



**KRAMPE HAREX®**

KNOW WHY.

# 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 m<sup>2</sup>**

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** world-  
wide we' never  
far away.

Germany  
Austria  
Czech Republic

Argentina  
Australia  
Baltic States  
Belgium  
Brazil  
Bosnia  
Bulgaria  
Chile  
Denmark  
France  
Ireland  
Israel  
Italy  
Canada  
Colombia  
Croatia  
Macedonia  
Mexico  
Montenegro  
Netherlands  
Norway  
Panama  
Poland  
Portugal  
Sweden  
Switzerland  
Serbia  
Slovakia  
Slovenia  
Spain  
Turkey  
Hungary  
USA  
United Arab Emirates  
United Kingdom  
Belarus

Because with

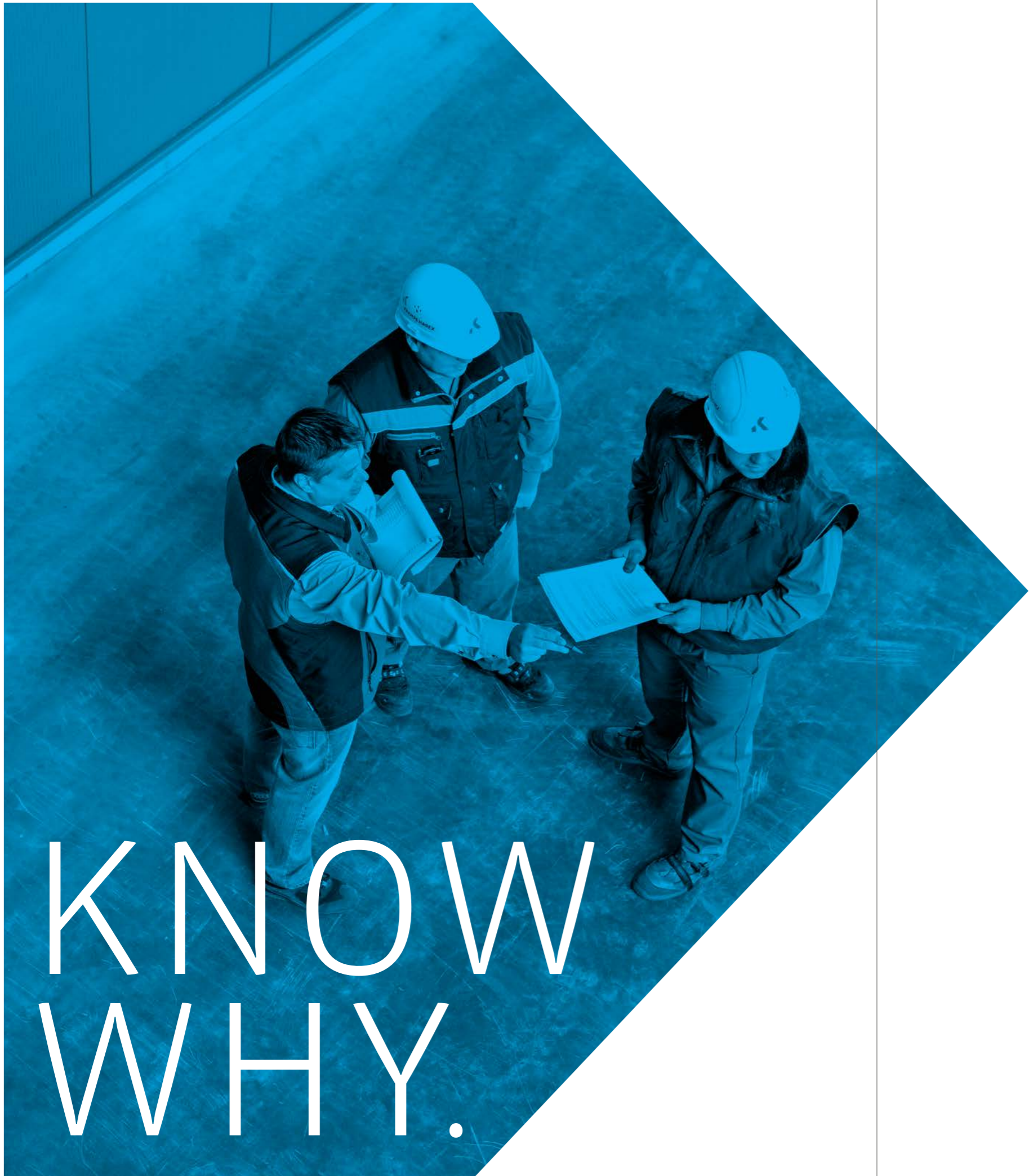
**3**

**locations worldwide**  
we offer three times  
more service.

Because with a total of

**2.6 million m<sup>3</sup>**

of KrampeHarex® fibre reinforced  
concrete, we could fill **1.000 Olympic**  
**swimming pools.**



# KNOW WHY.

## KRAMPEHAREX® – KNOW WHY EVERY FIBRE IS A PLEDGE.

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

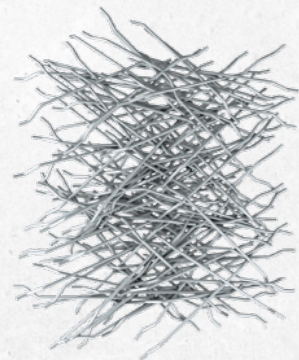
### DAS KRAMPEHAREX® ENVIRONMENTAL PLEDGE:

-  100% green power in all processes
-  Highly efficient intersectional technologies
-  Eco-friendly production and disposal

# KNOW WHY NOT ALL FIBRES ARE ALIKE.

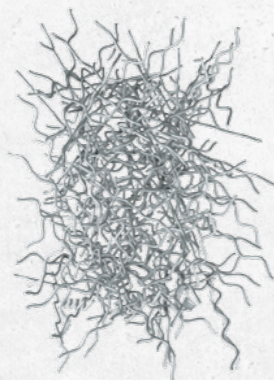
## WIRE FIBRES

### Hooked ends



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

### Corrugated steel fibres



### Straight steel fibres



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

## SLIT SHEET FIBRES



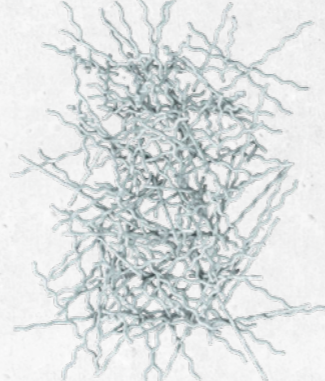
For concrete screeds

## SYNTHETIC MICROFIBRES



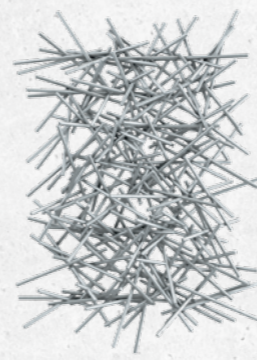
For passive fire protection, screeds and reducing shrinkage

## SYNTHETIC MACROFIBRES



For outside and agricultural applications, precast elements and sprayed concrete

## Microfibres



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

## GLASS FIBRES



For floors, screeds, precast elements and reducing shrinkage

# GOOD REASONS TO CHOOSE OUR FIBRES:

## + HIGHER DURABILITY

Better wear and impact protection for your project.

## + GREATER CONSTRUCTION AREAS

Greater distance between joints of up to 2,000 m<sup>2</sup>.

## + 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.

## + LOWER MATERIAL COSTS

A blinding layer and steel mesh reinforcement are no longer necessary.

## + IMPROVED MATERIAL QUALITIES

Better ductile material behaviour in all directions.

# KNOW WHY GROWTH BUILDS ON US.

## Security Technology

For bank vaults, ATM's,  
defence applications

## Residential Construction

For strip foundations,  
foundation slabs and  
precast cladding panels

## Traffic Areas

For roundabouts, bus stops,  
parking and heavy traffic  
areas

## Refractory Concrete

In the petrochemical, iron,  
steel and cement industries  
and ceramic furnaces

## Concrete Precast Elements

For pipes, shaft rings, TLS,  
prestressed girders

## Tunnel Construction

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

## Industrial Floors

For warehouses,  
production halls, logistic  
centres and clad rack  
projects

# KNOW WHY FIBRE FORCES WORK.

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 m<sup>2</sup> 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

## Tunnel Construction

### Tunnel Chain S35 Bruck Mixnitz, Austria

**Structure:** Tunnel  
**Fibre type:** Sprayed concrete DE 30/060 N  
Portal area DE 50/080 M  
Inner shell PM 3/15

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

## Industrial Floors

### BMW Parts Depot Gündelkofen, Germany

**Building component:** Floor slab  
**Concrete:** C 30/37  
**Fibre type:** DE 60/0.9 N

**Performance class:** L 1.2/0.9  
**Surface area:** 100,000 m<sup>2</sup>

## FibresIndustrial 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

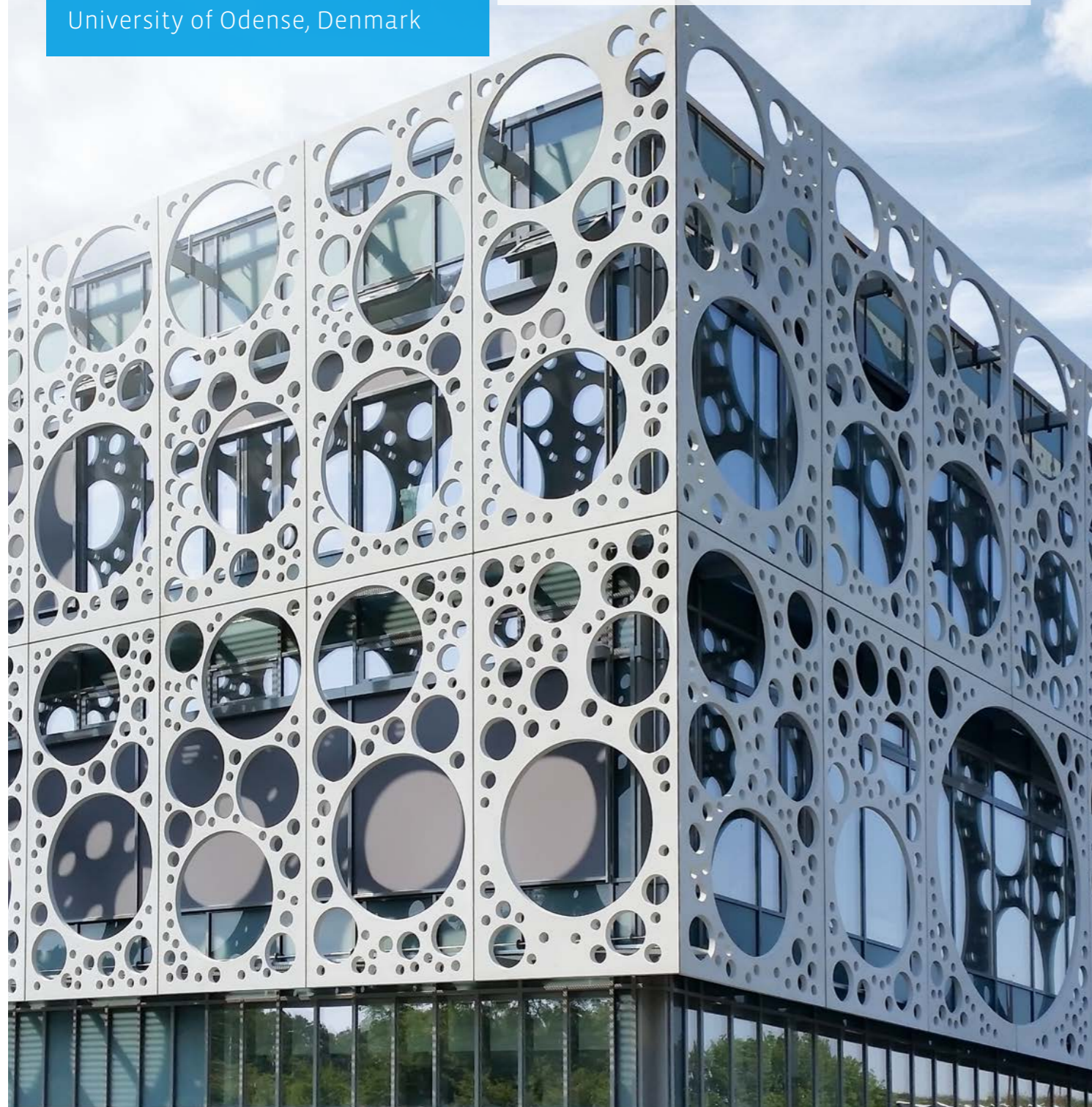
## Ultra High Compressive Concrete

### Facade Elements

University of Odense, Denmark

**Building component:** Prefabricated facade element  
**Concrete:** C 170/200

**Fibre type:** DG 12.5/0.3  
**Dosing rate:** 140 kg/m<sup>3</sup>  
**Total volume:** 1,400 m<sup>3</sup>



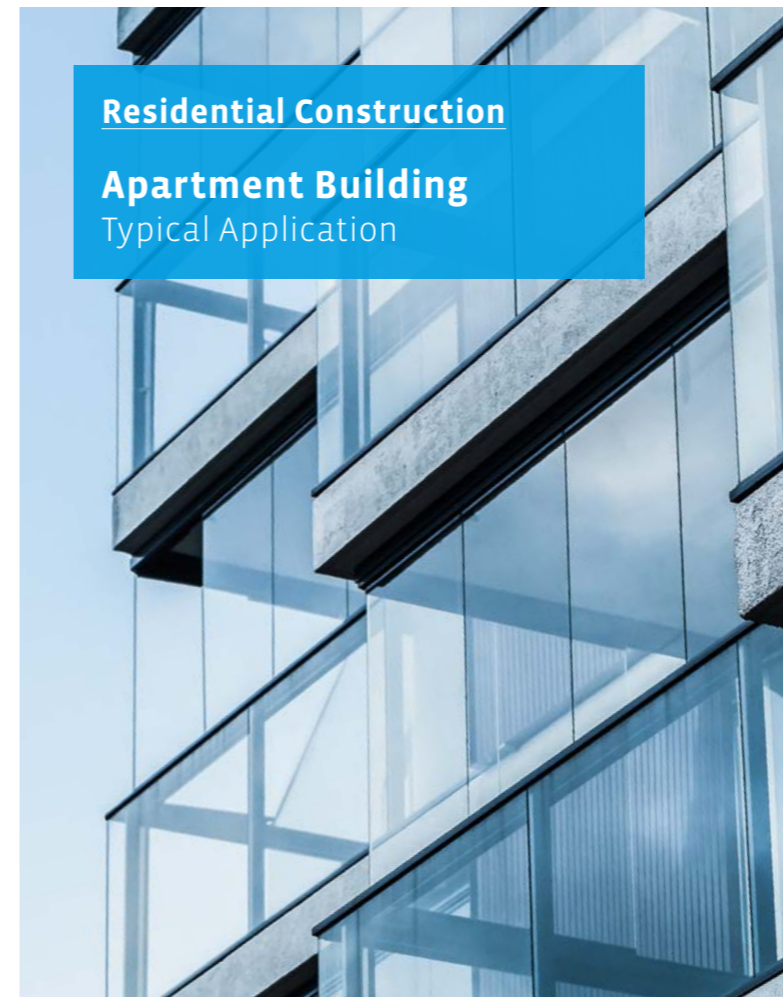
### FibresUHPC

- + 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



### FibresResidential Construction

- + Reducing the crack width of steel fibre reinforced concrete
- + Increased material elasticity and higher resistance against mechanical damage
- + Homogenic crack distribution in to the micro crack level
- + Less reinforcement and significantly faster construction progress

## Traffic Areas

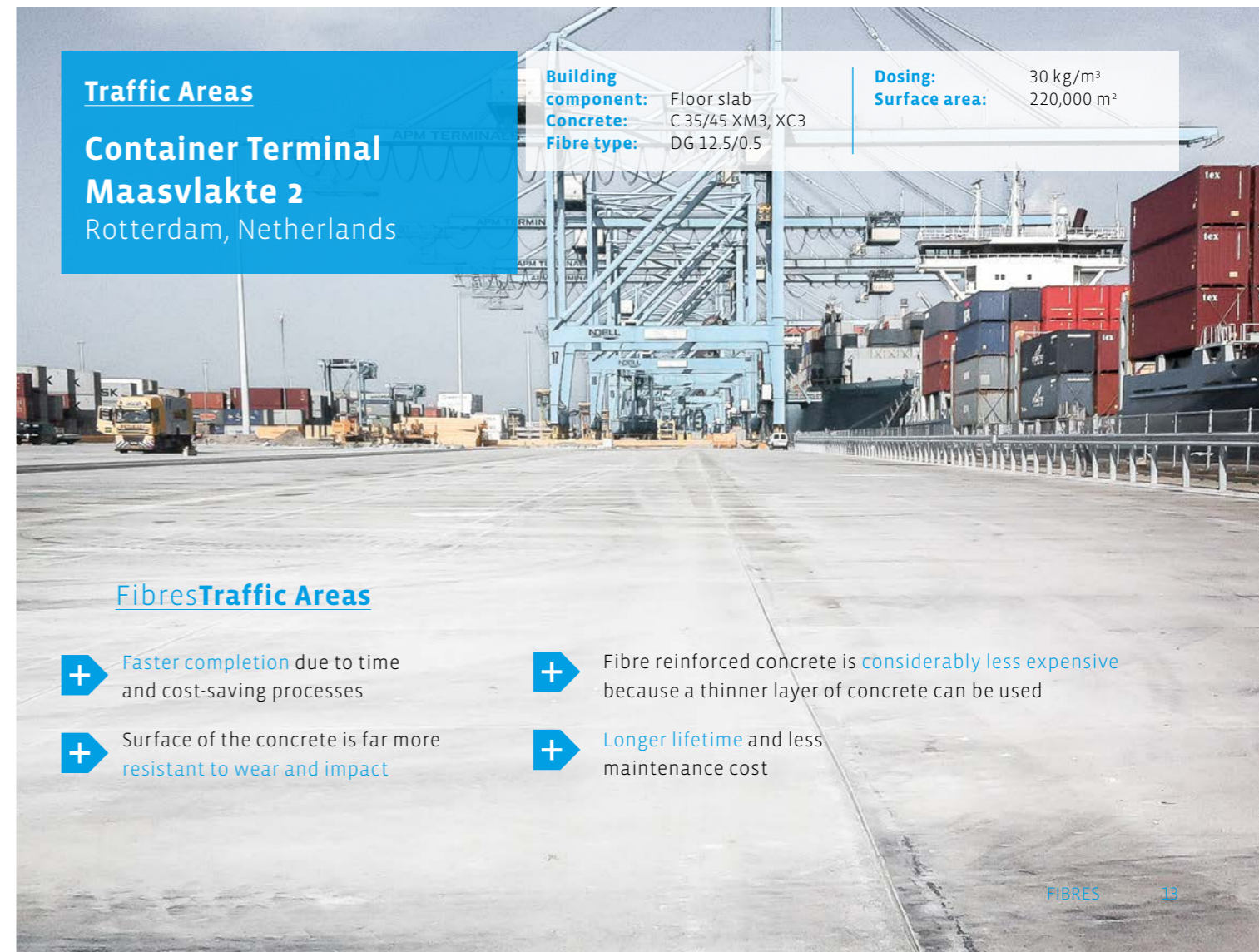
### Container Terminal

Maasvlakte 2

Rotterdam, Netherlands

**Building component:** Floor slab  
**Concrete:** C 35/45 XM3, XC3  
**Fibre type:** DG 12.5/0.5

**Dosing:** 30 kg/m<sup>3</sup>  
**Surface area:** 220,000 m<sup>2</sup>

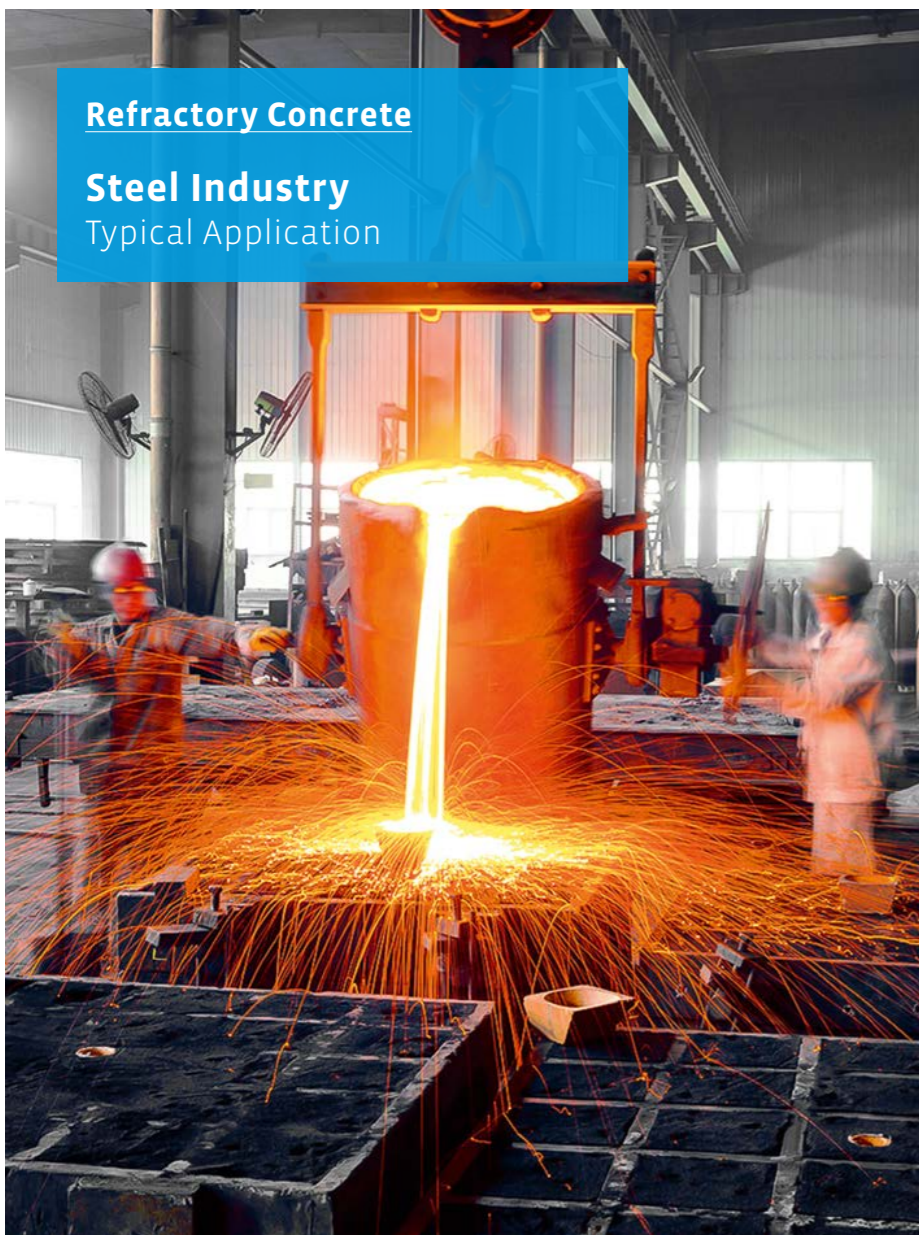


### FibresTraffic Areas

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

## Refractory Concrete

### Steel Industry Typical Application



### FibresRefractory 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

## Security Technology

### Bank Vaults Typical Application



### FibresSecurity Technology

- + 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

## Concrete Precast Elements

### Ikea Central Warehouse Dortmund, Germany

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



### FibresPrecast Elements

- + Significant lower production and material cost by reducing element thickness
- + Higher durability due to increased impact and tensile splitting strength
- + Reduced outlay for shear and punching shear reinforcement
- + Component is better protected against chipping



# KNOW WHY WE ACCOMPANY YOU WITH EVERY FIBRE. THAT'S SERVICE+

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.**



## Rental service for dosing devices.

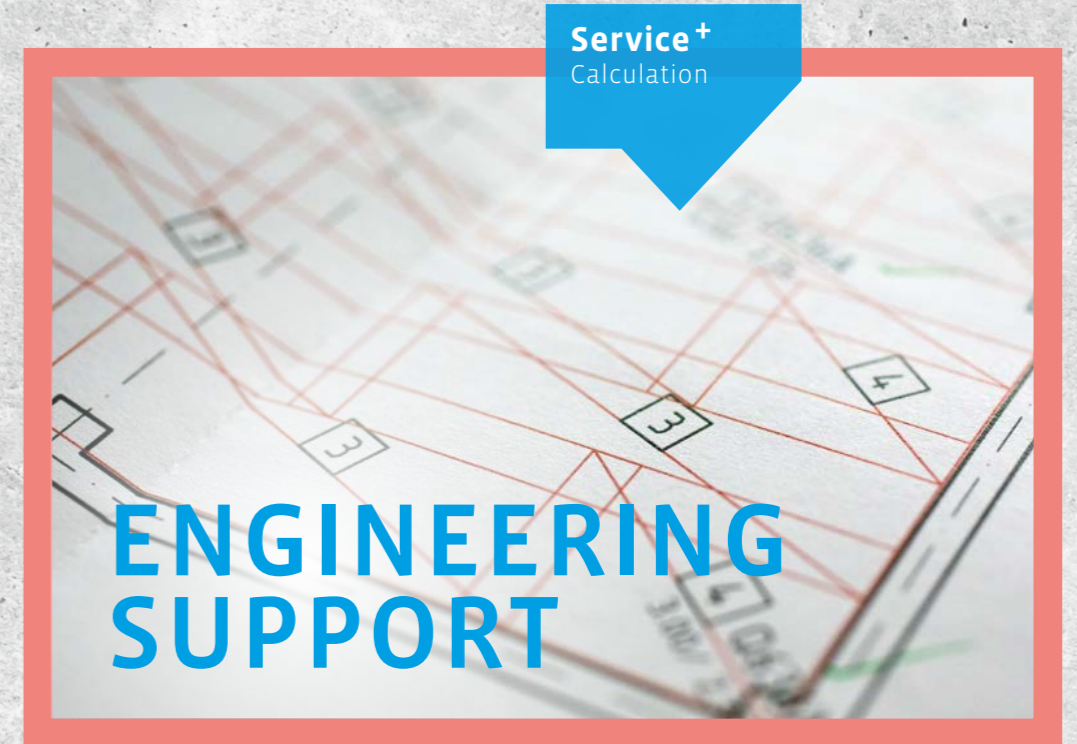
You can purchase a dosing device – or rent one from us. Conveyor belts, high-performance air blowers or fully automatic dosing systems: we offer the right dosing technology for every fibre type. You tell us where you need it and we'll supply it.



## ON-SITE CONSULTATION

## 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.



## ENGINEERING SUPPORT

## 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.



## SPECIAL SOLUTIONS

## Support for special solutions.

Our planning doesn't balk 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.

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

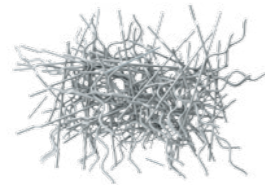
**Jochen Gerding**, Quality Manager



# OUR FIBRES – YOUR BENEFITS.

## FIBRES

### WIRE FIBRES



## APPLICATIONS

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

### SLIT SHEET FIBRES



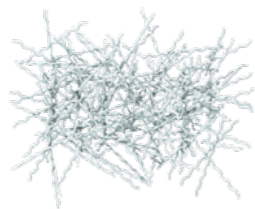
- > Screeds
- > Concrete maintenance

### SYNTHETIC MICROFIBRES



- > Screeds
- > Fire protection
- > Shrinkage reduction

### SYNTHETIC MACROFIBRES



- > Concrete agricultural slabs
- > Outdoor surfaces
- > Precast elements
- > Sprayed concrete

### GLASS FIBRES



- > Floors
- > Precast elements
- > Screeds
- > Shrinkage reduction

## FIBRE TYPE

## LENGTH (mm)

## CROSS SECTION (mm)

## MATERIAL SPECIFICATIONS

Fibre Type	Length (mm)	Cross Section (mm)	Material Specifications
Hooked ends	25/30/35/45/50/60	∅ 0.5-1.2	Normal tensile strength
Corrugated steel fibres	20-60	∅ 0.5-1.2	Medium tensile strength
Straight steel fibres	6-30	∅ 0.3-0.5	High tensile strength
Microfibres	6-15	∅ 0.15-0.2	Ultra-high tensile strength

Fibre Type	Length (mm)	Cross Section (mm)	Material Specifications
Hooked ends	20	0.65-1.7 x 0.5-0.7	Normal tensile strength

Fibre Type	Length (mm)	Cross Section (µm)	Material Specifications
Multifilament type	3/6/12/18	15/18/32/42 µm	-
Fibrillated type	6/18	50/200 µm	-
Fine fibrillated type	6/12	50/200; 60/200 µm	-

Fibre Type	Length (mm)	Cross Section (µm)	Material Specifications
Macrofibres	48/54	700-1100 µm	-

Fibre Type	Length (mm)	Cross Section (µm)	Material Specifications
Glass fibres	12/18	14 µm	- AR-glass fibres
			- E-glass fibres
			- EC-glass fibres



**KRAMPE HAREX®**

KNOW WHY.

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