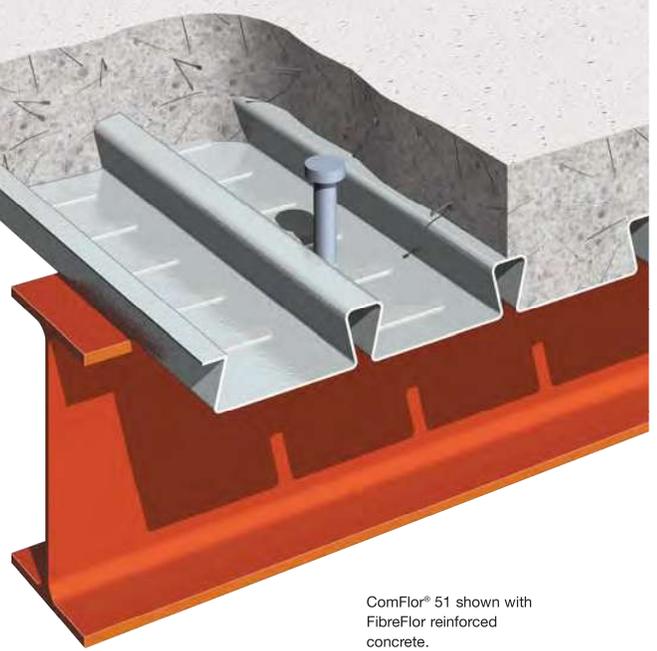


Made in Dubai, UAE

# ComFlor® 51

Shallow composite profile

ComFlor® 51 is a traditional dovetail re-entrant composite floor deck. This profile provides an excellent mechanical key into the concrete slab, offering a strong shear bond performance, which is augmented by cross stiffeners located in the profile trough. ComFlor® 51 presents a virtually flat soffit and a relatively thin slab is required to meet fire design requirements.



ComFlor® 51 shown with FibreFlor reinforced concrete.

- **Shear studs**

The wide trough of ComFlor® 51 permits a flexible and efficient placement of shear studs.

- **Fire performance of the composite beams**

Even for two hours fire rating, the top flange of the steel beam does not require fire protection, when used with ComFlor® 51 composite deck.

- **Under floor services**

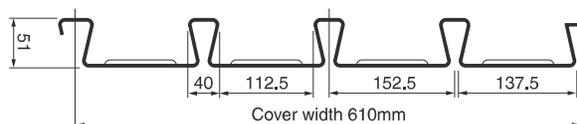
Services are easy to attach to ComFlor® 51, with the ribs presenting a dovetailed recessed groove in the concrete slab at 152.5mm centres. This provides the perfect connection for service hangars via a wedge nut or similar type device.

- **Fire performance of the slab**

The dovetail presents a very small opening and contributes little to the transfer of heat through the slab in the event of fire. Thus a lesser slab depth is needed for fire design purposes.



# ComFlor® 51 Design Information



## ComFlor® 51 Composite Slab - volume & weight

Slab Depth (mm)	Concrete volume (m <sup>3</sup> /m <sup>2</sup> )	Weight of Concrete (kN/m <sup>2</sup> )			
		Normal weight Concrete		Lightweight Concrete	
		Wet	Dry	Wet	Dry
101	0,092	2,16	2,12	1,71	1,62
105	0,096	2,26	2,21	1,79	1,69
110	0,101	2,37	2,32	1,88	1,78
115	0,106	2,49	2,44	1,97	1,87
120	0,111	2,61	2,55	2,07	1,96
125	0,116	2,73	2,67	2,16	2,04
130	0,121	2,84	2,78	2,25	2,13
150	0,141	3,32	3,25	2,62	2,49
200	0,191	4,49	4,40	3,56	3,37
240	0,231	5,43	5,32	4,30	4,08

### Volume & weight table notes

- Deck and beam deflection (i.e. ponding) is not allowed for in the table.
- Deck and mesh weight is not included in the weight of concrete figures.
- Density of concrete is taken as:
  - Normal weight (wet) 2400 kg/m<sup>3</sup>
  - Normal weight (dry) 2350 kg/m<sup>3</sup>
  - Lightweight (wet) 1900 kg/m<sup>3</sup>
  - Lightweight (dry) 1800 kg/m<sup>3</sup>

## Section Properties (per metre width)

Nominal thickness (mm)	Design thickness (mm)	Profile weight (kN/m <sup>2</sup> )	Area of steel (mm <sup>2</sup> /m)	Height to neutral axis (mm)	Moment of inertia (cm <sup>4</sup> /m)	Ultimate Moment capacity (kNm/m)	
						Sagging	Hogging
0.90	0.86	0.13	1579	16,74	55,70	5,69	6,99
1.00	0.96	0.14	1759	16,73	62,10	6,34	7,93
1.10	1,06	0,16	1938	16,73	68,50	7,00	8,88
1.20	1,16	0,17	2118	16,72	77,29	10,24	9,81

## Design Notes

### Deck material

Corus Galvatite, hot dip zinc coated steel EN 10326-S350GD+Z275, Guaranteed minimum yield stress 350N/mm<sup>2</sup>. Minimum zinc coating mass 275g/m<sup>2</sup> total both sides.

### Quick reference tables

The quick reference load/span and fire design tables, on the following 2 pages are intended as a guide for initial design, based on the parameters stated below the tables. Full design can be carried out using the free Comdek software.

### Anti-crack mesh

BS 5950: Part 4 currently recommends that anti-crack mesh should comprise 0,1% of slab area. The Eurocode 4 recommendation is that anti-crack mesh should comprise 0,2% of slab area for unpropped spans and 0,4% of slab area for propped spans. The mesh shown in the quick

reference tables complies with EC4 and the design program defaults to these values. Where EC4 mesh rules are used, the mesh may be reduced midspan - see Design Information on page 30. The reduced British Standard mesh values may still be used by overriding this default in the design program.

Where forklift truck (or other similar concentrated loading) is expected 0,5% minimum percentage reinforcement should be used over the supports and 2% elsewhere to control cracking. For further information refer to Design Notes on page 30 or SCI AD150.

Mesh top cover must be a minimum of 15mm, and a maximum of 30mm. Mesh laps are to be 300mm for A142 mesh and 400mm for A193, A252 & A393 mesh.

### Fire

For details of the performance of composite slabs comprising ComFlor® 51 decking under a fire condition with nominal anti-crack mesh, please refer to the quick reference fire load tables in this brochure. For other simplified design cases or for full fire engineering, refer to the Comdek software.

### Technical services

The Technical Department at Corus offers a comprehensive advisory service on design of composite flooring, which is available to all specifiers and users. Should queries arise which are not covered by this literature or by the Comdek software, please contact us.

### Left:

Project: Milton Keynes Football Stadium.  
Main Contractor: The Buckingham Group



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# FibreFlor CF51 Mesh Free - quick reference tables

FibreFlor CF51 - Span table - normal weight concrete

Props	Span	Fire Rating	Slab Depth (mm)	FibreFlor	MAXIMUM SPAN (m)											
					Deck Thickness (mm)											
					0.9			1.0			1.1			1.2		
Total Applied Load (kN/m <sup>2</sup> )			Total Applied Load (kN/m <sup>2</sup> )			Total Applied Load (kN/m <sup>2</sup> )			Total Applied Load (kN/m <sup>2</sup> )							
					3.5	5.0	10.0	3.5	5.0	10.0	3.5	5.0	10.0	3.5	5.0	10.0
No Temporary props	Single span deck & slab	1 hr	101	26	2.8	2.8	2.5	2.9	2.9	2.7	3.1	3.1	2.8	3.3	3.3	3.0
			130	26	2.5	2.5	2.5	2.7	2.7	2.7	2.8	2.8	2.8	3.0	3.0	3.0
		1.5 hr	110	31	2.7	2.7	2.2	2.9	2.9	2.3	3.0	3.0	2.4	3.1	3.1	2.4
			140	31	2.5	2.5	2.5	2.6	2.6	2.6	2.8	2.8	2.7	2.9	2.9	2.8
		2 hr	125	36	2.6	2.6	2.1	2.7	2.7	2.2	2.9	2.9	2.3	3.0	3.0	2.3
	150		36	2.5	2.5	2.5	2.6	2.6	2.6	2.7	2.7	2.6	2.8	2.8	2.7	
	Double span deck & slab	1 hr	101	26	3.2	3.2	2.6	3.4	3.4	2.7	3.5	3.5	2.8	3.7	3.7	3.0
			130	26	3.1	3.1	2.9	3.2	3.2	3.1	3.3	3.3	3.2	3.4	3.4	3.4
		1.5 hr	110	31	3.2	3.2	2.3	3.3	3.1	2.4	3.4	3.2	2.5	3.6	3.3	2.6
			140	31	3.0	3.0	2.7	3.2	3.2	2.8	3.3	3.3	2.9	3.4	3.4	3.0
2 hr		125	36	3.1	2.9	2.3	3.2	3.0	2.3	3.3	3.1	2.4	3.4	3.1	2.5	
	150	36	2.9	2.9	2.7	3.1	3.1	2.7	3.2	3.2	2.8	3.4	3.4	2.9		
1 Line of Temporary props	Double span slab	1 hr	101	26	3.6	3.1	2.4	3.8	3.3	2.5	3.9	3.5	2.7	4.1	3.6	2.8
			130	26	3.9	3.5	2.7	4.1	3.7	2.8	4.3	3.9	3.0	4.5	4.0	3.1
		1.5 hr	110	31	3.3	3.0	2.3	3.4	3.1	2.4	3.5	3.2	2.5	3.6	3.3	2.6
			140	31	3.7	3.4	2.7	3.8	3.5	2.8	3.9	3.6	2.9	4.1	3.7	3.0
		2 hr	125	36	3.1	2.9	2.3	3.2	3.0	2.3	3.3	3.1	2.4	3.4	3.1	2.5
			150	36	3.7	3.3	2.7	3.8	3.4	2.7	3.8	3.5	2.8	3.9	3.6	2.9

#### FibreFlor dosage

26 – Steel fibres 25kg/m<sup>3</sup>, Polypropylene fibres 0.9kg/m<sup>3</sup>

31 – Steel fibres 30kg/m<sup>3</sup>, Polypropylene fibres 0.9kg/m<sup>3</sup>

36 – Steel fibres 35kg/m<sup>3</sup>, Polypropylene fibres 0.9kg/m<sup>3</sup>

### Parameters assumed for quick reference span tables

<b>Mesh</b>	See notes on page 11. (Mesh is not required for FibreFlor)
<b>Spans</b>	Measured centre to centre of supports.
<b>Deck</b>	Standard deck material specification (see previous page).
<b>Bearing width</b>	The width of the support is assumed to be 150mm.
<b>Prop width</b>	Assumed to be 100mm.
<b>Deflection</b>	Construction stage L/130 or 30mm (ponding has been taken into account).
<b>Deflection</b>	Composite stage L/350.
<b>Concrete grade</b>	The concrete is assumed to be grade 35 with a maximum aggregate size of 20mm. The wet weight of concrete is taken to be normal weight 2400kg/m <sup>3</sup> and lightweight 1900 kg/m <sup>3</sup> . The modular ratio is 10 for normal weight and 15 for lightweight concrete.
<b>Construction load</b>	1.5 kN/m <sup>2</sup> construction load is taken into account, in accordance with BS 5950:Part 4. No allowance is made for heaping of concrete during the casting operation. See design notes.

**Applied load** The applied load stated in the tables covers allowable unfactored imposed live load, Partition loads, finishes, ceilings and services are not included. However the dead load of the slab itself has already been taken into account and need not be considered as part of the applied load.

**Simplified fire design method** The fire recommendations in the tables are based on the simplified design method.

**Fire engineering method** The fire engineering (FE) method may be used to calculate the additional reinforcement needed for fire, load and span conditions beyond the scope of these tables. The FE method of design is provided in the design CD.

**Fire insulation** The minimum slab thickness indicated in each table, for each fire rating satisfies the fire insulation requirements of BS 5950: Part 8.

**Span/depth ratio** Slab span to depth ratio is limited to 30 for lightweight concrete and 35 for normal weight concrete.



Project: The Eagle Shopping Centre, Derby.  
Client: Westfield Shopping Centres



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# ComFlor® 51 Using Mesh - quick reference tables

## ComFlor® 51 Span table - normal weight concrete

Props	Span	Fire Rating	Slab Depth (mm)	Mesh	MAXIMUM SPAN (m)												
					Deck Thickness (mm)												
					0.9			1.0			1.1			1.2			
Total Applied Load (kN/m <sup>2</sup> )			Total Applied Load (kN/m <sup>2</sup> )			Total Applied Load (kN/m <sup>2</sup> )			Total Applied Load (kN/m <sup>2</sup> )								
3.5	5.0	10.0	3.5	5.0	10.0	3.5	5.0	10.0	3.5	5.0	10.0						
No Temporary props	Single span slab & deck	1 hr	101	A142	2.8	2.8	2.5	2.9	2.9	2.6	3.1	3.1	2.7	3.2	3.2	2.8	
		1.5 hr	110	A142	2.7	2.7	2.2	2.9	2.9	2.3	3.0	3.0	2.4	3.1	3.0	2.4	
		2 hr	125	A193	2.6	2.5	2.0	2.7	2.5	2.0	2.8	2.6	2.0	2.9	2.6	2.1	
			200	A393	2.2	2.2	2.2	2.4	2.4	2.4	2.5	2.5	2.5	2.6	2.6	2.6	
	Double span slab & deck	1 hr	101	A142	3.2	3.2	2.6	3.4	3.4	2.7	3.5	3.5	2.8	3.7	3.7	3.0	
		1.5 hr	110	A142	3.2	3.2	2.4	3.3	3.3	2.6	3.5	3.3	2.7	3.6	3.4	2.7	
		2 hr	125	A193	3.1	3.0	2.3	3.2	3.1	2.4	3.3	3.1	2.5	3.4	3.2	2.5	
			240	A393	2.6	2.6	2.6	2.8	2.8	2.8	2.9	2.9	2.9	3.0	3.0	3.0	
	1 Line of Temporary props	Single span slab	1 hr	101	A252	3.6	3.1	2.4	3.8	3.3	2.5	3.9	3.5	2.7	4.0	3.6	2.8
				110	A252	3.7	3.3	2.5	3.8	3.4	2.6	4.0	3.5	2.8	4.1	3.7	2.9
				125	A393	3.8	3.4	2.6	4.1	3.6	2.8	4.3	3.8	2.9	4.4	4.0	3.1
			1.5 hr	110	A252	3.2	2.9	2.2	3.3	3.0	2.3	3.4	3.0	2.4	3.5	3.1	2.4
125				A393	3.5	3.2	2.5	3.6	3.3	2.6	3.7	3.3	2.6	3.8	3.4	2.7	
240				A393	3.0	2.7	2.1	3.1	2.8	2.2	3.1	2.8	2.2	3.1	2.8	2.2	
2 hr			200	2xA393	3.0	2.8	2.3	3.1	2.8	2.3	3.2	2.9	2.4	3.2	3.0	2.4	
			240	2xA393	3.0	2.8	2.3	3.1	2.9	2.4	3.2	3.0	2.4	3.3	3.0	2.5	
			101	A252	3.6	3.1	2.4	3.8	3.3	2.5	3.9	3.5	2.7	4.1	3.6	2.8	
Double span slab			1 hr	110	A252	3.7	3.3	2.5	3.9	3.4	2.6	4.1	3.6	2.8	4.2	3.8	2.9
				125	A393	3.8	3.4	2.6	4.1	3.6	2.8	4.3	3.8	2.9	4.4	4.0	3.1
				110	A252	3.7	3.3	2.5	3.9	3.4	2.6	4.0	3.5	2.8	4.0	3.6	2.8
		1.5 hr	125	A393	3.8	3.4	2.6	4.1	3.6	2.8	4.3	3.8	2.9	4.4	4.0	3.1	
			125	A393	3.6	3.2	2.5	3.6	3.3	2.6	3.7	3.3	2.6	3.7	3.3	2.6	
			200	2xA393	4.4	4.0	3.2	4.7	4.3	3.4	4.8	4.4	3.6	4.8	4.4	3.6	
		2 hr	240	2xA393	4.6	4.3	3.5	4.9	4.5	3.7	5.2	4.7	3.8	5.4	5.0	4.0	

## ComFlor® 51 Span table - lightweight concrete

Props	Span	Fire Rating	Slab Depth (mm)	Mesh	MAXIMUM SPAN (m)												
					Deck Thickness (mm)												
					0.9			1.0			1.1			1.2			
Total Applied Load (kN/m <sup>2</sup> )			Total Applied Load (kN/m <sup>2</sup> )			Total Applied Load (kN/m <sup>2</sup> )			Total Applied Load (kN/m <sup>2</sup> )								
3.5	5.0	10.0	3.5	5.0	10.0	3.5	5.0	10.0	3.5	5.0	10.0						
No Temporary props	Single span slab & deck	1 hr	101	A142	3.0	3.0	2.6	3.1	3.1	2.7	3.3	3.3	2.8	3.4	3.4	2.9	
		1.5 hr	105	A142	2.9	2.9	2.2	3.1	3.0	2.3	3.2	3.1	2.4	3.4	3.1	2.5	
		2 hr	115	A142	2.7	2.4	1.8	2.7	2.4	1.9	2.8	2.5	1.9	2.9	2.5	2.0	
			200	A393	2.4	2.4	2.4	2.6	2.6	2.6	2.7	2.7	2.6	2.9	2.9	2.7	
	Double span slab & deck	1 hr	240	A393	2.3	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.7	2.7	2.7	
			101	A142	3.4	3.4	2.6	3.6	3.6	2.7	3.8	3.8	2.9	3.9	3.9	3.0	
		1.5 hr	105	A142	3.4	3.3	2.6	3.6	3.4	2.6	3.7	3.5	2.7	3.9	3.6	2.7	
			115	A142	3.3	2.9	2.2	3.3	3.0	2.3	3.4	3.0	2.3	3.4	3.0	2.4	
	2 hr	200	A393	2.8	2.8	2.8	3.0	3.0	3.0	3.2	3.2	3.2	3.3	3.3	3.3		
		240	A393	2.6	2.6	2.6	2.8	2.8	2.8	3.0	3.0	3.0	3.1	3.1	3.1		
	1 Line of Temporary props	Single span slab	1 hr	101	A252	3.7	3.2	2.4	3.9	3.4	2.6	4.0	3.6	2.7	4.2	3.7	2.8
				105	A252	3.8	3.3	2.5	4.0	3.5	2.6	4.1	3.6	2.8	4.2	3.7	2.9
115				A393	3.9	3.4	2.6	4.1	3.6	2.7	4.3	3.8	2.9	4.5	4.0	3.0	
1.5 hr			105	A252	3.3	2.9	2.3	3.5	3.0	2.3	3.5	3.1	2.4	3.6	3.2	2.5	
			115	A393	3.7	3.3	2.5	3.8	3.4	2.6	3.9	3.4	2.6	3.9	3.5	2.7	
			115	A393	3.2	2.8	2.2	3.2	2.9	2.2	3.3	2.9	2.2	3.3	2.9	2.3	
2 hr			200	2xA393	3.2	2.9	2.4	3.3	3.0	2.4	3.4	3.1	2.5	3.4	3.1	2.5	
			240	2xA393	3.2	3.0	2.4	3.3	3.1	2.5	3.4	3.1	2.5	3.5	3.2	2.6	
			101	A252	3.7	3.2	2.4	3.9	3.4	2.6	4.1	3.6	2.7	4.3	3.8	2.8	
Double span slab			1 hr	105	A252	3.8	3.3	2.5	4.0	3.5	2.6	4.2	3.7	2.8	4.4	3.8	2.9
				115	A393	3.9	3.4	2.6	4.1	3.6	2.7	4.3	3.8	2.9	4.5	4.0	3.0
				105	A252	3.8	3.3	2.5	4.0	3.5	2.6	4.2	3.7	2.8	4.3	3.8	2.9
	1.5 hr	115	A393	3.9	3.4	2.6	4.1	3.6	2.7	4.3	3.8	2.9	4.5	4.0	3.0		
		115	A393	3.9	3.4	2.6	4.1	3.6	2.7	4.3	3.8	2.9	4.4	3.9	3.0		
		200	2xA393	4.7	4.3	3.3	5.0	4.5	3.5	5.3	4.7	3.7	5.5	5.0	3.9		
	2 hr	240	2xA393	5.0	4.5	3.6	5.3	4.8	3.8	5.5	5.0	4.0	5.8	5.3	4.2		