

 **BEKAERT**

better together

Sustainable solutions
for road renovations





Safe-guarding the quality of roads

There is nothing more frustrating than bad road conditions. Increased mobility puts severe strain on the existing infrastructure, leading to reflective cracking and structural road problems. These issues reduce driving comfort, which might lead to claims or even car accidents. In general, bad roads reflect negatively on the community or country.

To improve the quality of our road infrastructure, qualitative renovation is necessary to ensure:

- Long-lasting roads
- Optimal driving pleasure
- Less or no maintenance
- Safe road conditions

Steel interlayers the best choice for your road renovation

Renovating roads with a crack-preventing interlayer is a perfect alternative for complete road renovations. Using an interlayer speeds up construction because there is no need to expose the underlying pavement structure. Interlayers are available in many materials, including plastic, glass and carbon. However, steel offers the best solution:

① Cradle-to-cradle

Steel is the world's most recycled material because it doesn't typically degrade in quality each time it is reprocessed, unlike many plastics and paper materials.

② Durable

Steel, unlike many plastic and paper materials, has a very high young's modulus, resulting in a higher durability performance.

③ Stable

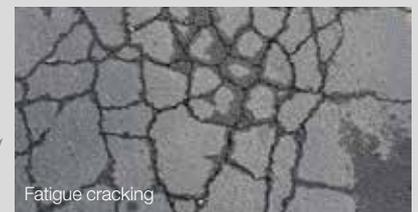
Steel is a high-grade building material that is proven to provide solid support for all types of applications.

| | Cradle to cradle | Durability | Stability |
|---------|------------------|------------|-----------|
| Plastic | ○○○○ | ●○○○ | ○○○○ |
| Glass | ○○○○ | ●●○○ | ○○○○ |
| Carbon | ○○○○ | ●●●● | ○○○○ |
| Steel | ●●●○ | ●●●○ | ●●●○ |

DEPENDING ON THE KIND OF PROBLEM WE OFFER 2 UNIQUE STEEL-BASED SOLUTIONS FOR LONG-LASTING ROAD RENOVATION.

Fortifix® for renovating road cracking and Mesh Track® for structural road problems.

ROAD CRACKING



STRUCTURAL PROBLEM



Fortifix®

Our solution for road cracking



Fortifix® is a steel anti-reflective cracking interlayer. The advanced steel cord structure is delivered on a low weight non-woven carrier to provide optimal stability. The unique balance of high stiffness and optimal elongation of the interlayer itself provides excellent anti-cracking properties to the road surface.

BENEFITS

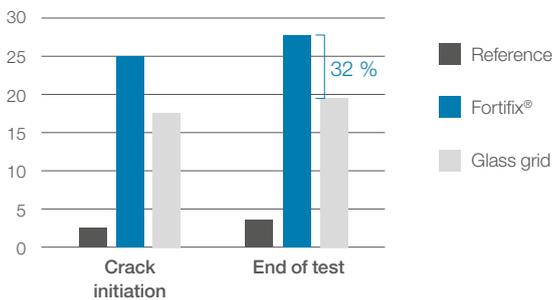
- 1 Straightforward installation
- 2 Millable & 100% recyclable
- 3 Extended life-time

| | Fortifix® 1-C | Fortifix® 2-C |
|-------------------|----------------------|----------------------|
| Grid | 40 x 30 mm | 50 x 50 mm |
| Tensile strength | 42 x 54 kN/m | 31 x 32 kN/m |
| Young's modulus | 190 GPa | 190 GPa |
| Tensile Stiffness | 2900 x 3900 kN/m | 2300 x 2300 kN/m |
| Weight | 353 g/m ² | 253 g/m ² |
| Carrier PET | non-woven | non-woven |
| Bitumen retention | 500 g/m ² | 500 g/m ² |

Extended life-time

Fortifix® retains its high stiffness and optimal elongation even after installation and continuous, heavy traffic. The reason for the better performance of steel can be found in the improved anchorage of the steel in the asphalt and has less to do with tensile strength.

Fortifix® has been fine-tuned through finite-elements simulations (FEM). Extensive performance tests, including 3-point bending tests, thermal-plate tests, and adhesion tests showed that the interlayer has a high tensile stiffness and increases the fatigue life-time of roadways significantly.



CONCLUSION

The anti-cracking properties clearly outperform compared to glasgrid with a similar EA and a higher tensile strength.

Millable & 100% recyclable

The magnetic properties of steel ensure a perfect separation of steel and asphalt. As a result, 100% of both materials can be recycled.



Straightforward installation

Fortifix® enables a quick and correct installation. The interlayer can be easily rolled out, either by hand or machine, on both rough and smooth surfaces.

Step 1

Mill the surface or apply a primer to smooth rough edges. Potholes and open cracks must be treated separately.

Step 2

Clean the surface thoroughly with a high-pressure washer with vacuum. The surface must be dry before moving on to the next step.

Step 3

Apply a bitumen emulsion, preferably polymer modified, onto the surface. Use residual bitumen of at least 500g/m².

Step 4

Unroll Fortifix®, manually or automatically, onto the wet tack coat. Assure the mesh lays completely flat. Make sure the reinforcement is fixed to the surface before moving to the next step.

Step 5

Spread about 100g/m² of aggregates onto the Fortifix interlayer to alleviate 'sticking' of construction tires to Fortifix®.

Step 6

After the breaking of the emulsion, Fortifix® can be covered with a thin layer of hot asphalt. We recommend an overlay of 4cm.

Watch our installation video at
www.bekaert.com/road-reinforcement





Mesh Track®

Our solution for structural road problems



Mesh Track® is a steel-based structural asphalt reinforcement solution that has been around for more than 30 years. Whereas roads with a typical top layer need renovation every 5 year, Mesh Track® delays this need by 20 years or more. Working with Mesh Track® also speeds up construction, as the underlying pavement structure does not need to be exposed. As a result, road renovation with Mesh Track® is not only more durable, but significantly more cost-effective than building a new road.

BENEFITS

- 1 Fast and easy installation
- 2 Long-lasting performance
- 3 100% recyclable

| | MT 1 | MT 2 |
|-------------------|------------------------|------------------------|
| Grid | 118 x 80 mm | 118 x 80 mm |
| Tensile strength | 40 x 50 kN/m | 32 x 34 kN/m |
| Young's modulus | 200 GPa | 200 GPa |
| Tensile Stiffness | 23000 x 29000 kN/m | 19000x21000 kN/m |
| Weight | 1,73 kg/m ² | 1,30 kg/m ² |

100% recyclable

Mesh Track® is completely cradle-to-cradle. While it cannot be milled, the steel can be reprocessed without losing material integrity.

Long-lasting performance

Mesh Track® has been around for more than 30 years. Whereas roads with a typical top layer need renovation every 5 year. The performance of Mesh Track has been extensively tested, not just by time, but also by modern research facilities.

Working with Mesh Track® enables a sustainable road renovation at reasonable cost compared to a complete road renovation.

CASE STUDY

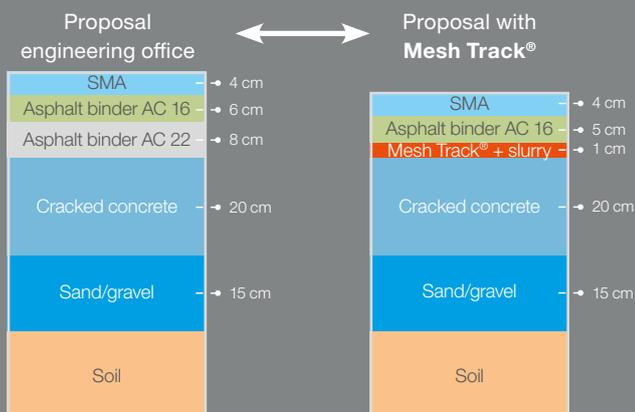
EXISTING SITUATION

A street in urban environment with the following build up: sand/gravel layer of 15cm foundation, a layer of 20cm of cracked old concrete and 2 layers of asphalt of respectively 6 and 4 cm.

This road needed to undergo a structural renovation to achieve a lifetime of 20 years based on 3,65 mln axle loads (100kN).

One of the 2 renovation proposals the engineering office created uses Mesh Track®. Both cases start with the removal of the 10 cm asphalt overlay. See the proposals below.

STRUCTURAL RENOVATION (3,65mlj axles (100kN) in 20 yrs)



CONCLUSION

The Mesh Track® proposal is at least 15% cheaper based on material cost, 33% faster in execution and does not require structural modifications.

Fast and easy installation

As you can tell from the comparison below, reinforcing roads with Mesh Track® takes less time and is cheaper than not reinforcing your road at all.

Step 1

Mill the surface or apply a levelling course in case of severe damages. Fill and compact major cracks.

Step 2

Clean and dry the surface thoroughly with a high pressure washer with vacuum. The surface must be dry before moving on to the next step.

Step 3

Unroll Mesh Track®. Always start from the top.

Step 4

Cut the edge wire approximately every 10m to facilitate the flattening.

Step 5

Put beginning of 2nd roll under end of 1st roll. When rolled out longitudinal use maximum 1 mesh overlap. Avoid overlapping of transverse flat bars. When rolled out transversal use a 30 cm overlap.

Step 6

Flatten with a rubber-tired roller.

- Do not tension the mesh as this may cause it to wave
- Start in the middle of the roll
- Continue until mesh is completely flat

Step 7

If necessary fix the first transverse bar with some nails. Nail before slurry seal operation.

Step 8

Slurry Sealing

- Dosage: 20- 25 Kg/m²
- Use a modified bitumen emulsion slurry

INSTALLATION SUPPORTED BY PROFESSIONALS

You can rely on their experience for the installation of Mesh Track®. We advise to put Mesh Track® not under top layer, but deep into the structure. It will simplify future road works when replacing the road completely.

YOUR SPECIALIST IN STEEL BASED REINFORCEMENT SOLUTIONS

Bekaert has more than 40 years of experience in producing building products. From

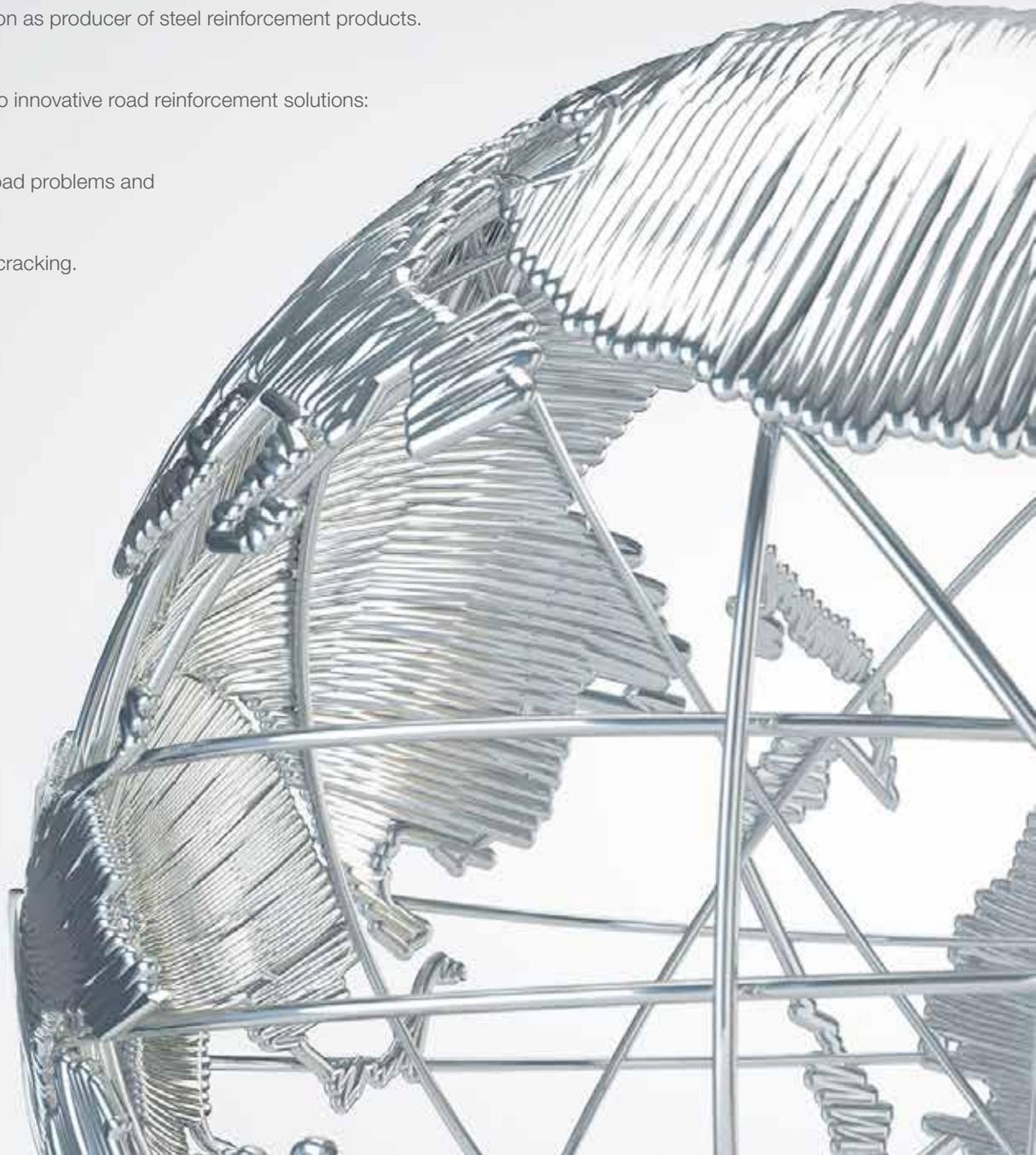
tiny steel fibers for concrete structures to sturdy steel interlayers for road renovation,

Bekaert has a leading position as producer of steel reinforcement products.

This brochure introduces two innovative road reinforcement solutions:

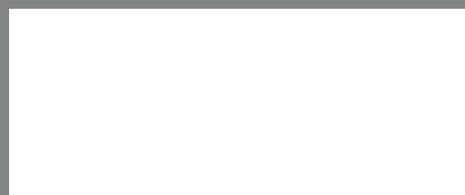
Mesh Track® for structural road problems and

Fortifix® for renovating road cracking.



Contact us

More
Information?



www.bekaert.com/road-reinforcement

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