

# Dramix<sup>®</sup>



**Composite slabs with  
Steel decking**

# BEKAERT & KINGSPAN composite slab system

Following extensive research work, and analysis by the Steel Construction Institute, Bekaert and Kingspan now announce a new method of construction: Dramix® steel fibre concrete, currently used worldwide for ground floors, is now available for multi-storey applications.

## BEKAERT

The **Dramix® RC-65/60-BN** fibre is a glued super performant steel wire fibre belonging to the **higher l/d** category.

The use of a Dramix® Steel Fibre Reinforced Concrete slab provides a “pre-reinforced” concrete. No mesh has to be installed.



The **Kingspan Multideck 60** profiled metal deck provides savings in **concrete volume** compared to many other decks on the market.

### CONSTRUCTION ADVANTAGES

- ✓ Time savings
- ✓ Earlier project completion
- ✓ No mesh to transport, buy, store, lay etc...
- ✓ Simplified process
- ✓ Concrete volume savings
- ✓ Reduction in crane hire time
- ✓ Pre-reinforced concrete
- ✓ Reinforcement always at the right place

The combined expertise and experience of **Bekaert Building Products** and **Kingspan Building Components**, has come together to offer the contractor significant benefits in steel deck construction.



*Simplified process.*



*Time savings.*



*High tech multi-storey applications.*



*Concrete time savings by using Kingspan MD 60 metal deck and Dramix® reinforced concrete.*

# Design Support

For technical assistance  
contact the  
Bekaert specialists

## Technical support



Technical support in the development of the load-span tables was provided by the SCI.

## Fire test report



Fire resistance test in accordance with BS476-Part 21 - 1987 Clause 7 on a loadbearing Dramix® composite floor and Kingspan floordeck.  
(24 pages document is available on request).

## Design software



Multideck design software available free of charge on CD Rom.  
(Contact Kingspan Metl-con Limited).

## RC-65/60-BN load/span fire tables. (min. dosage 30 kg/m<sup>3</sup>)

### Permissible span\*

Fire rating: 1.0 hour(s)								NWC C25/30						
Slab Depth (mm)	MD60 deck 0,9 mm							MD60 deck 1.0 mm						
	Imposed load (kN/m <sup>2</sup> )													
	4	4.5	5	5.5	6	6.7	7	4	4.5	5	5.5	6	6.7	7
130	3240	3120	3020	2920	2830	2720	2680	3370	3250	3140	3040	2950	2830	2790
140	3390	3270	3160	3060	2970	2860	2810	3520	3400	3280	3180	3090	2970	2920
150	3520	3400	3290	3190	3100	2990	2940	3660	3540	3420	3320	3220	3100	3060
160	3660	3540	3420	3320	3230	3110	3070	3800	3670	3550	3450	3350	3230	3180
170	3790	3660	3550	3450	3360	3240	3190	3920	3800	3680	3580	3480	3360	3310
180	3910	3790	3670	3570	3480	3360	3310	4050	3920	3800	3700	3600	3480	3430
190	4030	3900	3790	3690	3590	3470	3420	4170	4040	3920	3820	3720	3590	3540
200	4150	4020	3910	3800	3710	3590	3540	4290	4160	4040	3930	3830	3710	3660
210	4260	4130	4020	3920	3820	3700	3650	4400	4270	4150	4050	3950	3820	3770
220	4370	4240	4130	4030	3930	3800	3750	4510	4380	4270	4160	4060	3930	3880
230	4480	4350	4240	4130	4040	3910	3860	4620	4490	4370	4260	4160	4030	3980
240	4580	4460	4340	4240	4140	4010	3960	4720	4600	4480	4370	4270	4140	4090
250	4680	4560	4450	4340	4240	4110	4060	4830	4700	4580	4470	4370	4240	4190

Fire rating: 1.0 hour(s)								NWC C25/30						
Slab Depth (mm)	MD60 deck 1.1 mm							MD60 deck 1.2 mm						
	Imposed load (kN/m <sup>2</sup> )													
	4	4.5	5	5.5	6	6.7	7	4	4.5	5	5.5	6	6.7	7
130	3500	3370	3260	3150	3060	2940	2890	3620	3490	3370	3260	3160	3040	2990
140	3650	3520	3400	3300	3200	3080	3030	3780	3640	3520	3410	3310	3180	3140
150	3790	3660	3540	3440	3340	3210	3170	3920	3780	3660	3550	3450	3320	3270
160	3930	3800	3680	3570	3470	3340	3300	4060	3920	3800	3690	3580	3450	3400
170	4060	3930	3810	3700	3600	3470	3420	4190	4050	3930	3820	3710	3580	3530
180	4190	4050	3930	3820	3720	3590	3540	4320	4180	4060	3940	3840	3700	3650
190	4310	4170	4050	3940	3840	3710	3660	4440	4300	4180	4060	3960	3820	3770
200	4420	4290	4170	4060	3960	3830	3770	4560	4420	4300	4180	4080	3940	3890
210	4540	4410	4280	4170	4070	3940	3890	4670	4540	4410	4300	4190	4050	4000
220	4650	4520	4400	4280	4180	4050	3990	4780	4650	4520	4410	4300	4160	4110
230	4760	4620	4500	4390	4290	4150	4100	4890	4760	4630	4520	4410	4270	4220
240	4860	4730	4610	4500	4390	4260	4200	5000	4860	4740	4620	4510	4380	4320
250	4960	4830	4710	4600	4500	4360	4310	5100	4960	4840	4730	4620	4480	4420

\*The spans given in the tables are for slabs that are continuous over at least one support.

\*Permissible span is between centres of supports. A support width of 100 mm is assured.

## Permissible span\*

Fire rating: 1.5 hour(s)								NWC C25/30						
Slab Depth (mm)	MD60 deck 0,9 mm							MD60 deck 1.0 mm						
	Imposed load (kN/m <sup>2</sup> )													
	4	4.5	5	5.5	6	6.7	7	4	4.5	5	5.5	6	6.7	7
140	2570	2480	2390	2320	2250	2170	2140	2650	2560	2470	2400	2330	2240	2210
150	2690	2600	2520	2440	2370	2290	2250	2780	2680	2600	2520	2450	2360	2320
160	2820	2720	2640	2560	2490	2400	2370	2900	2810	2720	2640	2570	2480	2440
170	2940	2840	2760	2680	2610	2520	2480	3030	2930	2840	2760	2680	2590	2550
180	3060	2960	2870	2790	2720	2630	2590	3140	3050	2960	2870	2800	2700	2660
190	3170	3080	2990	2910	2830	2740	2700	3260	3160	3070	2990	2910	2810	2770
200	3290	3190	3100	3020	2940	2850	2810	3380	3280	3180	3100	3020	2920	2880
210	3400	3300	3210	3130	3050	2960	2920	3490	3390	3290	3210	3130	3030	2990
220	3510	3410	3320	3240	3160	3060	3020	3600	3500	3400	3320	3240	3130	3090
230	3620	3520	3430	3340	3270	3170	3120	3710	3600	3510	3420	3340	3240	3200
240	3730	3630	3540	3450	3370	3270	3230	3810	3710	3610	3530	3450	3340	3300
250	3830	3730	3640	3550	3470	3370	3330	3920	3810	3720	3630	3550	3440	3400

Fire rating: 1.5 hour(s)								NWC C25/30						
Slab Depth (mm)	MD60 deck 1,1 mm							MD60 deck 1.2 mm						
	imposed load (kN/m <sup>2</sup> )													
	4	4.5	5	5.5	6	6.7	7	4	4.5	5	5.5	6	6.7	7
140	2740	2640	2550	2470	2400	2310	2280	2820	2720	2630	2550	2470	2380	2340
150	2860	2770	2680	2600	2520	2430	2390	2950	2840	2750	2670	2600	2500	2460
160	2990	2890	2800	2720	2640	2550	2510	3070	2970	2880	2790	2710	2620	2580
170	3110	3010	2920	2840	2760	2660	2620	3190	3090	3000	2910	2830	2730	2690
180	3230	3130	3040	2950	2870	2770	2740	3310	3210	3110	3030	2950	2850	2800
190	3350	3240	3150	3060	2990	2890	2850	3430	3320	3230	3140	3060	2960	2920
200	3460	3360	3260	3180	3100	2990	2950	3540	3440	3340	3250	3170	3060	3020
210	3570	3470	3370	3290	3200	3100	3060	3650	3550	3450	3360	3280	3170	3130
220	3680	3580	3480	3390	3310	3210	3160	3760	3660	3560	3470	3380	3280	3230
230	3790	3680	3590	3500	3420	3310	3270	3870	3760	3660	3570	3490	3380	3340
240	3890	3790	3690	3600	3520	3410	3370	3970	3870	3770	3680	3590	3480	3440
250	4000	3890	3790	3700	3620	3510	3470	4080	3970	3870	3780	3690	3580	3540

\*The spans given in the tables are for slabs that are continuous over at least one support.

\*Permissible span is between centres of supports. A support width of 100 mm is assured.

## ■ Shear strength

The shear resistance of Dramix® concrete reinforced with 30 kg/m<sup>3</sup> RC-65/60-BN exceeds that of mesh reinforced concrete. This means that codified checks for longitudinal shear can be adopted and will not penalise fibre reinforced slabs. For 30 kg/m<sup>3</sup> the area of fibres crossing a shear plane may be taken as 0,37% of the concrete area.

## ■ Shear stud resistance

The following reduction factors have to be applied to the resistance of shear studs used in concrete with 30 kg/m<sup>3</sup> Dramix® RC-65/60-BN:

- 0.87 for design to BS5950-3
- 0.96 for design to ENV 1994-1-1 (Eurocode 4)

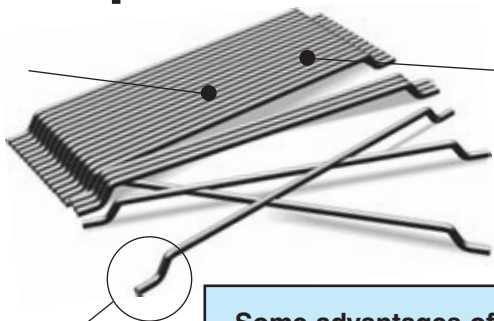
T E C H N I C A L  
A D V A N T A G E S

- ✓ Proven 1, 1.5 hour fire rating
- ✓ Structural design information developed by the SCI
- ✓ Full depth reinforcement offers excellent crack control
- ✓ Design advice and assistance

# Dramix®

## The complete fibre concept

*Dramix® fibres are made from prime quality hard-drawn steel-wire to ensure high tensile strength and close tolerances.*



*The glueing of the fibres into bundles guarantees quick and easy mixing with perfectly homogenous distribution.*

*A hooked end which slowly deforms during pull-out is generally considered as the best form of anchorage.*

### Some advantages of Dramix® steel fibre concrete:

- ✓ ductile concrete with a high load bearing capacity
- ✓ efficient crack control
- ✓ quick and easy application
- ✓ efficient and cost effective solution

## Dramix® RC-65/60-BN

### ■ Recommendations - mixing

#### 1. General

- preferably use a central batching plant mixer
- a continuous grading is preferred
- mix until all glued fibres are separated into individual fibres. Fibres don't increase mixing time significantly.

#### 2. Fibre addition

##### 2.1. In batching plant mixer

- never add fibres as first component in the mixer
- fibres can be introduced together with sand and aggregates, or can be added in freshly mixed concrete

##### 2.2 Truckmixer

- add Dramix® as the final component into the back of the mixer truck
- run mixer at drum speed: 12-18 rpm
- adjust slump to a min. of 12 cm (with preferably water reducing admixtures or high water reducing admixtures)
- add fibres with maximum speed of 40 kg/min
- after adding the fibres, continue mixing at highest speed for 4-5 min. ( $\pm 70$  rotations)

##### 2.3. Pumping recommendations

- care and attention to the slump and consider a higher fines content for the mix design.
- selection of pumping equipment must be carefully considered.

### ■ Recommendations - storage



*Protect the pallets against rain*



*Do not stack the pallets on top of each other*

### ■ Geometry



length (l)  
60 mm

diameter (d)

0,90 mm

**65** Performance class: 65  
**80** Aspect ratio (= l/d): 67  
**45** **65** **80**  
l/d

3200 fibres/kg



*No trip hazard.*

# Bekaert & Kingspan service

Should you require further assistance please contact us for:

✓ **Information about:**

- Composite slab design
- Dramix® data sheet RC-65/60-BN
- Fire test report
- Composite slab load-span tables
- Composite slab fire resistance tables
- SCI reports
- Other Dramix® applications

✓ **Application specifications**

✓ **Design advice and assistance**

- fast
- professional
- warranted

✓ **Assistance in optimizing the mix design**

✓ **On site support**

✓ **Dramix documentation on**

- Concrete floors
- Tunneling and underground structures
- Precast applications

## Packing



bags: 20 kg



60 bags/pallet  
(1200 kg)

## Quality

Dramix® steel fibers are manufactured in accordance with the ISO 9001 quality specifications.



## Addresses

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