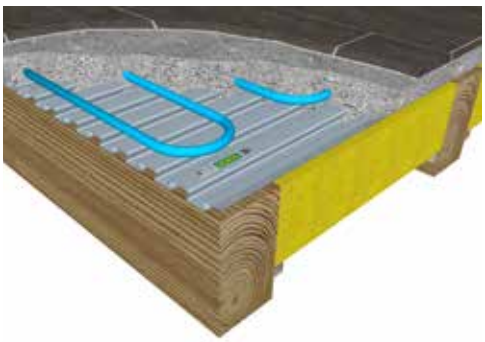
LEWIS®
Metal Deck



As part of a joisted floor construction LEWIS® Deck provides a first class solution for acoustics, fire protection and underfloor heating systems.

LEWIS® provides a number of solutions for renovations and conversions as well as with new build projects using all types of build including traditional, timber or steel frame as well as new methods of build such as ICF and modular off site construction and mezzanine floors.

Apart from standard domestic separating floors, LEWIS® provides exceptional solutions for bespoke acoustic floors within live music venues, night clubs, restaurants, recording studios, recreational performance studios, specialist test labs, plant rooms and many other commercial applications.

Features

- Low dead load from 0.90 kN/m^2
- Floor thickness from 50 mm
- High permissible loads
- Spans of up to 2500 mm
- High impact and airborne sound insulation
- Up to 120 minutes fire resistance
- Easy to install

LEWIS

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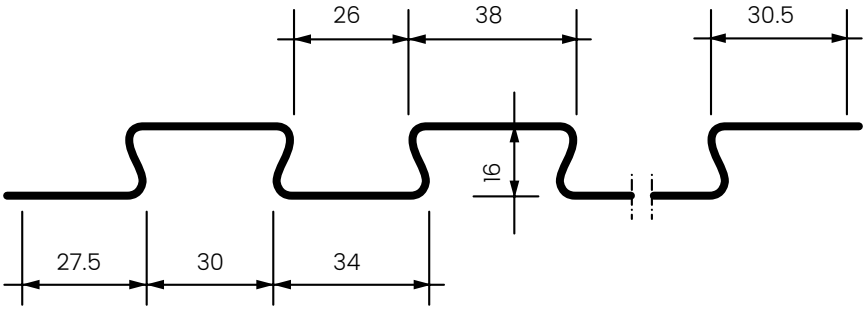
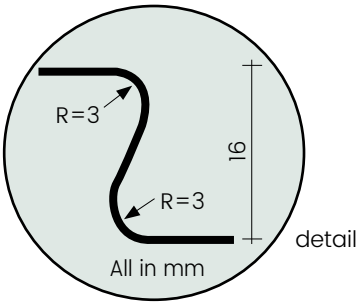
LEWIS® Metal Deck

Standard profile (sizes in mm)





LEWIS® Metal decking

The unique LEWIS® profile with its optimal geometry provides a combined action between the LEWIS® deck and the concrete/screed ensuring an extremely high load bearing capacity.

A LEWIS® composite floor consists of the LEWIS® cold rolled steel sheet covered with a relatively thin layer of C20/25 fine grade aggregate concrete or CA25 F4 free flowing, selflevelling, liquid screed. During the curing period the LEWIS® deck acts as shuttering, but once the concrete/screed has cured, locking into the LEWIS® deck it forms an extremely strong, composite, structurally sound floor, i.e. it becomes reinforcement for the concrete/screed. The use of fine grade aggregate concrete can also provide a monolithic finish to provide a "finished floor" option. The overall depth of a LEWIS® composite floor can be relatively thin – 50 mm in most cases.

Acoustics

Best results are achieved by laying a LEWIS® composite floor as a "floating Floor", creating separation between the supporting floor, joists or beams with the introduction of resilient strips. Strips are laid directly to the existing timber floor or placed on top of any supporting joist/beam. The type of resilient strip is determined by the required acoustic and load bearing performance requirements. When looking at an existing floor or timber joists LEWIS® High Density Mineral Wool Strip is the most likely solution. When looking for a higher acoustic performance or when the joist/beam spans exceed 800 mm and the load bearing capacity will exceed 2.5 Kn/m^2 there are a range of specialist solutions such as LEWIS® CDM PF resilient strips or LEWIS® CDM MTA recycled rubber granulate strips. A range of acoustic strips are available for use with light gauge steel or structural steel beams – details on application. Apart from standard domestic separating floors, LEWIS® provides exceptional solutions for bespoke acoustic floors within live music venues, night clubs, restaurants, recording studios, recreational performance studios, specialist test labs, plant rooms and many other commercial applications.

Fire Resistance

LEWIS® Dovetailed Sheeting makes it possible to design a composite floor meeting the standards without complicated details. Generally a fire resistance of 60 – 120 minutes is achievable with all standard LEWIS® details. Fire tests certification meeting EN 13501-2 are available.

Common Applications

- Acoustic separating floors
- Fire resistant floors
- Bespoke Green Guide A+ rated sustainable floors
- Can easily also include underfloor heating
- Suitable sub-floor for ceramic or stone tiles, timber or laminate floor finishes.
- Can be used as a structural floor element within the building
- Mezzanine floors
- Bathrooms and wet rooms
- Suitable for traditional, off-site construction and conversion projects
- Raised ground floors

Wet Rooms

- Stiff and high load bearing, ideal for all tile options
- Floors ready for final finishing
- Floor thicknesses from only 36 mm
- Spans joists or laid direct to the existing floor
- Easy to incorporate underfloor heating
- Excellent acoustic performance

Wet Rooms

LEWIS® Dovetailed Sheeting composite floors are ideal for wet rooms or bathrooms in existing or new build construction. Sheets are placed on the existing floor or used as a replacement for timber decks. An exceptional waterproof wall to floor joint is created by the use of a simple damp proof membrane worked into the concrete/screed and bonded to the walls. The floor and walls are now ready for tiling or other final finishing with no fear of movement or cracking.

Underfloor Heating and Cooling

Underfloor heating is becoming commonplace in modern residential, commercial and public building projects. A LEWIS® solution allows all of the efficiencies of a ground floor to be constructed on the upper floors. Pipes are secured to the upper flanges of the sheet, fixed using the LEWIS® clip or the LEWIS® rail fixing system. A minimum 20 mm of concrete /screed coverage is all that is required above the pipes. An even spread of heat is transferred from pipes to sheets and within the floor slab.

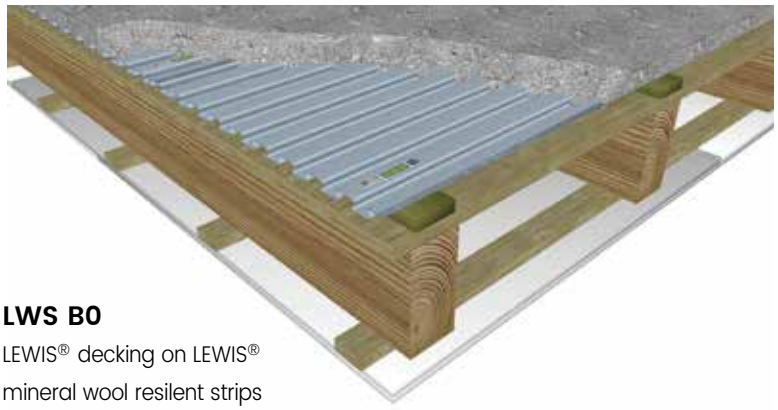
Underfloor Heating and Cooling

- Floor thickness typically 52 mm (with typical 16 mm pipes)
- Provides a thermal mass
- Even spread of heat eliminating cold spots
- Easy to install

Renovation and Conversions

LEWIS® composite floors provide an excellent solution when looking to upgrade acoustic and fire protection performance to separating floors during the renovation or conversion of existing buildings. LEWIS® composite floors make it possible floor" on top of the existing floor construction.to create light weight, cost effective and easy installed "floating If floor to ceiling heights are an issue the existing floor boards can be removed with the LEWIS® deck then laid directly to the joists. A standard LEWIS® floor type detail LWS-BO easily achievesthe building requirements for acousticand fire resistance for residential separating floors.Higher performance standards are easily achievable.

- Easily achieves the standards for acoustic and fire performance.
- Low dead loads
- Ideal for all renovation, conversion and new build applications including timber frame, SIPS and ICF building systems.



LWS B0

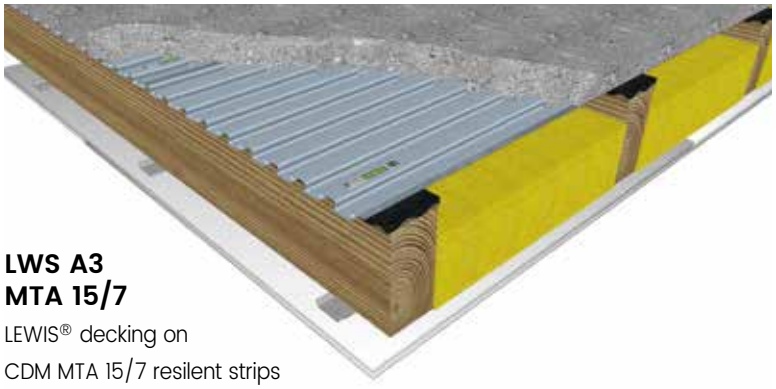
LEWIS® decking on LEWIS® mineral wool resilent strips

Airborne sound

Rw (C100-3150, Ctr 100-3150) 55 (-1,-7)dB
DnT.w + Ctr 47 dB
DnT.w 54 dB

Impact sound

Ln,w (CI 100-2500, CI 50-2500) 49 (-1,)dB
$L_{nT,w}$ 50 dB



LWS A3 MTA 15/7

LEWIS® decking on CDM MTA 15/7 resilent strips

Airborne sound

Rw (C100-3150, Ctr 100-3150) 68 (-2,-6)dB
DnT.w + Ctr 58 dB
DnT.w 64 dB

Impact sound

Ln,w (CI 100-2500, CI 50-2500) 48 (-1,7)dB
$L_{nT,w}$ 51 dB

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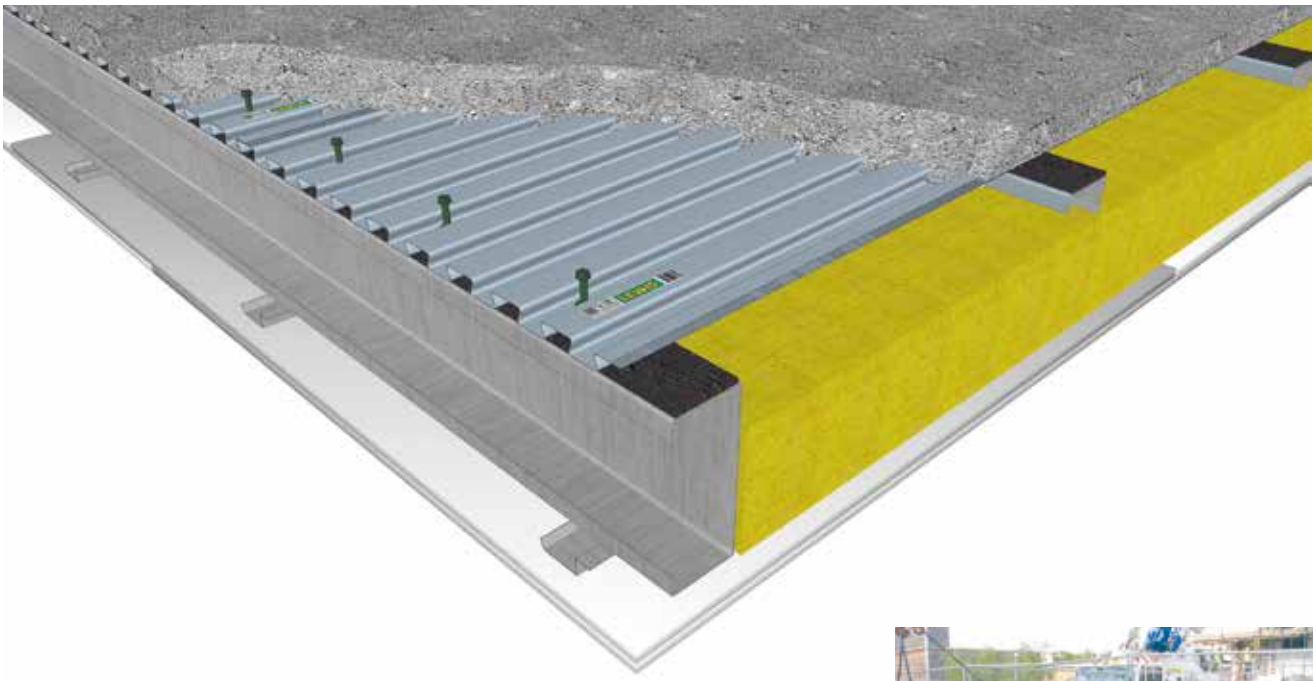

Steel and Modular Construction

LEWIS® provides exceptional solutions for light gauge steel framed off-site, modular and volumetric building systems. A high load bearing capacity combined with a low dead load makes LEWIS® an ideal choice when incorporating a concrete/screed floor within LGSF or Modular systems.

Method of installation

Please see the separate leaflet providing the recommended method of installation. Detailed instruction is given on the laying, jointing and fixing of the sheets, types of concrete and screed. Additional technical advice is available on request.

Certification and Reports

The production facility is ISO 9001 and ISO 14001 certified. The LEWIS® system is fully tested and carries the following certification:

- Dutch KIWA technical approval certification K105315
- Belgian Technical approval certification ATG 2096
- German Allgemeine Bauartgenehmigung Z-26.1-36
- French Avis Technique C.S.T.B. 3/09-592

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Design information

Table 1: Permissible uniformly distributed load

span L in (mm)	slab depth D in (mm)	permissible load Qk in kN/m² (excl. partial factor)
600	50	36,2
900	50	22,7
1200	50	14,8
1500	50	10,6
2000	75	11,3
2500*	75	8,2

assumptions:
- concrete strength class C20/25
- partial factors $\xi_{\gamma Q}$ = 1,25 en γ_Q = 1,5 (consequence class CC2)

Table 2: Permissible concentrated load

span L in (mm)	slab depth D in (mm)	permissible concentrated load Qk in (kN) excl. partial factor			
		no free edges		free edges	
		unreinforced	reinforced*	unreinforced	reinforced*
600	50	3,8	5,7	2,3	3,3
900	50	3,6	5,5	2,2	3,2
1200	50	3,5	5,4	2,1	3,1
1500	50	3,4	5,3	2,0	3,1
2000	75	4,4	6,5	**	3,6
2500*	75	4,2	6,3	**	3,5

* reinforcement mesh Ø5 -150 (Q131) or Ø6 - 200 (A142)
** failure mode transverse bending is not considered for these spans

assumptions:
- partial factors $\xi_{\gamma Q}$ = 1,25 en γ_Q = 1,5 (consequence class CC2)
- load area dimensions 50 mm x 50 mm
- concrete strength class C20/25

TECHNICAL DETAILS LEWIS® METAL DECKING

Nominal width		630 mm
Effective width		580 mm
Standard lengths		1220 / 1530 / 1830 / 2000 mm / 2500
Length range		800 - 7000 mm
Dimensional tolerances	length:	1 - 4 mm
	width :	1 - 3 mm
Moment of inertia		I_X = 3.6 cm⁴/m¹
Moment of resistance		W_X = 3.0 cm³/m¹
Steel gauge		0.5 mm
		(0.4, 0.6 and 0.7 mm available on request)
Height of profile		16 mm
Flange width		38 / 34 mm
Weight		0.058 kN/m²

Steel quality: S320GD + Z100 N-A-C according to EN 10346 Z275 and ZM310 Magnelis® available on request.

Table 3: Design table

category	actions		no free edges				free edges***			
			D = 50 mm		D = 75 mm		D = 50 mm		D = 75 mm	
			unreinforced	reinforced*	unreinforced	reinforced*	unreinforced	reinforced**	unreinforced	reinforced**
A1, A2	1,5 kN/m²	2,0								
A3	2,0 kN/m²	2,0								
A4	2,0 kN/m²	2,7								
B1	2,5 kN/m²	2,7								
B2	3,0 kN/m²	2,7								
C11	2,0 kN/m²	3,0								
C12	2,5 kN/m²	4,0					not possible due to high concentrated load			
C13	3,0 kN/m²	3,0								
C21	4,0 kN/m²	3,6	L≤1 m	L>1 m						
C22	3,0 kN/m²	2,7								
C31	3,0 kN/m²	4,5					not possible due to high concentrated load			
C32	3,0 kN/m²	4,0					not possible due to high concentrated load			
C33	4,0 kN/m²	4,5					not possible due to high concentrated load			
C34	5,0 kN/m²	4,5					not possible due to high concentrated load			
C35	4,0 kN/m²	4,0					not possible due to high concentrated load			
C36	3,0 kN/m²	2,0								
C37	5,0 kN/m²	3,6	L≤1 m	L>1 m						
C38	7,5 kN/m²	4,5					not possible due to high concentrated load			
C39	4,0 kN/m²	4,5					not possible due to high concentrated load			
C41	5,0 kN/m²	3,6	L≤1 m	L>1 m						
C42	5,0 kN/m²	7,0	not possible due to high concentrated load							
C51	5,0 kN/m²	3,6	L≤1 m	L>1 m						
D1, D2	4,0 kN/m²	3,6	L≤1 m	L>1 m						

* reinforcement mesh Ø5-150 (Q131) or Ø6 - 200 (A142) for whole floor area
** only reinforcement mesh (Q131 or A142) needed at free edges (over width of sheeting)
*** free edges can be avoided with suporting beams along the free edges

assumptions:
- maximum span 1500 mm
- actions according to NA to BS EN 1991-1:2002
- partial factors $\xi_{\gamma Q}$ = 1,25 en γ_Q = 1,5 (consequence class CC2)
- concentrated load area dimensions 50 mm x 50 mm
- concrete strength class C20/25

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