THE BIG 5 International Building & Construction Show

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DUBAI WORLD TRADE CENTRE

3D Concrete Printing with Technical Fibres

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ABOUT US

STW

CERTIFICATION

ISO 9001:2015

ISO 50001:2011

ecovadis – silver medal

FOCUS ON

Circular Economy

Sustainability

Reduction of GHG Emissions

COMPETENCIES

Short Cut Fibres

Fibre Fillers

Fibrids/Pulp

TURNOVER

10.000 to/a capacity

EXPORT

Worldwide

AGENDA

01 BASICS ABOUT FIBRES

02 FIBRES IN CONSTRUCTION

03 3D CONCRETE PRINTING

BASICS ABOUT FIBRES

FIBRE PRODUCTS

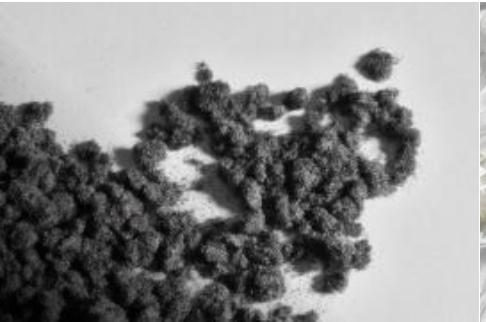
0.2 – 3.0 mm

Glass, Basalt and Mineral Fibres

Natural Fibres (Cotton, Flax, Sisal, Jute, etc.)

Synthetic Fibres (PAN, PA, PES)

FIBRE FILLERS



1.0 – 24.0 mm

Polyacrylonitrile

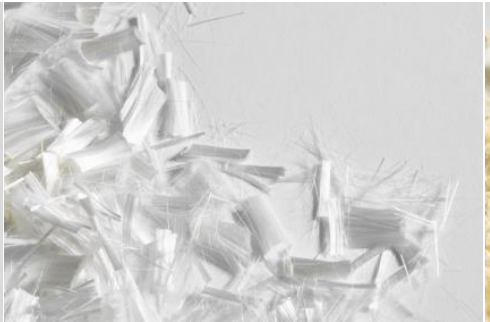
Polyamide

Polyester

Polypropylene

Cellulose

SHORT CUT FIBRES



0.2 – 3.0 mm

Polyethylene

Polyacrylonitrile

Aramid

Lyocell

FIBRIDS & PULP

Thixotropic agent „Compound“

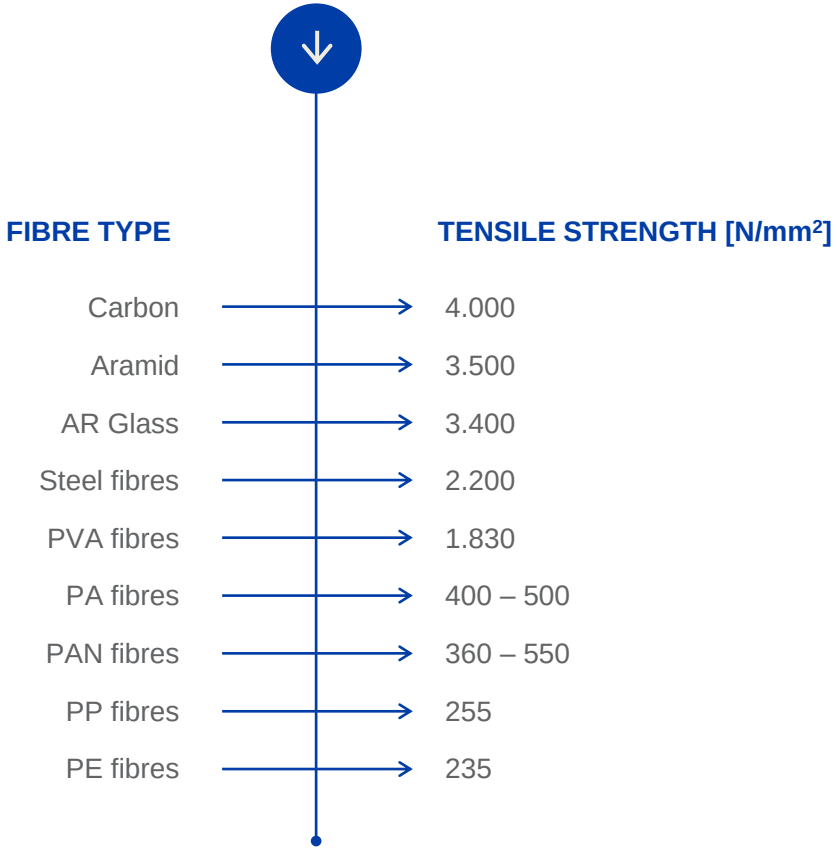
Cotton threads and chips

Chopped cord

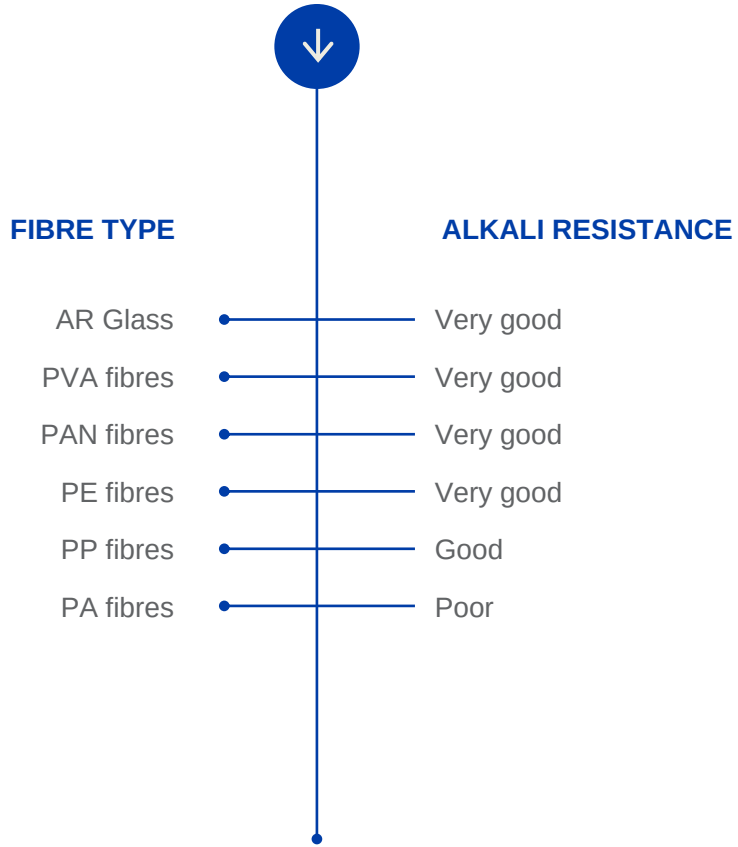
Etc.

SPECIAL PRODUCTS

TENSILE STRENGTH



ALKALI RESISTANCE



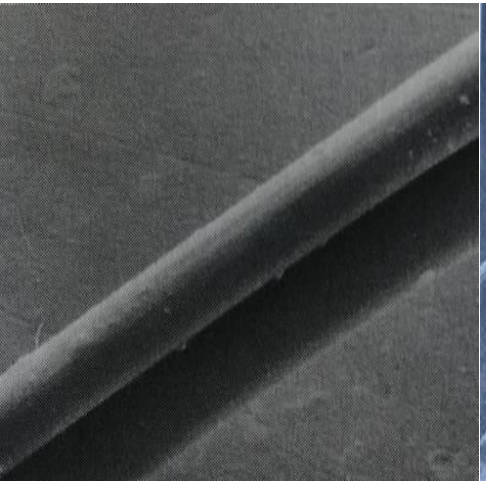
BASICS ABOUT FIBRES

FIBRE SURFACE AND SHAPE

smooth surface
round shape in cross section view

textured surface
kidney-shaped in cross section view

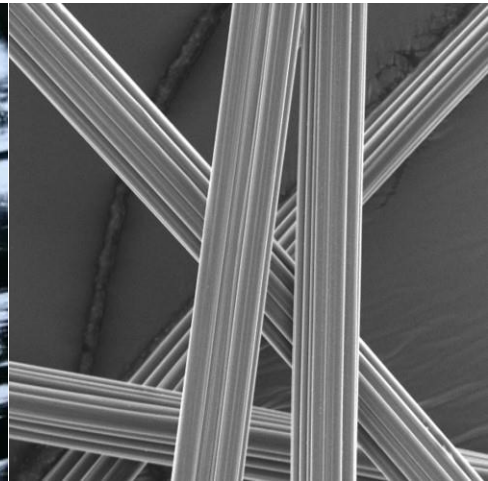
GLASS FIBRE



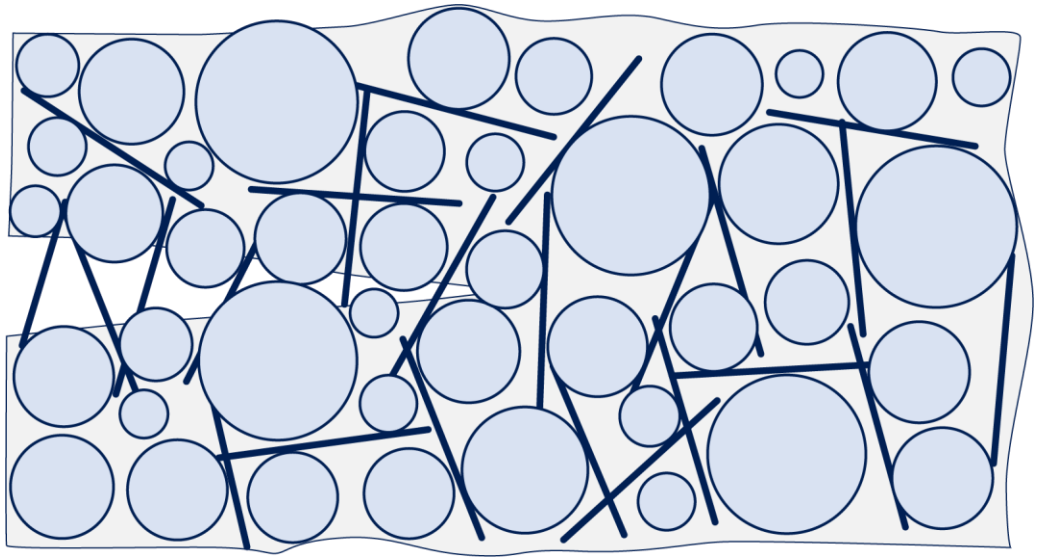
POLYPROPYLENE FIBRE

POLYACRYLONITRILE FIBRE

VISCOSE FIBRE



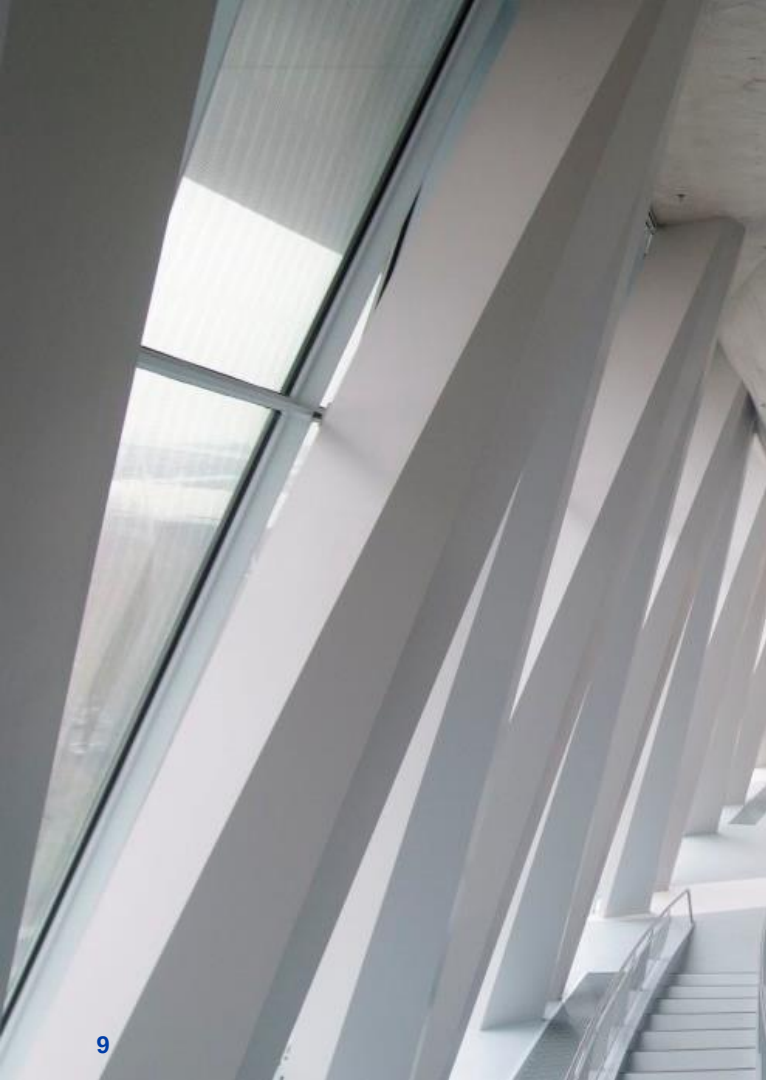
EFFECT OF THE FIBRES



Fibres produce a matrix that gives the composite strength and flexibility

The fibre addition level must be chosen carefully:

- fibre content too low: only a few cross points in the matrix, no strengthening effect
- fibre content too high: danger of lumps / cluster formation



ADVANTAGES OF FIBRES

- Replaces steel reinforcement
- Higher green strength
- Minimises fractures during hardening
- Good flow properties
- High alkali - resistance
- Very good dispersibility

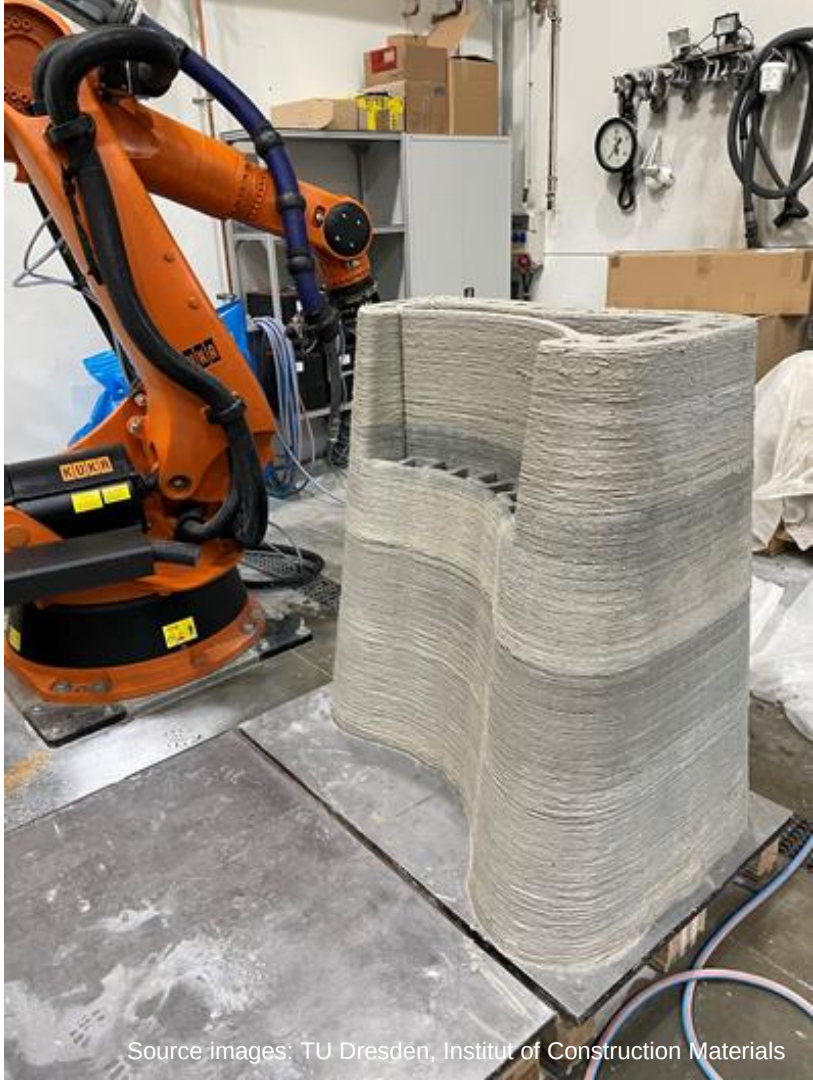
FIBRE SUGGESTIONS

PAC 251/60 dtex	Polyacrylonitrile High Modulus Fibres
F FGCS 70-30… X	Glass Short Cut Fibres (AR-Glass)
FGCS HP	Glass Short Cut Fibres (AR-Glass)
Stewathix	Thixotropic Agent
Stewabas 465	Basalt Short Cut Fibres
Stewabas 466 AR	Basalt Short Cut Fibres (AR-Basalt)
PP BKG	Polypropylene Split Fibres, coarse
F 517	Hemp Fibre Filler
F PE 900, 910, 930 T	Polyethylene Fibre Filler

3D CONCRETE PRINTING

PURPOSE

- Mass printing of high-quality building with automated machines
- Create new possibilities for design
- Add new safety value to the working onsite
- Elimination of the framework
- Saving time and material costs
- Long-term sustainable solutions
- Integrating the construction industry into the Digitalization Era
- High productivity with less space



Source images: TU Dresden, Institut of Construction Materials

FIBRES IN 3D CONCRETE PRINTING

- Fibres are the backbone of the 3D Concrete Printing
- Thicker layers possible
- Strong thixotropic effect
- Reduction of shrinkage cracks
- Improvement of mechanical properties
- Absorption of the wet content of the mixture
- Stability and strengthening for the fresh concrete

Source images: TU Dresden, Institut of Construction Materials

FIBRES IN 3D CONCRETE PRINTING

- Development of new sustainable non cement mixtures
- Buildings with non 3D printing design using putties strengthened with the same fibres
- More efficiency for the mixing process
- Corrosion, alkali and weather resistance solutions
- Joint solutions between traditional build and 3D printed parts
- The interactions with the other formulation components and with the reinforcement rebars

Source images: TU Dresden, Institut of Construction Materials

3D CONCRETE PRINTING

THANK YOU


Talks
Concrete
Talks
Facilities Management
Talks
Geotechnical & Engineering
Talks
HVAC R
Talks
Offsite & Modular
Talks
Project Management
Talks
Solar
Talks
Stone Design
Talks
Technology
Talks
Urban Design & Landscape