Bekaert

Dramix®

The proven game-changing solution for precast

The next level
in precast concrete reinforcement

Manufacturers of precast concrete elements such as pipes, walls, tanks, gutters, stairs, electricity cabins and other modular construction structures around the globe face a number of obstacles. An overall costs increase, higher productivity, durability and sustainability needs, a lack of skilled labour... all while meeting higher safety standards. This is why precasters increasingly choose the type of reinforcement that optimizes their concrete elements in each of these regards.

More and more precasters are introducing Dramix® steel fibers, to partially or totally replace mesh and bars. Dramix® steel fibers provide high performance at lower total cost, with reduced CO_2 emissions, improved productivity and enhanced safety. Integrating steel fibers in their production requires low investments as they are mixed into the concrete via existing equipment or with a separate dosing machine.

Steel fiber reinforced concrete, as its name suggests, is concrete that has been reinforced with steel fibers. Unlike conventional reinforcement, steel fibers are relatively short, discontinuous elements that are randomly distributed throughout the concrete member. As such, the fibers become part of the concrete matrix, turning it into a composite material.

Steel fibers guarantee high quality, durable precast elements

	Total cost of ownership	Faster and safer	Sustainability	Durability	Customization
Concrete with traditional reinforcement	●○○	●○○	●●○	●●○	●○○
Steel fiber reinforced concrete	●●●	●●●	●●●	●●●	●●●

Lower total cost of ownership (TCO)

Using steel fibers is, in general, less expensive than using steel mesh or rebars. While the initial purchase price of Dramix® steel fibers is higher than rebar, this is offset by a host of advantages. Dramix® offers a more efficient design with less reinforcement material – and in certain cases with thinner concrete structures. Energy consumption is reduced. The production process is simplified so less investment in expensive machinery is necessary. Both labor and the time needed are reduced. The resulting lower TCO drives up profitability for precasters.

Faster and safer

Working with rebar and mesh involves the extremely time-consuming and labor-intensive activities of placing, tying, cutting and bending the reinforcement. In contrast, steel fibers are added directly to the concrete, eliminating all the obstacles of traditional reinforcement. Traditional reinforcement activities also need a lot of space on-site, which can be put to better use when steel fibers are used. Moreover, mesh and rebar pose a high risk of hand injuries, which can lead to delays. Working with steel fibers, on the other hand, is a quicker, cleaner, more controlled and thus safer process.

More sustainable

Steel fiber reinforcement allows for significant savings of reinforcement material – and in some situations of concrete too. This results in a lower steel and cement consumption. Combined with the fact that less energy is used in the construction process, transitioning to steel fiber reinforcement enables a significant reduction of the carbon footprint of precasters' operations.

Increased durability

Steel fibers prevent and control cracks more easily and more efficiently. They reinforce every part of the concrete structure, because unlike steel mesh, the fibers are distributed in every part of the concrete structure. As a result, steel fibers detect small cracks much faster than traditional reinforcement. Dramix® steel fibers also provide electromagnetic shielding for buildings such as data centers.

Easy to customize

Using steel fibers makes it easy to design precast concrete elements, even enabling the design and manufacture of unusual and/or complex shapes.

Compatible with building codes

Dramix® steel fibers designs comply with national codes and standards. Our expert team provides full support during real-size testing and can also support acquiring relevant local certifications for your precast element.

Dramix® steel fibers are the ideal reinforcement solution for a wide range of precast applications

Building application

- Wall elements
- Facades
- Plinths
- Modular houses
- Balconies
- Architectural elements
- Other building elements such as pavements, cabins, burial vaults, steps/stairs and beam skins

Civil engineering/ Infrastructure application

- Energy infrastructure such as utility vaults and electric cabins
- Water infrastructure such as box culvert, pipes/ manholes, grease interceptors, catch basins, gutters, water tanks and septic tanks
- Transportation infrastructure such as box culvert, railway elements, road barriers and noise barriers
- Other civil engineering elements such as footings, retainer walls and nuclear containment

Unique, high-quality steel fiber reinforcement

Dramix® steel fibers are designed to provide optimal reinforcement and superior crack control for structural and non-structural concrete elements. Bekaert is the only company in the world offering steel fibers with the following features:

- Deformable end-hooks for optimized anchorage to concrete matrix
- High tensile strength (from 1500 to 3000 N/ mm²)
- Galvanized for higher durability and rust-free aesthetic structures
- Glued in bundles to ease homogeneity into concrete
- High length/diameter ratio for high performance

Our fiber portfolio

Bekaert offers a complete range of steel fibers for the reinforcement of different precast elements. Every fiber has been specifically engineered to provide the right solution for precast needs.

The Dramix® steel fiber concrete reinforcement series consists of three fiber types - 3D, 4D and 5D - featuring different anchorage, tensile strength, aspect ratio and three dimensional reinforcement.

Dramix® is engineered to have a better anchorage with unique hook design, combined with higher tensile strength than traditional reinforcement. All Dramix® types are available in a wide range of length/diameter (l/d) ratios (aspect ratio). High aspect ratio creates denser network of fibers (ranging from 6 km/m³ in normal concrete to 480 km/m³ in high performance concrete) which increases precast elements performance for your specific project requirements.

Our Bekaert experts can advise on the right fiber to use for a specific precast element and the correct fiber dosage.

Why galvanized?

Galvanized steel fibers are rust-free over their long lifetime. This means no performance degradation over time due to rusting. Furthermore, there is no unattractive discoloring of the final precast element, which means no compromise of the aesthetic aspect of precast elements.

Why glued?

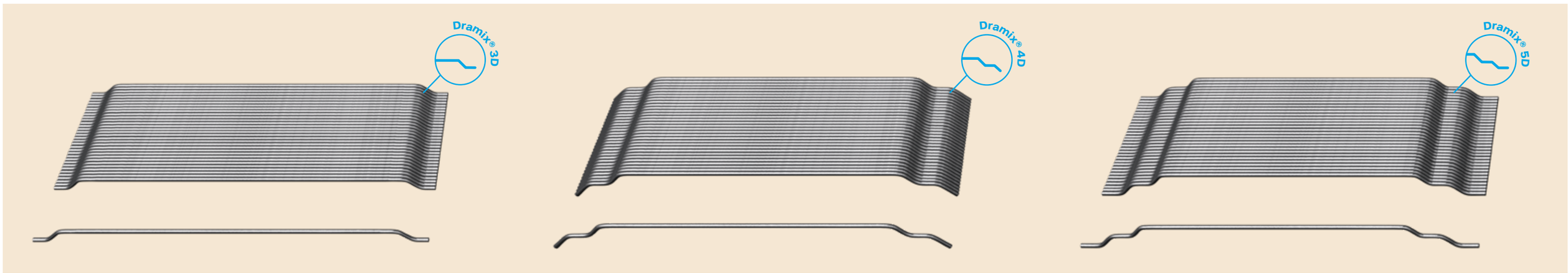
Dramix® steel fibers are bundled with water-soluble glue. The glue helps prevent fiber balling during mixing and enables a homogenous distribution of fibers throughout the concrete mix. This results in a more efficient mixing process, and superior three-dimensional reinforcement.

Dramix®: The sustainable solution

Dramix® steel fiber reinforced precast concrete element contains up to 50-75% less reinforcement in weight while having the same performance. This means they reduce CO2 emissions by up to 25-50% per project. In the long term, the choice of concrete reinforcement also has an important impact on the quality and durability of precast elements. At the end of lifecycle of a precast element, Dramix® can be recovered by separating the steel fibers from the concrete by using a heavy crusher and a magnetic separator. The recovered material can be used in new steel production and some can be reused. The concrete can also be recycled to be used in new concrete.

EPD certified

Bekaert has obtained multiple Environmental Product Declarations (EPD) for its Dramix® portfolio, manufactured in different production plants. EPDs allow precasters to compare the environmental impact of concrete reinforcement solutions through a life cycle assessment (LCA) using an LCA tool. This objective tool demonstrates how much CO2 can be saved using Dramix® steel fibers compared to other concrete reinforcement solutions.



Dedicated precast experts

Bekaert's local precast experts offer in-depth technical expertise to precasters for each step of a project, from concept design to on-site quality support. They can help with design, construction detailing, concrete optimization and total quality control procedures.

Precast design support

Bekaert precast experts support customers all the way through the design process using various online software tools, which are based on global and local design standards and guidelines. For example, Bekaert's own Dramix® Pro software and our specific software modules for precast applications make designing precast elements fast, simple and accurate.

Concrete expertise center

We can perform tests and offer assistance on-site as well as in the lab to optimize the mechanical performance and recipe for projects with fiber reinforced concrete. We have wide range of test equipment available to run different tests such as beam tests, compression tests and fiber distribution tests according to the most used standards, including: EN14651, EN14488, ASTMC1609, ASTM C1550 and DAfStb

Dosing equipment

For intensive daily production, dosing equipment can optimize operations. Bekaert can provide you with dosing equipment which allows automation traceability and better quality control, hence higher production efficiency.

bekaert.com/precast

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