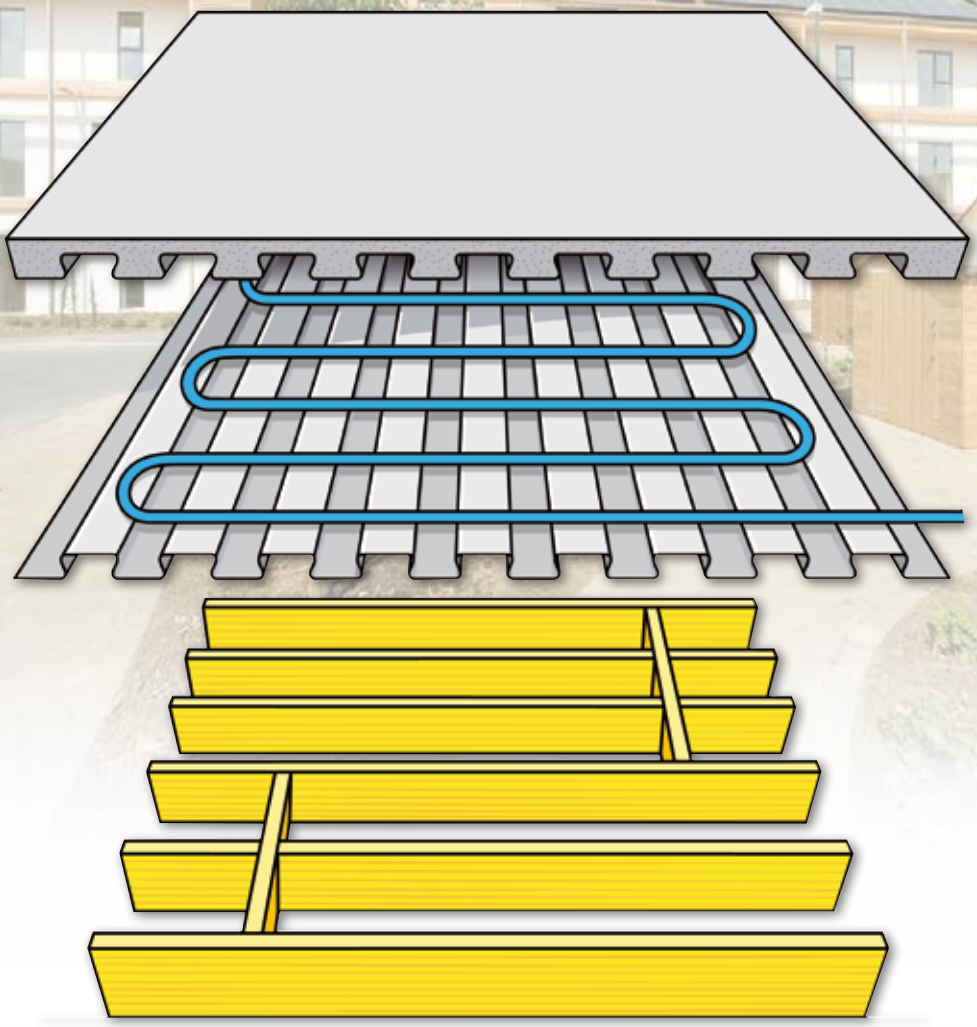
LEWIS®
Metal Deck

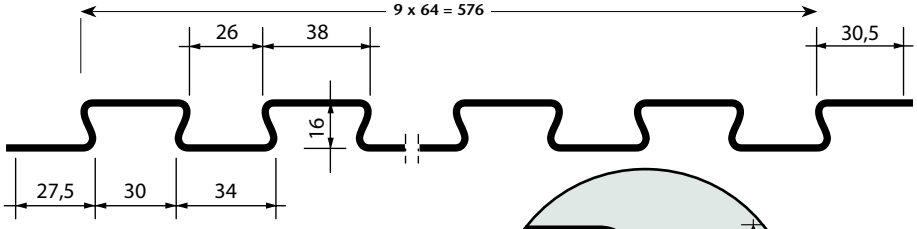


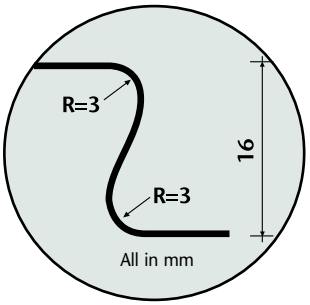
As part of a joisted floor construction, LEWIS® Dovetailed metal decking provides a first class solution for ACOUSTICS, FIRE PROTECTION and works well with UNDERFLOOR HEATING AND COOLING systems.

LEWIS® Dovetailed metal decking solutions are used in a range of applications including renovations and conversions, traditional new build, timber frame, steel frame and other off-site building systems, ICF and modular construction and mezzanine floors.

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.

standard profile





detail

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 CA25F4 free flowing, self-levelling, 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.

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

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.

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.

Features

- Low dead weight
- Thin floor thickness (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
- Manufactured from high quality galvanised steel

Wet Rooms

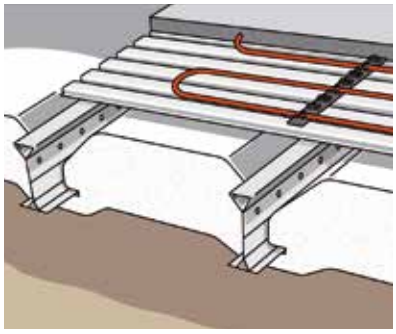
LEWIS® Dovetailed Sheeting composite floors are ideal for wet rooms or bathrooms in existing or new build construction. Sheets are placed on the existing floor or used as a replacement for timber decks. An exceptional waterproof wall to floor joint is created by the use of a simple damp proof membrane 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.

- 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

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.

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

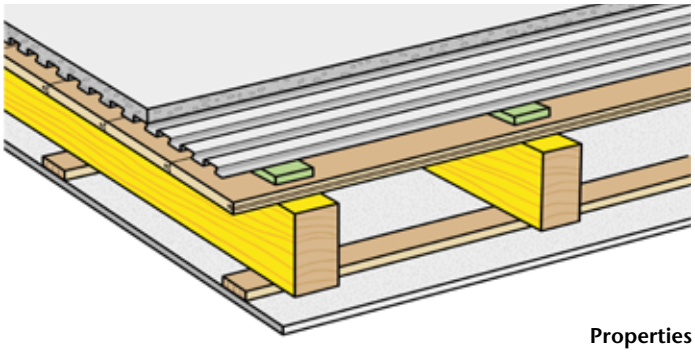


Renovation and Conversions

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 to create light weight, cost effective and easy installed “floating floor” on top of the existing floor construction. If floor to ceiling heights are an issues the existing floor boards can be removed with the LEWIS® deck then laid directly to the joists.

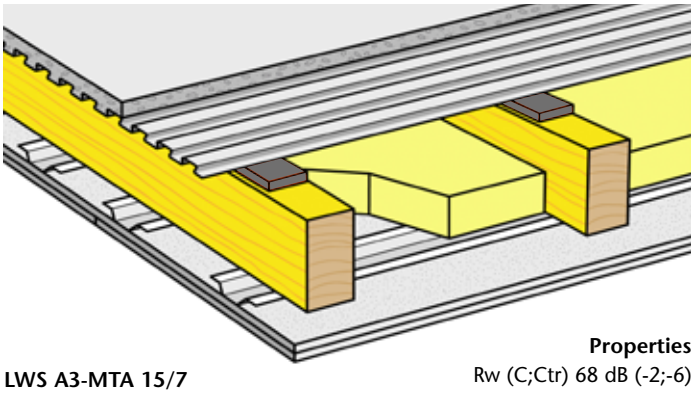
A standard LEWIS® floor type detail LWS-BO easily achieves the building requirements for acoustic and fire resistance for residential separating floors. Higher performance standards are easily achievable.

- 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

Properties
Rw (C;Ctr) 55 dB (-1;-7)
Ln,w (CI) 49 dB (-1)
REI ≥ 60 minutes



LWS A3-MTA 15/7
LEWIS® decking on CDM MTA 15/7 resilent strips

Properties
Rw (C;Ctr) 68 dB (-2;-6)
Ln,w (CI) 48 dB (-1,7)
REI ≥ 60 minutes

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.

- Low dead load from 0.90 kN/m^2
- Floor thickness from 50 mm
- High permissible loads
- Spans up to 2500 mm
- Used in floor cassettes

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:

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 $_{\gamma Q}$ = 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 $_{\gamma Q}$ = 1,5 (consequence class CC2)
- load area dimensions 50 mm x 50 mm
- concrete strength class C20/25

Technical details

nominal width	:		630 mm
effective width	:		580 mm
standard lengths	:		1,220 mm
			1,530 mm
			1,830 mm
			2,000 mm
			2,500 mm
length range	:		800 - 7,000 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 en 0.7 mm available on request)	
height of profile	:		16 mm
flange width	:		38/34 mm
weight	:		0.058 kN/m²

minimum 'fine grade' concrete thickness:
16 mm profile height + 34 = 50 mm. For composition and quality of concrete see separate application instructions.

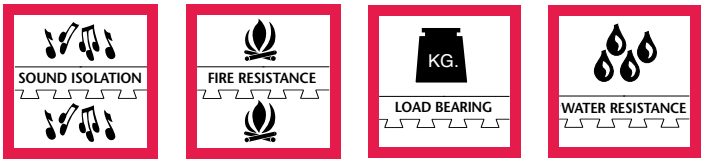
Steel quality: S320GD + Z100 N-A-C according to EN 10346
Z275 and ZM310 Magnelis® available on request.

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 $_{\gamma Q}$ = 1,5 (consequence class CC2)
- concentrated load area dimensions 50 mm x 50 mm
- concrete strength class C20/25



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REPPEL bv
- Pieter Zeemanweg 107
- 3316 GZ Dordrecht • The Netherlands
- Tel. : +31 (0)78 617 44 00
- E-mail : reppel@reppel.nl
- Website : www.reppel.nl

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