4.11 KF40® Fire Resistance Tables

Index of KF40® Fire Resistance Tables

Fire Resistance Tables Notes

The fire resistance tables are to be used to design fire rated KingFlor composite slabs that meet the assumptions below. For designs outside the parameters below and specified on the tables refer to the KingFlor Designer Suite or your local Fielders representative. For propping requirements refer to the temporary propping tables.

Notation

Dcs = depth of composite slab.
L = Span between permanent supports.

Loads

Construction Live Load 1.0kPa
Ceiling & Services Load 0.35kPa
Partitions Load 0.5kPa

Short & Long-Term Factors

Short-term factor ψ = 0.7
Long-term factor ψ = 0.4
Combination-term factor ψ = 0.4

Concrete Properties

Normal wet density of concrete 2400kg/m^3
Normal dry density of concrete 2350 kg/m^3
Concrete strength f'c = 25MPa
Exposure Classification A1 with moderate crack control
Cover to top reinforcement is 30mm

Reinforcing

Steel Yield Strength f_{sy} = 500MPa
Bars - N12@200 indicates N12 bars at 200mm centers.

Mesh

Mesh is to be located in the top of the slab. Where the mesh code ends with a 'T' (eg. RL918T), the larger bars are to be located perpendicular to the decking ribs with the smaller perpendicular bars on top. Laps in mesh are to occur midspan.

Bars

Bars where required, are to be placed over internal permanent supports, on top of mesh. Length of bars are to be 0.6 x larger span + width of support. The bars are to be located 0.3 x span from edge of support for internal supports.

Fire reinforcement (Fire Reo) is to be located in the bottom of the slab in accordance with AS 3600:2001, Table 5.5.3 (A) "Fire Resistance Periods for Slabs". Bars are to be continuous & lapped at supports.

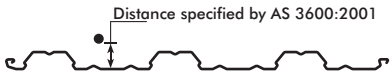


Figure 4.11.A Fire Reinforcement Detail

Spans

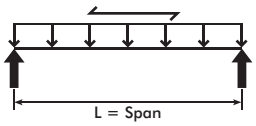
Spans L1, L2, L3 etc. cannot differ by more than 5% from both L1 and Ln.

Span is considered to be the larger of L1, L2...Ln.

Support width 50mm

The fire resistance tables have been prepared with the assumptions stated above. More refined designs can be obtained from Fielders or by using the KingFlor Designer Suite. Contact your local Fielders representative for design assistance.

KF40® Fire Resistance
Single Spans - Floor Live Load 1.5kPa

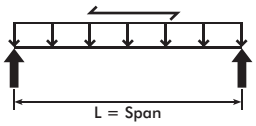


1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	115	SL92	-	-	120	SL102	-	-	150	SL81	-	-
3,000	120	SL92	-	1xN10/247✦	120	SL102	-	1xN10/247✦	160	SL81	-	1XN12/247✦
3,500	120	SL92	-	1XN12/247✦	130	SL102	-	1XN12/247✦	170	SL81	-	1xN16/247✦
4,000	140	SL102	-	1XN12/247✦	145	SL81	-	1XN12/247✦	170	SL81	-	1xN16/247✦
4,500	160	SL81	-	1XN12/247✦	155	SL81	-	1XN12/247✦	180	RL918T	-	2xN16/247✦
5,000	185	RL918T	-	1xN16/247✶	185	RL918T	-	1xN16/247✦	185	RL918T	-	2xN16/247✦
5,500	210	RL1018T	-	1xN16/247✦	210	RL1018T	-	1xN16/247✦	210	RL1018T	-	2xN16/247✦
6,000	235	RL1018T	-	1xN16/247✦	235	RL1018T	-	1xN16/247✶	240	RL1018T	-	2xN16/247✦
6,500	260	RL1118T	-	1xN16/247✦	265	RL1118T	-	1xN16/247✶	265	RL1118T	-	2xN16/247✦
7,000	295	RL1118T	-	2xN16/247✦	295	RL1118T	-	2xN16/247✦	295	RL1118T	-	2xN16/247✦

Table 4.11.A KF40® Fire Resistance - Single Spans - Floor Live Load 1.5kPa

KF40® Fire Resistance
Single Spans - Floor Live Load 3.0kPa



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL102	-	-	120	SL92	-	1xN10/247✦	160	SL81	-	-
3,000	120	SL102	-	1xN10/247✦	140	SL102	-	1xN10/247✶	175	RL918T	-	1xN16/247✦
3,500	125	SL102	-	1xN12/247✦	150	SL81	-	1XN12/247✦	185	RL918T	-	1xN16/247✦
4,000	145	SL81	-	1xN12/247✦	165	SL81	-	1XN12/247✶	195	RL918T	-	1xN16/247✦
4,500	170	SL81	-	1xN12/247✶	185	RL918T	-	1xN16/247✦	205	RL918T	-	2XN16/247✦
5,000	205	RL918T	-	1xN12/247✶	205	RL918T	-	1xN16/247✦	210	RL1018T	-	2XN16/247✦
5,500	230	RL1018T	-	1xN16/247✦	230	RL1018T	-	1xN16/247✦	230	RL1018T	-	2XN16/247✦
6,000	255	RL1118T	-	1xN16/247✦	255	RL1118T	-	1xN16/247✶	255	RL1118T	-	2XN16/247✦
6,500	285	RL1118T	-	1xN16/247✦	285	RL1118T	-	1xN16/247✶	285	RL1118T	-	2XN16/247✦
7,000	320	RL1218T	-	1xN16/247✦	320	RL1218T	-	1xN16/247✶	320	RL1218T	-	2XN16/247✦

Table 4.11.B KF40® Fire Resistance - Single Spans - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm

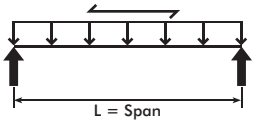
✶ 40mm

† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Fire Resistance
Single Spans - Floor Live Load 5.0kPa



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	1xN10/247✦	130	SL102	-	1xN12/247✦	160	SL81	-	1xN12/247✦
3,000	120	SL102	-	1xN10/247✦	140	SL81	-	1xN12/247✦	165	SL81	-	1xN16/247✦
3,500	140	SL102	-	1xN12/247✦	155	SL81	-	1xN12/247✶	165	SL81	-	1xN16/247✦
4,000	165	SL81	-	1xN12/247✦	170	SL81	-	1xN16/247✦	185	RL918T	-	1xN16/247✦
4,500	195	RL918T	-	1xN12/247✶	195	RL918T	-	1xN16/247✦	195	RL918T	-	2xN16/247✦
5,000	225	RL1018T	-	1xN12/247✶	225	RL1018T	-	1xN16/247✦	220	RL1018T	-	2xN16/247✦
5,500	255	RL1118T	-	1xN16/247✦	255	RL1118T	-	1xN16/247✦	255	RL1118T	-	2xN16/247✦
6,000	280	RL1118T	-	1xN16/247✦	280	RL1118T	-	1xN16/247✶	280	RL1118T	-	2xN16/247✦
6,500	315	RL1218T	-	1xN16/247✦	315	RL1218T	-	1xN16/247✶	315	RL1218T	-	2xN16/247✦
7,000	345	RL1218T	-	1xN16/247✦	345	RL1218T	-	1xN16/247✶	345	RL1218T	-	2xN16/247✦

Table 4.11.C KF40® Fire Resistance - Single Spans - Floor Live Load 5.0kPa

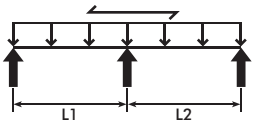
The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Fire Resistance
Double Spans - Floor Live Load 1.5kPa

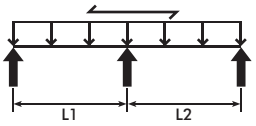


1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,500	115	SL102	-	-	130	SL102	-	1xN10/247✶	150	SL81	-	1xN12/247✶
4,000	120	SL81	-	-	140	SL81	-	1xN10/247✶	165	SL81	-	1xN12/247✶
4,500	120	SL81	N10@400	1xN10/247✦	145	SL81	-	1xN10/247✶	170	RL918T	N10@300	1xN16/247✶
5,000	130	SL81	N10@400	1xN10/247✶	145	SL81	N10@400	1xN12/247✶	185	RL918T	N10@300	1xN16/247✶
5,500	155	SL81	N10@400	1xN10/247✶	160	SL81	N10@400	1xN12/247✶	200	RL1018T	N10@250	1xN16/247✶
6,000	170	SL81	N10@275	1xN10/247✶	170	SL81	N10@275	1xN12/247✶	210	RL1018T	N12@250	1xN16/247✶
6,500	210	RL1018T	N12@200	1xN10/247✶	210	RL1018T	N12@200	1xN12/247✶	240	RL1118T	N12@200	1xN16/247✶
7,000	250	RL1118T	N12@200	1xN10/247✶	250	RL1118T	N12@200	1xN12/247✶	250	RL1118T	N12@200	2xN16/247✶

Table 4.11.D KF40® Fire Resistance - Double Spans - Floor Live Load 1.5kPa

KF40® Fire Resistance
Double Spans - Floor Live Load 3.0kPa



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,000	110	SL102	-	-	120	SL102	-	-	150	SL81	-	-
3,500	120	SL81	-	-	125	SL81	-	-	150	SL81	-	1xN12/247✶
4,000	150	SL81	-	1xN10/247✦	150	SL81	-	1xN10/247✶	160	SL81	-	1xN16/247✶
4,500	150	SL81	N10@400	1xN10/247✦	150	SL81	N10@400	1xN10/247✶	170	SL81	N10@400	1xN16/247✶
5,000	155	SL81	N10@300	1xN10/247✦	170	SL81	N10@400	1xN10/247✶	170	SL81	N10@400	2xN16/247✶
5,500	170	SL81	N10@200	1xN10/247✦	170	SL81	N10@225	1xN12/247✶	170	SL81	N10@200	2xN16/247✶
6,000	200	RL918T	N16@300	1xN10/247✦	200	RL918T	N16@300	1xN12/247✶	200	RL918T	N16@300	2xN16/247✶
6,500	200	RL918T	N16@250	1xN10/247✶	210	RL1018T	N16@275	1xN12/247✶	210	RL1018T	N16@275	2xN16/247✶
7,000	220	RL1018T	N16@225	1xN12/247✶	220	RL1018T	N16@225	1xN12/247✶	230	RL1118T	N16@250	2xN16/247✶

Table 4.11.E KF40® Fire Resistance - Double Spans - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm

✶ 40mm

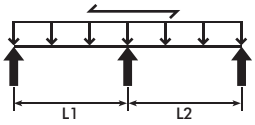
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Fire Resistance
Double Spans - Floor Live Load 5.0kPa

KF40®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	120	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,000	140	SL102	-	-	140	SL102	-	-	155	SL81	-	-
3,500	140	SL102	N10@400	1xN10/247✦	140	SL102	N10@400	1xN10/247✶	160	SL81	N10@400	1xN12/247✶
4,000	140	SL102	N10@250	1xN10/247✦	140	SL102	N10@250	1xN10/247✶	170	SL81	N10@375	1xN12/247✶
4,500	155	SL81	N10@250	1xN10/247✦	155	SL81	N10@250	1xN10/247✶	170	SL81	N10@350	1xN16/247✶
5,000	170	SL81	N12@250	1xN10/247✦	170	SL81	N12@250	1xN12/247✶	170	SL81	N12@200	1xN16/247✶
5,500	205	RL918T	N16@300	1xN10/247✦	205	RL918T	N16@300	1xN12/247✶	205	RL918T	N16@300	1xN16/247✶
6,000	240	RL1018T	N16@300	1xN10/247✦	240	RL1018T	N16@300	1xN12/247✶	240	RL1018T	N16@300	1xN16/247✶
6,500	250	RL1118T	N16@250	1xN10/247✶	250	RL1118T	N16@250	1xN12/247✶	250	RL1118T	N16@250	1xN16/247✶
7,000	290	RL1118T	N16@225	1xN10/247✶	290	RL1118T	N16@225	1xN12/247✶	290	RL1118T	N16@225	1xN16/247✶

Table 4.11.F KF40® Fire Resistance - Double Spans - Floor Live Load 5.0kPa

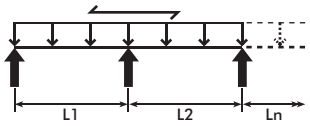
The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Fire Resistance
Continuous Spans - Floor Live Load 1.5kPa

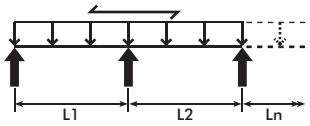


1.5kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,000	110	SL92	-	-	120	SL102	-	-	150	SL81	-	-
3,500	115	SL92	-	1xN10/247✦	120	SL102	-	1xN10/247✶	150	SL81	-	1xN12/247✶
4,000	125	SL102	-	1xN10/247✦	130	SL102	-	1xN10/247✶	150	SL81	-	1xN16/247✶
4,500	130	SL81	-	1xN10/247✦	130	SL102	N10@400	1xN12/247✶	160	SL81	-	1xN16/247✶
5,000	140	SL81	N10@400	1xN10/247✦	140	SL81	N10@400	1xN12/247✶	160	SL81	N10@400	1xN16/247✶
5,500	155	SL81	N10@400	1xN10/247✶	155	SL81	N10@400	1xN12/247✶	170	SL81	N10@400	1xN16/247✶
6,000	180	RL918T	N10@200	1xN12/247✦	180	RL918T	N10@200	1xN16/247✶	180	RL918T	N10@200	2xN16/247✶
6,500	200	RL918T	N12@250	1xN12/247✶	200	RL918T	N12@250	1xN16/247✶	200	RL918T	N12@250	2xN16/247✶
7,000	220	RL1018T	N12@225	1xN12/247✶	220	RL1018T	N12@225	1xN16/247✶	220	RL1018T	N12@225	2xN16/247✶

Table 4.11.G KF40® Fire Resistance - Continuous Spans - Floor Live Load 1.5kPa

KF40® Fire Resistance
Continuous Spans - Floor Live Load 3.0kPa



3.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
3,000	110	SL102	-	-	125	SL102	-	-	150	SL81	-	-
3,500	125	SL102	-	1xN10/247✦	125	SL102	-	1xN10/247✶	150	SL81	-	1xN12/247✶
4,000	130	SL81	-	1xN10/247✦	135	SL81	-	1xN10/247✶	155	SL81	-	1xN16/247✶
4,500	165	SL81	-	1xN10/247✦	165	SL81	-	1xN10/247✶	165	SL81	-	1xN16/247✶
5,000	170	SL81	N10@400	1xN10/247✦	170	SL81	N10@400	1xN10/247✶	170	SL81	N10@400	1xN16/247✶
5,500	180	RL918T	N12@275	1xN10/247✶	180	RL918T	N12@275	1xN12/247✶	180	RL918T	N12@275	2xN16/247✶
6,000	200	RL918T	N12@225	1xN10/247✶	200	RL918T	N12@225	1xN12/247✶	200	RL918T	N12@225	2xN16/247✶
6,500	220	RL1018T	N12@200	1xN10/247✶	220	RL1018T	N12@200	1xN12/247✶	220	RL1018T	N12@200	2xN16/247✶
7,000	240	RL1118T	N12@175	1xN12/247✶	240	RL1118T	N12@175	1xN16/247✶	240	RL1118T	N12@175	2xN16/247✶

Table 4.11.H KF40® Fire Resistance - Continuous Spans - Floor Live Load 3.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm

✶ 40mm

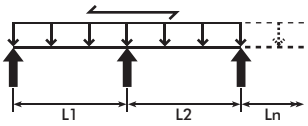
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.

KF40® Fire Resistance
Continuous Spans - Floor Live Load 5.0kPa

KF40®



5.0kPa

Span (mm)	60 minutes				90 minutes				180 minutes			
	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo	Dcs	Mesh	Bars	Fire Reo
1,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
1,500	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,000	110	SL92	-	-	120	SL92	-	-	150	SL81	-	-
2,500	110	SL92	-	-	120	SL102	-	-	150	SL81	-	-
3,000	125	SL102	-	1xN10/247✦	125	SL102	-	1xN10/247✶	150	SL81	-	1xN12/247✶
3,500	135	SL81	-	1xN10/247✦	135	SL81	-	1xN10/247✶	150	SL81	-	1xN16/247✶
4,000	135	SL81	N10@400	1xN10/247✦	135	SL81	N10@400	1xN12/247✶	150	SL81	N10@400	1xN16/247✶
4,500	155	SL81	N10@400	1xN10/247✦	155	SL81	N10@400	1xN12/247✶	155	SL81	N10@350	1xN16/247✶
5,000	170	SL81	N10@275	1xN10/247✦	170	SL81	N10@275	1xN12/247✶	170	SL81	N10@200	1xN16/247✶
5,500	205	RL918T	N12@200	1xN10/247✦	205	RL918T	N12@200	1xN12/247✶	205	RL918T	N12@200	1xN16/247✶
6,000	220	RL1018T	N16@300	1xN10/247✶	220	RL1018T	N16@300	1xN12/247✶	220	RL1018T	N16@300	1xN16/247✶
6,500	265	RL1118T	N16@300	1xN10/247✶	265	RL1118T	N16@300	1xN12/247✶	265	RL1118T	N16@300	1xN16/247✶
7,000	270	RL1118T	N16@275	1xN10/247✶	270	RL1118T	N16@275	1xN16/247✶	270	RL1118T	N16@275	2xN16/247✶

Table 4.11.I KF40® Fire Resistance - Continuous Spans - Floor Live Load 5.0kPa

The bottom cover for fire reinforcement shall be determined in accordance to Clause 5.5.3 and Table 5.5.3(A) of AS 3600:2001. The marked reinforcements require additional thickness for the bottom cover approximately within the following ranges:

✦ 20mm
✶ 40mm
† 60mm

Shaded cells denote that internal span fire reinforcement is required. (No end spans)

Refer to the start of this section for additional parameters used to calculate the above table.