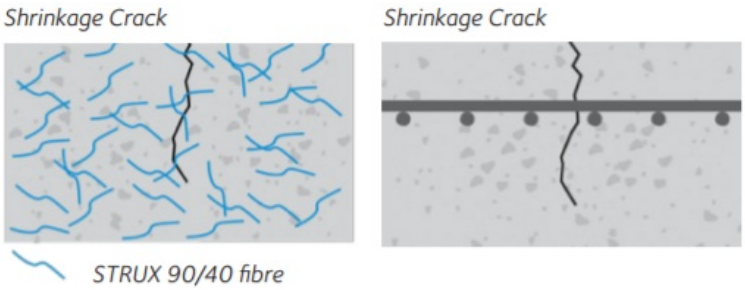
STRUX® 90/40

Advanced synthetic macro fibre reinforcement that controls shrinkage cracking in concrete

Product Description

STRUX® 90/40 is a unique, high strength, high modulus synthetic macro fibre reinforcement that is added to ready-mix and precast concrete at the batching stage. STRUX® 90/40 controls drying shrinkage cracking, so can be used as an alternative to steel fabric and steel fibre reinforcement. STRUX® 90/40 conforms to EN 14889-2, Fibres for concrete - Part 2: Polymer fibres - Definitions, specifications and conformity.



Advantages

- Controls drying shrinkage cracking by controlling the propagation of micro-cracking - improves toughness and durability of concrete.
- Can be used as an alternative to steel fabric reinforcement and steel fibre reinforcement.
- Uniformly distributed throughout the concrete matrix - no risk of incorrect steel fabric reinforcement placement.
- Improves residual flexural strength, impact and fatigue resistance of concrete - Re,3 values in excess of 30% can be reliably achieved (see Concrete Society Technical Report 34, 3rd Edition).
- Removes a site process so saves time on construction programme.
- No steel fabric storage, movement or crane costs.
- No risk of injuries from moving and installing steel fabric reinforcement.
- Ready-mix concrete truck can back up and freely discharge concrete, could remove/ reduce pumping costs.

Applications

- Ground bearing floor slabs
- External pavements
- Composite steel deck flooring
- Precast concrete

Note: STRUX® 90/40 is not intended as a substitute for steel reinforcement in any application other than those listed. Always consult relevant national and European codes

Addition Rates

STRUX® 90/40 addition rates are dependent on the specific application. Addition rates are also dependant on the desired hardened concrete properties and will vary between 2.3 to 7.0 kg/m^3. Please see STRUX® 90/40 engineering bulletin for detailed information.

Comparison of STRUX® 90/40 and Other Types of Reinforcement

Reinforcement Type	Reduces				Provides		
	Plastic shrinkage cracking	Drying shrinkage cracking	Corrosion risk	Freeze/thaw damage	Safe easy handling	Quick, well controlled installation	Post– crack load carrying capacity
Polypropylene "Micro" fibres	+	-	+	+/-	+	+	-
Steel fibres	-	+	-	-	-	+	+
Steel fabric	-	+	-	-	-	-	+
STRUX® 90/40	+	+	+	-	+	+	+

+ = positive effect (1) Only if positioned in top third of floor slab

– = no effect (2) Only if positioned in bottom third of floor slab

Mix Design and Mixing Requirements

STRUX® 90/40 may require the use of a superplasticiser such as ADVA® to achieve the required workability. In addition, slight increases in fine aggregate contents may be needed. At dry batch ready-mix plants, add the STRUX® 90/40 bags to the truck before the concrete constituents. STRUX® 90/40 bags are water degradable and will degrade when wetted. At wet batch ready-mix plants, add the STRUX® 90/40 bags to the truck before the concrete constituents. Add the first batch of concrete constituents to the truck SEMIDRY. This will break up the STRUX® 90/40 bags and evenly disperse the fibres. Remember to make up the water content on subsequent batches. After fibre addition, the concrete must be mixed in a drum at the recommended mixing speed for a minimum of 70 revolutions to ensure adequate dispersion. Please contact GCP for further information.

Compatibility

STRUX® 90/40 is compatible with all GCP admixtures. The action of STRUX® 90/40 in concrete is mechanical and will not affect the hydration process of the cement. Each liquid admixture should be added separately to the concrete mix.

Packaging

STRUX® 90/40 is available in 2.3 kg concrete-ready bags.

Technical Data

STRUX® 90/40	
Specific Gravity (20°C)	0.92
Absorption	None
Modulus of Elasticity	9.5GPa
Tensile Strength	620 MPa.
Melting Point	160°C
Ignition Point	590°C
Alkali, Acid & Salt Resistance	High

Effect of STRUX® 90/40 Dosage on Residual Strength

Note: These curves are based on averages of several beam tests. The toughness performance will depend on the concrete mix design used

STRUX® 90/40 dosage rate (kg/m^3)	$f_{e,3}$ (MPa)	$R_{e,3}$ (%)
3.8	1.95	38%
4.6	2.40	46%
5.4	2.75	54%

Note:
These figures (fe,3 and Re,3) are indicative of the performance of concrete mixes containing STRUX® 90/40 but they will vary depending on the hardened properties of the concrete. It is reasonable to expect higher figures when tested in other concrete mixes

Note:
The addition of STRUX® 90/40 fibres, to control plastic shrinkage cracking, does not negate the need for appropriate and efficient curing techniques.

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Steel fibres	–	+	–	–	–	+	+
Steel fabric	–	+(1)	–	–	–	–	+(2)
STRUX 90/40	+	+	+	–	+	+	+

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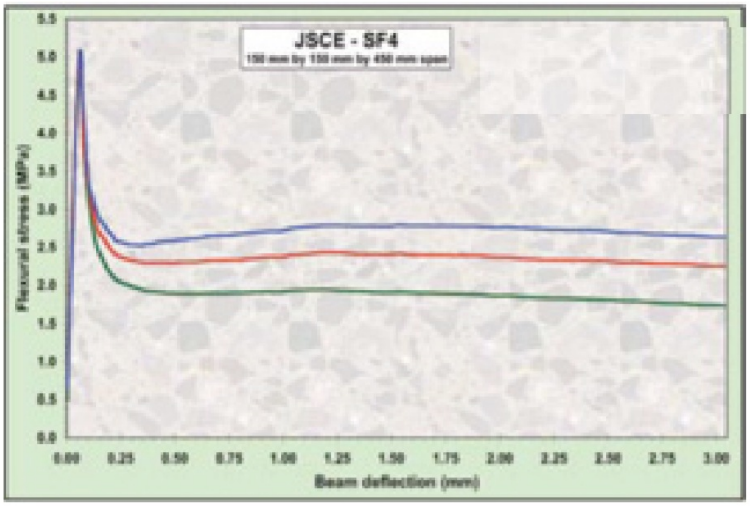

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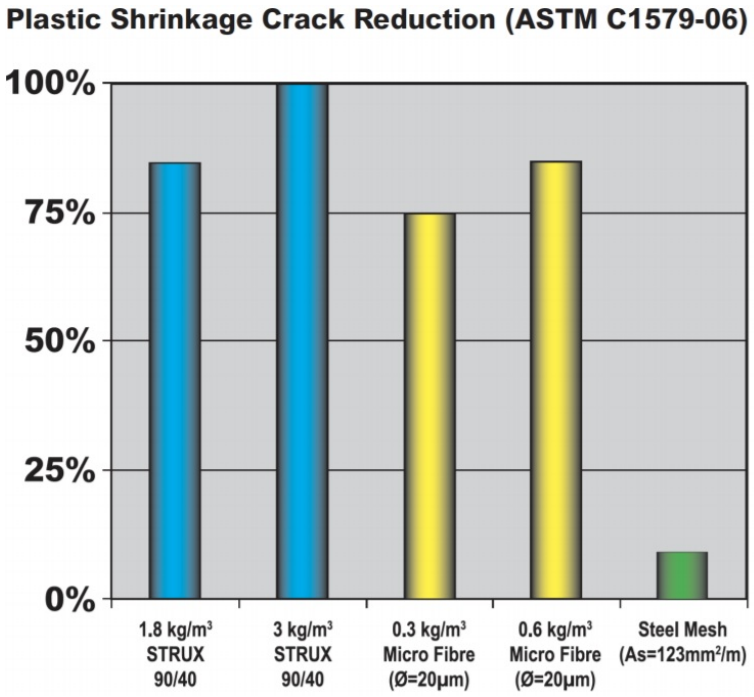

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gcpat.uk/solutions/products/strux-synthetic-macrofibers/strux-9040