

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

Benefits & 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/m³. 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	-	+(1)	-	-	-	-	+(2)
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

Specific Gravity	0.92
Absorption	None
Modulus of Elasticity	9.5 GPa
Tensile Strength	620 MPa.
Melting Point	160°C

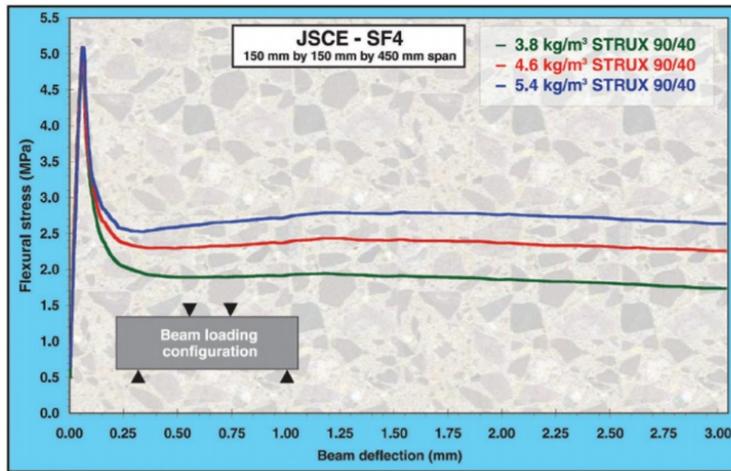
Ignition Point

590°C

Alkali, Acid & Salt Resistance

High

Effect of STRUX® 90/40 Dosage on Residual Strength

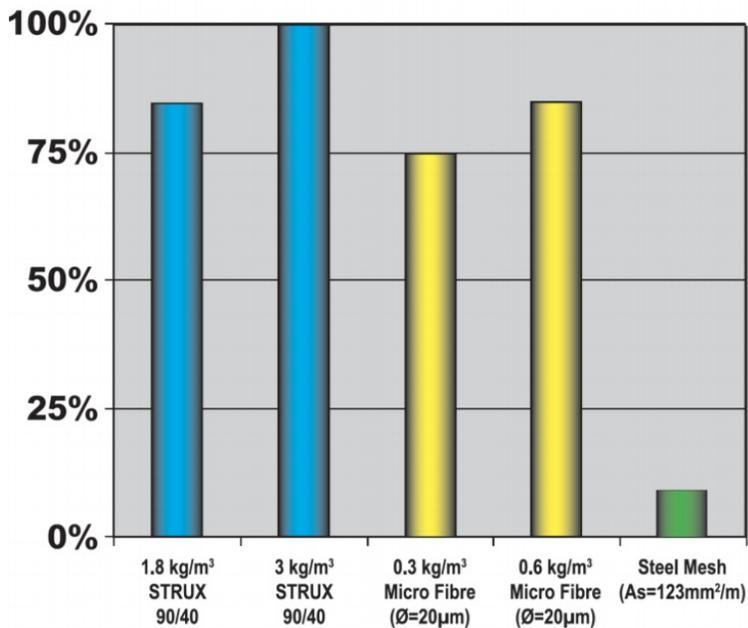


Note: These curves are based on averages of several beam tests. The toughness performance will depend on the concrete mix design used.

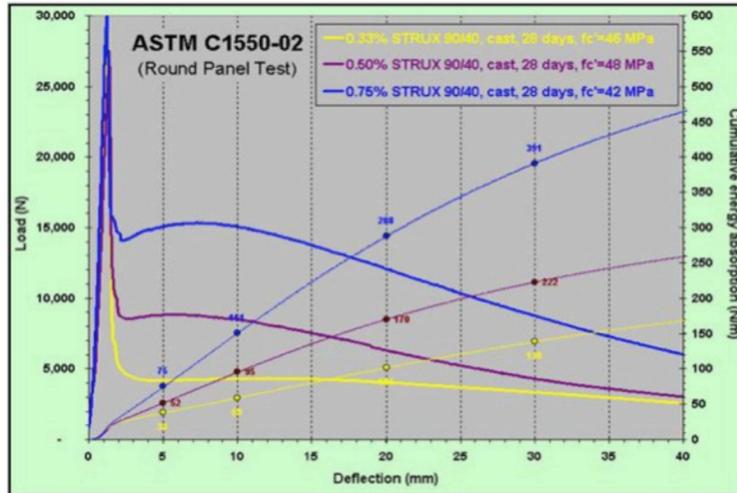
STRUX® 90/40 DOSAGE RATE (KG/M3)	FE,3 (MPA)	RE,3 (%)
3.8	1.95	38%
4.6	2.40	46%
5.4	2.75	54%

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.

Plastic Shrinkage Crack Reduction (ASTM C1579-06)



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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Last Updated: 2025-05-15

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