THE FORCE IN CONSTRUCTION
FIBRES & FIBRE ENGINEERING

Concrete precast elements / Refractory concrete / Industrial floors /
Security technology / Tunnel construction / Traffic areas / Residential construction
KNOW WHY
WE’RE THE FORCE
IN CONSTRUCTION.

Because of
18,400 m²
of production space we’re
as big as 3 soccer pitches.

Because since
1982
we’ve been the market enabler.

Because with
13,000,000 km
of drawn wire per year we could
go round the equator 325 times.

Because of
11,500 MWh
per year, we use as much green power
as 4,200 German households.

Because with
54
contacts worldwide we’ll never
be far away.

Because with
3
locations worldwide we offer three times
more service.

Because with a total of
2.6 million m³
of KrampeHarex® fibre reinforced
concrete, we could fill 1,000 Olympic
swimming pools.
When it comes to fibres, KrampeHarex® is a global technology leader. Expertise you can rely on, continual specialization and above-average service, lay the foundation for satisfied customers in more than 50 different countries.

When we talk about fibre engineering, we’re talking about our mission – to make your construction project safer. For 35 years now, we’ve been in the business of making concrete more stable and more resistant. Our know-why – the key to our successful handling of even the most complex projects – has convinced countless customers all over the globe. We’d like to show you today how KrampeHarex® puts fibre forces to efficient use.

Together, we can come up with the optimal fibre solution to meet your needs. We’ve already developed solutions for the following applications:

- Concrete precast elements
- Refractory concrete
- Industrial floors
- Security technology
- Tunnel construction
- Traffic areas
- Residential construction

KRAMPEHAREX® – KNOW WHY EVERY FIBRE IS A PLEDGE.

DAS KRAMPEHAREX® ENVIRONMENTAL PLEDGE:

- 100% green power in all processes
- Highly efficient intersectional technologies
- Eco-friendly production and disposal
LOWER MATERIAL COSTS
A blinding layer and steel mesh reinforcement are no longer necessary.

IMPROVED MATERIAL QUALITIES
Better ductile material behaviour in all directions.

HIGHER DURABILITY
Better wear and impact protection for your project.

GREATER CONSTRUCTION AREAS
Greater distance between joints of up to 2,000 m².

FASTER CONSTRUCTION PROGRESS
Time savings due to considerable reduction in construction procedures.

BETTER SHRINKAGE BEHAVIOUR
Higher surface quality due to the reduction of contraction stress.

COMBINED SOLUTIONS
The ideal synergy of fibre and steel rebar reinforcement.

GOOD REASONS TO CHOOSE OUR FIBRES:

KNOW WHY
NOT ALL FIBRES ARE ALIKE.

WIRE FIBRES
- Hooked ends
- Corrugated steel fibres
- Straight steel fibres
- Microfibres

For concrete precast elements, refractory concrete, industrial floors, security technology, tunnel construction, traffic areas and residential construction.

For ultra high performance concrete, security technology and ready-mixed mortar.

For ultra high performance concrete, security technology and ready-mixed mortar.

For floors, screeds, precast elements and reducing shrinkage.

SLIT SHEET FIBRES
- For concrete screeds.

SYNTHETIC MICROFIBRES
- For passive fire protection, screeds and reducing shrinkage.

SYNTHETIC MACROFIBRES
- For outside and agricultural applications, precast elements and sprayed concrete.

GLASS FIBRES
- For floors, screeds, precast elements and reducing shrinkage.
KNOW WHY
GROWTH BUILDS ON US.

Industrial Floors
For warehouses, production halls, logistic centres and clad-rack projects.

Traffic Areas
For roundabouts, bus stops, parking and heavy traffic areas.

Concrete Precast Elements
For pipes, shaft rings, TLS, prestressed girders.

Residential Construction
For strip foundations, foundation slabs and precast cladding panels.

Security Technology
For bank vaults, ATM’s, defence applications.

Refractory Concrete
In the petrochemical, iron, steel and cement industries and ceramic furnaces.

Tunnel Construction
For sprayed concrete, tunnel segment lining, for passive fire protection in precast and insitu concrete.

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For pipes, shaft rings, TLS, prestressed girders.
Industrial floors, residential building, tunnel construction or precast elements and much more – the fields of application of KrampeHarex® fibres are multifaceted and the savings in time and costs are considerable. And for good reason.

After decades of conventional reinforced concrete as the status quo in industrial floor construction, fibre reinforced concrete has created a new approach which is generally more efficient. The homogeneous steel fibre concrete made with KrampeHarex® steel fibres is applied directly from the truck mixer. There is no need for extensive reinforcement work or installation of a blinding layer. This saves time by simplifying the procedure: much thinner slabs are possible because no concrete cover is required and even concrete sections of up to 2,000 m² are not a problem.

Are extreme concentrated loads likely along with stringent requirements regarding the maximum crack width? If so, KrampeHarex® combined reinforcement (fibres and rebar) may make sense. Contact us. We know why a particular solution is just right for you.

Economic Solution
- Surface of the concrete is protected from possible damage
- Lower maintenance costs thanks to reduced cracking
- High fire resistance when synthetic fibre concrete is used
- Faster completion due to time and cost-saving processes

KNOW WHY FIBRE FORCES WORK.

Industrial Floors
BMW Parts Depot
Gundelkofen, Germany

Surface of the concrete is protected from possible damage
Lower maintenance costs thanks to reduced cracking
High fire resistance when synthetic fibre concrete is used
Faster completion due to time and cost-saving processes

Tunnel Construction
Tunnel Chain S35 Bruck
Mixnitz, Austria

Structure: Tunnel
Fibre type: Sprayed concrete DE 30/60 N
Portal area DE 50/90 M
Inner shell PM 3/15

Tunnel chain: Kaltenbach 1,165 m
Pernegg 2,800 m
Mixnitz 680 m

Fibres
Industrial Floors

Low maintenance costs thanks to increased mechanical resistance
Improved post-cracking behaviour in all directions due to the addition of fibres
Cost savings in labour, equipment and time
Higher durability due to increased resistance to wear and impact
Ultra High Compressive Concrete
Facade Elements
University of Odense, Denmark

Fibres UHPC
Increased concrete rigidity, even when cracked
High-density, wear-resistant surfaces
Lower dead load because the components are exceptionally thin
20 times better resistance and durability

Residential Construction
Apartment Building
Typical Application

Fibres Residential Construction
- Reducing the crack width of steel fibre reinforced concrete
- Increased material elasticity and higher resistance against mechanical damage
- Homogeneous crack distribution into the micro crack level
- Less reinforcement and significantly faster construction progress

Traffic Areas
Container Terminal Maasvlakte 2
Rotterdam, Netherlands

Fibres Traffic Areas
- Faster completion due to time and cost-saving processes
- Fibre reinforced concrete is considerably less expensive because a thinner layer of concrete can be used
- Surface of the concrete is far more resistant to wear and impact
- Longer lifetime and less maintenance cost

Building component: Prefabricated facade element
Concrete: C 170/200
Fibre type: DG 12.5/0.3
Dosing rate: 140 kg/m³
Total volume: 1,400 m³

Building component: Floor slab
Concrete: C 35/45 XM 3, XC 3
Fibre type: DG 12.5/0.5
Dosing: 30 kg/m³
Surface area: 220,000 m²

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Concrete: C 35/45 XM 3, XC 3
Fibre type: DG 12.5/0.5
Dosing: 30 kg/m³
Surface area: 220,000 m²
**Fibres**

**Refractory Concrete**

Greatly improved durability for use in the petrochemical, iron and steel industries

Less high-temperature corrosion under extreme heat conditions

Optimal homogeneity because the concrete is less prone to chipping

Significantly longer service life for lances

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**Concrete Precast Elements**

Ikea Central Warehouse

Dortmund, Germany

- Building component: Prestressed girders, 22 m
- Concrete: C 45/55
- Fibre type: DE60/0.75M
- Performance class: L 2.4/2.1
- Total volume: 820 pcs.

Significant lower production and material cost by reducing element thickness

Reduced outlay for shear and punching shear reinforcement

Higher durability due to increased impact and tensile splitting strength

Component is better protected against chipping

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**Fibres**

**Security Technology**

Bank Vaults

Typical Application

- Effective security for bank vaults, ATMs and defence applications
- Optimal resistance for blast and ballistic impacts due to higher ductility
- Better protection against high-temperature corrosion
- Best protection due to optimal material utilisation

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**Fibres**

**Steel Industry**

Typical Application

Security Technology

Bank Vaults

Typical Application

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**Fibres**

**Precast Elements**

- Significant lower production and material cost by reducing element thickness
- Reduced outlay for shear and punching shear reinforcement
- Higher durability due to increased impact and tensile splitting strength
- Component is better protected against chipping
Fibres are our core area of expertise at KrampeHarex®. This is because we know more than simply how it works; we also know why it works. Our customers discover what this means in practice when we take on challenges that others shy away from. As a technology leader, we share our knowledge, discuss questions, resolve problems and develop new ideas together with you in direct interaction. We search for solutions until we find the one that meets your requirements perfectly.

KrampeHarex® Service+ means static calculations, wet concrete inspections or the selection of a suitable fibre type – we are at your side the whole time, from the planning phase through to completion.

Service® solutions for your project:
- Engineering support.
- Construction assistance.
- Special solutions.
- Rental service for dosing devices.
- Quality system.

Service+ Rental Service

Rental service for dosing devices.
You can purchase a dosing device or rent one from us. Conveyor belts, high-performance air blowers or fully automatic dosing systems: we offer the right dosing technology for every fibre type. You tell us where you need it and we’ll supply it.

Service+ Construction Support

Construction assistance.
From process control to the concrete composition – we provide assistance from A to Z, accompanying you all the way through your construction project from beginning to end. Not simply in theory but always in direct interaction with you, wherever you happen to be in more than 50 different countries.

Service+ Custom-made

Special Solutions

Support for special solutions.
Our planning doesn’t baulk at revolutionary construction projects that set new standards. Quite the opposite: for us, every new challenge is the best possible inspiration to continue to outdo ourselves and come up with exactly the solution you’ve been looking for.

Service+ Calculation

Engineering Support

In the field of engineering, we work closely together with our strong partner: Schulz Concrete Engineering GmbH. The range of services include the design and planning of steel fibre reinforced concrete and/or combined solutions with fibre and rebar, as well as concrete testing, construction supervision and floor flatness measurements. Our service is based on the latest standards and guidelines.

»Why KrampeHarex®? Because for decades now, we’ve been taking our customers’ projects as a yardstick of fibre quality.«

Jochen Gerding, Quality Manager

ON-SITE CONSULTATION

SPECIAL SOLUTIONS

QUALITY SYSTEM

ENGINEERING SUPPORT
### OUR FIBRES – YOUR BENEFITS.

#### APPLICATIONS

<table>
<thead>
<tr>
<th>Wire Fibres</th>
<th>Slit Sheet Fibres</th>
<th>Synthetic Microfibres</th>
<th>Synthetic Macrofibres</th>
<th>Glass Fibres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete precast elements</td>
<td>Screeds</td>
<td>Screeds</td>
<td>Screeds</td>
<td>Fibres</td>
</tr>
<tr>
<td>Refractory concrete</td>
<td>Concrete maintenance</td>
<td>Fire protection</td>
<td>Outdoor agricultural slabs</td>
<td>Precast elements</td>
</tr>
<tr>
<td>Industrial floors</td>
<td></td>
<td>Shrinkage reduction</td>
<td></td>
<td>Screeds</td>
</tr>
<tr>
<td>Security technology</td>
<td></td>
<td></td>
<td></td>
<td>Precast elements</td>
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<td>Sprayed concrete</td>
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<td></td>
<td></td>
<td>Fibres</td>
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<tr>
<td>Traffic areas</td>
<td></td>
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<td>Shrinkage reduction</td>
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<tr>
<td>Residential construction</td>
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<td></td>
<td>AR-glass fibres</td>
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</tbody>
</table>

#### FIBRE TYPE

<table>
<thead>
<tr>
<th>FIBRE TYPE</th>
<th>LENGTH (mm)</th>
<th>CROSS SECTION (mm)</th>
<th>MATERIAL SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hooked ends</td>
<td>25/30/35/45/50/60</td>
<td>ø 0.5–1.2</td>
<td>Normal tensile strength</td>
</tr>
<tr>
<td>Corrugated steel fibres</td>
<td>20–40</td>
<td>ø 0.5–1.2</td>
<td>Normal tensile strength</td>
</tr>
<tr>
<td>Straight steel fibres</td>
<td>6–30</td>
<td>ø 0.2–0.5</td>
<td>Normal tensile strength</td>
</tr>
<tr>
<td>Microfibres</td>
<td>6–15</td>
<td>ø 0.15–0.2</td>
<td>Normal tensile strength</td>
</tr>
<tr>
<td>Multifilament type</td>
<td>3/6/12/18</td>
<td>15/18/32/42 µm</td>
<td>Normal tensile strength</td>
</tr>
<tr>
<td>Fibrillated type</td>
<td>6/12</td>
<td>50/100 µm</td>
<td>Normal tensile strength</td>
</tr>
<tr>
<td>Fine fibrillated type</td>
<td>6/12</td>
<td>50/100, 60/200 µm</td>
<td>Normal tensile strength</td>
</tr>
<tr>
<td>Macrofibres</td>
<td>48 / 54</td>
<td>700–1100 µm</td>
<td>Normal tensile strength</td>
</tr>
<tr>
<td>Glass fibres</td>
<td>12/18</td>
<td>14 µm</td>
<td>Normal tensile strength</td>
</tr>
</tbody>
</table>

#### Material Specifications

- Normal tensile strength
- Medium tensile strength
- High tensile strength
- Ultra-high tensile strength
- Stainless steel

- € 304
- € 314
- € 320
- € 330
- € 440

#### Specifications

- Ø 0.5–1.2
- Ø 0.5–1.2
- Ø 0.2–0.5
- Ø 0.15–0.2
- 6–30
- 6–15
- 20
- 0.65–1.7 x 0.5–0.7
- 3/6/12/18
- 6/12
- 14 µm
- 12/18

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**KRAMPEHAREX®**

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