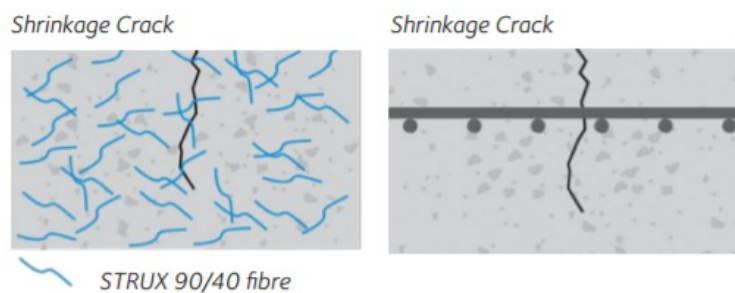


STRUX[®] 90/40

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/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	-	+	-	-	-	-	+
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/m³)	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 (f_{e,3} and R_{e,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.

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.

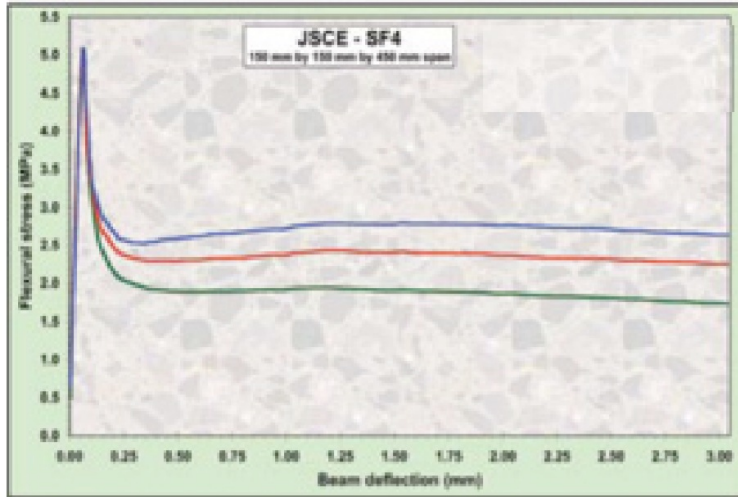
Packaging

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

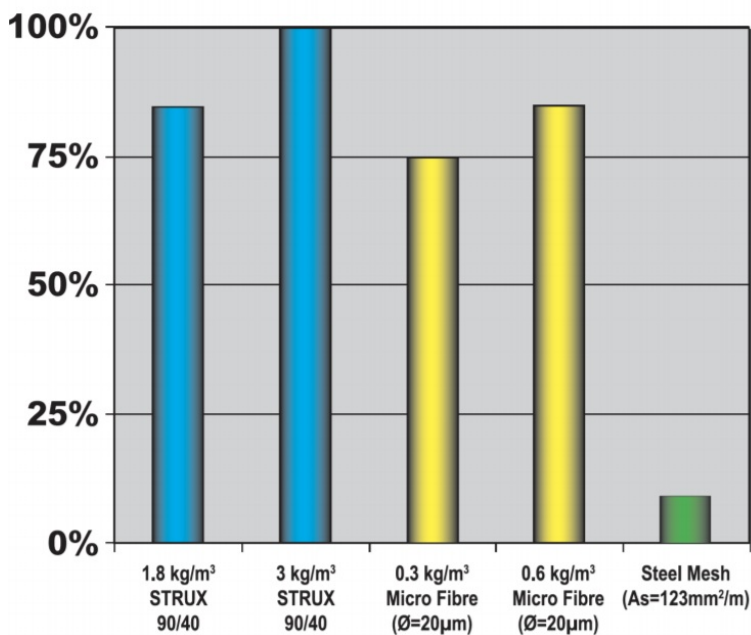


Note: These curves are based on averages of several beam tests. The toughness performance will depend on the concrete mix design used.

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

gcpat.uk | United Kingdom customer service: +44 (0) 1925 855330 Fax: 01925 855350

We hope the information here will be helpful. It is based on data and knowledge considered to be true and accurate, and is offered for consideration, investigation and verification by the user, but we do not warrant the results to be obtained. Please read all statements, recommendations, and suggestions in conjunction with our conditions of sale, which apply to all goods supplied by us. No statement, recommendation, or suggestion is intended for any use that would infringe any patent, copyright, or other third party right.

STRUX is a trademark, which may be registered in the United States and/or other countries, of GCP Applied Technologies Inc. This trademark list has been compiled using available published information as of the publication date and may not accurately reflect current trademark ownership or status.

© Copyright 2020 GCP Applied Technologies Inc. All rights reserved.

GCP Applied Technologies Inc., 62 Whittemore Avenue, Cambridge, MA 02140 USA.

GCP Applied Technologies (UK) Ltd, Gate St, Dukinfield SK16 4RU.

This document is only current as of the last updated date stated below and is valid only for use in the United Kingdom. It is important that you always refer to the currently available information at the URL below to provide the most current product information at the time of use. Additional literature such as Contractor Manuals, Technical Bulletins, Detail Drawings and detailing recommendations and other relevant documents are also available on www.gcpat.uk. Information found on other websites must not be relied upon, as they may not be up-to-date or applicable to the conditions in your location and we do not accept any responsibility for their content. If there are any conflicts or if you need more information, please contact GCP Customer Service.

Last Updated: 2021-02-05

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