Dramix®

BEKAERT

better together

Reinforcing your industrial floors

Shaping the future of concrete industrial floors

BEKAERT

‘Modern-day warehouses have become very demanding environments. Floors are a critical element to ensure safe and efficient operation. That’s why we opt for jointless fibre-reinforced floors in all the warehouses we build all over the world.’

‘The Dramix® steel fibres in particular offer a strong answer to the challenge of crack control, enabling us to reduce maintenance for our floors and create more durable and environmentally friendly warehouses.’

Gregory Loësel,
Director Project Management
Prologis France, Southern Europe

PROLOGIS

A world of new possibilities for steel fibre floors

Every floor has its needs
Every industrial floor has its own very specific needs. From the liquid-impermeable surfaces in the chemical industry to the foundations for high-tech clad racks, modern floors play a crucial role in ensuring safe and efficient operation. The new Dramix® range of steel fibres provides you with the right solution for the reinforcement of any type of floor.

STANDARD indoor industrial floors and hardstandings

HIGH SERVICEABILITY industrial floors

HIGH SERVICEABILITY pavement

STRUCTURAL industrial floors

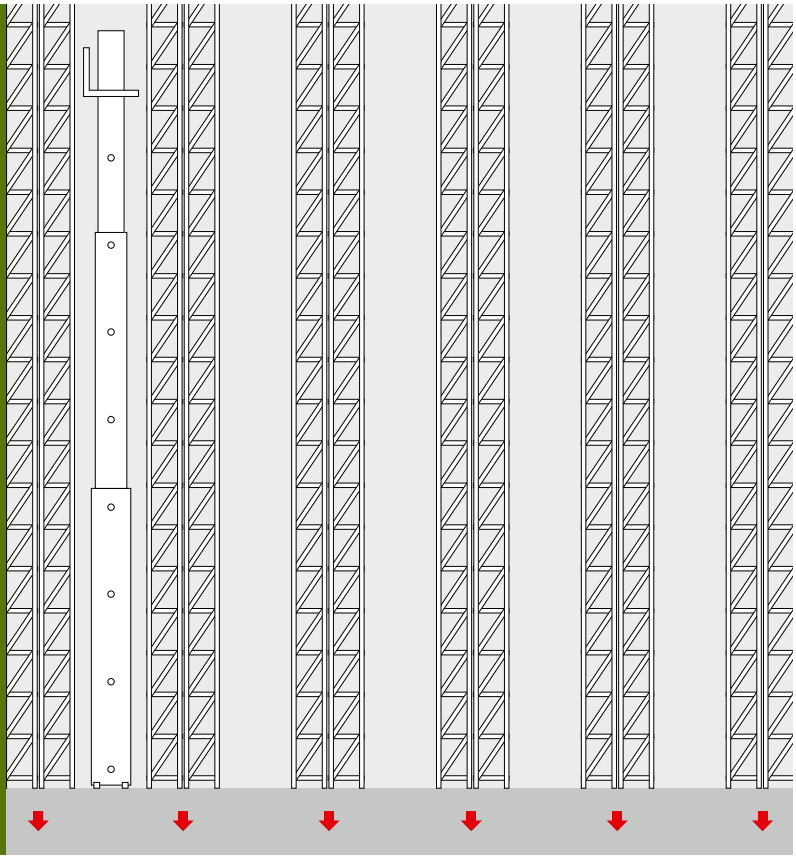
Four reasons to have all future floors with steel fibres

A multidimensional network reinforces your floor

Reinforcing your industrial floors with steel fibres has many advantages. Since the fibres are evenly distributed throughout the concrete, every part of your floor is actively reinforced—at the top layer, in the core, at the sides, at the bottom. No matter what forces are working on your floor, no matter how strong they are, the fibres are always in exactly the right place to do their job.

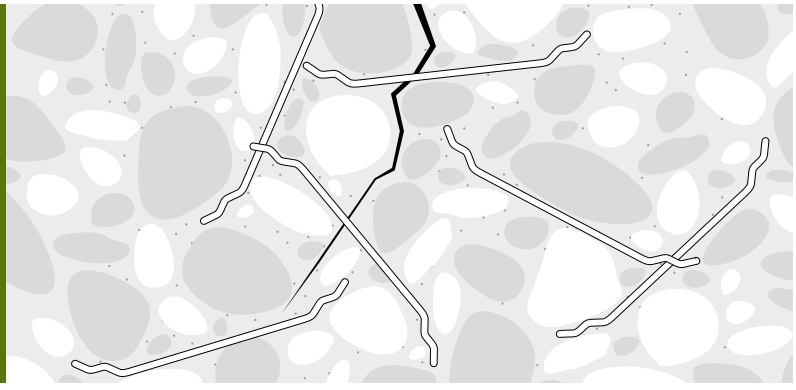
1 Optimal load bearing

Steel fibres reinforce your floor throughout the concrete slab. No matter where the load is placed or where the stresses occur, optimal load bearing is always guaranteed, avoiding deformation and damage.



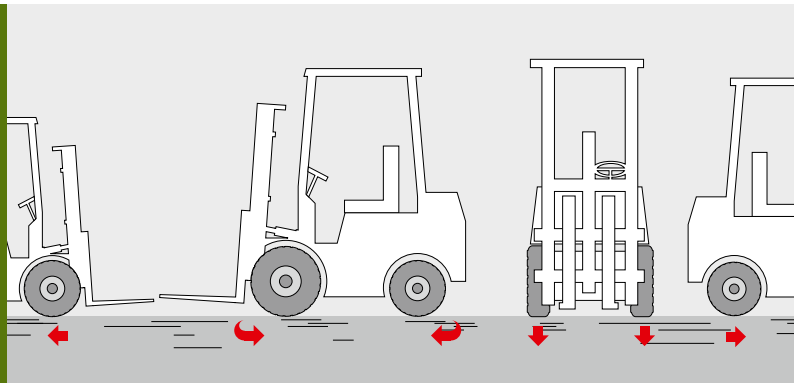
2 Optimal crack control

Steel fibres ensure optimal control of even the smallest cracks in your concrete floors—ensuring safe and efficient operations at all times. They also enable you to create liquid tight floors that comply with the most stringent safety and environmental requirements.



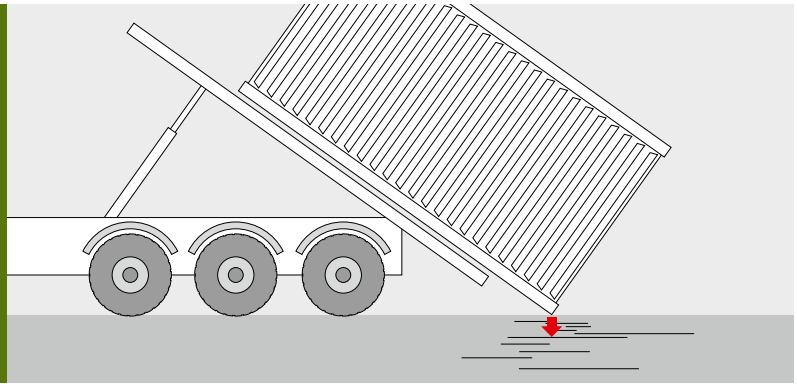
3 High fatigue resistance

Fibre floors offer a higher fatigue resistance than traditional reinforcement methods. They reduce maintenance and repair costs in even the most demanding and heavy-duty environments, and make longer lifespans a reality.



4 High impact resistance

Fibre floors are better equipped to resist impact, keeping the surface of your industrial floors intact and ensuring smooth operations.



Get more out of your floor

Easier to maintain
Optimized crack control means fibre floors are easier to maintain, since the floor structure is more resistant to wear and tear.

Longer lifespan
Thanks to high fatigue and impact resistance, fibre floors enjoy a longer lifespan, while minimizing the need for repairs.

Better performance
Steel fibres enable you to get the best out of your floor—heavier loads, more efficient operations, increased safety, better environmental performance.

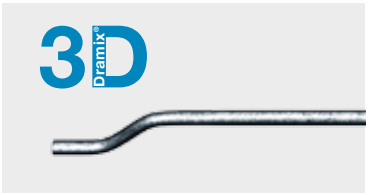
Optimized thickness
Steel fibre reinforcement enables you to optimize the thickness of your concrete floors, while safeguarding performance and durability.

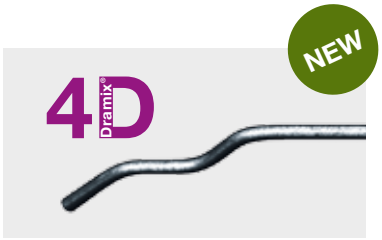
Timesaving construction
Using steel fibres for reinforcement saves time and money during construction.

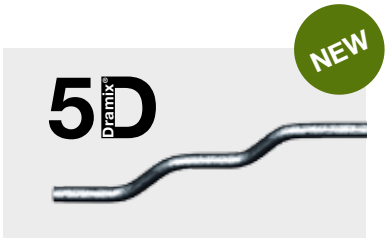

5
4
3D
D

The ultimate range of Dramix® fibres

Bekaert offers you a complete range of steel fibres for the concrete reinforcement of industrial floors. Every fibre has been specifically engineered to provide the right solution for all of your applications, from standard industrial floors to the most demanding one-off applications.







Standard floors

A proven concept for cost-efficient industrial floors

Over the years, the Dramix® 3D steel fibres have proven to be the most cost-efficient solution for the reinforcement of standard industrial floors. Mesh is no longer necessary, saving time during construction, while delivering excellent performance and durability, along with optimized crack control.

High serviceability floors

For the highest hygiene and safety requirements

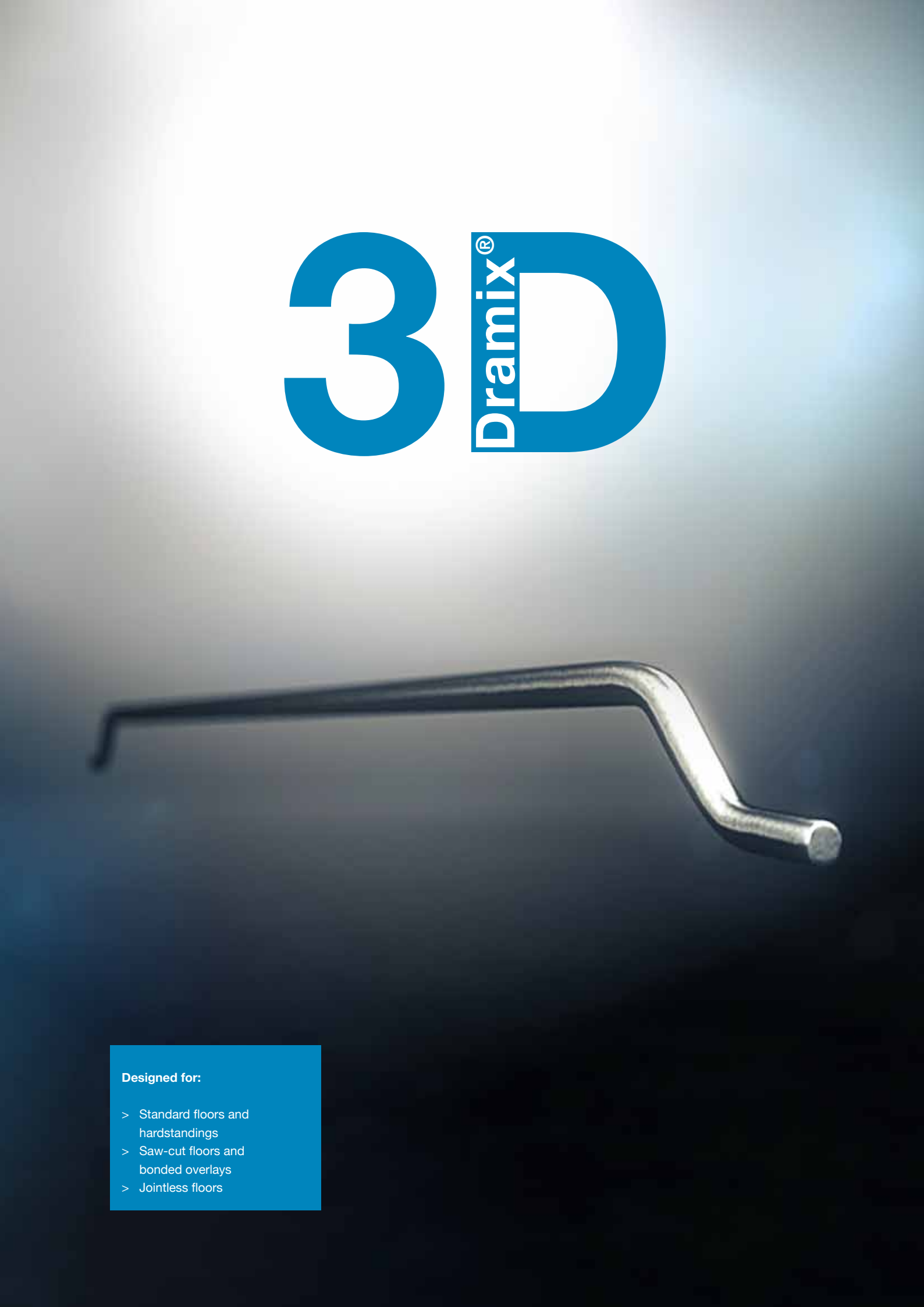
The Dramix® 4D series has been designed with the highest serviceability in mind. It enables you to meet the most demanding hygiene, safety, and environmental requirements. The 4D is also the recommended solution for combined reinforcement, giving you the most cost effective and efficient liquid tight solution.

Structural floors

Unseen levels of performance

The unique capabilities of the Dramix® 5D series enable you to use fibre-only reinforcement in a wide range of new applications including structural floors, extremely demanding environments, and high-tech applications such as clad racks and floors on piles.

3D Dramix®



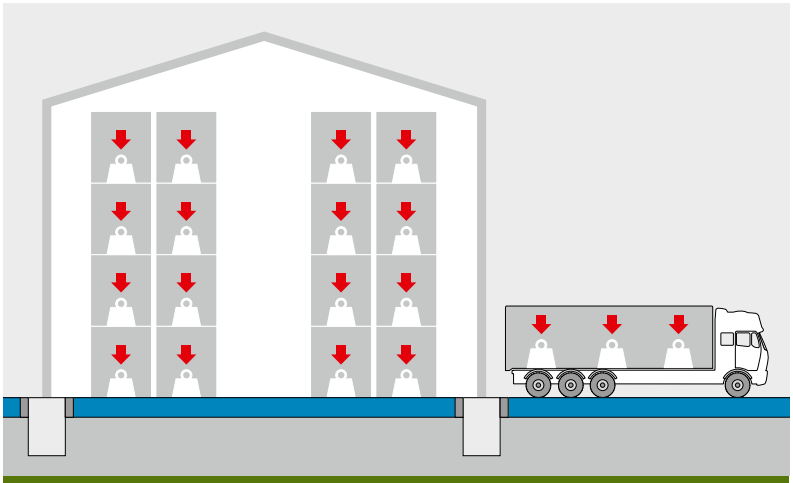
Designed for:

- Standard floors and hardstandings
- Saw-cut floors and bonded overlays
- Jointless floors

Standard floors and hardstandings

The perfect balance between cost-efficiency and performance

The 3D series is a robust reinforcement solution for industrial floors that are independent of the building structure, with regular load-bearing requirements and dynamic loadings. The 3D fibres offer excellent performance and durability without having to rely on more expensive and time-consuming traditional reinforcement solutions. At the same time, the thickness of the concrete slab can be optimized, enabling further saving on material and construction costs.



The Dramix® 3D series strikes a perfect balance between cost-efficiency and performance for standard industrial floors and hardstandings.

Saw-cut floors and bonded overlays

- Production halls
- Light-trafficked warehouses
- Bulk storage

40 000 m², Fort Stewart US Army Base, USA

Solid and cost-efficient fibre floors

The Dramix® 3D series provides you with the most cost-efficient solution for solid, durable, and virtually maintenance-free saw-cut floors. Mesh—or any other traditional reinforcement method—is no longer needed to build a long-lasting floor, saving time and money during construction.

The excellent performance of the 3D steel fibres also enables you to optimize the thickness of your floors, and the amount of fibres needed for reinforcement.

Bonded overlays

Dramix® 3D also provides you with the ultimate solution for the repair of your floors should they ever need it: a thin overlay of steel fibre concrete respecting the existing saw-cuts.

Jointless floors

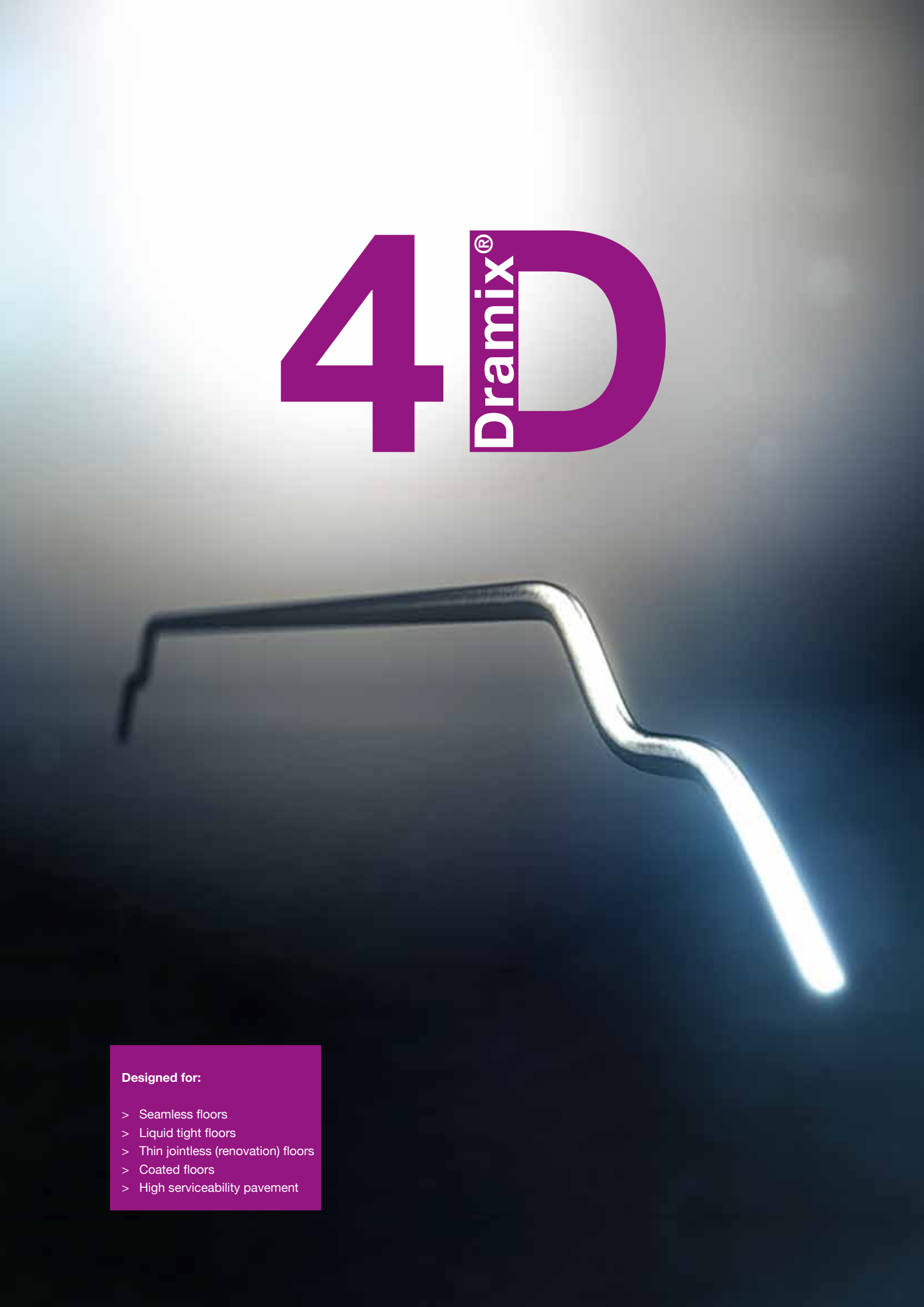
- Distribution centers
- High-bay warehouses
- Cold-storage rooms

77 000 m², Amazon.co.uk

For intensive and specific usage

The Dramix® 3D series enables you to build jointless and super-flat floors for high-intensity traffic and high-bay warehouses in the most cost-efficient manner without the use of mesh and with a minimum thickness of concrete. Because of its excellent performance in impact resistance and crack control, the 3D series also offers a cost-efficient solution for more demanding applications such as cold-storage rooms.

4D Dramix®



Designed for:

- Seamless floors
- Liquid tight floors
- Thin jointless (renovation) floors
- Coated floors
- High serviceability pavement

High serviceability floors

For the highest serviceability requirements

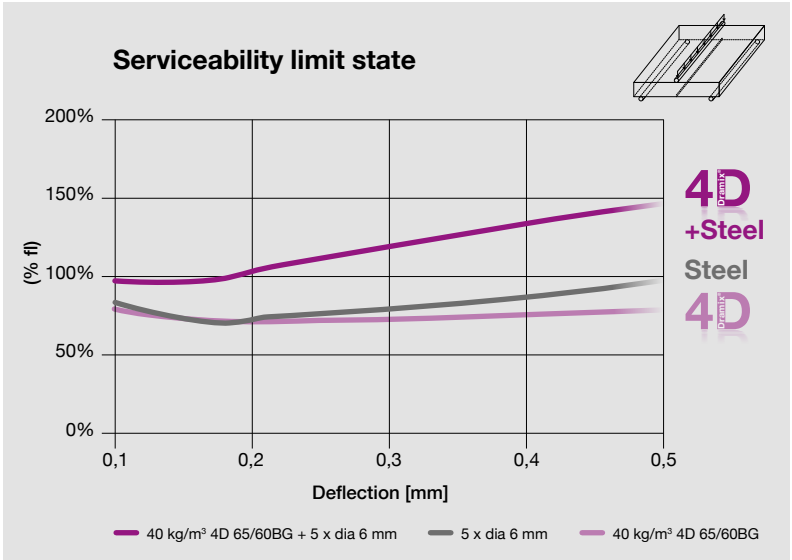
Regular industrial floors are most often designed according to anticipated load requirements. Serviceability specifications are generally met with subsequent detailing and execution. However, there are floors with high requirements of serviceability for which additional consideration of a stringent crack control is mandatory, while the traditional way of doing can't either be applied or is not sufficient to meet the requirements. This is particularly the case for seamless floors in the chemical and food industries or wherever a fluid tight floor and/or coating is requested. Special requirements for serviceability of floors typically lead to high levels of traditional reinforcement. Dramix® 4D fibres in combination with a single top layer of steel fabric (mesh) fulfil the serviceability requirement in a very effective, cost, and timesaving manner. Controlling tight crack width limitation along with load considerations can be applied by means of this combined solution. Traditional reinforcement is largely replaced by the addition of 4D fibres.

Control of even smallest cracks

The Dramix® 4D fibres have been engineered with special regard for achieving the smallest crack widths immediately. Their greatest effectiveness occurs in the range of 0.1 to 0.3 mm in order to meet high requirements in the serviceability limit state of floors. High durability and tight floors are achieved in all of those special flooring applications in which hygiene and environmental safety takes priority and demands special considerations.

Ideal solution for combined reinforcement

Steel fibres of the Dramix® 4D family are the ideal solution for combined reinforcement (steel fibres along with traditional reinforcement). Including 4D steel fibres in a concrete mix makes it possible to replace a huge amount of conventional reinforcement in order to achieve the same or even a lower crack width limitation compared to a highly reinforced traditional solution. Our 4D steel fibres immediately pick up stresses at smallest crack width and simultaneously provide the highest performance level at small cracks. Along with traditional reinforcement, an ideal solution is provided to assure for highest serviceability and crack control for cracks in the range of 0.1 to 0.3 mm.



Combining mesh and Dramix® 4D fibres offers you the best of both worlds—perfect crack control between 0.1 and 0.3 mm, and the added strength of the mesh.

Seamless floors

- Distribution centres
- High-bay warehouses
- Cold-storage rooms
- Scrap yards

NEW Completely joint-free floor surfaces

All joint troubles now belong to the past. Thanks to Dramix® 4D we create 40 000 m^2 warehouses without any joints or expansion joints.

Large surfaces, intensive use, no joints

Seamless industrial floors are increasingly replacing jointless floors as the industry standard for traffic intensive and high bay warehouses. Whereas jointless floors still have expansion joints every 40 meters or less, seamless floors have no joints whatsoever no matter how large the surface of your floor. The optimized crack control and high impact resistance of the Dramix® 4D series in combination with mesh ensures the surface of your seamless floors remains intact even with intensive usage, reducing maintenance and repair costs, and boosting your productivity.

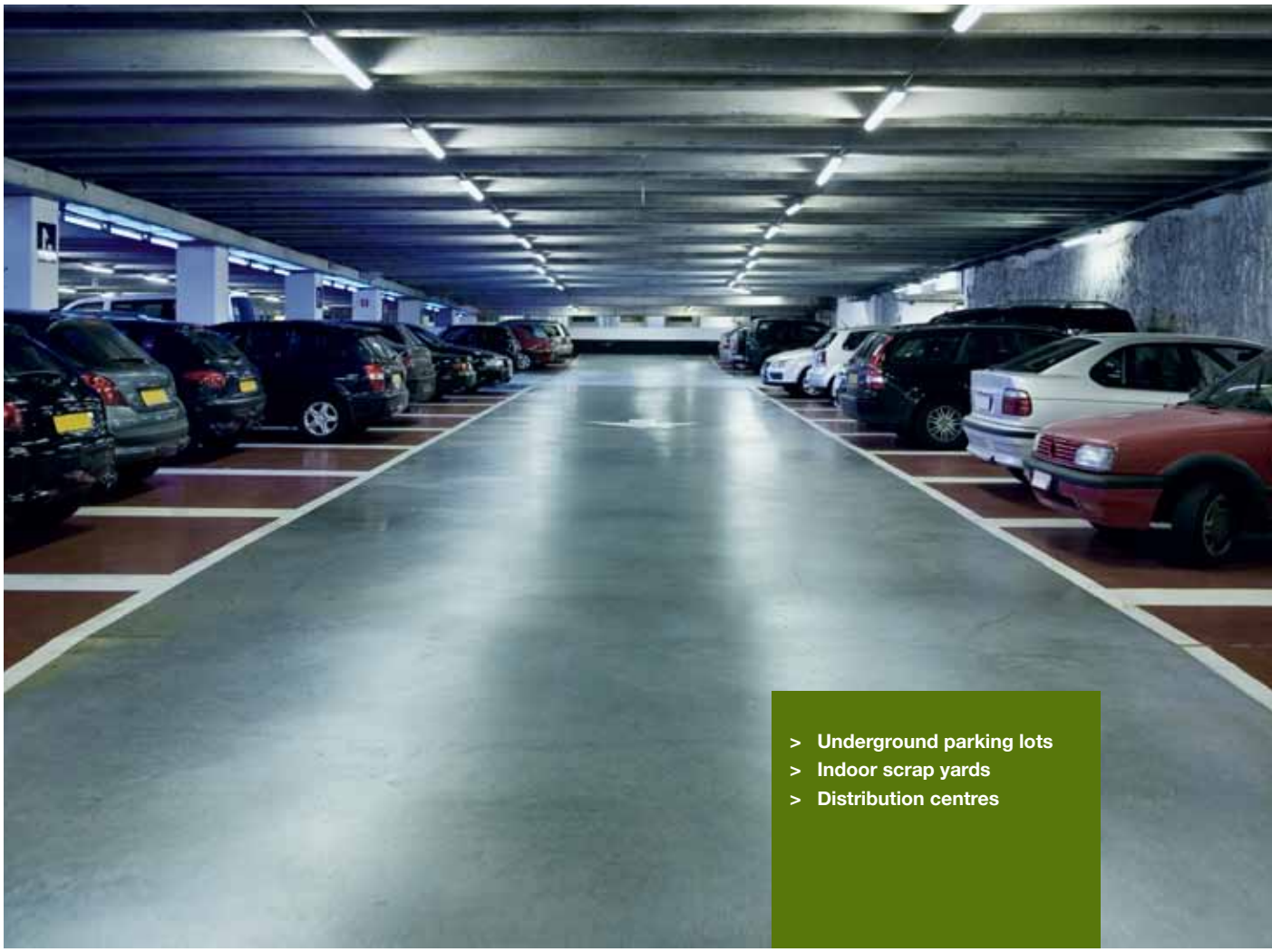
Liquid tight floors

- Food industry
- Chemical industry
- Petrochemical industry

For the highest hygienic and environmental requirements
The Dramix® 4D series has been specifically designed to affect cracks between 0.1 and 0.3 mm, enabling you to create durable liquid tight floors that comply with the most stringent hygienic and environmental requirements. These 4D floors of fibres in combination with mesh have been designed in compliance with the relevant standards (Eurocode 2 and DAfstb Richtlinie (German guidelines)).

They are the perfect solution for the food, chemical, and petro-chemical industry.

Thin jointless (renovation) floors



- Underground parking lots
- Indoor scrap yards
- Distribution centres

Cost-efficient renewal of your floors

The Dramix® 4D series provides you with a cost-efficient solution for the renovation of any type of industrial floor. Using steel fibres and top mesh enables you to create a new—and completely joint-free—thin overlay of reinforced concrete in a minimum of time and using a minimum amount of concrete. The excellent crack control and impact resistance of the 4D series ensures that the renovation layer is durable and requires only a minimum of maintenance.

Coated floors

- Medical and healthcare
- Chemical industry
- Food industry
- Semiconductor industry
- Underground parking lots

A supplementary protection
Dramix® 4D floors can also be used as the substrate for hard thin toppings such as epoxy layers and other coatings. Thanks to the optimized crack control of the 4D fibres, liquids or corrosive substances are prevented from infiltrating the concrete. At the same time, potential damage from concrete cracks to your coatings is reduced to an absolute minimum. Here also the 4D series is the ideal solution in combination with mesh.

High serviceability pavements

Port of Barcelona, Spain
4D without mesh

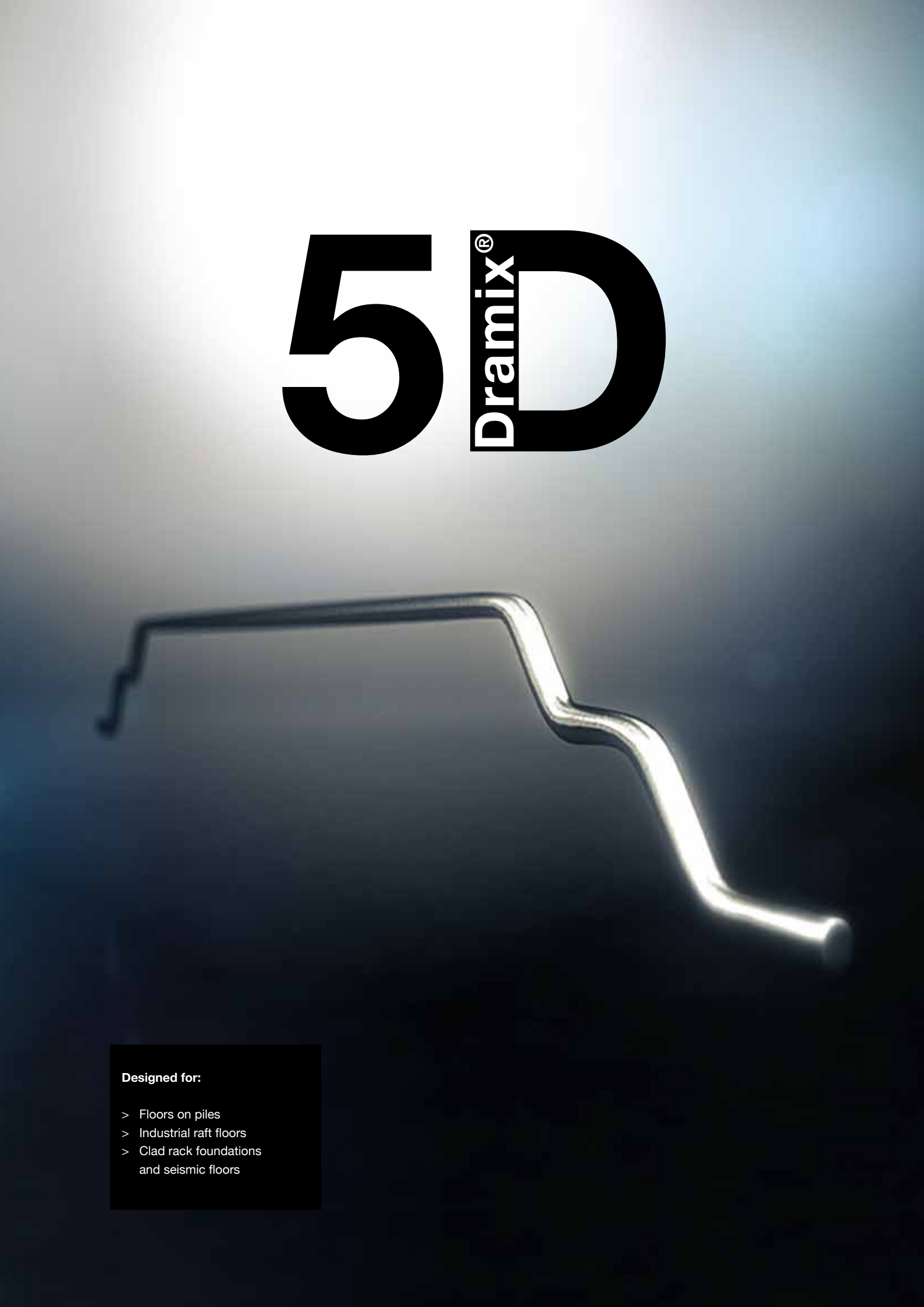
4D Dramix®

- Harbour pavement
- Airport pavement
- Outdoor scrap yards

Heavy-duty concrete in any type of environment

The Dramix® 4D series is the ideal solution for dynamic loading: heavy-duty pavement for harbours, airports, and other outdoor industrial activities. Engineered to affect small cracks, the 4D fibres protect the pavement surface from the most severe weather conditions and the damaging effects of seawater or chemical substances. High impact resistance results in a surface free of spalling effects, ensuring safe and efficient operations, and preventing damage to machinery and containers. Because of their ease-of-use during construction, 4D pavement also represents a cost-efficient solution when compared to traditional paving methods.

5D Dramix®



Designed for:

- Floors on piles
- Industrial raft floors
- Clad rack foundations and seismic floors

Structural floors

The high demands of structural floors

Industrial floors are usually ground-supported and completely separated from the actual structure of the building. However, this design principle cannot be applied in some situations.

> **Poor soil conditions** often necessitate the use of pile-supported floors. Without the support of the soil, the load-bearing capacity of the floor slab needs to be much higher. Even though pile-supported floors are usually separated from the building, they must meet the structural requirements.

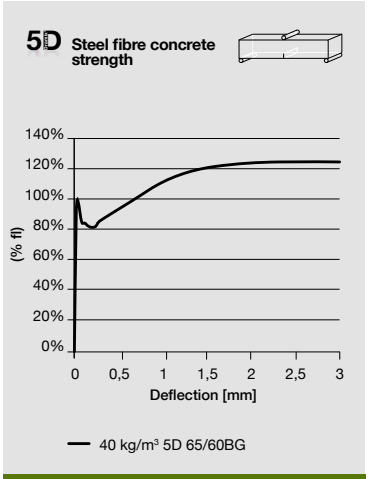
> **In seismic areas**, floors often function as a tie beam for structural elements, such as columns and pad foundations. Significant upward forces, originating from the horizontal movement of the racks during a seismic event, have to be dealt with as well.

> **Modern warehouses and industrial facilities** increasingly use floors that also act as the superstructure's foundation system or are at least an integral part of the foundation. These structural floors not only have to withstand all loads from the regular operations but also from the building itself. The weight of the building, along with snow and wind loads, has to be safely transmitted into the ground. Resistance to seismic loads is an additional but critical requirement.

Naturally, the design and the execution of these floors need to comply with the most stringent requirements.

The ultimate in load bearing capacity

The Dramix® 5D series has been developed with the demands of structural floors in mind. Because of their unique features and capabilities, the 5D fibres offer a load-bearing capacity never before seen in steel fibre reinforcement, enabling fibre-only solutions for structural floors. In extremely demanding environments, the 5D fibres can be combined with (local) traditional reinforcement methods.

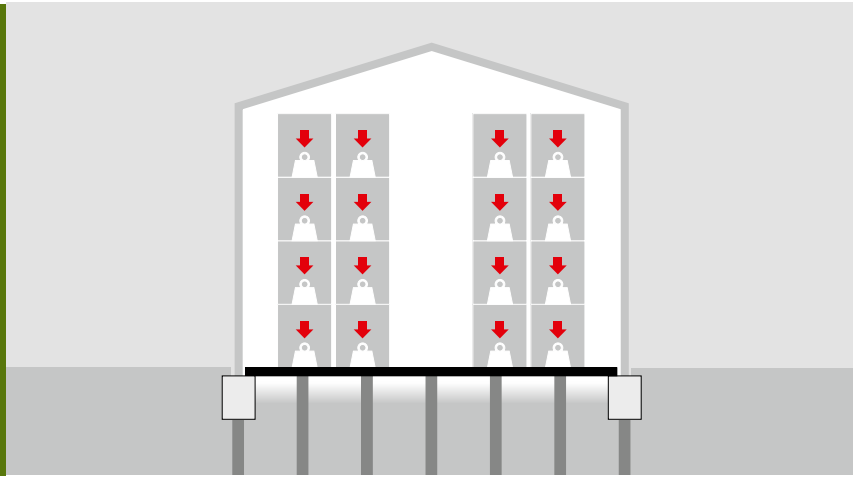


The Dramix® 5D series offers the ultimate in load-bearing capacity and outperforms any steel fibre on the market today.

Dramix® 5D fibres offer a comparable load bearing capacity to structural reinforcement at a lower cost.

Floors on piles

The Dramix® 5D series enables the construction of floors on piles without the use of mesh or any other traditional reinforcement method.



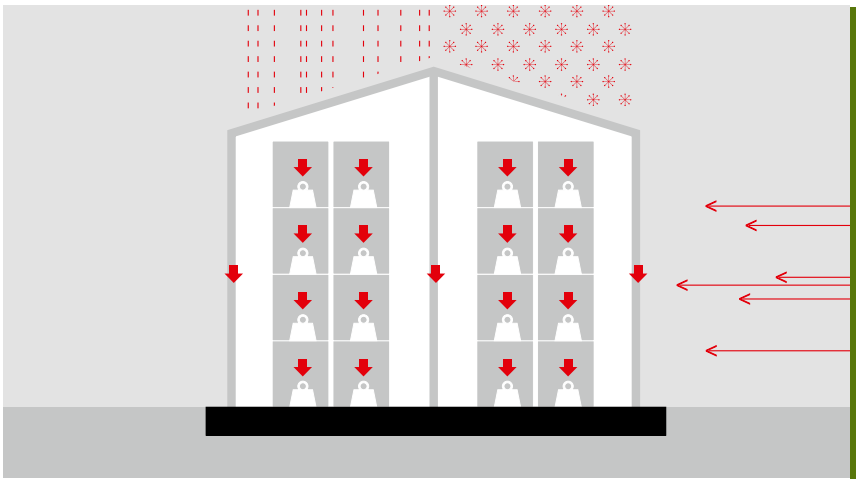
5D Dramix®

> Warehouses
> Production halls
> Shopping malls
> Distribution centres

The fibre-only solution for structural floors

Because of its exceptional load-bearing capacities, Dramix® 5D steel fibres enable the construction of floors on piles—fully independent from the structure—without or with a minimum use of mesh or other traditional reinforcement methods. This not only saves time during construction, but also creates new possibilities and new applications for floors on piles.

Industrial raft floors



Thanks to its unique capabilities, the Dramix® 5D can be used to reinforce foundation floors without the use of additional mesh.

5D Dramix®

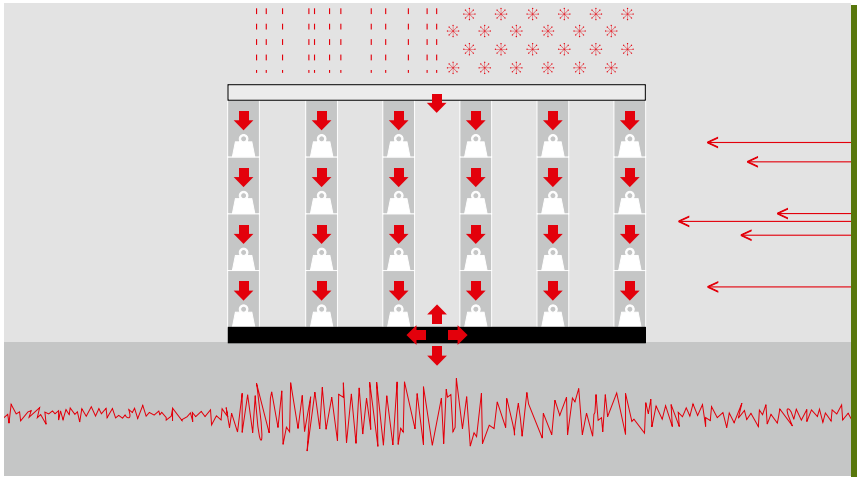
- Seismic floors
- Foundation floors

The fibre-only solution for foundation floors

The Dramix® 5D steel fibres have been designed with structural applications in mind. Its unique and outstanding performance in concrete makes it the perfect fibre-only solution for industrial floors that—unlike traditional floors—also act as the foundation of the building structure itself.

The 5D series not only enables you to create extremely strong and durable foundation floors, but also enables you to save time during construction since mesh is no longer needed. This is especially convenient when constructing foundation floors in more challenging circumstances and environments.

Clad rack foundations



The Dramix® 5D series has been designed to withstand the downward, uplift, and even the seismic forces clad rack structures are subjected to.

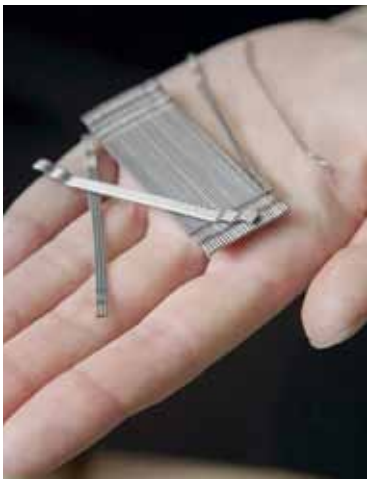
Dramix® 5D

> High capacity distribution centres

Concrete floors for high-tech warehouses

The Dramix® 5D series offers you the ideal solution for the reinforcement of clad rack foundations. This can be in combination with or even without the use of mesh or any other traditional reinforcement methods. Because of its unique capabilities, the 5D series provides the required strength and durability to preserve the integrity of the clad rack structure from downward, uplift from windloads, and even seismic forces.

Reinforcing your knowledge



Pushing the boundaries—together
The Dramix® steel fibres open up a whole new world of possibilities for concrete floor applications. However, with new applications come new challenges. Whatever your project, our knowledge and expertise is only a click or a phone call away. From online calculation tools to on-site consultancy, we are here to help you push the boundaries !

Register now ! http://dramixclub.bekaert.com

Our design and calculation services

> **DraPro:**
Become a member of Dramix® club and use our online calculation tool.

> **Support:**
We help you determine the most suitable fibre types, calculate optimal dosages, select the right concrete quality, and/or advise you on the best usage.

> **Integrated full service:**
We can guide you step by step through your structural applications or projects.

All our calculation tools and methods comply with international standards.

Reinforcing your world

Bekaert provides building professionals around the world with innovative, high-performance, and durable reinforcement systems. Our aim is to answer the needs of the modern world of building, a world in which speed, cost-efficiency, safety, and sustainability are critical.

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BEKAERT

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Bekaert Building Products has production plants and sales offices all over the world. This means you can always count on fast delivery, extensive support, and professional advice. Anytime, anywhere.

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BEKAERT

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better together

Bekaert (www.bekaert.com) is a world market and technology leader in advanced solutions based on steel wire transformation and coatings.

Bekaert (Euronext Brussels: BEKB) was established in 1880 and is a global company with headquarters in Belgium, employing more than 25 000 people worldwide. Serving customers in 120 countries, Bekaert pursues sustainable profitable growth in all its activities.

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