**_z26** _r0 for all heights _r25 for all heights _r50 from height 190
_z26 26,5 mm-high additional layer for fire resistance **for F30-B** according to National Technical Approval	**_z26_p0** _r0 for all heights _r25 for all heights _r50 from height 190 	**_z26_p26** _r0 for all heights _r25 for all heights _r50 from height 210 	**_z26_p53** _r0 from height 170 _r25 from height 210 _r50 from height 210 	**_z53** _r0 from height 170 _r25 from height 170 _r50 from height 210 
_z53 53 mm-high additional layer for fire resistance **for F60-B** according to National Technical Approval	**_z53_p0** _r0 from height 170 _r25 from height 170 _r50 from height 210 	**_z53_p26** _r0 from height 170 _r25 from height 210 _r50 from height 210 	**_z53_p53** _r0 from height 210 _r25 from height 210 _r50 from height 230 	**_z80** _r0 from height 190 _r25 from height 210 _r50 from height 230 
_z80 80 mm-high additional layer for fire resistance **for F90-B** according to National Technical Approval	**_z80_p0** _r0 from height 190 _r25 from height 210 _r50 from height 230 	**_z80_p26** _r0 from height 210 _r25 from height 230 _r50 from height 230 	**_z80_p53** _r0 from height 230 _r25 from height 230 _r50 not available 	

Configuration of the element soffit LIGNO® Rippe Q3 Acoustic profile, absorber _a50g

Sound-absorbing slat profiles

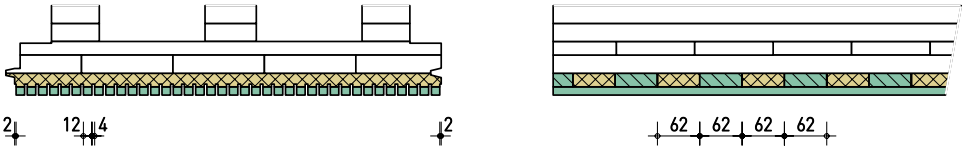
To achieve a sound-absorbing effect of the element surface on the room side, the wood surface can be profiled ex works with joints. The transverse layer located underneath is then fitted with an absorber.

Transverse layer _a50g

with soft wood fibre acoustic absorber (50% of area)

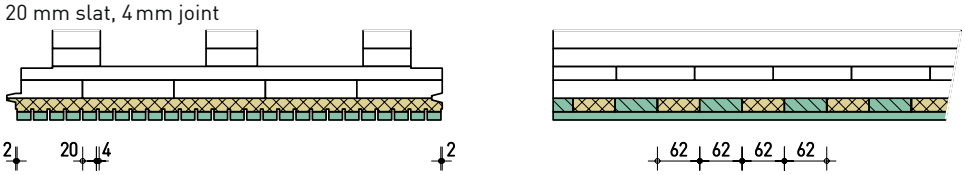
_625-12-4

12 mm slat, 4 mm joint



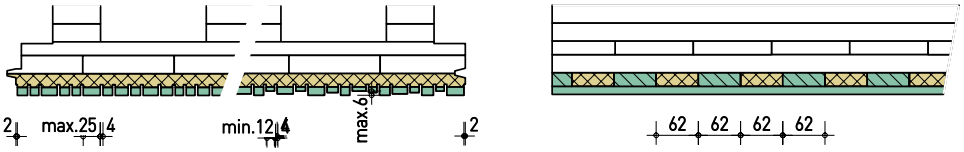
_625-20-4

20 mm slat, 4 mm joint



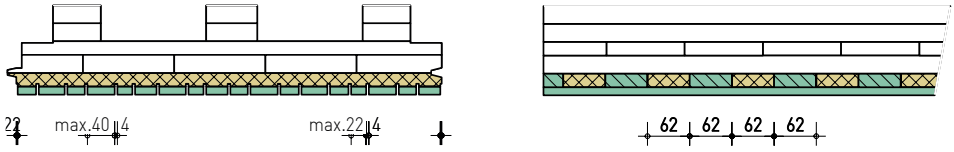
_625-12 n 25-4
_625-12 n 25-4:3D

nature profile: Slat width from 12 to 25 mm in irregular sequence, 4 mm joint
3D: Slats additionally graduated in height by 2, 4 or 6 mm



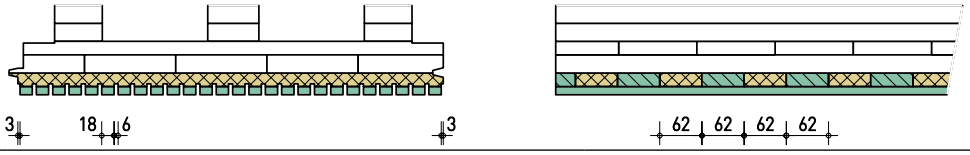
_625-22n40-4

nature profile: Slat width from 22 to 40 mm in irregular sequence, 4 mm joint



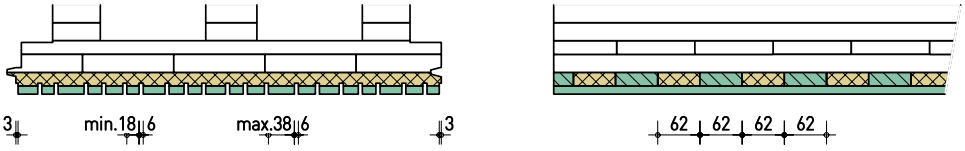
_625-18-6

18 mm slat, 6 mm joint



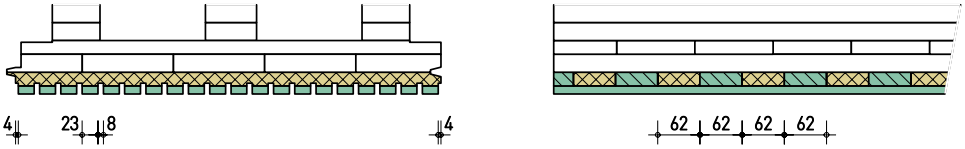
_625-18 n 38-6

nature profile: Slat width from 18 to 38 mm in irregular sequence, 6 mm joint



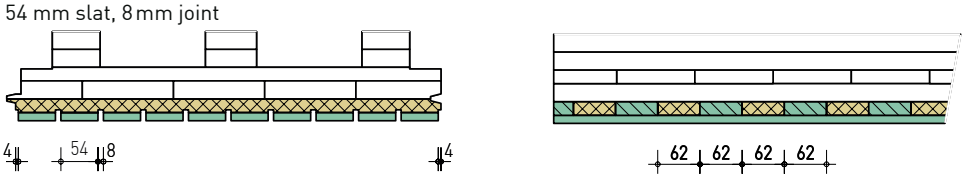
_625-23-8

23 mm slat, 8 mm joint



_625-54-8

54 mm slat, 8 mm joint



The component soffit of LIGNO® Rippe Q2i is made of LIGNO® Acoustic light.

▶ TD LIGNO® Acoustic light

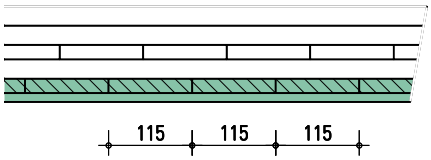
Configuration of the element soffit LIGNO® Rippe Q3 Low absorbent and closed profiles

Low sound-absorbent slat profiles

If a slat surface is desired, but a low sound absorption is sufficient, no acoustic absorber is placed in the transverse layer. Cross-sectional structure of the **profile variants otherwise analogous to the absorbent variants**.

Transverse layer _a0

with solid wood transverse layer, no absorber



Laminar, closed real wood soffit

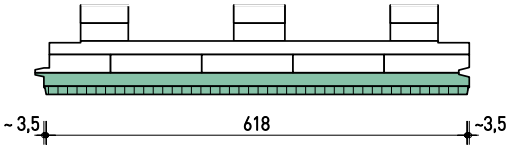
The element soffit can also be implemented with a closed real wood surface over the element width of 625 mm.

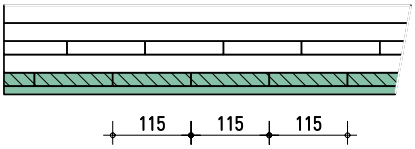
Transverse layer _a0

with solid wood transverse layer, no absorber

_625-618-7
all types of wood
except **_WTE**

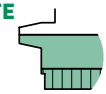
V-shaped joint at lateral element butt joint

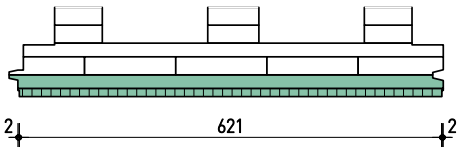


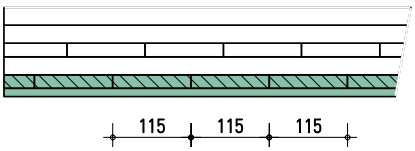


_625-621-4
all types of wood
except **_WTE**

Sharp-edged 4 mm joint at lateral element butt joint

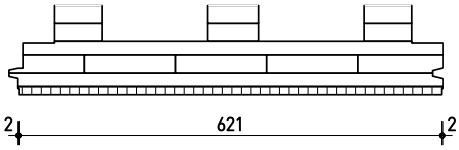


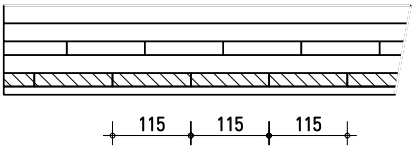




_625-621-4
NSi

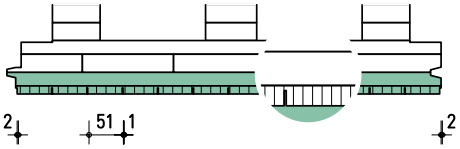
Sharp-edged 4 mm joint at lateral element butt joint

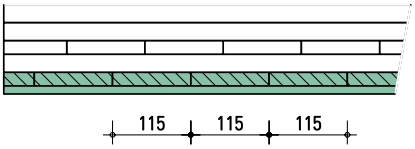




_625-51-1
all types of wood

51 mm strips, 1 mm joint in the surface, sharp-edged 4 mm joint at lateral element butt joint





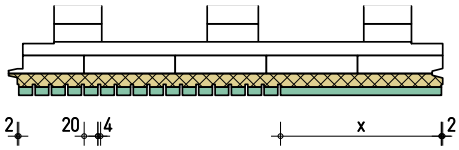
Special versions (on request)

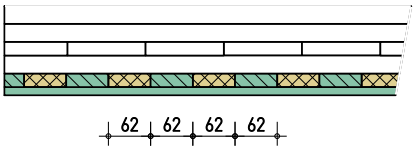
Profiling of partial surfaces

Only a part of the soffit is scored.

Transverse layer _a50g or **_a0**

Transverse layer with or without absorber





Acoustic perforation

Drilling the soffit,
provided this is technically feasible.

Transverse layer _a50g or **_a0**

Transverse layer with or without absorber

Configuration of the element soffit
Type of timber, surface treatment

High-quality real wood soffit

With most types of timber, the single-layer boards used for the visible layer of the elements consist of lamella sections, which are connected lengthwise by vertical or horizontal finger-joints. Approx. every 2.87 m, the elements are coupled by a general butt joint, which is recognisable close up as a fine line over the 625 mm element width.

▶ **The technical data sheet "LIGNO® surfaces" contains a precise description of the timber character**

Silver fir knotless, patterned	**_WTL**	Vivid pattern, variation in brightness and colour
Silver fir knotless, patterned, impregnated	**_WTL-i**	Like WTL, but impregnated for flame retardancy. Only in conjunction with acoustic profile. Required on the load-bearing element only in special cases.
Silver fir knotless, plain	**_WTS**	Like WTL, but with less variation, finer grain. Availability limited, please enquire about delivery time.
Silver fir knotless, economy	**_WTE**	Like WTL, but with wood irregularities. Only in connection with the profile 625-51-1 and with acoustic profiles.
Spruce knotless, plain	**_FIS**	Comparable with WTS, but very little colour variation
Spruce knotless, plain, impregnated	**_FIS-i**	Like FIS, but impregnated for flame retardancy. Only in conjunction with acoustic profile. Required on the load-bearing element only in special cases.
Spruce knotty (A qual.)	**_FI-ä**	Grade with knots, homogeneous pattern, continuous lamellae without finger-joints. Note: Knots may be conspicuous with narrow slat profiles.
Knotless oak	**_EI**	Vivid pattern, variation in the brightness, lamella joint visible only as a line (horizontal finger joints). Availability/stock limited, please enquire about delivery time.
Larch	**_LÄS** **_LÄE**	LÄS has a vivid pattern with slight variations in brightness, LÄE on the other hand has a calmer appearance
Other types of timber	Should the element soffit be designed with a different type of timber? Contact the Lignotrend consultant; he will check the feasibility.	

Inexpensive soffit without visible quality requirement

If the ceiling soffit is to be clad on site with plasterboard or implemented with a suspended ceiling, wood in a non-visible quality is used for the lowest layer.

Industrial quality	**_NSI**	Single boards laid with joints or single-layer plates that are unsuitable for visible qualities. Different types of timber can be mixed in elements or pickings.

Surface treatment

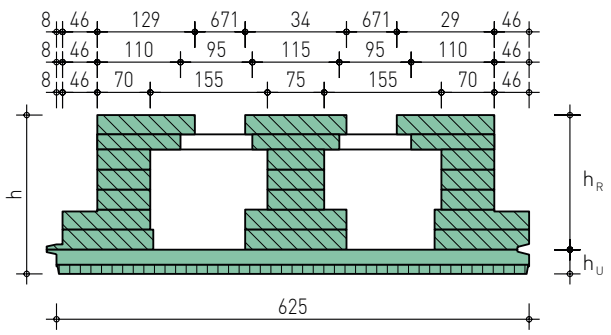
Light-protection primer, colourless	Glaze for light-coloured woods: Colourless UV-protection primer to prevent darkening of the wood. Suitable for interior use (not classified as toxic). Final treatment necessary if washout cannot be ruled out. Make: Adler Lignovit Interior UV 100 LT5.
Other surface treatments	An on-site application is recommended for other final treatments of the surface.

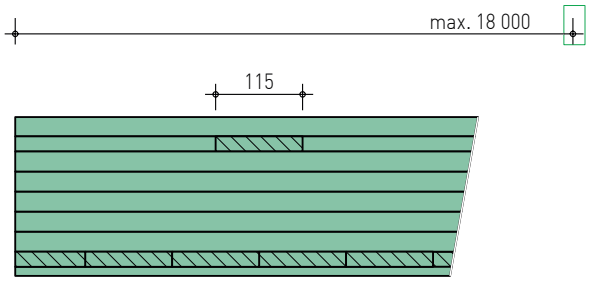
Basic element configuration LIGNO® Rippe Q3 Fire resistance F0-B

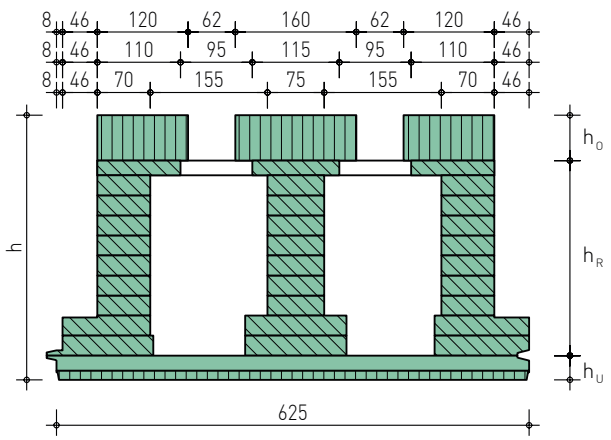
LIGNO® Rippe Q3_z0_p0

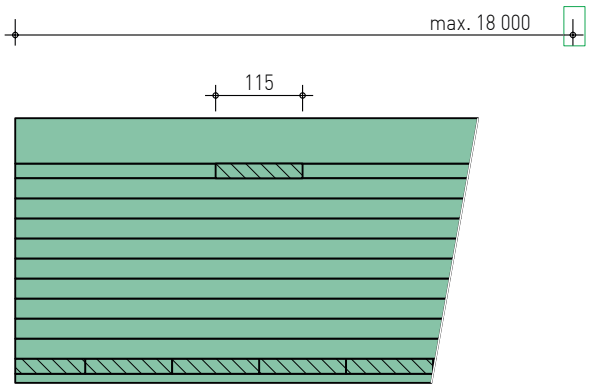
Height	Recom-mended maximum length	Upper chord h_O	Web h_R	Dead weight Closed surface	Dead weight Acoustic surface	Cavity	Limestone gravel fillings at 1400 kg/m³	+ 60 mm soft wood fibre	+ 120 mm soft wood fibre	+ 180 mm soft wood fibre
150	≤ 15 m		118,0	49	45	0,049	67	34		
170	≤ 15 m		138,0	52	49	0,062	85	52		
190	≤ 18 m		158,0	55	52	0,076	104	71		
210	≤ 18 m		178,0	59	55	0,088	122	89	45	
230	≤ 18 m		198,0	62	59	0,102	141	107	63	
250	≤ 18 m		218,0	66	62	0,115	159	126	82	
270	≤ 18 m		238,0	69	66	0,128	177	144	100	54
290	≤ 18 m		258,0	73	69	0,141	196	162	119	73
310	≤ 18 m	60	218,0	81	78	0,144	199	166	122	76
330	≤ 18 m	60	238,0	85	81	0,157	218	184	140	95
350	≤ 18 m	60	258,0	88	85	0,170	236	203	159	113
370	≤ 18 m	80	258,0	95	91	0,177	246	213	169	123
390	≤ 18 m	100	258,0	101	98	0,184	256	223	179	133
410	≤ 18 m	120	258,0	107	104	0,192	266	233	189	143
430	≤ 18 m	140	258,0	114	110	0,199	276	243	199	153
450	≤ 18 m	160	258,0	120	117	0,206	286	253	209	163
mm		mm	mm	kg/m²	kg/m²	m³/m²	kg/m²	kg/m²	kg/m²	kg/m²

Additional layer	_z0	h_Z	-	Blocking layer	h_S
No plus layer	_p0	h_P	-	Soffit	h_U







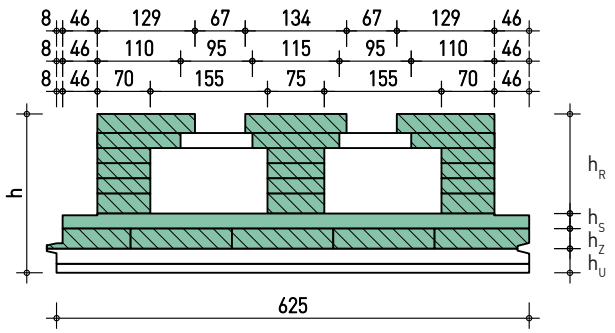


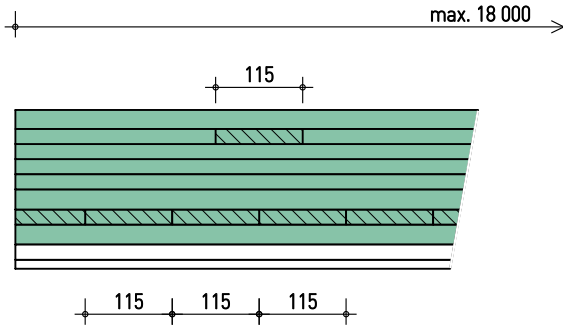
Basic element configuration LIGNO® Rippe Q3 Fire resistance F30-B

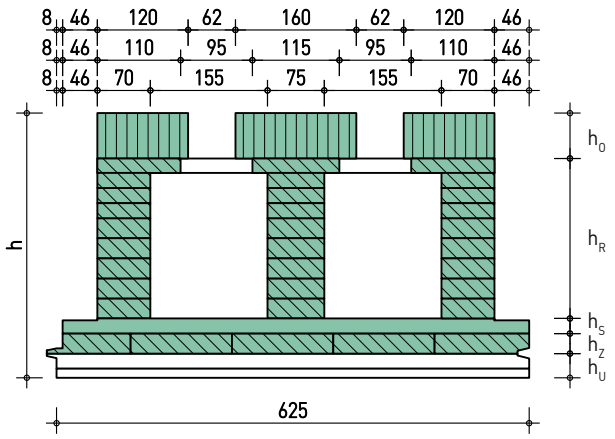
LIGNO® Rippe Q3_z26_p0

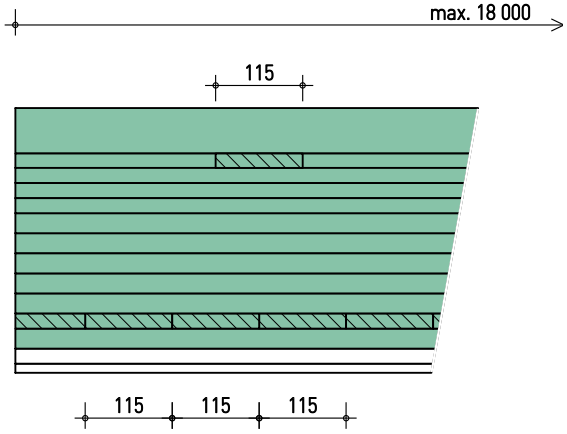
Height	Recom-mended maximum length	Upper chord h_0	Web h_R	Dead weight **Closed** surface	Dead weight **Acoustic** surface	Cavity	Limestone gravel fillings at 1400 kg/m³	+ 60 mm soft wood fibre	+ 120 mm soft wood fibre	+ 180 mm soft wood fibre
150	≤ 15 m		71,5	57	53	0,032	45			
170	≤ 15 m		91,5	60	57	0,045	63			
190	≤ 18 m		111,5	63	60	0,058	82	40		
210	≤ 18 m		131,5	67	63	0,072	100	59		
230	≤ 18 m		151,5	70	67	0,084	118	77		
250	≤ 18 m		171,5	74	70	0,098	137	96	54	
270	≤ 18 m		191,5	77	74	0,111	155	115	73	
290	≤ 18 m		211,5	81	77	0,124	173	134	92	
310	≤ 18 m	60	171,5	89	86	0,125	177	137	95	
330	≤ 18 m	60	191,5	93	89	0,138	195	156	114	
350	≤ 18 m	60	211,5	96	93	0,152	214	174	133	89
370	≤ 18 m	80	211,5	103	99	0,159	224	184	143	99
390	≤ 18 m	100	211,5	109	106	0,167	234	194	153	110
410	≤ 18 m	120	211,5	115	112	0,173	244	205	163	120
430	≤ 18 m	140	211,5	122	118	0,180	254	215	173	130
450	≤ 18 m	160	211,5	128	125	0,187	264	225	183	140
mm		mm	mm	kg/m²	kg/m²	m³/m²	kg/m²	kg/m²	kg/m²	kg/m²

Additional layer **_z26**	h_Z	26,5 mm	Blocking layer	h_S	20 mm
No plus layer **_p0**	h_P	–	Soffit	h_U	32 mm





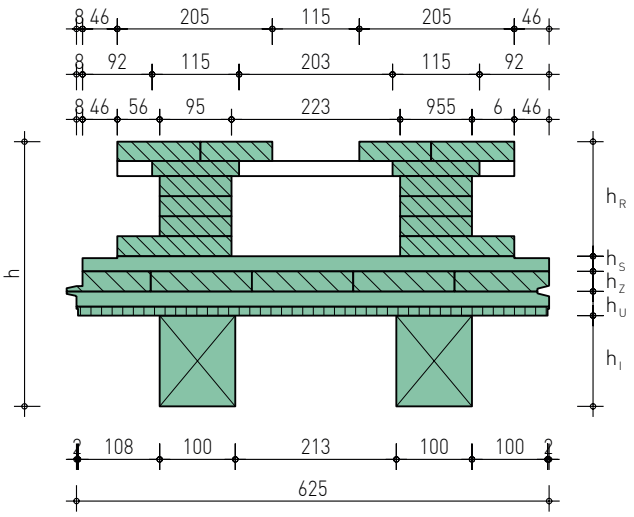


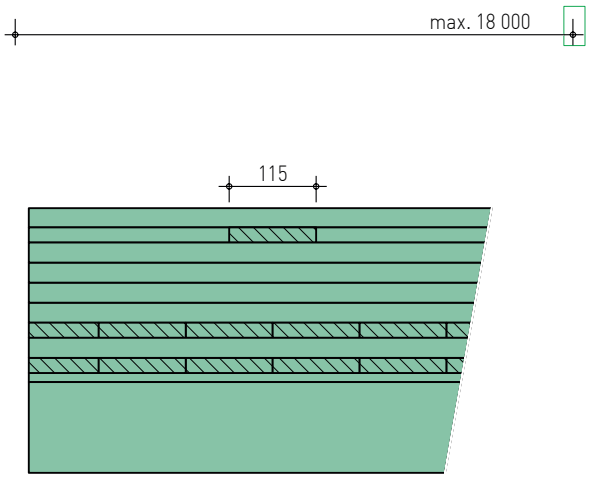


Basic element configuration LIGNO® Rippe Q2i Fire resistance F30-B

LIGNO® Rippe Q2i_z26						
Height	**Installation height**	Recommended maximum length	Web h_R	Dead weight	Cavity	Bulk weight at 1400 kg/m³
170	**120**	≤ 10 m	91,5	80	0,045	63
	160	≤ 10 m	91,5	86	0,045	63
190	**120**	≤ 10 m	111,5	82	0,059	82
	160	≤ 10 m	111,5	88	0,059	82
210	**120**	≤ 10 m	131,5	85	0,073	102
	160	≤ 10 m	131,5	91	0,073	102
	200	≤ 10 m	131,5	98	0,073	102
230	**120**	≤ 10 m	151,5	88	0,087	121
	160	≤ 10 m	151,5	94	0,087	121
	200	≤ 10 m	151,5	101	0,087	121
250	**120**	≤ 10 m	171,5	91	0,100	141
	160	≤ 10 m	171,5	98	0,100	141
	200	≤ 10 m	171,5	104	0,100	141
270	**120**	≤ 10 m	191,5	94	0,114	160
	160	≤ 10 m	191,5	101	0,114	160
	200	≤ 10 m	191,5	107	0,114	160
290	**120**	≤ 10 m	211,5	98	0,128	180
	160	≤ 10 m	211,5	104	0,128	180
	200	≤ 10 m	211,5	110	0,128	180
mm	**mm**	m	mm	kg/m²	m³/m²	kg/m²

Additional layer_**z26** h_Z 26,5 mm Blocking layer h_S 20 mm
Soffit h_U 32 mm

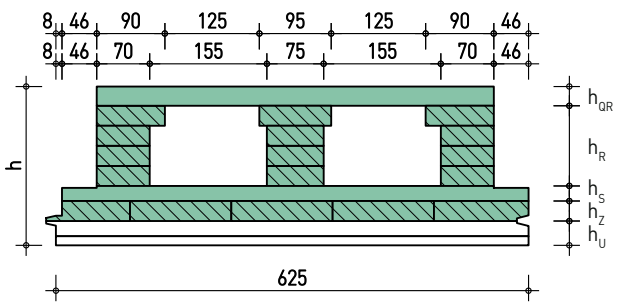


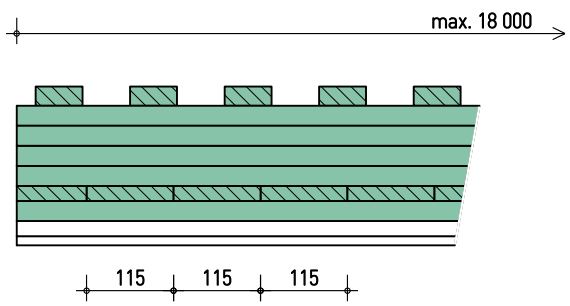


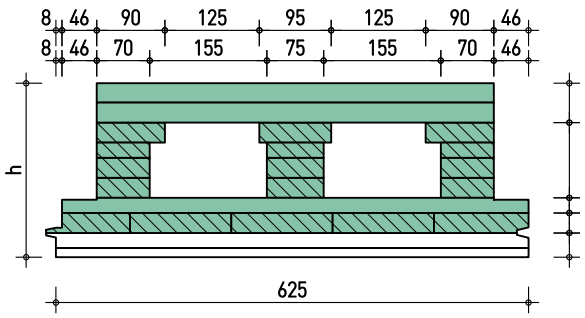
Basic element configuration LIGNO® Rippe Q3_r F30-B for transverse installation on element / under the floor structure

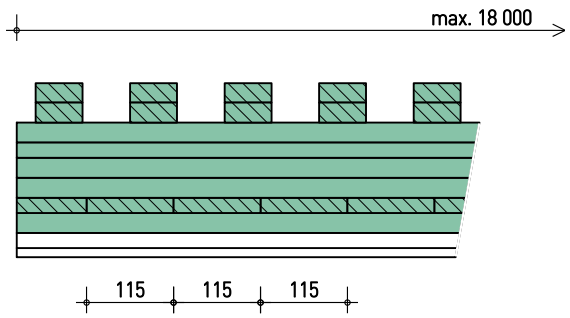
Height	Recom-mended maximum length	Upper chord h_O	Web h_R	Dead weight Closed surface	Dead weight Acoustic surface	Cavity	Limestone gravel fillings at 1400 kg/m³	+ 60 mm soft wood fibre	+ 120 mm soft wood fibre	+ 180 mm soft wood fibre
LIGNO® Rippe Q3_r25_z26_p0										
150	≤ 15 m		46,5	54	51	0,03856	52			
170	≤ 18 m		66,5	58	54	0,05168	70			
190	≤ 18 m		86,5	61	58	0,0648	88	47		
210	≤ 18 m		106,5	64	61	0,07792	107	66		
230	≤ 18 m		126,5	68	64	0,09104	125	84		
250	≤ 18 m		146,5	71	68	0,10416	143	103	60	
270	≤ 18 m		166,5	75	71	0,1176	162	122	79	
290	≤ 18 m		186,5	78	75	0,1304	180	140	98	
LIGNO® Rippe Q3_r50_z26_p0										
190	≤ 18 m		61,5	57	53	0,06352	86			
210	≤ 18 m		81,5	60	57	0,076	104			
230	≤ 18 m		101,5	63	60	0,08912	122	81		
250	≤ 18 m		121,5	67	64	0,10224	141	100		
270	≤ 18 m		141,5	70	67	0,11536	159	119		
290	≤ 18 m		161,5	74	70	0,12832	178	137	95	
mm	m		mm	kg/m²	kg/m²	m³/m²	kg/m²	kg/m²	kg/m²	kg/m²

Upper transverse grid	**_r25**	h_{QR}	25 mm	Blocking layer h_S	20 mm
	_r50	h_{QR}	50 mm	Soffit h_U	32 mm
Additional layer	**_z26**	h_Z	26,5 mm		
No plus layer	**_p0**	h_P	-		







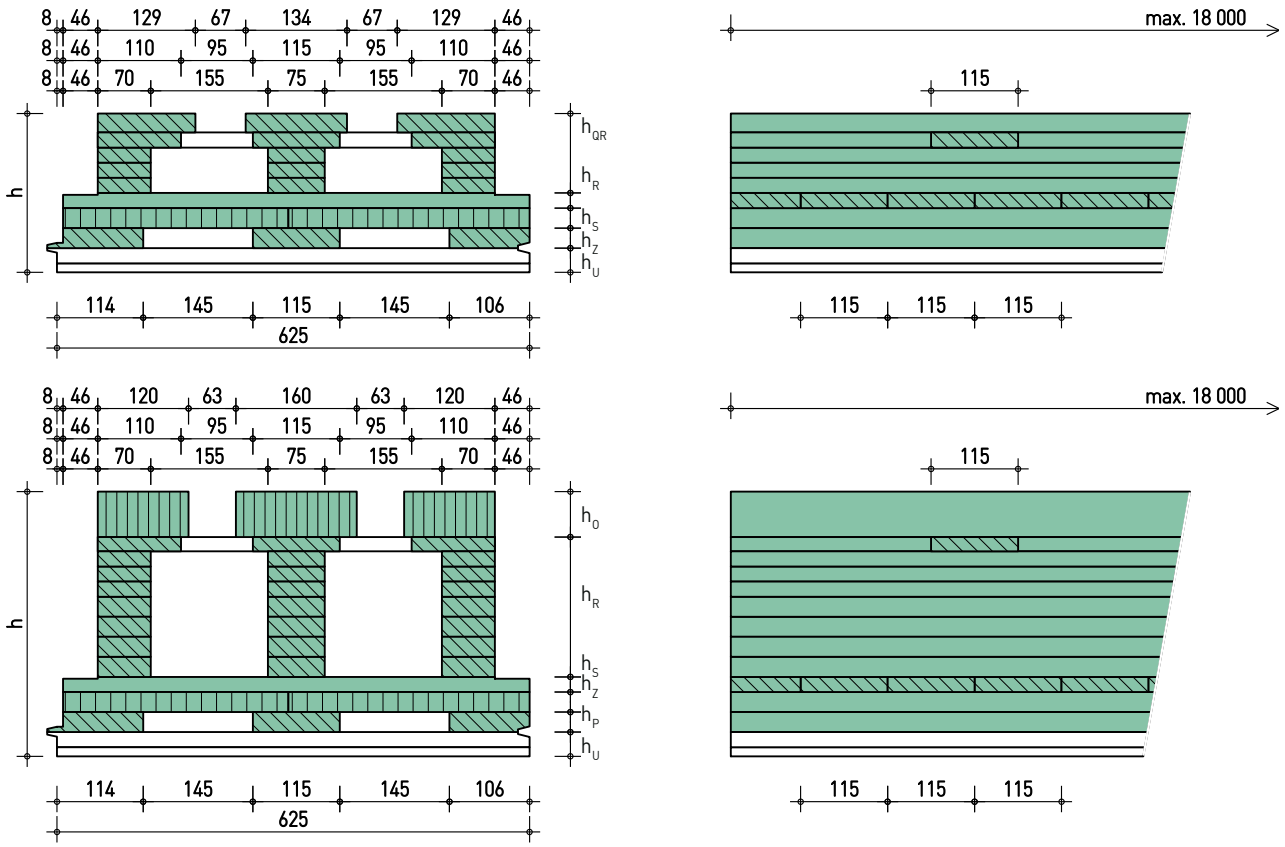


Basic element configuration **LIGNO® Rippe Q3** F30-B with installation area underneath the fire protection level

LIGNO® Rippe Q3_z26_p26

Height	Recom-mended maximum length	Upper chord h_O	Web h_R	Dead weight **Closed** surface	Dead weight **Acoustic** surface	Cavity	Limestone gravel fillings at 1400 kg/m³	+ 60 mm soft wood fibre	+ 120 mm soft wood fibre	+ 180 mm soft wood fibre
170	≤ 15 m		65,0	62	59	0,028	39			
190	≤ 18 m		85,0	66	62	0,041	57			
210	≤ 18 m		105,0	69	66	0,054	76	34		
230	≤ 18 m		125,0	73	69	0,067	94	53		
250	≤ 18 m		145,0	76	73	0,080	112	71		
270	≤ 18 m		165,0	80	76	0,093	131	90	47	
290	≤ 18 m		185,0	83	80	0,106	149	109	66	
310	≤ 18 m	60	145,0	92	88	0,109	153	112	69	
330	≤ 18 m	60	165,0	95	92	0,122	171	131	89	
350	≤ 18 m	60	185,0	99	95	0,136	189	150	108	
370	≤ 18 m	80	185,0	105	102	0,143	200	160	118	
390	≤ 18 m	100	185,0	111	108	0,150	209	170	128	
410	≤ 18 m	120	185,0	118	114	0,157	220	180	138	
430	≤ 18 m	140	185,0	124	121	0,164	230	190	148	
450	≤ 18 m	160	185,0	131	127	0,172	240	200	158	
mm		mm	mm	kg/m²	kg/m²	m³/m²	kg/m²	kg/m²	kg/m²	kg/m²

Additional layer **_z26**	h_Z	26,5 mm	Blocking layer	h_S	20 mm
No plus layer **_p26**	h_P	26,5 mm	Soffit	h_U	32 mm

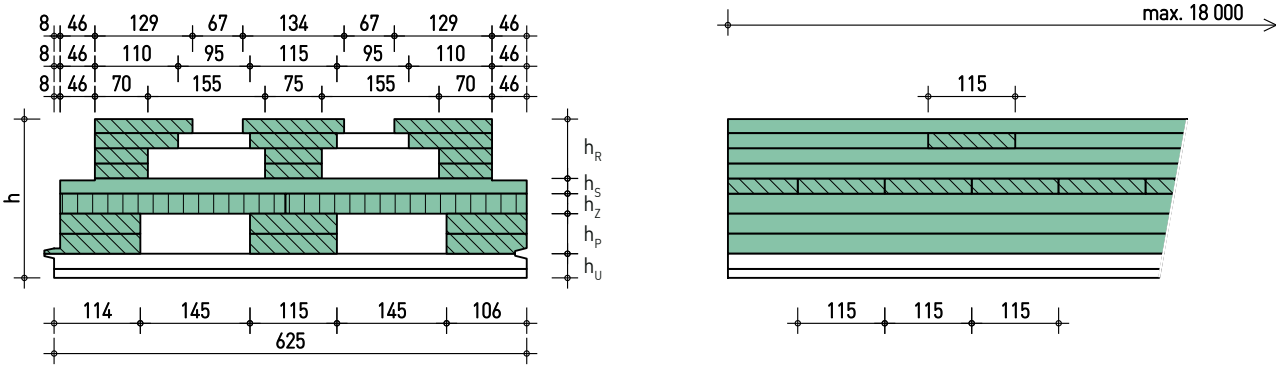


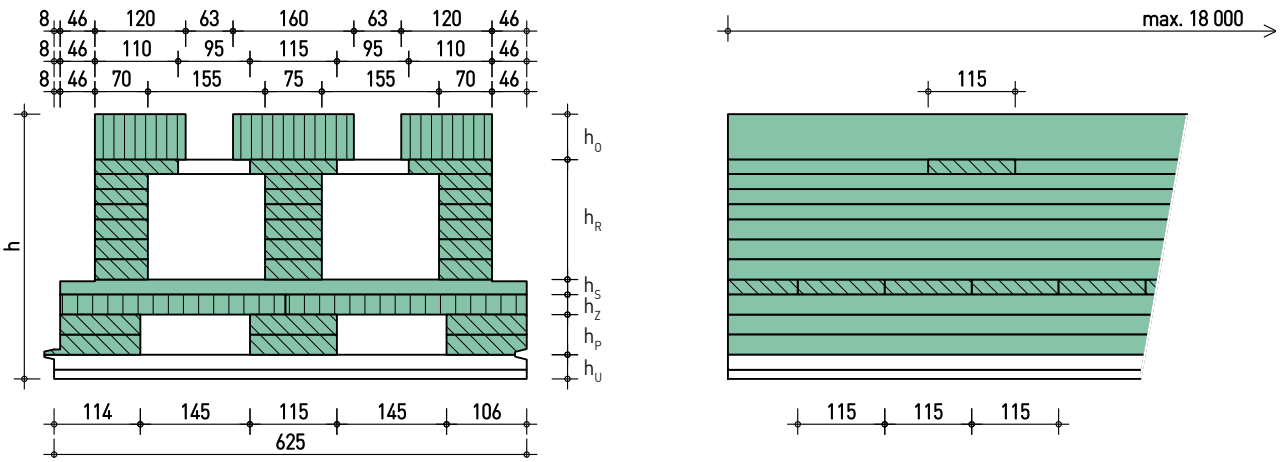
Basic element configuration LIGNO® Rippe Q3 F30-B with installation area underneath the fire protection level

LIGNO® Rippe Q3_z26_p53

Height	Recommended maximum length	Upper chord h_0	Web h_R	Dead weight Closed surface	Dead weight Acoustic surface	Cavity	Limestone gravel fillings at 1400 kg/m³	+ 60 mm soft wood fibre	+ 120 mm soft wood fibre	+ 180 mm soft wood fibre
190	≤ 18 m		58,5	68	65	0,025	33			
210	≤ 18 m		78,5	72	68	0,039	51			
230	≤ 18 m		98,5	75	72	0,050	70			
250	≤ 18 m		118,5	79	75	0,063	88	47		
270	≤ 18 m		138,5	82	79	0,076	106	65		
290	≤ 18 m		158,5	85	82	0,089	125	84		
310	≤ 18 m	60	118,5	94	91	0,092	128	87		
330	≤ 18 m	60	138,5	98	94	0,105	147	106	63	
350	≤ 18 m	60	158,5	101	98	0,118	165	125	82	
370	≤ 18 m	80	158,5	107	104	0,125	175	135	92	
390	≤ 18 m	100	158,5	114	110	0,132	185	145	103	
410	≤ 18 m	120	158,5	120	117	0,140	195	155	113	
430	≤ 18 m	140	158,5	127	123	0,147	205	165	123	
450	≤ 18 m	160	158,5	133	130	0,154	215	175	133	
mm		mm	mm	kg/m²	kg/m²	m³/m²	kg/m²	kg/m²	kg/m²	kg/m²

Additional layer	_z26	h_Z	26,5 mm	Blocking layer h_S	20 mm
No plus layer	_p53	h_P	53 mm	Soffit h_U	32 mm



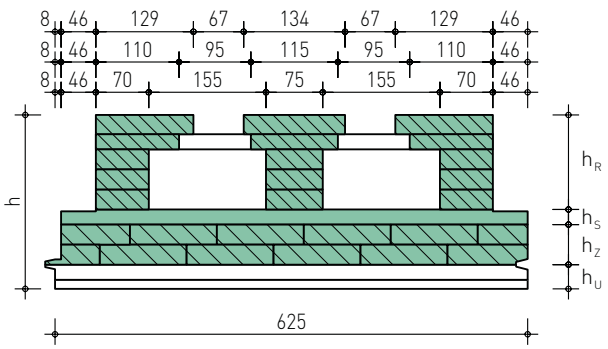


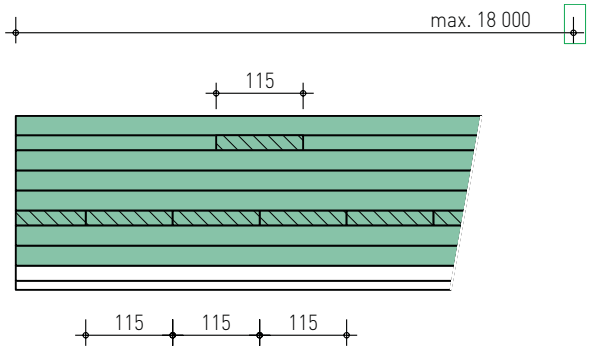
Basic element configuration LIGNO® Rippe Q3 Fire resistance F60-B

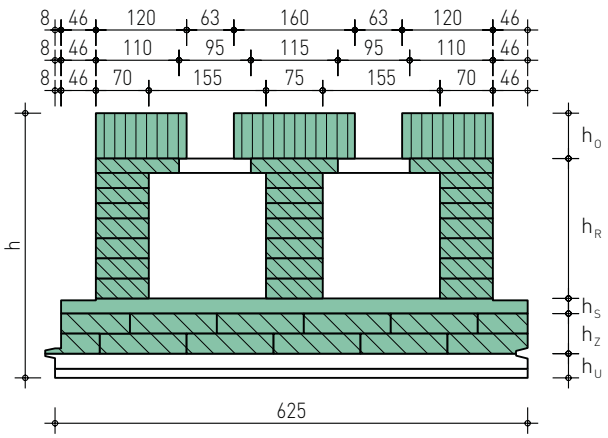
LIGNO® Rippe Q3_z53_p0

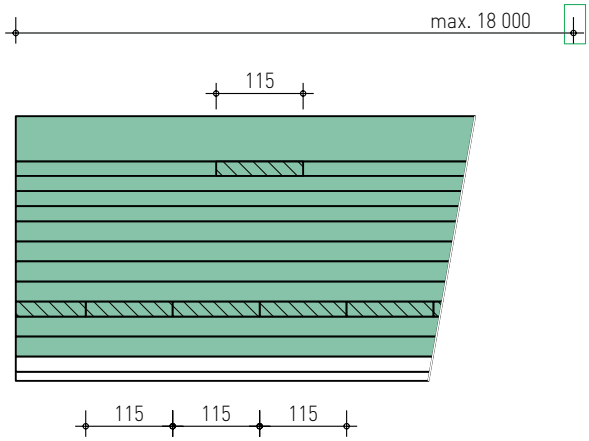
Height	Recom-mended maximum length	Upper chord h_O	Web h_R	Dead weight **Closed** surface	Dead weight **Acoustic** surface	Cavity	Limestone gravel fillings at 1400 kg/m³	+ 60 mm soft wood fibre	+ 120 mm soft wood fibre	+ 180 mm soft wood fibre
170	≤ 15 m		65,0	69	65	0,028	39			
190	≤ 18 m		85,0	72	69	0,041	57			
210	≤ 18 m		105,0	75	72	0,054	76	34		
230	≤ 18 m		125,0	79	75	0,067	94	53		
250	≤ 18 m		145,0	82	79	0,080	112	71		
270	≤ 18 m		165,0	86	82	0,093	131	90	47	
290	≤ 18 m		185,0	89	86	0,106	149	109	66	
310	≤ 18 m	60	145,0	98	95	0,109	153	112	69	
330	≤ 18 m	60	165,0	101	98	0,122	171	131	89	
350	≤ 18 m	60	185,0	105	101	0,136	189	150	108	
370	≤ 18 m	80	185,0	111	108	0,143	199	160	118	
390	≤ 18 m	100	185,0	118	114	0,150	209	170	128	
410	≤ 18 m	120	185,0	124	121	0,157	220	180	138	
430	≤ 18 m	140	185,0	130	127	0,164	230	190	148	
450	≤ 18 m	160	185,0	137	133	0,172	240	200	158	
mm		mm	mm	kg/m²	kg/m²	m³/m²	kg/m²	kg/m²	kg/m²	kg/m²

Additional layer **_z53**	h_Z	53 mm	Blocking layer	h_S	20 mm
No plus layer **_p0**	h_P	-	Soffit	h_U	32 mm







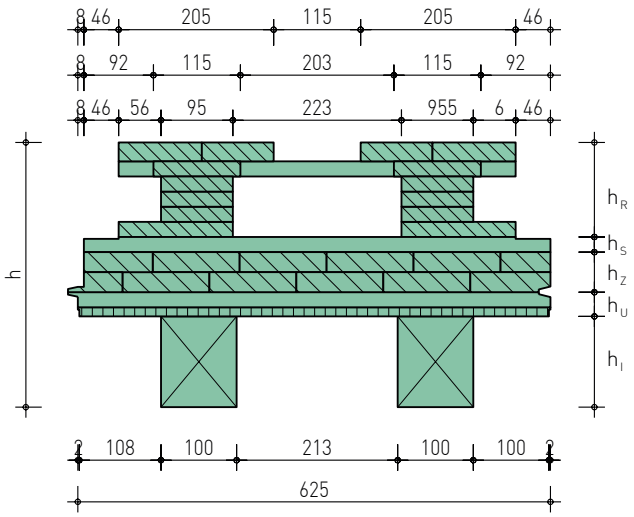


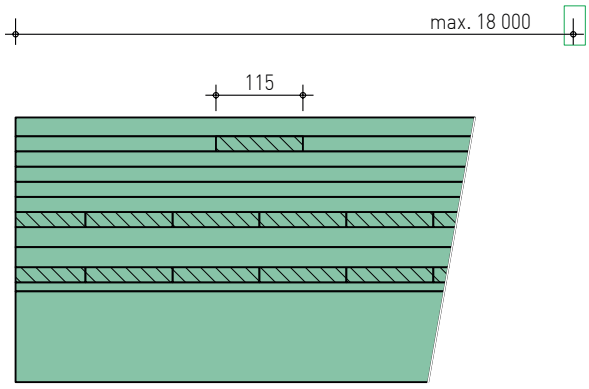
Basic element configuration LIGNO® Rippe Q2i Fire resistance F60-B

LIGNO® Rippe Q2i_z53

Height	Installation height	Recommended maximum length	Web h_R	Dead weight	Cavity	Bulk weight at 1400 kg/m³
190	120	≤ 10m	85,0	91	0,042	57
	160	≤ 10m	85,0	98	0,042	57
210	120	≤ 10m	105,0	94	0,056	76
	160	≤ 10m	105,0	101	0,056	76
	200	≤ 10m	105,0	107	0,056	76
230	120	≤ 10m	125,0	98	0,070	96
	160	≤ 10m	125,0	104	0,070	96
	200	≤ 10m	125,0	110	0,070	96
250	120	≤ 10m	145,0	101	0,083	115
	160	≤ 10m	145,0	107	0,083	115
	200	≤ 10m	145,0	114	0,083	115
270	120	≤ 10m	165,0	104	0,097	135
	160	≤ 10m	165,0	110	0,097	135
	200	≤ 10m	165,0	117	0,097	135
290	120	≤ 10m	185,0	107	0,111	154
	160	≤ 10m	185,0	114	0,111	154
	200	≤ 10m	185,0	120	0,111	154
mm	mm	m	mm	kg/m²	m³/m²	kg/m²

Additional layer **_z53**	h_Z	53 mm	Blocking layer	h_S	20 mm
			Soffit	h_U	32 mm





Basic element configuration LIGNO® Rippe Q3_r F60-B with installation area underneath the fire protection level

LIGNO® Rippe Q3_z53_p26

Height	Recom-mended maximum length	Upper chord h_0	Web h_R	Dead weight **Closed** surface	Dead weight **Acoustic** surface	Cavity	Limestone gravel fillings at 1400 kg/m³	+ 60 mm soft wood fibre	+ 120 mm soft wood fibre	+ 180 mm soft wood fibre
190	≤ 18 m		58,5	74	71	0,025	33			
210	≤ 18 m		78,5	78	74	0,039	51			
230	≤ 18 m		98,5	81	78	0,050	70			
250	≤ 18 m		118,5	85	81	0,063	88	47		
270	≤ 18 m		138,5	88	85	0,076	106	65		
290	≤ 18 m		158,5	92	88	0,089	125	84		
310	≤ 18 m	60	118,5	100	97	0,092	128	87		
330	≤ 18 m	60	138,5	104	100	0,105	147	106	63	
350	≤ 18 m	60	158,5	107	104	0,118	165	125	82	
370	≤ 18 m	80	158,5	114	110	0,125	175	135	92	
390	≤ 18 m	100	158,5	120	117	0,132	185	145	103	
410	≤ 18 m	120	158,5	126	123	0,140	195	155	113	
430	≤ 18 m	140	158,5	133	129	0,147	205	165	123	
450	≤ 18 m	160	158,5	139	136	0,154	215	175	133	
mm	m		mm	kg/m²	kg/m²	m³/m²	kg/m²	kg/m²	kg/m²	kg/m²

Additional layer **_z53**	h_Z	53 mm	Blocking layer	h_S	20 mm
No plus layer **_p26**	h_P	26,5 mm-	Soffit	h_U	32 mm

LIGNO® Rippe Q3_z53_p53

Height	Recom-mended maximum length	Upper chord h_0	Web h_R	Dead weight **Closed** surface	Dead weight **Acoustic** surface	Cavity	Limestone gravel fillings at 1400 kg/m³	+ 60 mm soft wood fibre	+ 120 mm soft wood fibre	+ 180 mm soft wood fibre
230	≤ 18 m		72,0	84	80	0,032	45			
250	≤ 18 m		92,0	87	84	0,045	64			
270	≤ 18 m		112,0	90	87	0,059	82	40		
290	≤ 18 m		132,0	94	91	0,072	100	59		
310	≤ 18 m	60	92,0	103	99	0,074	104	62		
330	≤ 18 m	60	112,0	106	103	0,088	122	81		
350	≤ 18 m	60	132,0	110	106	0,101	141	100		
370	≤ 18 m	80	132,0	116	113	0,108	151	110		
390	≤ 18 m	100	132,0	122	119	0,115	161	120		
410	≤ 18 m	120	132,0	129	125	0,122	171	130		
430	≤ 18 m	140	132,0	135	132	0,129	181	140		
450	≤ 18 m	160	132,0	142	138	0,137	191	150		
mm	m		mm	kg/m²	kg/m²	m³/m²	kg/m²	kg/m²	kg/m²	kg/m²

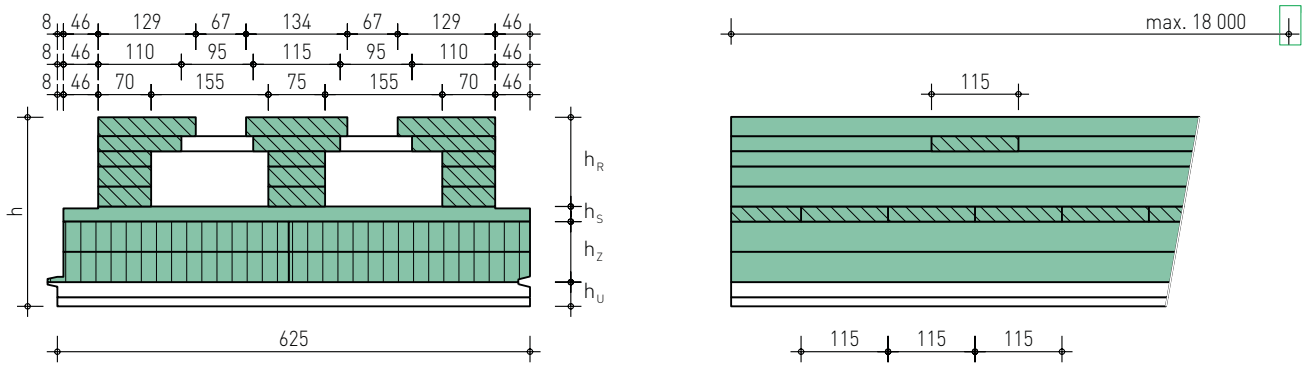
Additional layer **_z53**	h_Z	53 mm	Blocking layer	h_S	20 mm
No plus layer **_p53**	h_P	53 mm	Soffit	h_U	32 mm

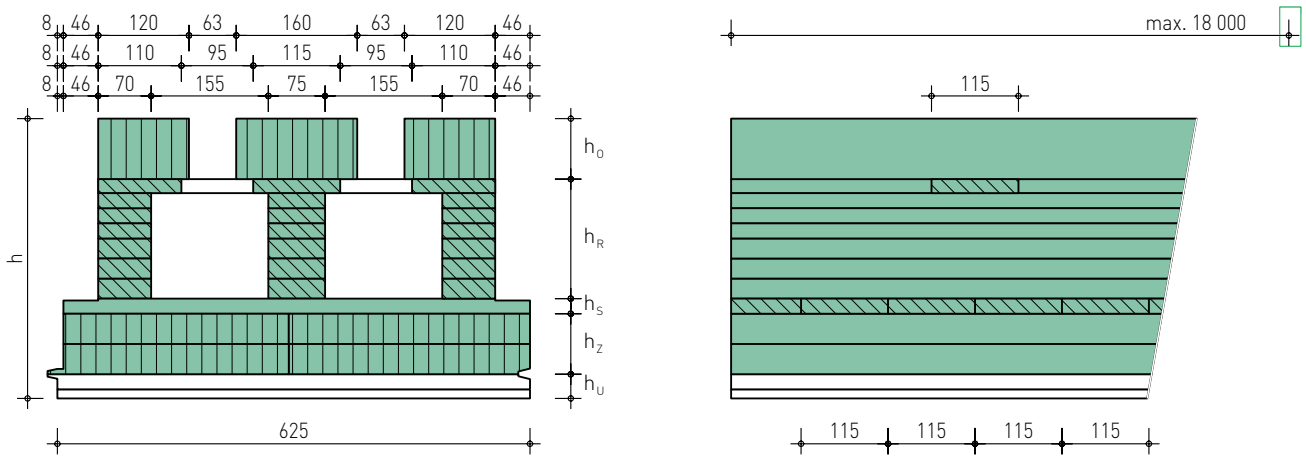
Basic element configuration LIGNO® Rippe Q3 Fire resistance F90-B

LIGNO® Rippe Q3_z80_p0

Height	Recom-mended maximum length	Upper chord h_0	Web h_R	Dead weight **Closed** surface	Dead weight **Acoustic** surface	Cavity	Limestone gravel fillings at 1400 kg/m³	+ 60 mm soft wood fibre	+ 120 mm soft wood fibre	+ 180 mm soft wood fibre
190	≤ 18 m		58,0	81	77	0,025	32			
210	≤ 18 m		78,0	84	81	0,038	51			
230	≤ 18 m		98,0	88	84	0,050	69			
250	≤ 18 m		118,0	91	88	0,063	87	46		
270	≤ 18 m		138,0	94	91	0,076	106	65		
290	≤ 18 m		158,0	98	94	0,089	124	83		
310	≤ 18 m	60	118,0	107	103	0,092	128	87		
330	≤ 18 m	60	138,0	110	107	0,105	146	106	63	
350	≤ 18 m	60	158,0	113	110	0,118	165	124	82	
370	≤ 18 m	80	158,0	120	116	0,125	175	134	92	
390	≤ 18 m	100	158,0	126	123	0,132	185	144	102	
410	≤ 18 m	120	158,0	133	129	0,139	195	154	112	
430	≤ 18 m	140	158,0	139	136	0,147	205	165	122	
450	≤ 18 m	160	158,0	145	142	0,154	215	175	132	
mm	m		mm	kg/m²	kg/m²	m³/m²	kg/m²	kg/m²	kg/m²	kg/m²

Additional layer	**_z53**	h_Z	53 mm	Blocking layer h_S	20 mm
No plus layer	**_p26**	h_P	26,5 mm-	Soffit h_U	32 mm

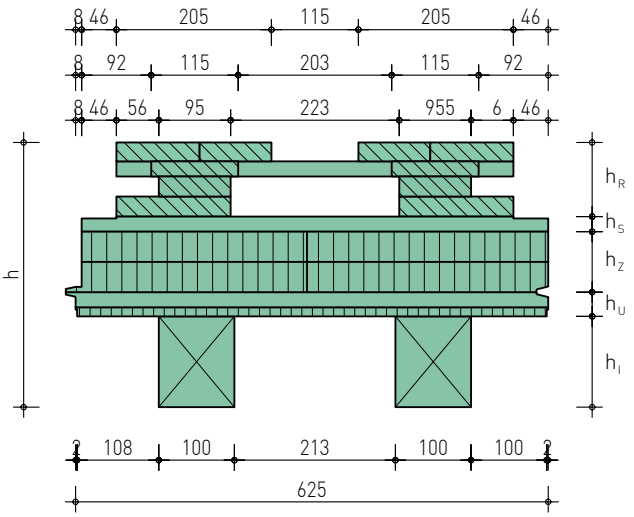


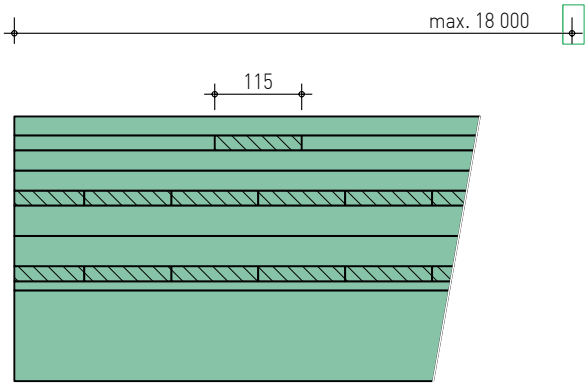


Basic element configuration LIGNO® Rippe Q2i Fire resistance F90-B

LIGNO® Rippe Q2i_z80						
Height	**Installation height**	Recommended maximum length	Web h_R	Dead weight	Cavity	Bulk weight at 1400 kg/m³
230	120	≤ 10m	98,0	107	0,050	69
	160	≤ 10m	98,0	114	0,050	69
	200	≤ 10m	98,0	120	0,050	69
250	120	≤ 10m	118,0	110	0,064	89
	160	≤ 10m	118,0	117	0,064	89
	200	≤ 10m	118,0	123	0,064	89
270	120	≤ 10m	138,0	112	0,077	108
	160	≤ 10m	138,0	118	0,077	108
	200	≤ 10m	138,0	125	0,077	108
290	120	≤ 10m	158,0	115	0,091	128
	160	≤ 10m	158,0	122	0,091	128
	200	≤ 10m	158,0	128	0,091	128
mm	mm	m	mm	kg/m²	m³/m²	kg/m²

Additional layer **_z80**	h_Z	80 mm	Blocking layer	h_S	20 mm
			Soffit	h_U	32 mm





Sound insulation Requirements

Normative requirements and recommendation

		Noise protection level		
	1	2	3	4
	Component	Base ≙ DIN 4109-1:2018	Base +	Comfort
1	Apartment isolating wall	$R'_w \geq 53$ dB	$R'_w \geq 56$ dB	$R'_w \geq 59$ dB
2	Row house isolating wall	$R'_w \geq 62$ dB	$R'_w \geq 62$ dB $R_w + C_{50\text{-}5000} \geq 62$ dB [1 5]	$R'_w \geq 67$ dB $R_w + C_{50\text{-}5000} \geq 65$ dB [1 5]
3	Apartment isolating ceiling	$R'_w \geq 54$ dB	$R'_w \geq 57$ dB	$R'_w \geq 60$ dB
4	Apartment isolating ceiling impact sound level	$L'_{n,w} \leq 53$ dB [3]	$L'_{n,w} \leq 50$ dB $L_{n,w} + C_{I,50\text{-}2500} \leq 50$ dB [2]	$L'_{n,w} \leq 46$ dB $L_{n,w} + C_{I,50\text{-}2500} \leq 47$ dB [2]
5	Roof terraces and loggias with living spaces underneath	$L'_{n,w} \leq 50$ dB	$L'_{n,w} \leq 50$ dB	$L'_{n,w} \leq 46$ dB
6	Ceilings under arcades (in all sound propagation directions)	$L'_{n,w} \leq 53$ dB	$L'_{n,w} \leq 50$ dB	$L'_{n,w} \leq 46$ dB
7	Staircase and stair landing	$L'_{n,w} \leq 53$ dB	$L'_{n,w} \leq 50$ dB	$L'_{n,w} \leq 46$ dB
8	Exterior noise according to noise level range and requirements of DIN 4109			Requirement according to DIN 4109 incl. consideration $C_{tr,50\text{-}5000}$ for the opaque component [4]
9	Further components	according to DIN 4109-1:2018	according to DIN 4109-1:2018	according to DIN 4109-5:2019 [6]

Source: Schallschutz im Holzbau - Grundlagen und Vorbemessung; Holzbau Handbuch | Reihe 3 | Teil 3 | Folge 1; Seite 13

1 Supplementary airborne sound requirement value only for the component without flanks
2 Supplementary impact sound requirement value only on the component without flanks
3 Special regulation for ceiling constructions to be assigned to DIN 4109-33:2016 otherwise $L'_{n,w} \leq 50$ dB
4 Separate consideration for window area parts over 30 %, pure component requirement
5 Requirement for the double-skin wall, both walls
6 According to the respective valid version or E-DIN 4109-5:2018

Characteristic values with regard to building physics (heat/humidity)

The usage case of the (upwardly open) LIGNO® Rippe cross-laminated timber web element as an exterior component is comparatively rare and usually only occurs in the case of ceilings that run from the interior to the areas of loggias or roof patios.

In this case the Lignotrend consultants and the engineers from the Lignotrend internal Technical Service can also provide **thermal conductivities** and **vapour diffusion resistance figures** for ceiling elements as well as support with the detailed planning where necessary.

Noise protection characteristic values
Structural ceilings

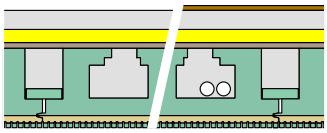
Impact sound and airborne sound with structural ceilings

Ceiling components made of LIGNO® achieve very good values for the standard impact sound level $L_{n,w}$ and for the sound insulation value R_w, even without cladding on the underside. If implemented appropriately, separating ceilings with increased noise protection can also be realised. Only those products that are equivalent in terms of the noise-relevant characteristic values to the products specified in the test reports (e.g. density, dynamic stiffness) may be used in the structure!

Specified values are laboratory values; **a reserve is therefore to be taken into account in the verification for the secondary sound paths!** The following must be adhered to:
existing $R'_w \geq$ required R'_w as well as existing $L'_{n,w} \leq$ required $L'_{n,w}$.

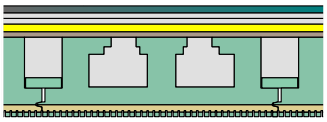
Test report ▶ **www.lignotrend.com**

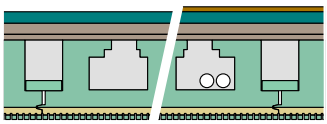
Structural ceilings with cement screed



Covering	–		-		Schwimmend verlegter Belag	
Screed	50 mm	Cement screed	50 mm	Cement screed	50 mm	Cement screed
Impact sound	40/35 mm	Mineral fibre impact sound insulation Isover Akustic EP1 (dyn. rigidity s' = 5 MN/m³)	35/30 mm	Mineral fibre impact sound insulation G+H 73T (Isover Akustic EP1, dyn. rigidity s' = 5 MN/m³)	35/30 mm	Mineral fibre impact sound insulation G+H 73T (Isover Akustic EP1, dyn. rigidity s' = 5 MN/m³)
Pressure distribution	15 mm	Pressure distribution board soft wood fibre, Gutex Standard-n	15 mm	Pressure distribution board soft wood fibre, Gutex Standard-n	15 mm	Pressure distribution board soft wood fibre, Gutex Standard-n
Load-bearing element	LIGNO® Rippe-x Filling according to left-hand gap		LIGNO® Rippe-x Filling according to left-hand gap		LIGNO® Rippe-x Filling according to left-hand gap	
Element weight: 55 kg/m² Filling weight: 196 kg/m² **Element + filling: 251 kg/m²**	$L_{n,w}$ = **37 dB** $C_{I,50\text{-}2500}$ = **+7 dB** C_I = 0 dB R_w = **78 dB** 168 30649/X15+X16					
Element weight: 50 kg/m² Filling weight: 147 kg/m² **Element + filling: 197 kg/m²**	$L_{n,w}$ = **40 dB** $C_{I,50\text{-}2500}$ = **+8 dB** C_I = 0 dB R_w = **75 dB** 168 30649/X11+X12					
Element weight: 52 kg/m² Filling weight: 88 kg/m² **Element + filling: 140 kg/m²**			$L_{n,w}$ = **45 dB** $C_{I,50\text{-}2500}$ = **+7 dB** C_I = 0 dB R_w **> 70 dB** PB 9802_T22-50 PB 980202_L22-50		$L_{n,w}$ = **37 dB** $C_{I,50\text{-}2500}$ = **+11 dB** C_I = 1 dB R_w **> 70 dB** PB 9802_T22-60	
Element weight: 53 kg/m² Filling weight: 83 kg/m² **Element + filling: 136 kg/m²**	$L_{n,w}$ = **45 dB** $C_{I,50\text{-}2500}$ = **7 dB** C_I = -2 dB R_w = **73 dB** PB 168 33947_x5_x6					
withour filling **Element: 53 kg/m²**	$L_{n,w}$ = **55 dB** $C_{I,50\text{-}2500}$ = **4 dB** C_I = -2 dB R_w = **66 dB** PB 168 33947_x1_x2					

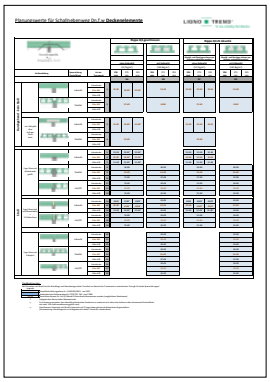
Structural ceilings with dry screed





Covering	–		–		Floating covering	
Screed	18 mm	Precast screed Knauf GIFAfloor Hugo L18	30 mm	Dry screed element Fermacell	30 mm	Dry screed element Fermacell
Impact sound	32/30 mm 20 mm	Sound insulation board PhoneStar Tri Wolf Bavaria (dyn. rigidity s'= 32.6 MN/m³) Mineral fibre impact sound insulation Isover Akustic EP3 (dyn. rigidity s' = 40 MN/m³)	32/30 mm	Holzweichfaser-Trittschall dämmung, Gutex Thermo-floor	32/30 mm	Holzweichfaser-Trittschall dämmung, Gutex Thermo-floor
Pressure distribution	15 mm	Pressure distribution board soft wood fibre, Gutex Standard-n	15 mm	Pressure distribution board soft wood fibre, Gutex Standard-n	15 mm	Pressure distribution board soft wood fibre, Gutex Standard-n
Load-bearing element	LIGNO® Rippe-x Filling according to left-hand gap		LIGNO® Rippe-x Filling according to left-hand gap		LIGNO® Rippe-x Filling according to left-hand gap	
Element weight: 52 kg / m² Filling weight: 88 kg / m² **Element + filling: 140 kg / m²**			$L_{n,w}$ = **49 dB** $C_{I,50-2500}$ = **+6 dB** R_w **> 67 dB** 980202.T22-110 980202.L22-110		$L_{n,w}$ = **47 dB** $C_{I,50-2500}$ = **+8 dB** R_w **> 67 dB** 980202.T22-120	
Element weight: 57 kg / m² Filling weight: 98 kg / m² **Element + filling: 155 kg / m²**	$L_{n,w}$ = **44 dB** $C_{I,50-2500}$ = **+6 dB** C_I = +2 dB R_w = **69 dB** 18-002898-PR02 PB X03-F03-04-de-01 **NEU**					

Secondary sound paths



The extent of the secondary sound paths depends on the implementation of the ceiling itself at the respective node as well as the structure and sound insulation of the adjoining wall components.

The complete interruption of the beam at delicate detail points is usually most favourable. If that is not possible, a more favourable characteristic value can be achieved by use of the gravel filling and/ or suitable isolation of the compartments.

On request we will provide a **combination matrix for the respectively relevant flank transmission assessment variable $D_{n,f,w}$** for the verification of many combinations of LIGNO® Rippe/Decke and cross-laminated timber walls in different thicknesses as well as timber frame walls.

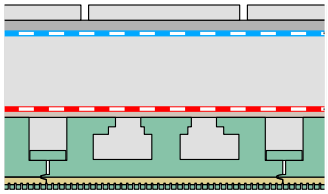
The engineers from our internal Technical Service will advise you on the carrying out of the verification or implementation.

Taking into account walking noises

Consideration of low sound frequencies is recommended for a good sound insulation quality of timber ceilings in order to be able to estimate how well the transmission of muffled, rumbling walking noises is prevented. Although there is no requirement (yet) in the standards, the sum of impact sound level and spectrum adaptation value $L_{n,w}$ + $C_{I,50-2500}$ can be taken as a comparison value for two component superstructures.

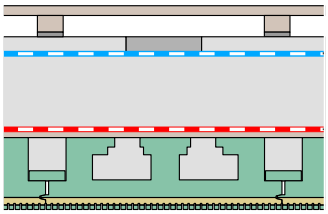
Noise protection characteristic values
Roof patios, sound-insulating flat roofs

Roof patios with pebbles



Covering	40 mm 30 mm	Concrete slabs, 91 kg/m² Fine aggregate (grading 5/8), 39 kg/m²	40 mm 30 mm	Concrete slabs, 91 kg/m² Fine aggregate (grading 5/8), 39 kg/m²	40 mm 30 mm	Concrete slabs, 91 kg/m² Fine aggregate (grading 5/8), 39 kg/m²
Supports					5 mm	Attic protection mat, ZinCo SSM 45
Roof sealing	2.5 mm	EPDM roofing felt, alwitra	2.5 mm	EPDM roofing felt, alwitra	2.5 mm	EPDM roofing felt, alwitra
Impact sound	140 mm	Flat roof insulating board PUR (dyn. rigidity s'= 28 MN/m³)	200 mm	Flat roof insulating board EPS 035 DAA (dyn. rigidity s' = 30 MN/m³)	200 mm	Flat roof insulating board EPS 035 DAA (dyn. rigidity s' = 30 MN/m³)
Pressure distribution	22 mm	OSB 4 TOP (Egger)	22 mm	OSB 4 TOP (Egger)	22 mm	OSB 4 TOP (Egger)
Load-bearing element	LIGNO® Rippe-x Filling according to left-hand gap		LIGNO® Rippe-x Filling according to left-hand gap		LIGNO® Rippe-x Filling according to left-hand gap	
Element weight: 57 kg / m² Filling weight: 98 kg / m² **Element + filling: 155 kg / m²**	$L_{n,w}$ = **46 dB** $C_{I,50\text{-}2500}$ = **+7 dB** C_I = +1 dB R_w = **65 dB** 18-002112-PR01 PB 14-F01-04-de-01		$L_{n,w}$ = **44 dB** $C_{I,50\text{-}2500}$ = **+9 dB** C_I = +1 dB R_w = **66 dB** 18-002112-PR01 PB 15-F01-04-de-01		$L_{n,w}$ = **40 dB** $C_{I,50\text{-}2500}$ = **+11 dB** C_I = 0 dB R_w = **57 dB** 18-002112-PR01 PB 30-F01-04-de-01	

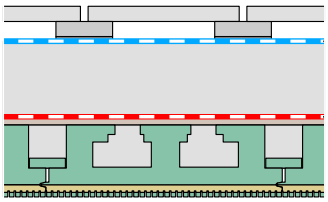
Roof patios with wooden grid



Membrane roof

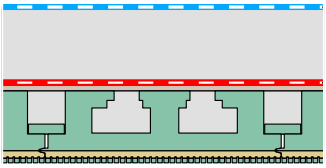
Covering	26 mm 44 mm	Larch floorboards Support wedges	26 mm 44 mm	Larch floorboards Support wedges		
Supports	12 mm 40 mm	Sylomer support s' < 40MN/m³ Concrete slabs, 50 kg/m², in between Fine aggregate (grading 5/8), 39kg kg/m².	12 mm 40 mm	Sylomer support s' < 40MN/m³ Concrete slabs, 91 kg/m²		
Roof sealing	2.5 mm	EPDM roofing felt, alwitra	2.5 mm	EPDM roofing felt, alwitra	2.5 mm	EPDM roofing felt, alwitra
Impact sound	200 mm	Flat roof insulating board EPS 035 DAA (dyn. rigidity s' = 30 MN/m³)	200 mm	Flat roof insulating board EPS 035 DAA (dyn. rigidity s' = 30 MN/m³)	200 mm	Flat roof insulating board EPS 035 DAA (dyn. rigidity s' = 30 MN/m³)
Pressure distribution	22 mm	OSB 4 TOP (Egger)	22 mm	OSB 4 TOP (Egger)	22 mm	OSB 4 TOP (Egger)
Load-bearing element	LIGNO® Rippe-x Filling according to left-hand gap		LIGNO® Rippe-x Filling according to left-hand gap		LIGNO® Rippe-x Filling according to left-hand gap	
Element weight: 57 kg / m² Filling weight: 98 kg / m² **Element + filling: 155 kg / m²**	$L_{n,w}$ = **35 dB** $C_{I,50\text{-}2500}$ = **+14 dB** C_I = +5dB R_w = **64 dB** 18-002112-PR01 PB 18-F01-04-de-01		$L_{n,w}$ = **40 dB** $C_{I,50\text{-}2500}$ = **+10 dB** C_I = +5 dB R_w = **55 dB** 18-002112-PR01 PB 29-F01-04-de-01		R_w = **45 dB** 18-002112-PR01 GAS 01-F01-04-de-01 (FA1)	

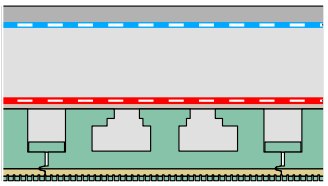
Dachterrassen auf Stelzlager



40 mm	Concrete slabs, 91 kg/m²	40 mm	Concrete slabs, 91 kg/m² on paving support pads PA20plus	40 mm	Concrete slabs, 91 kg/m² on paving support pads PA20plus
30 mm	Fine aggregate (grading 5/8), 39 kg/m²				
5 mm	Attic protection mat, ZinCo SSM 45	12 mm	Sylomer support s' < 40MN/m³		
2.5 mm	EPDM roofing felt, alwitra	2.5 mm	EPDM roofing felt, alwitra	2.5 mm	EPDM roofing felt, alwitra
58 mm	Patio insulating board UltraVIP (dyn. rigidity s'= 48 MN/m³)	200 mm	Flat roof insulating board EPS 035 DAA (dyn. rigidity s' = 30 MN/m³)	200 mm	Flat roof insulating board EPS 035 DAA (dyn. rigidity s' = 30 MN/m³)
22 mm	OSB 4 TOP (Egger)	22 mm	OSB 4 TOP (Egger)	22 mm	OSB 4 TOP (Egger)
LIGNO® Rippe-x Filling according to left-hand gap		LIGNO® Rippe-x Filling according to left-hand gap			
$L_{n,w}$ = **44 dB** $C_{I,50\text{-}2500}$ = **+9 dB** C_I = 0 dB R_w = **55 dB**		$L_{n,w}$ = **38 dB** $C_{I,50\text{-}2500}$ = **+6 dB** C_I = -1 dB R_w = **51 dB**		$L_{n,w}$ = **43 dB** $C_{I,50\text{-}2500}$ = **+5 dB** C_I = -2 dB R_w = **51 dB**	
18-002112-PR01 GAS 01-F01-04-de-01 (TE1)		18-002112-PR01 PB 17-F01-04-de-01		18-002112-PR01 PB 16-F01-04-de-01	

Roof with pebble covering





		50 mm	Pebble grading 4/16 87 kg/m²	50 mm	Pebble grading 4/16 87 kg/m²	50 mm	Pebble grading 4/16 87 kg/m²
		5 mm	Attic protection mat, ZinCo SSM 45	5 mm	Attic protection mat, ZinCo SSM 45		
2.5 mm	EPDM roofing felt, alwitra	2.5 mm	EPDM roofing felt, alwitra	2.5 mm	EPDM roofing felt, alwitra	2.5 mm	EPDM roofing felt, alwitra
200 mm	Flat roof insulating board Rockwool Hardrock 040 (dyn. rigidity s'= 20 MN/m³)	200 mm	Flat roof insulating board Rockwool Hardrock 040 (dyn. rigidity s' = 20 MN/m³)	200 mm	Flat roof insulating board EPS 035 DAA (dyn. rigidity s' = 30 MN/m³)	200 mm	Flat roof insulating board EPS 035 DAA (dyn. rigidity s' = 30 MN/m³)
22 mm	OSB 4 TOP (Egger)	22 mm	OSB 4 TOP (Egger)	22 mm	OSB 4 TOP (Egger)	22 mm	OSB 4 TOP (Egger)
LIGNO® Rippe-x Filling according to left-hand gap							
R_w = **56 dB**		R_w = **64 dB**		R_w = **55 dB**		R_w = **64 dB**	
18-002112-PR01 GAS 01-F01-04-de-01 (FA1)		18-002112-PR01 GAS 01-F01-04-de-01 (FE1)		18-002112-PR01 GAS 01-F01-04-de-01 (FD1)		18-002112-PR01 GAS 01-F01-04-de-01 (FC1)	

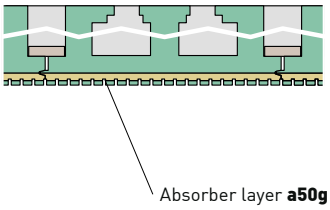
Characteristic values
Acoustic absorption

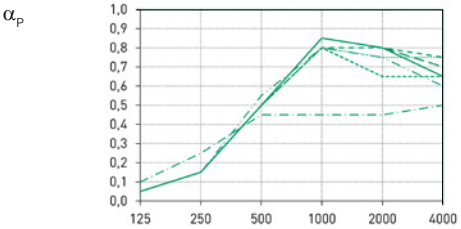
Key absorption figures

Subsequent interior finishing work for room acoustics absorbing suspended ceilings is rendered superfluous if the element is configured with an acoustic slat profile, see ▶ page 11. Natural soft wood fibre material is used as the absorber material. To improve the low-frequency properties, optional cavity insulation is inserted in the plus layer if necessary. Test report ▶ www.lignotrend.com

LIGNO® Rippe-x Q3 _z26/z53/z80_p0_a50g

all element heights



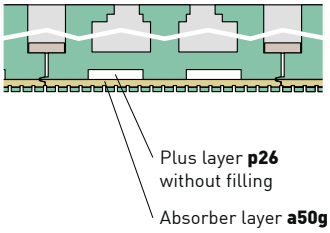


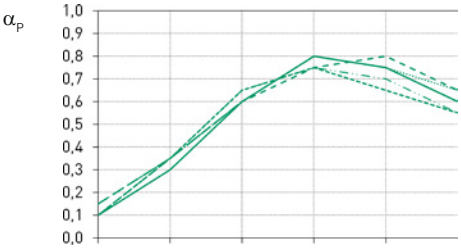
Additional layer is located directly behind the absorber layer, limited low-frequency absorption.

Profile	α_w	NRC	SAA	SAK	Shape	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
625-12-4	**0,45**	0,55	0,56	D	MH	0,05	0,15	0,50	0,80	0,80	0,75
625-18-6	**0,45**	0,55	0,56	D		0,05	0,15	0,50	0,85	0,80	0,65
625-23-8	**0,45**	0,55	0,56	D	MH	0,05	0,15	0,50	0,85	0,80	0,70
625-20-4	**0,45**	0,55	0,53	D	MH	0,05	0,15	0,50	0,80	0,65	0,65
625-12n25-4	**0,45**	0,55	0,56	D	MH	0,05	0,15	0,50	0,75	0,75	0,75
625-18n38-6	**0,45**	0,55	0,56	D	MH	0,05	0,15	0,55	0,80	0,75	0,60
625-54-8	**0,45**	0,40	0,42	D		0,10	0,25	0,45	0,45	0,45	0,50

LIGNO® Rippe-x Q3 _z26/z53/z80_p26_a50g

all element heights



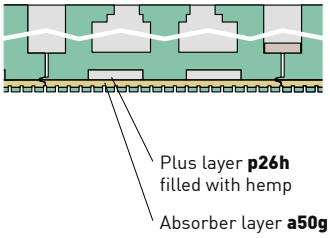


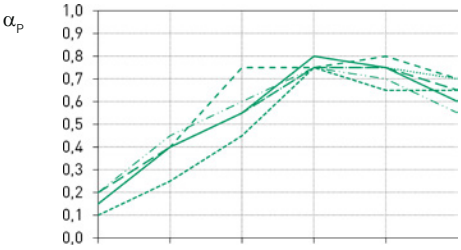
Plus layer with cavity behind the absorber layer, improved low-frequency absorption.

Profile	α_w	NRC	SAA	SAK	Shape	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
625-12-4	**0,60**	0,60	0,62	C		0,10	0,35	0,60	0,75	0,80	0,65
625-18-6	**0,60**	0,60	0,62	C		0,10	0,30	0,60	0,80	0,75	0,60
625-23-8	**0,60**	0,60	0,62	C		0,15	0,35	0,60	0,80	0,75	0,60
625-20-4	**0,65**	0,60	0,59	C		0,10	0,35	0,65	0,75	0,65	0,55
625-12n25-4	**0,60**	0,60	0,61	C		0,10	0,35	0,60	0,80	0,75	0,65
625-18n38-6	**0,65**	0,60	0,62	C		0,15	0,35	0,65	0,75	0,70	0,55

LIGNO® Rippe-x Q3 _z26/z53/z80_p26h_a50g

all element heights



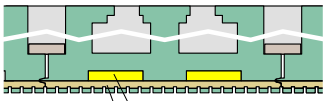


Pluslage mit hanfgedämmtem Hohlraum hinter der Absorberlage, verbesserte tieffrequente Absorption.

Profile	α_w	NRC	SAA	SAK	Shape	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
625-12-4	**0,60**	0,60	0,62	C		0,15	0,40	0,75	0,75	0,80	0,70
625-18-6	**0,60**	0,60	0,62	C		0,15	0,40	0,55	0,80	0,75	0,60
625-23-8	**0,60**	0,60	0,62	C		0,20	0,40	0,55	0,75	0,75	0,65
625-20-4	**0,50**	0,55	0,53	D	MH	0,10	0,25	0,45	0,75	0,65	0,65
625-12n25-4	**0,60**	0,60	0,62	C		0,15	0,40	0,55	0,75	0,75	0,70
625-18n38-6	**0,65**	0,60	0,62	C		0,20	0,45	0,60	0,75	0,70	0,55

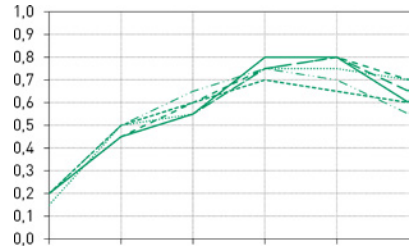
LIGNO® Rippe-x Q3 _z26/z53/z80_p26mw_a50g

all element heights



Plus layer **p26mw** partly filled with rockwool

Absorber layer **a50g**

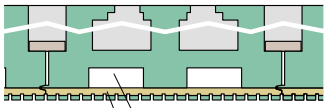


Plus layer with rockwool-insulated cavity behind the absorber layer, improved low-frequency absorption.

Profile	α_w	NRC	SAA	SAK	Shape	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
625-12-4	**0,65**	0,65	0,65	C		0,20	0,45	0,60	0,75	0,80	0,70
625-18-6	**0,65**	0,65	0,65	C		0,20	0,45	0,55	0,80	0,80	0,60
625-23-8	**0,65**	0,65	0,65	C		0,20	0,45	0,55	0,75	0,80	0,65
625-20-4	**0,65**	0,60	0,62	C		0,20	0,50	0,60	0,70	0,65	0,60
625-12n25-4	**0,65**	0,65	0,64	C		0,15	0,50	0,55	0,75	0,75	0,70
625-18n38-6	**0,70**	0,65	0,65	C		0,20	0,50	0,65	0,75	0,70	0,55

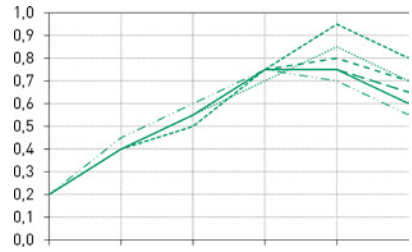
LIGNO® Rippe-x Q3 _z26/z53/z80_p53_a50g

all element heights



Plus layer **p53** without filling

Absorber layer **a50g**

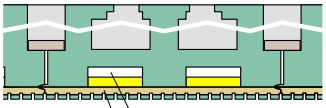


Plus layer with high cavity behind the absorber layer, improved low-frequency absorption.

Profile	α_w	NRC	SAA	SAK	Shape	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
625-12-4	**0,60**	0,60	0,62	C		0,20	0,40	0,55	0,75	0,80	0,70
625-18-6	**0,60**	0,60	0,62	C		0,20	0,40	0,55	0,75	0,75	0,60
625-23-8	**0,60**	0,60	0,62	C		0,20	0,40	0,55	0,75	0,75	0,65
625-20-4	**0,60**	0,65	0,65	C	H	0,20	0,40	0,50	0,75	0,95	0,80
625-12n25-4	**0,60**	0,60	0,62	C	H	0,20	0,40	0,55	0,70	0,85	0,70
625-18n38-6	**0,65**	0,60	0,62	C		0,20	0,45	0,60	0,75	0,70	0,55

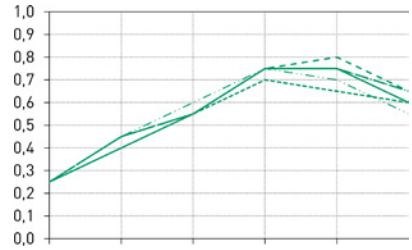
LIGNO® Rippe-x Q3 _z26/z53/z80_p53mw_a50g

all element heights



Plus layer **p53mw** partly filled with rockwool

Absorber layer **a50g**



Plus layer with partly rockwool-insulated cavity behind the absorber layer, improved low-frequency absorption.

Profile	α_w	NRC	SAA	SAK	Shape	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
625-12-4	**0,65**	0,60	0,62	C		0,25	0,45	0,55	0,75	0,80	0,65
625-18-6	**0,60**	0,60	0,62	C		0,25	0,40	0,55	0,75	0,75	0,60
625-23-8	**0,65**	0,60	0,62	C		0,25	0,45	0,55	0,75	0,75	0,65
625-20-4	**0,65**	0,60	0,59	C		0,25	0,45	0,55	0,70	0,65	0,60
625-12n25-4	**0,65**	0,60	0,62	C		0,25	0,45	0,55	0,75	0,75	0,65
625-18n38-6	**0,65**	0,60	0,62	C		0,25	0,45	0,60	0,75	0,70	0,55

Online room acoustics calculation for investigating the room acoustics properties of rooms

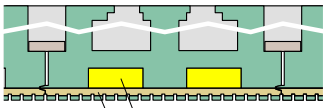
▶ www.lignotrend.com/raumakustik-rechner

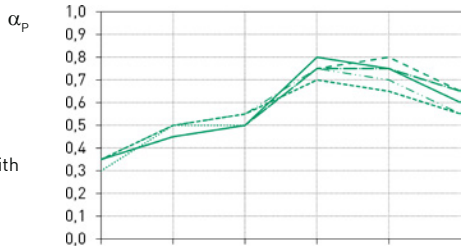
Note: This calculation software merely determines the absorber area required for the described cubature and does not make any statement regarding the location of the absorber areas in the room. The results should therefore be regarded as an orientation and are not a substitute for an expert in room acoustics (e.g. specialist engineer).

LIGNO® Rippe Q3 _z26/z53/z80_p53mwv_a50g

all element heights

Plus layer with completely rockwool-insulated cavity behind the absorber layer, improved low-frequency absorption.



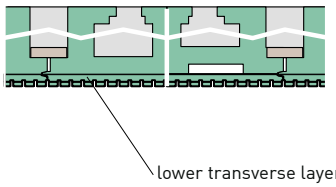


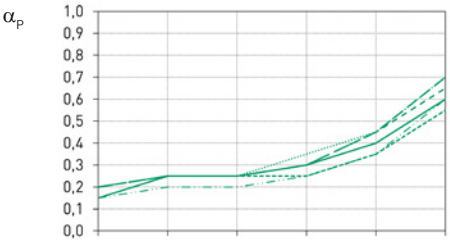
Profile	α_w	NRC	SAA	SAK	Shape	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
625-12-4	**0,60**	0,65	0,63	C		0,35	0,45	0,50	0,75	0,80	0,65
625-18-6	**0,60**	0,65	0,63	C		0,35	0,45	0,50	0,80	0,75	0,60
625-23-8	**0,60**	0,65	0,63	C		0,35	0,45	0,50	0,75	0,75	0,65
625-20-4	**0,65**	0,60	0,59	C		0,35	0,50	0,55	0,70	0,65	0,55
625-12n25-4	**0,60**	0,60	0,62	C		0,30	0,50	0,50	0,75	0,75	0,65
625-18n38-6	**0,65**	0,65	0,63	C		0,35	0,50	0,55	0,75	0,70	0,55

LIGNO® Rippe Q3 _z26/z53/z80_p0/p26/p53_a0

all element heights

Element without absorber layer.
The scoring produces a slight absorption effect.

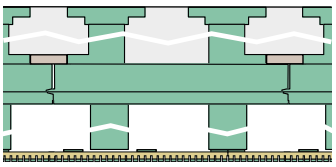




Profile	α_w	NRC	SAA	SAK	Shape	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
625-12-4	**0,30**	0,30	0,31	D	H	0,20	0,25	0,25	0,30	0,45	0,65
625-18-6	**0,30**	0,30	0,30	D	H	0,15	0,25	0,25	0,30	0,40	0,60
625-23-8	**0,30**	0,30	0,31	D	H	0,20	0,25	0,25	0,30	0,45	0,70
625-20-4	**0,30**	0,25	0,27	D	H	0,20	0,25	0,25	0,25	0,35	0,55
625-12n25-4	**0,35**	0,30	0,33	D	H	0,20	0,25	0,25	0,35	0,45	0,70
625-18n38-6	**0,25**	0,25	0,26	E	H	0,15	0,20	0,20	0,25	0,35	0,60

LIGNO® Rippe Q2i +i120/+i160/+i200

Acoustic absorption varies with the height of the cavity underneath. For details see:
▶ Technical data LIGNO® Acoustic light



Online room acoustics calculation for investigating the room acoustics properties of rooms
▶ www.lignotrend.com/acoustic-calculator

Note: This calculation software merely determines the absorber area required for the described cubature and does not make any statement regarding the location of the absorber areas in the room. The results should therefore be regarded as an orientation and are not a substitute for an expert in room acoustics (e.g. specialist engineer).

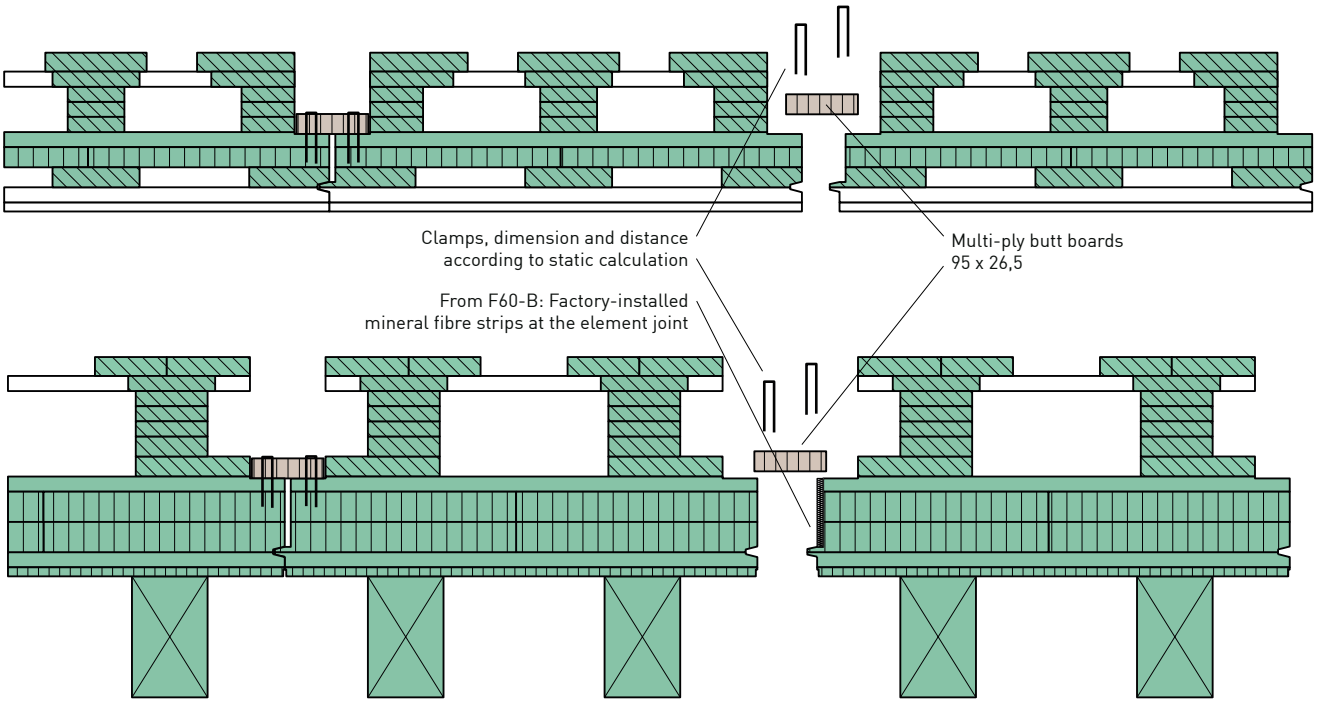
Formation of statically effective plates

Coupling

Coupling is done by means of a butt board at the **lateral butt joint of the element strips**. Multi-ply butt boards (cross-section 95 mm x 26,5 mm) are delivered as standard. Additional stiffening boards or diagonals are not usually necessary.

The butt boards are connected to both adjacent elements with **brackets**, wood screws are used less often (dimension and distance of the connecting means as specified in the static calculation).

The **connection of the plate to the adjacent components** is usually done with **long wood screws (d= 8 mm)**, which are mounted through the bars



The butt boards are used as boards for the transport pallets when delivering. Use the dismantled pallets for the element joint!

Static verification

In particular, the following points must be taken into account when verifying ceiling plates:

- Load-bearing capacity of the elements as well as of butt board and connection means
- Plate edge belt
- Connection joints to neighbouring components
- Resilience of the connection means/plate deformation

Software for static calculation for roof and ceiling plates ▶ **www.lignotrend.com/downloads**.
The Technical Dept. is available for support with the verification.

Load capacity values

Butt board C24 (95 mm x 26.5 mm)		acceptable shear flow	R_k			53				kN/m
Clamps		Distance	e	3	5	7,5	10	15	100	cm
	1,80 x 50	acceptable shear flow	R_k	20,63	12,38	8,25	6,19	4,13	0,62	kN/m
	1,53 x 50	acceptable shear flow	R_k	15,80	9,48	6,32	4,74	3,16	0,47	kN/m
Wood screws		Distance	e	10	20	30	50	100	200	cm
	d= 6 mm	acceptable shear flow	R_k	12,6	6,30	4,20	2,52	1,26	0,63	kN/m
	d= 8 mm	acceptable shear flow	R_k	22,2	11,1	7,39	4,44	2,22	1,11	kN/m

Plate characteristic values LIGNO® Rippe Q3

Load capacity and rigidity values

The characteristic values from the following tables are entered in the plate verification. Since, as a rule, depending on the load case transverse to or parallel with the element strips, either the complete number of *whole* elements or *exactly one edge element are applied for the load dissipation, the* **values for the shear load capacity of the elements per element in the laying width of 0.625 m are specified**, *not* on the 1 m-wide plate surface.

LIGNO® Rippe Q3

	_z0_p0		_z26_p0		_z26_p26		_z26_p53	
	$V_{R,k,xy}$ = 6,3 kN GA_{ef} = 943 kN		$V_{R,k,xy}$ = 73,0 kN GA_{ef} = 36 627 kN		$V_{R,k,xy}$ = 52,9 kN GA_{ef} = 29 635 kN		$V_{R,k,xy}$ = 52,9 kN GA_{ef} = 29 635 kN	
Height	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$
150	142,7	80,4	117,3	72,2				
170	157,4	88,7	132,0	81,2	150,1	82,2		
190	172,1	96,9	146,7	90,3	164,8	90,3	182,8	100,2
210	186,8	105,2	161,3	99,3	179,4	98,3	197,5	108,2
230	201,4	113,5	176,0	108,3	194,1	106,4	212,2	116,3
250	216,1	121,8	190,7	117,4	208,8	114,4	226,9	124,3
270	230,8	130,0	205,4	126,4	223,5	122,4	241,5	132,4
290	245,5	138,3	220,0	135,4	238,1	130,5	256,2	140,4
310	270,4	152,4	245,0	150,8	263,1	144,2	281,2	154,1
330	285,1	160,6	259,7	159,8	277,8	152,2	295,9	162,1
350	299,8	168,9	274,4	168,8	292,5	160,3	310,5	170,2
370	320,7	180,7	295,3	181,7	313,4	171,7	331,5	181,6
390	341,7	192,5	316,3	194,6	334,3	183,2	352,4	193,1
410	362,6	204,3	337,2	207,5	355,3	194,7	373,4	204,6
430	383,5	216,1	358,1	220,4	376,2	206,2	394,3	216,1
450	404,5	227,9	379,1	233,3	397,2	217,6	415,3	227,5
mm	10^3 cm^4	kNm	10^3 cm^4	kNm	10^3 cm^4	kNm	10^3 cm^4	kNm

	_z53_p0		_z53_p26		_z53_p53		_z80_p0		_z80_p26		_z80_p53	
	$V_{R,k,xy}$ = 73,0 kN GA_{ef} = 47 908 kN		$V_{R,k,xy}$ = 52,9 kN GA_{ef} = 40 917 kN		$V_{R,k,xy}$ = 52,9 kN GA_{ef} = 40 917 kN		$V_{R,k,xy}$ = 73,0 kN GA_{ef} = 59 403 kN		$V_{R,k,xy}$ = 73,0 kN GA_{ef} = 59 403 kN		$V_{R,k,xy}$ = 52,9 kN GA_{ef} = 52 411 kN	
Height	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$
170	164,4	101,2										
190	179,1	110,2	197,2	108,0			212,1	130,5				
210	193,8	119,2	211,9	116,1			226,8	139,6				
230	208,4	128,3	226,5	124,1	244,6	134,0	241,5	148,6	241,5	148,6		
250	223,1	137,3	241,2	132,2	259,3	142,1	256,1	157,6	256,1	157,6	292,3	160,2
270	237,8	146,3	255,9	140,2	274,0	150,1	270,8	166,7	270,8	166,7	307,0	168,2
290	252,5	155,4	270,6	148,3	288,6	158,2	285,5	175,7	285,5	175,7	321,7	176,3
310	277,4	170,7	295,5	161,9	313,6	171,9	310,5	191,1	310,5	191,1	346,7	190,0
330	292,1	179,8	310,2	170,0	328,3	179,9	325,2	200,1	325,2	200,1	361,3	198,0
350	306,8	188,8	324,9	178,0	343,0	187,9	339,8	209,1	339,8	209,1	376,0	206,0
370	327,7	201,7	345,8	189,5	363,9	199,4	360,8	222,0	360,8	222,0	396,9	217,5
390	348,7	214,6	366,8	201,0	384,9	210,9	381,7	234,9	381,7	234,9	417,9	229,0
410	369,6	227,5	387,7	212,4	405,8	222,4	402,7	247,8	402,7	247,8	438,8	240,5
430	390,6	240,3	408,6	223,9	426,7	233,8	423,6	260,7	423,6	260,7	459,8	251,9
450	411,5	253,2	429,6	235,4	447,7	245,3	444,5	273,6	444,5	273,6	480,7	263,4
mm	10^3 cm^4	kNm	10^3 cm^4	kNm	10^3 cm^4	kNm	10^3 cm^4	kNm	10^3 cm^4	kNm	10^3 cm^4	kNm

Plate characteristic values LIGNO® Rippe Q2i

LIGNO® Rippe Q2i

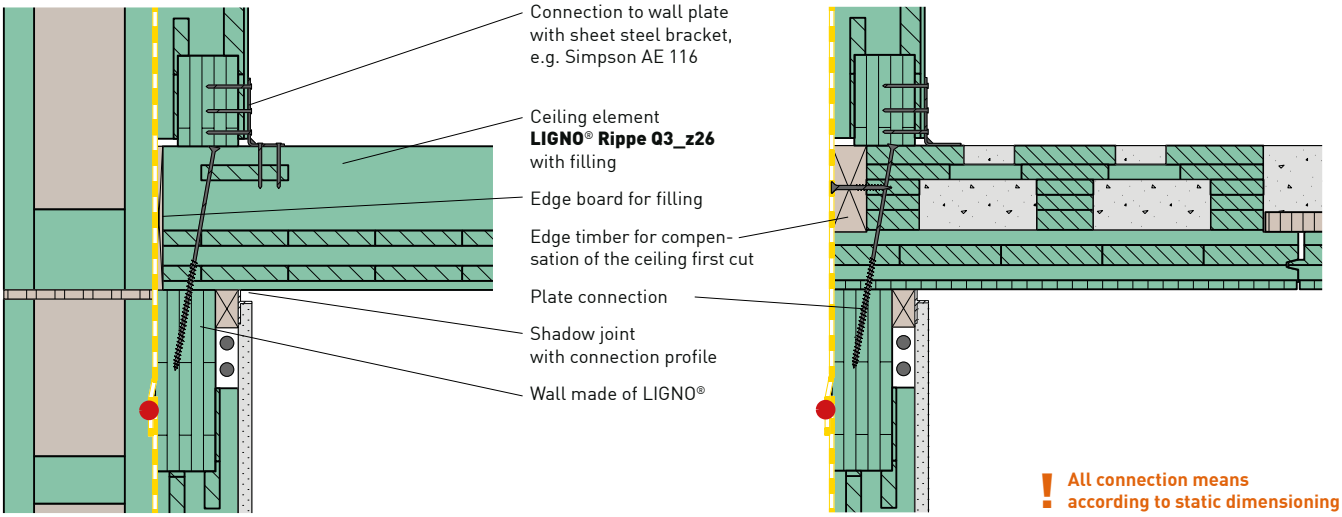
	_z26 +i120		_z26 +i160		_z26 +i200	
	$V_{R,k,xy}$ = 97,0 kN GA_{ef} = 36 161 kN		$V_{R,k,xy}$ = 97,0 kN GA_{ef} = 36 161 kN		$V_{R,k,xy}$ = 97,0 kN GA_{ef} = 36 161 kN	
Height	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$
170	193,9	126,3	214,2	139,5		
190	203,8	132,7	224,1	145,9		
210	213,7	139,2	234,0	152,4	254,3	165,6
230	223,6	145,6	243,9	158,8	264,1	172,0
250	233,5	152,1	253,8	165,3	274,0	178,4
270	243,4	158,5	263,7	171,7	283,9	184,9
290	253,3	164,9	273,6	178,1	293,8	191,3
mm	10^3 cm⁴	kNm	10^3 cm⁴	kNm	10^3 cm⁴	kNm

	_z53 +i120		_z53 +i160		_z53 +i200	
	$V_{R,k,xy}$ = 104,2 kN GA_{ef} = 36 161 kN		$V_{R,k,xy}$ = 104,2 kN GA_{ef} = 36 161 kN		$V_{R,k,xy}$ = 104,2 kN GA_{ef} = 36 161 kN	
Height	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$
190	242,6	158,0	262,9	171,2		
210	252,5	164,4	272,8	177,6	293,0	190,8
230	262,4	170,9	282,6	184,1	302,9	197,2
250	272,3	177,3	292,5	190,5	312,8	203,7
270	282,2	183,7	302,4	196,9	322,7	210,1
290	292,1	190,2	312,3	203,4	332,6	216,6
mm	10^3 cm⁴	kNm	10^3 cm⁴	kNm	10^3 cm⁴	kNm

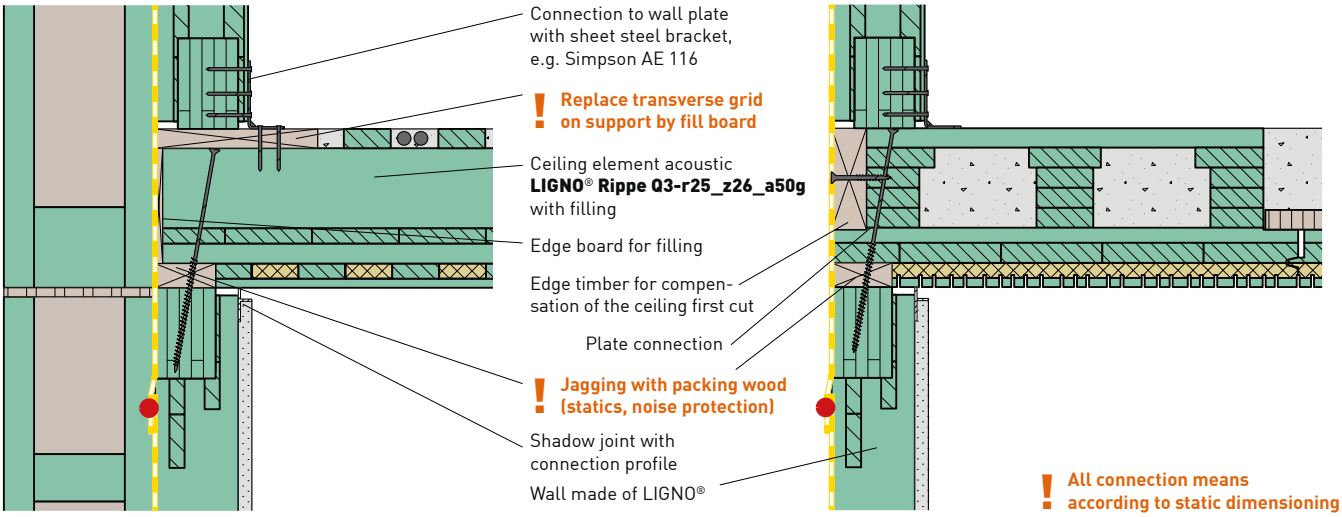
	_z80 +i120		_z80 +i160		_z80 +i200	
	$V_{R,k,xy}$ = 104,2 kN GA_{ef} = 36 161 kN		$V_{R,k,xy}$ = 104,2 kN GA_{ef} = 36 161 kN		$V_{R,k,xy}$ = 104,2 kN GA_{ef} = 36 161 kN	
Height	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$	I_z	$M_{R,k,z}$
230	301,9	196,6	322,1	209,8	342,4	223,0
250	311,8	203,0	332,0	216,2	352,3	229,4
270	321,7	209,5	341,9	222,7	362,2	235,8
290	331,6	215,9	351,8	229,1	372,1	242,3
mm	10^3 cm⁴	kNm	10^3 cm⁴	kNm	10^3 cm⁴	kNm

Design proposals LIGNO® Rippe Q3
Wall connections

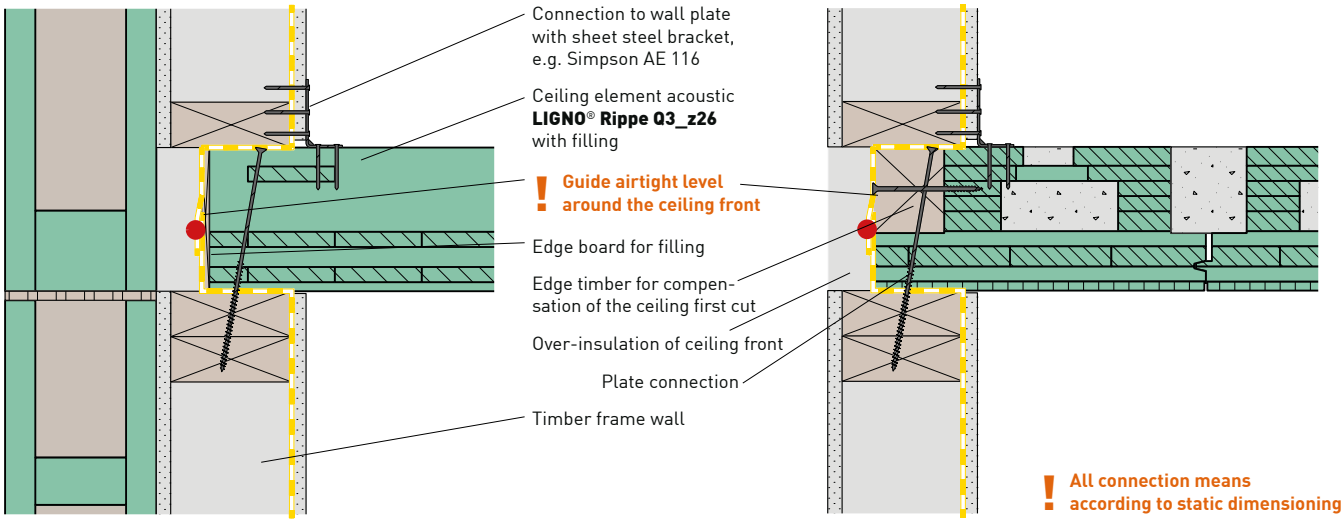
Connection to solid timber wall
Elements with closed surface



Connection to solid timber wall
Elements with acoustic profile

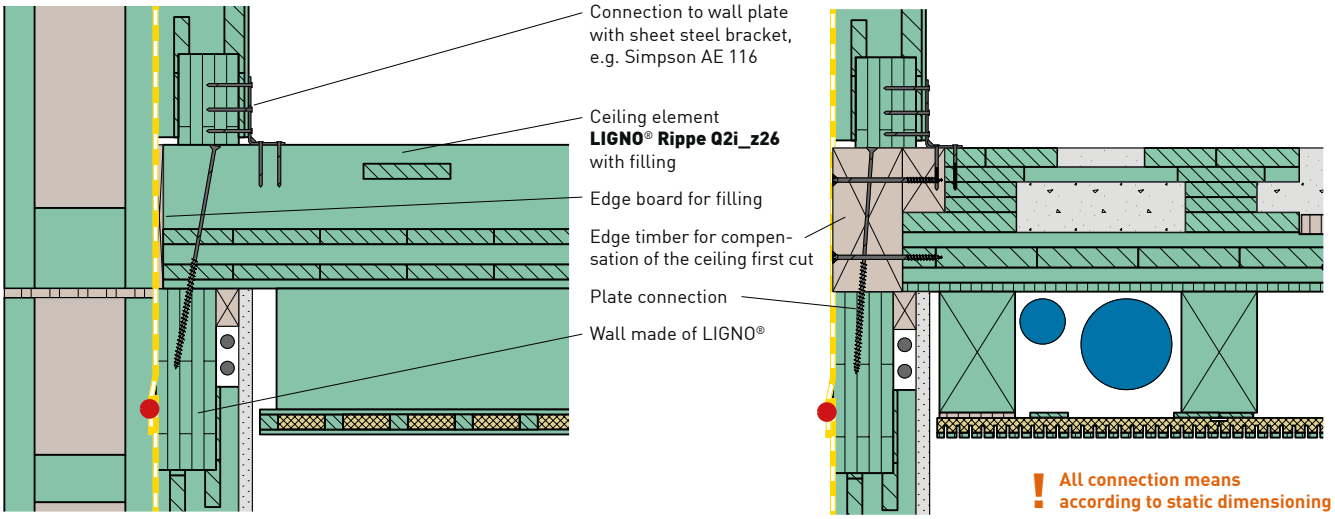


Connection to timber frame wall
with over-insulation

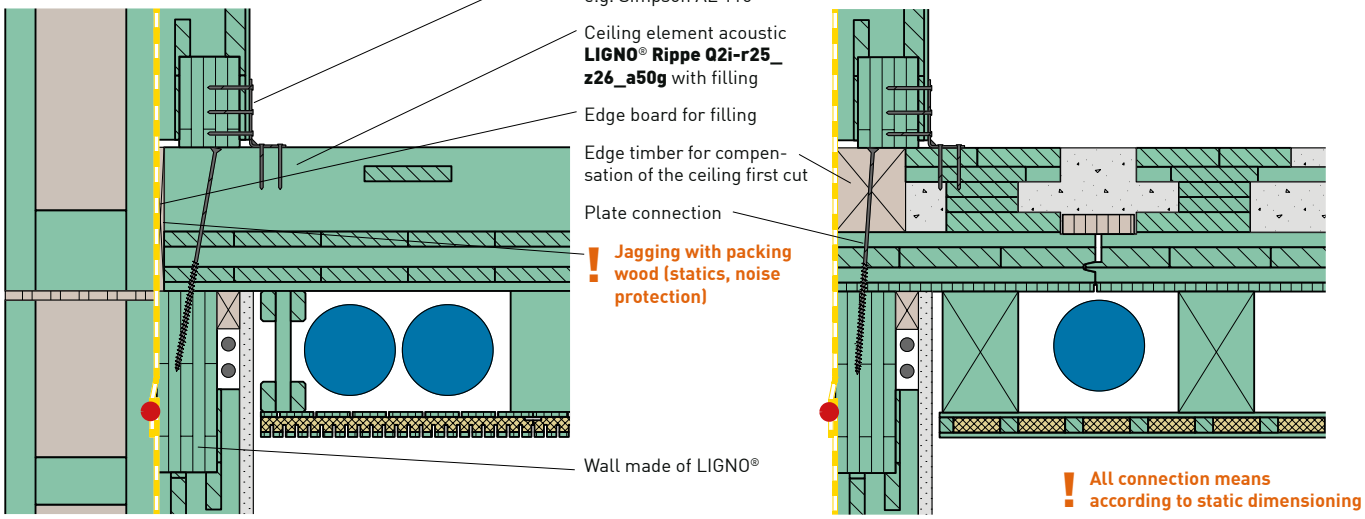


Design proposals LIGNO® Rippe Q2i
Wall connections

Connection to solid timber wall
Elements with acoustic profile



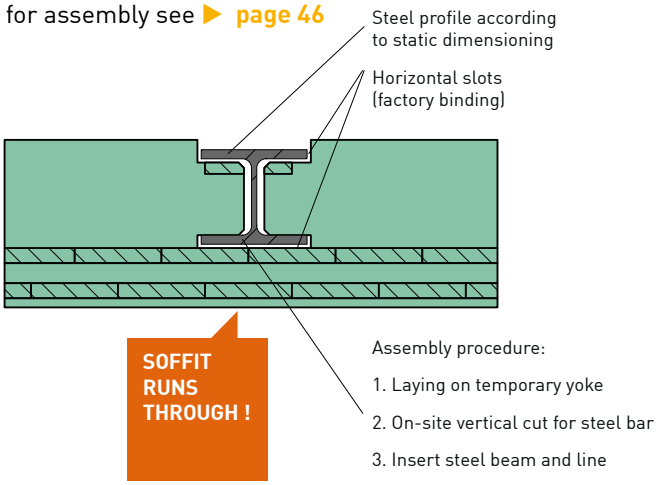
Connection to solid timber wall
Elements with acoustic profile



Design proposals
Joists, wall supports

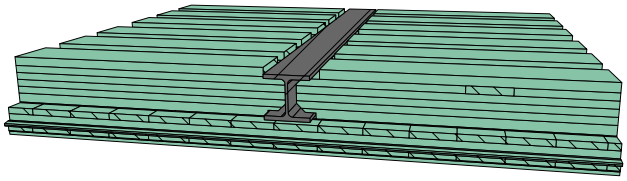
Flush-with-the-ceiling joist (steel profile)

A continuous ceiling element,
for assembly see ▶ page 46



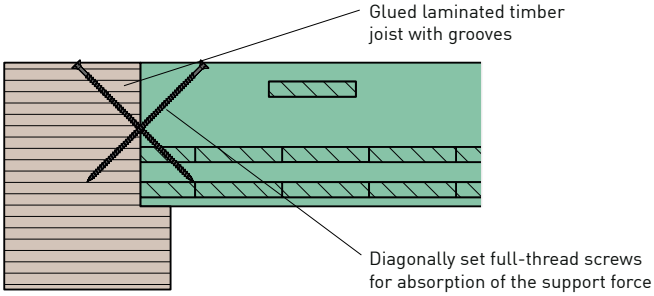
Assembly procedure:

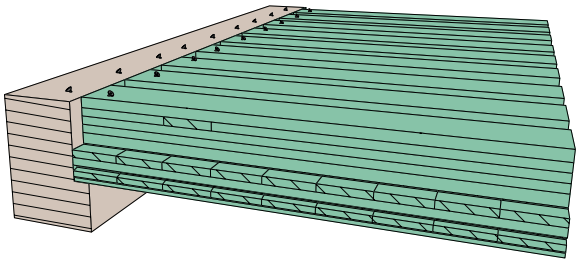
1. Laying on temporary yoke
2. On-site vertical cut for steel bar
3. Insert steel beam and line



Flush-with-the-ceiling joist (glued laminated timber)

Full-thread screws, diagonal

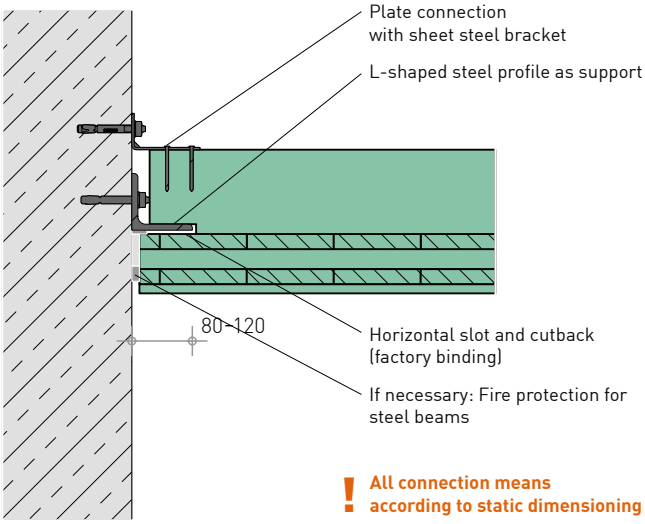


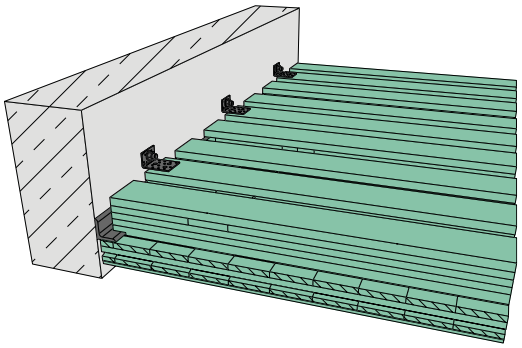


! Joist and connection means according to static dimensioning

Wall support, concrete wall

with L-shaped steel profile

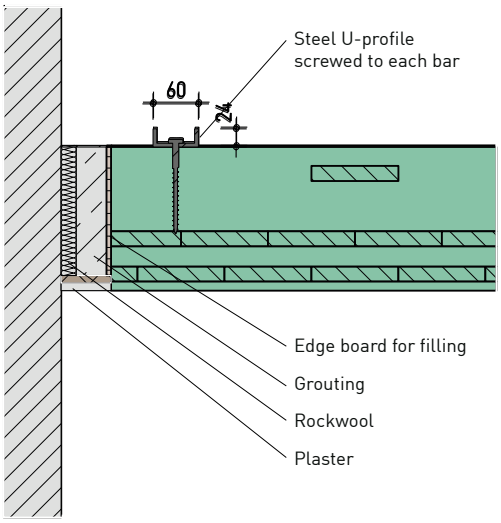


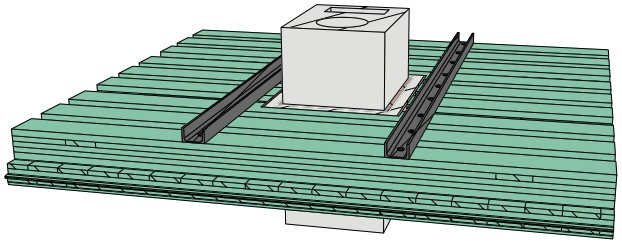


! All connection means according to static dimensioning

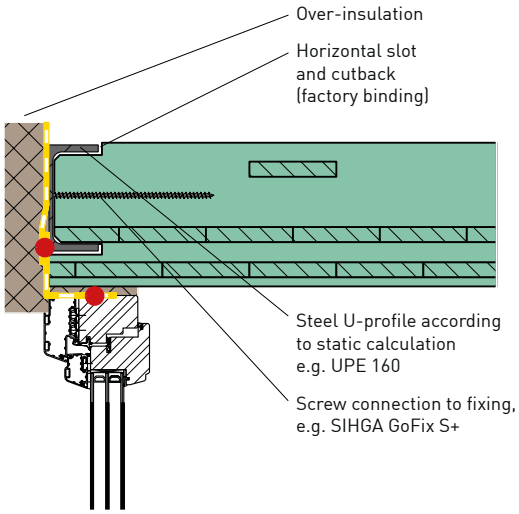
Design proposals
Cut-outs

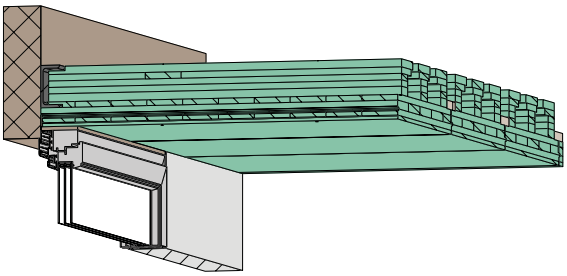
Chimney cut-out
Elements with closed surface



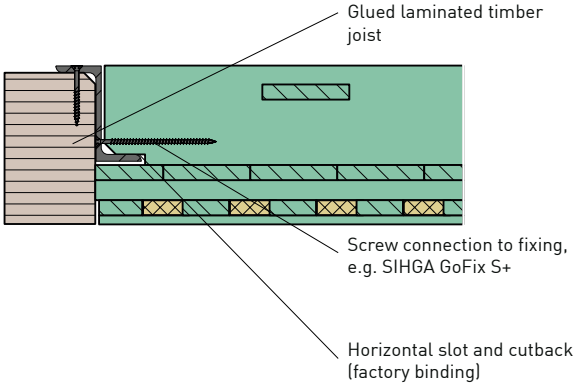


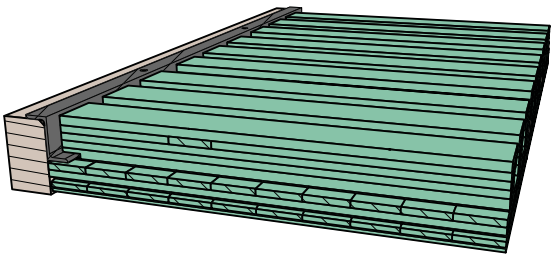
Flush-with-the-ceiling window lintel / edge joist
Elements with closed surface





Flush-with-the-ceiling window lintel / edge joist
Elements with closed surface

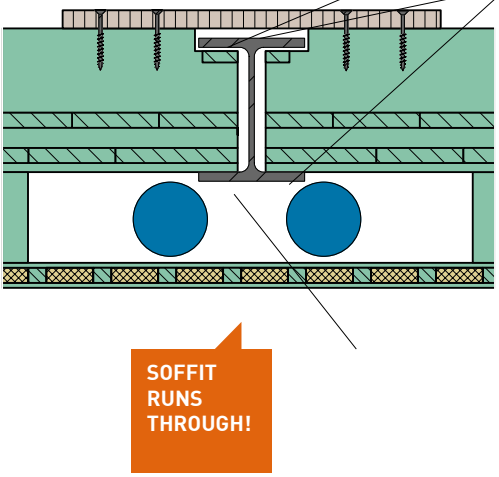


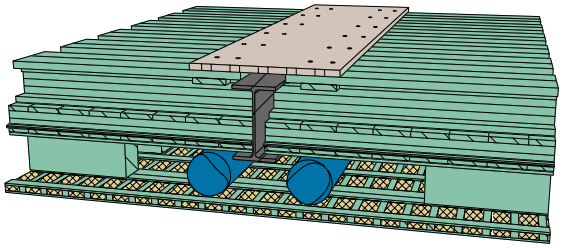


Konstruktionsvorschläge LIGNO® Rippe Q2i Unterzüge, Wandauflager

Flush-with-the-ceiling joist (steel profile)

A continuous ceiling element,
for assembly see ▶ page 46



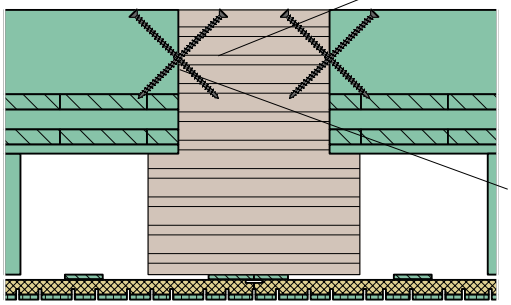


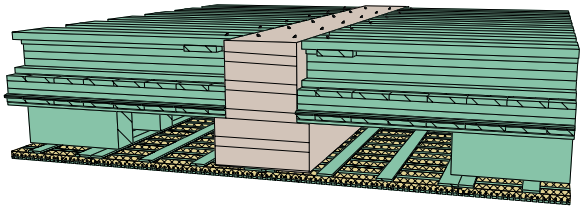
Assembly procedure:

1. Laying on temporary yoke
2. On-site vertical cut for steel bar
3. Insert steel beam and line

Flush-with-the-ceiling joist (glued laminated timber)

Full-thread screws, diagonal

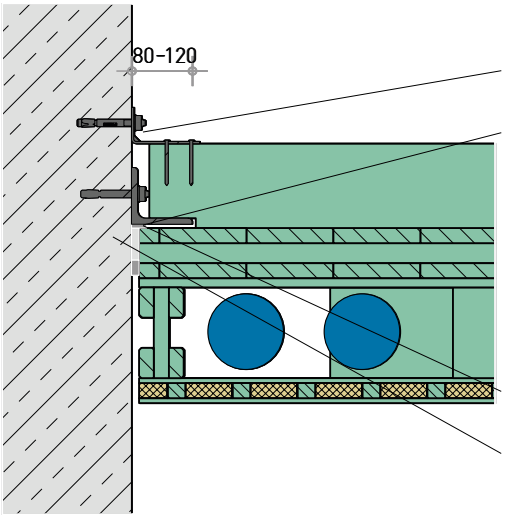


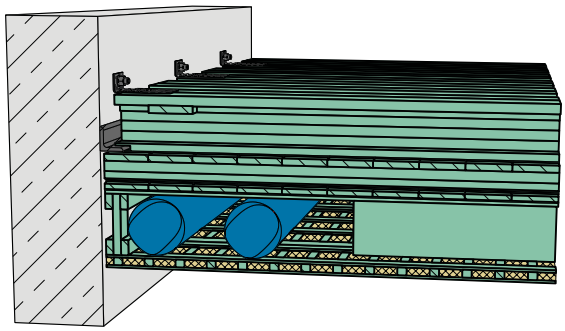


! Joist and connection means according to static dimensioning

Wall support, concrete wall

with L-shaped steel profile

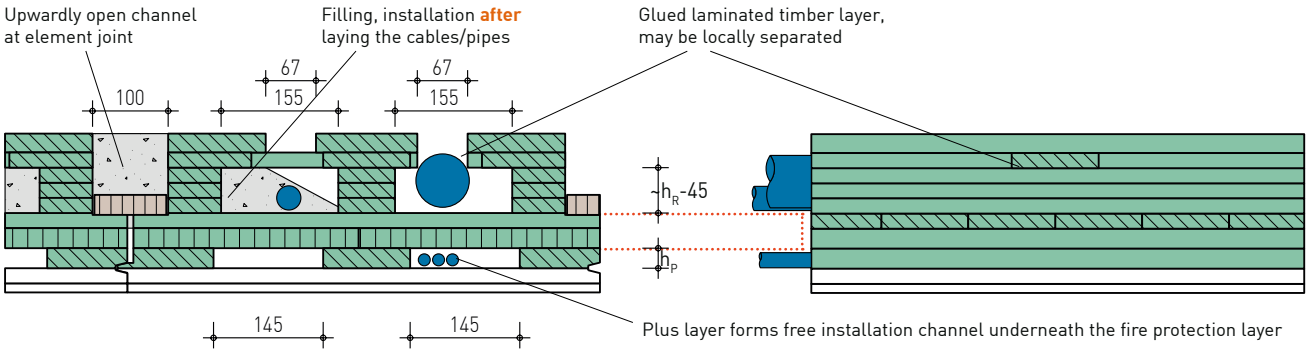




! All connection means according to static dimensioning

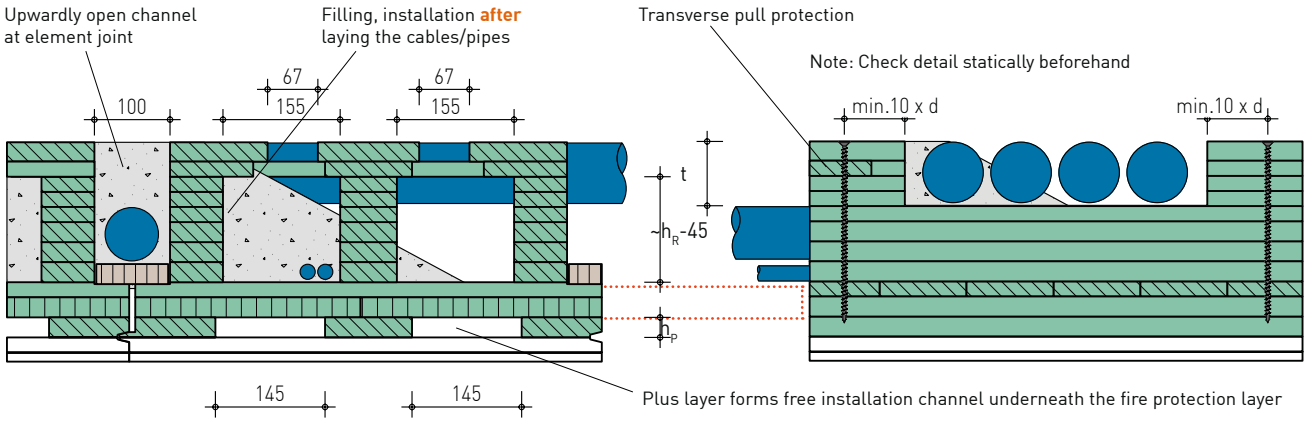
Cable/pipe layout
Installation options

Longitudinal installation (e.g. LIGNO® Rippe Q3_z26_p26)
above and below the fire protection layer in existing channels

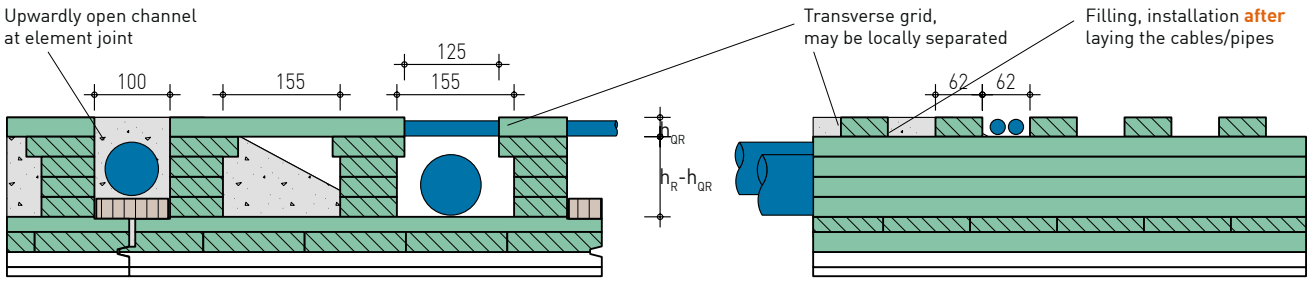


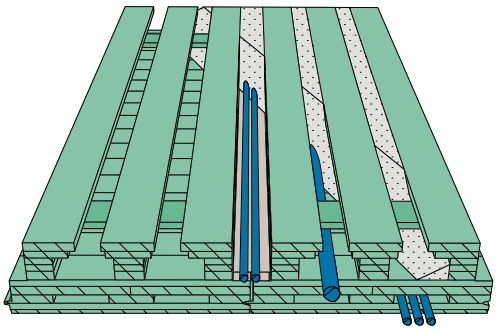
Longitudinal and transverse installation (e.g. LIGNO® Rippe Q3_z26_p26)
with additional top-sided jagging and transverse pull protection

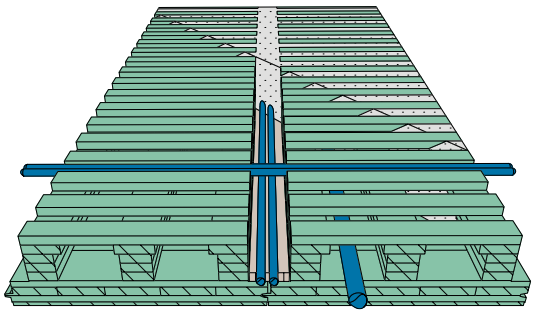
! Position and depth of the jagging are limited – definition must take place through static dimensioning



Longitudinal and transverse installation (e.g. LIGNO® Rippe Q3_r25_z26_p0)
in transverse grid and existing channels, configuration according to ▶ page 8

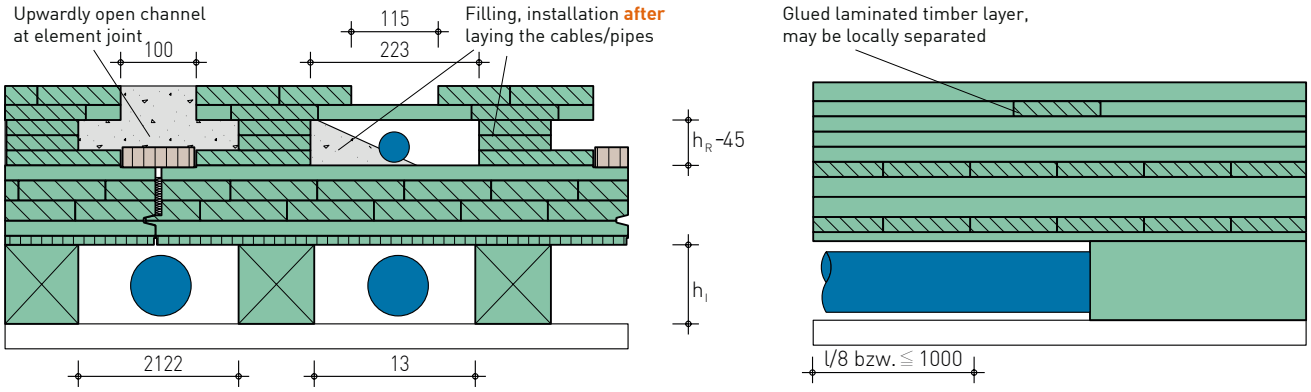




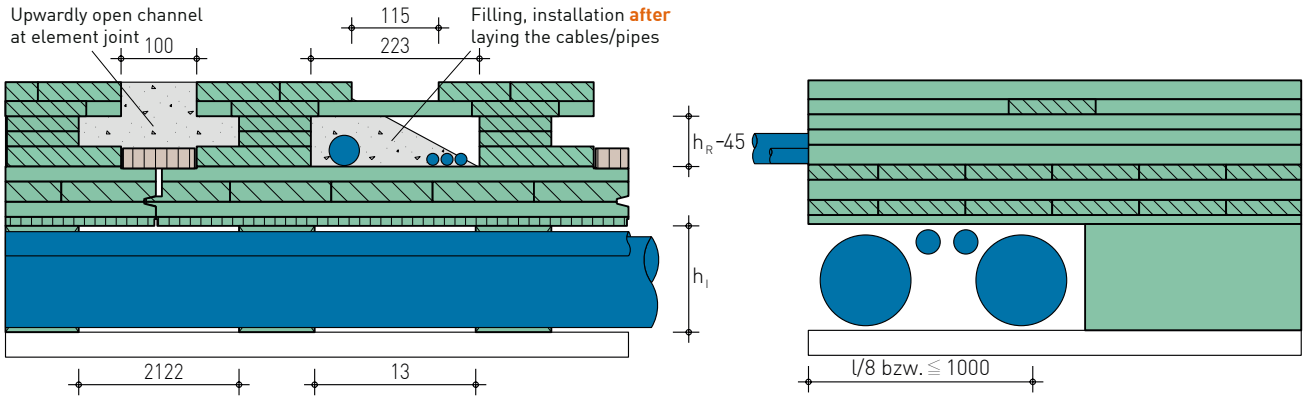


Cable/pipe layout
Installation options LIGNO® Rippe Q2i

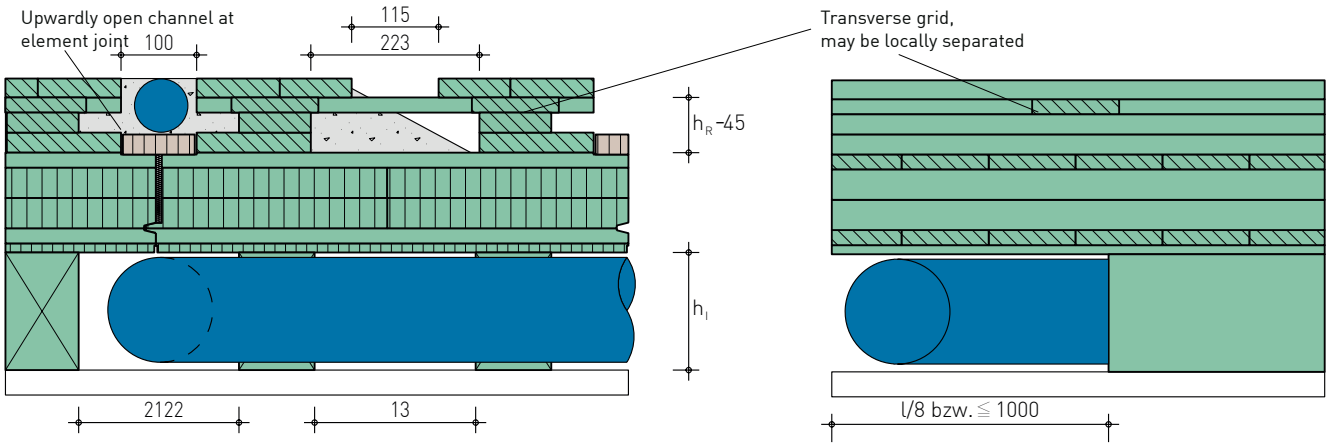
Longitudinal installation (e.g. LIGNO® Rippe Q2i_z53)
above and below the fire protection layer in existing channels

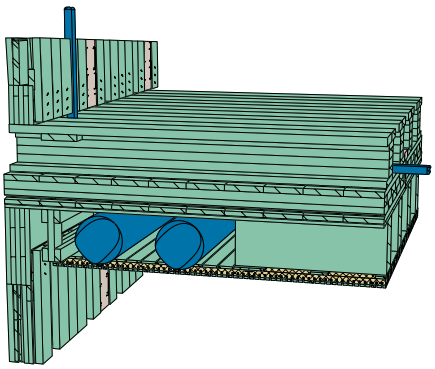


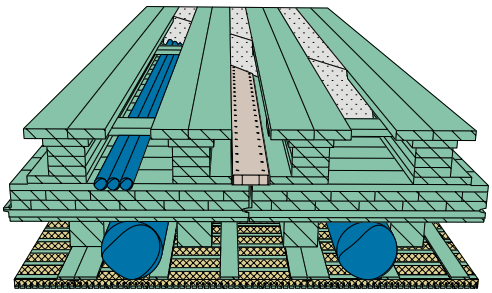
Longitudinal and transverse installation (e.g. LIGNO® Rippe Q2i_z53)
with additional top-sided jagging and transverse pull protection



Longitudinal and transverse installation (e.g. LIGNO® Rippe Q2i_z80)
in transverse grid and existing channels, configuration according to ▶ page 8





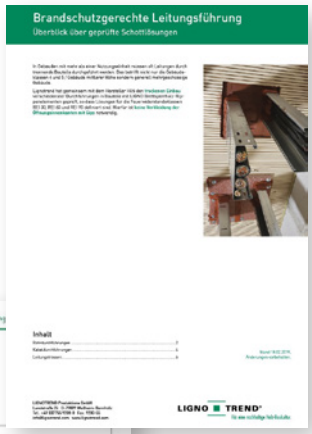


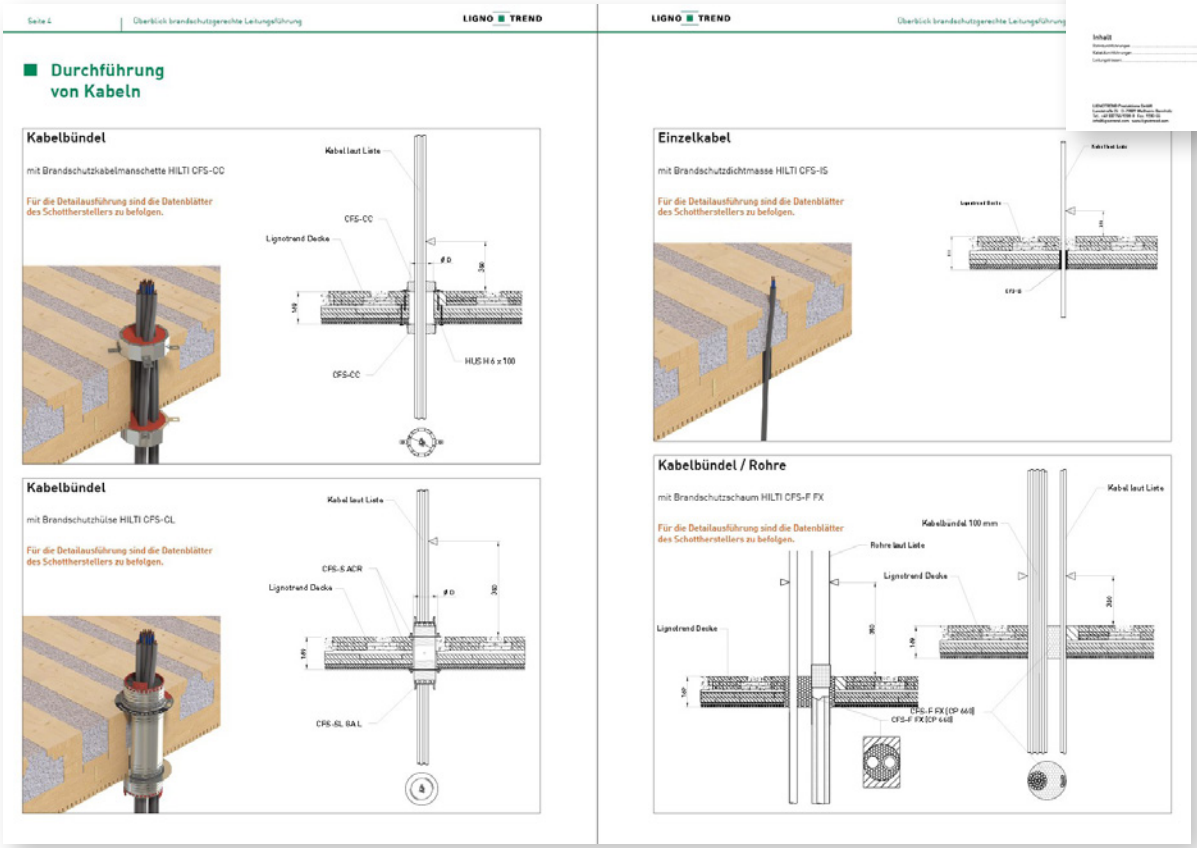
Cable/pipe layout
Fire protection compatible bulkhead

Tested detailed solutions

For the feeding of cables/pipes of various types through ceiling components of the fire resistance classes REI 60 and REI 90, tested solutions were developed with the bulkhead manufacturer HILTI. For a detailed report, see

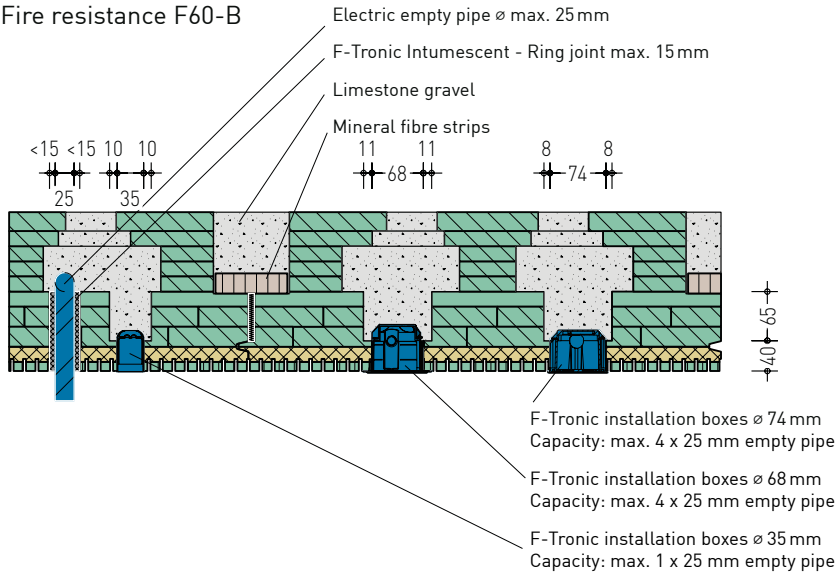
▶ **Data sheet "Fire protection compatible cable/pipe layout"**





Fire protection socket box F-Tronic (e.g. LIGNO® Rippe Q3_z53_p0)

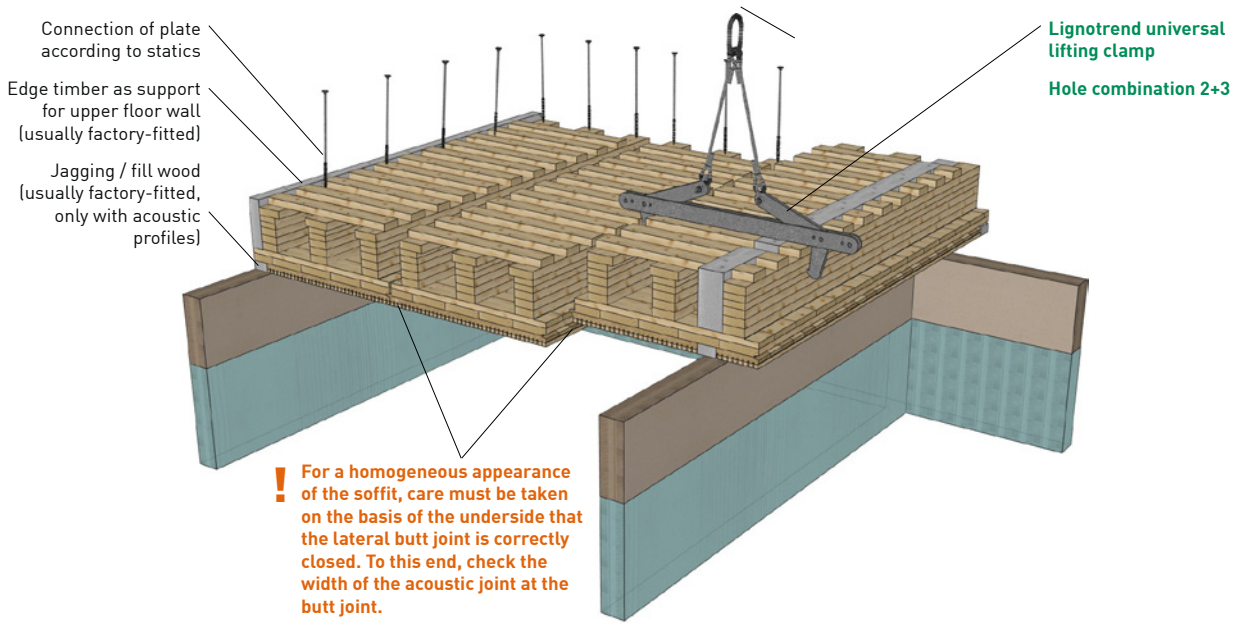
Fire resistance F60-B



Assembly procedure general

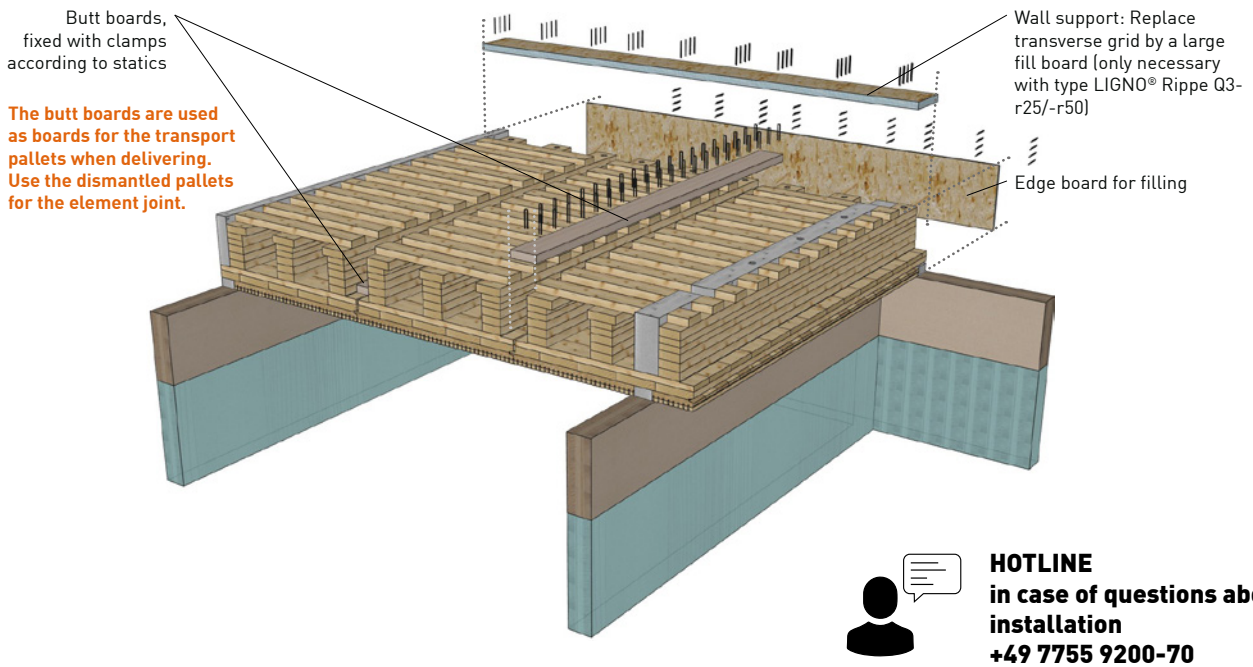
Step 1: Laying

The ceiling elements are laid strip-wise and pulled together laterally – if necessary, a rafter or a clamp can be used as an aid. After aligning the elements, each element is fixed to the walls.



Step 2: Plate formation

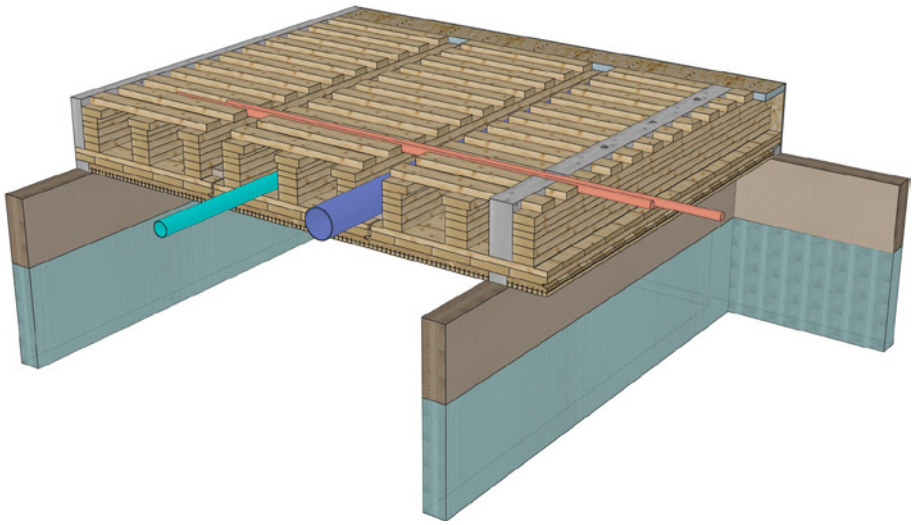
After checking the soffit, the butt boards can be inserted and fixed (see ▶ page 33). If not factory-fitted, edge boards are attached to prevent the filling from flowing out later. The following storey can be erected.



HOTLINE
in case of questions about installation
+49 7755 9200-70

Step 3: Installation of cables/pipes (after completion of the building shell)

The cables/pipes are installed in the longitudinal and transverse channels.
For available installation area, see ▶ page 41.

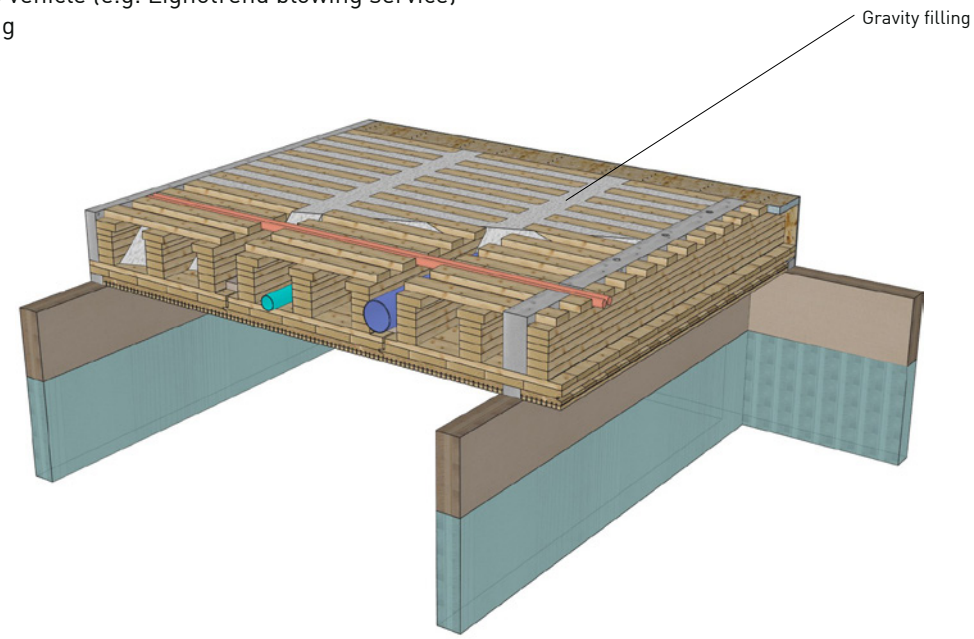


Step 4: Gravel filling and ceiling construction

After installing the cables/pipes, the cavities are filled and the floor structure is installed with impact sound insulation and covering. Please note the material specifications for tested noise protection characteristic values, see ▶ page 25.

Installation procedure for limestone gravel:

- Blowing in from silo vehicle (e.g. Lignotrend blowing service)
- Pouring from big bag
- Bagged goods

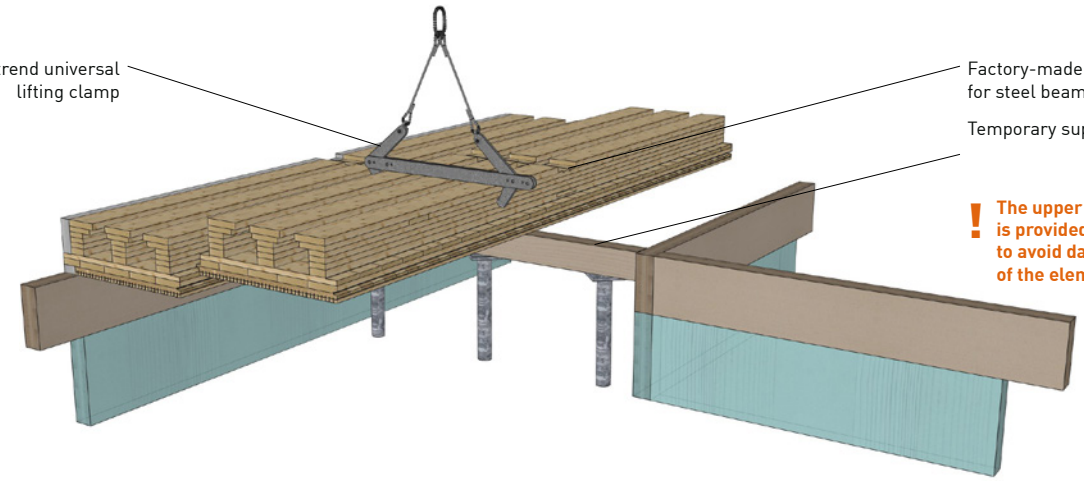


Assembly procedure
Flush-with-the-ceiling steel girders

Step 1: Yoke preparation and installation

A yoke is erected and levelled at the hypothetical support height in the axis of the steel beam that is to be installed later. Subsequently, the ceiling elements can be installed following the normal procedure.

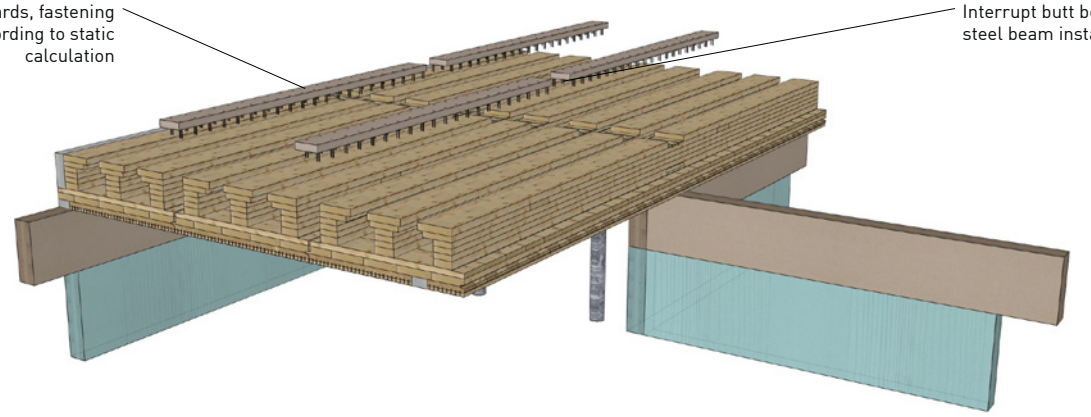
For construction details, see ▶ page 38.



! The upper side of the yoke is provided with a protective fleece to avoid damaging the underside of the element.

Step 2: Fixing the ceiling

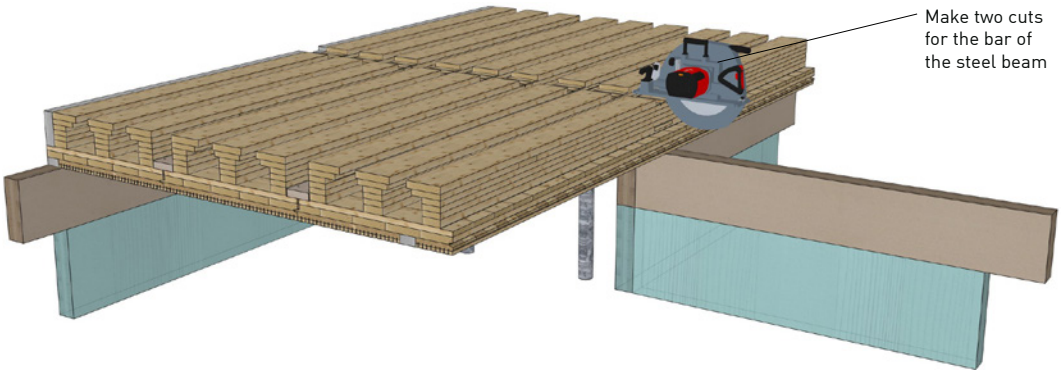
The ceiling plate is fixed to the wall construction, butt boards installed.



HOTLINE
in case of questions about installation
+49 7755 9200-70

Step 3: Cut for steel bar

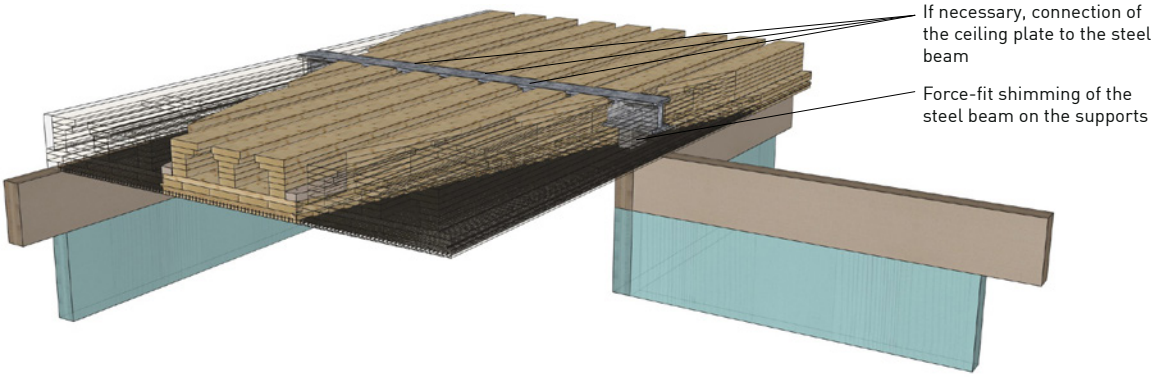
For the installation of the steel profile, the ceiling elements in the beam axis are separated on site.



Step 4: Support of steel beam, removal of yoke

The steel beam is shimmed with a force fit at its support points. If statically foreseen, the ceiling plate is connected via the steel beam.

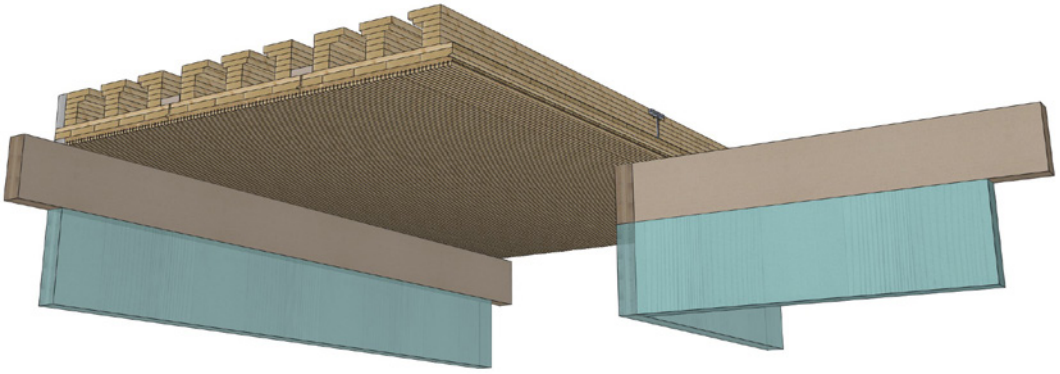
The yoke can be removed.



Step 5: Result: Continuous soffit

Without changing the laying direction, a continuous soffit is created.

The steel beam is located, protected against fire, behind the fire protection layer; coating is not necessary.



Processing instructions

Incoming goods / unloading

- Unload the elements one by one
- Never transport loads above people.

Unloading with fork-lift truck:

- Use a fork-lift truck only if the elements are on pallets or have no visible surface.
- Recommended for short elements up to a length of 6 metres (risk of sagging).
  Use a crane to unload longer elements.
- Unload only on a level surface.
- Set the forks as far apart as possible.
- Make sure the fork-lift truck has a sufficient load capacity and that its forks are long enough.

Unloading with a crane:

- Ensure stability and a sufficient load capacity.
- Use only intact attachment and load lifting devices.
- Observe the maximum working load limit of all individual components.
- Never stretch textile attachment devices over sharp edges; use edge protectors if necessary.
- Do not stretch chain slings or wire ropes over the visible surface.

If using Würth transport anchors:

- Always attach transport anchor bolts vertically, without diagonal pull.
  (Risk of overloading the transport anchor bolts or pulling them out)
- Always attach all factory-fitted transport anchor bolts for lifting and transporting.
- Use a cross beam with load compensation if there are more than two transport anchor bolts per element side.

If using textile attachment devices (e.g. lifting straps, round slings):

- Suitable only for single elements!
- Attach to the element in at least two places.
  When doing this, keep at least 1 metre from the abutting edge and the centre of gravity.
- If necessary, lay a board under the element over its entire width so that the attachment device is not pulled directly over the outer edge of the visible surface.

If using LIGNO® lifting clamps:

- Suitable only for single elements!
- Adjust the lifting clamps to the individual element width.
- Attach two lifting clamps to the element.
- Always attach lifting clamps vertically, no diagonal pull. (Risk of the handle being unhooked or torn out)

Intermediate storage

- Store protected against splash water and level on suitable support wedges
- Protect against moisture and long-term solar irradiation
- No long-term outdoor storage!
  (also not under foil, otherwise danger of formation of dew and mould!)

Assembly

- To protect the visible surface, use only the illustrated or equivalent lifting tools
- For protection against dirt, wear clean gloves when assembling

Weather protection

- **Keep a large tarpaulin at the ready (for use in case of thunderstorms, for example)**
- **Apply the first sealing layer (e.g. weatherproof vapour barrier) as soon as possible after assembly.**

Coupling to the plate

- Fastening with clamps according to statics, see also ▶ page 24. Plate connection to wall construction with screws according to statics.
- The butt boards are used as boards for the packaging pallets when delivering.
  Use the dismantled pallets for the element joint.

Important note:

- **When installing elements with acoustic profile, attention must be paid to the width of the acoustic joint in the butt joint.**
- **Before fixing each element: check the butt joint from the underside of the ceiling!**

In addition, the general application notes on Lignotrend cross-laminated timber products are to be observed.

▶ Assembly hotline +49 (0) 77 55 – 92 00-0