

STRUX® 90/40

SYNTHETIC STRUCTURAL FIBER REINFORCEMENT

Description

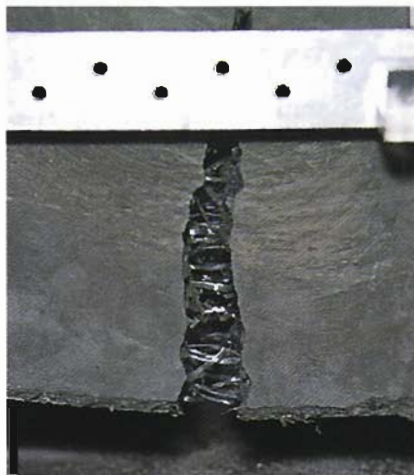
STRUX® 90/40 Synthetic Structural Fiber Reinforcement is a unique form of high strength, high modulus synthetic structural reinforcement that is distributed throughout the concrete matrix. STRUX 90/40 gives toughness, impact and fatigue resistance to concrete. It consists of synthetic fibers 40 mm (1.55 in.) in length with an aspect ratio of 90 that have specifically been designed to replace welded wire fabric, light reinforcing bars and steel fibers in flooring applications. STRUX 90/40 is a user-friendly fiber reinforcement which is easier and safer to use, compared to the three types of steel reinforcement.

Uses

STRUX 90/40 is specially designed for ease of use, rapid dispersion, good finishability and improved pumpability in flooring applications. STRUX 90/40 may be used in commercial floors, industrial floors, residential floors, other flat work applications and form work applications. The performance of STRUX 90/40 depends on the compressive strength of concrete.

Advantages

STRUX 90/40 enhances safety during installation by eliminating the risk for potential injury caused by handling and placement difficulties commonly associated with steel fibers or welded wire fabrics. Additionally, STRUX 90/40 does not corrode.



ASTM C 1018-97 Testing

The geometry, strength and the elastic modulus of STRUX 90/40 were optimized to provide superior crack control. With STRUX 90/40, fibers are uniformly built into the concrete, eliminating a concern over proper positioning of reinforcement. Also, STRUX 90/40 controls plastic shrinkage cracking and cracking due to drying shrinkage of the concrete.

Addition Rates

STRUX 90/40 addition rates are dependent on the specific application and desired properties and will vary between 1.8 to 7.0 kg/m³ (3.0 to 11.8 lbs/yd³). Please see STRUX 90/40 conversion tables for detailed information.

Product Advantages

STRUX 90/40 has been designed to provide:

- Tight crack control
- Good dispersion and pumpability
- Ductility
- Durability
- No corrosion issue
- Quick, easy and safe application
- An efficient and cost effective reinforcement alternative

Mix Design and Mixing Requirements

The utilization of STRUX 90/40 may require the use of a superplasticizer such as ADVA® to restore the required workability. In addition, slight increases in fine aggregate contents may be needed.

STRUX 90/40 may be added to concrete at any point during the batching or mixing process. STRUX 90/40 can be added as fast as one bag every 5 seconds. After fiber 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 your Grace representative with any questions.

Compatibility

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

Packaging and Dispensing

STRUX 90/40 is available in 2.26 kg (5 lbs) Concrete-Ready Bags.

STRUX 90/40 Properties

Specific Gravity	0.92
Absorption	None
Modulus of Elasticity	9.5 GPa (1,378 ksi)
Tensile Strength	540 MPa (78 ksi)
Melting Point	160°C (320°F)
Ignition Point	590°C (1,094°F)
Alkali, Acid & Salt Resistance	High

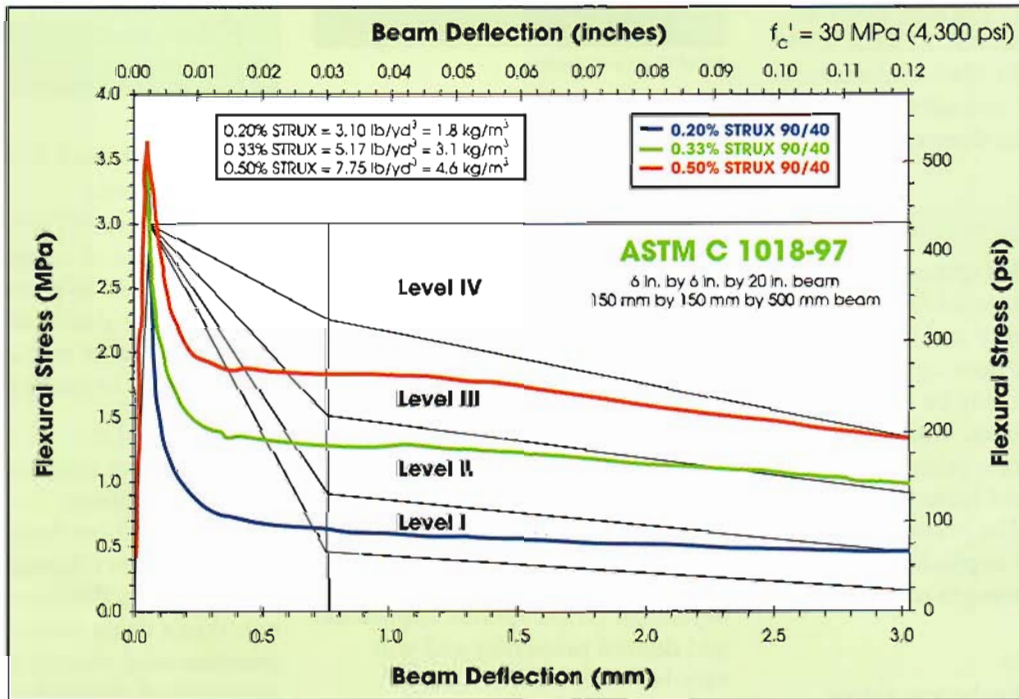
Flexural Strength and Toughness (Compressive Strength: 30 MPa)

STRUX 90/40 Dosage Rate	Defl. @ 1st crack (mm)	Specimen Cross-section		Max. Load (kN)	Flexural Strength (MPa)	ASTM C 1018-97 Toughness Indices					ASTM C 1018-97 Residual Strength Factors					JSCE*	
		Base (mm)	Height (mm)			I _f	I ₁₀	I ₂₀	I ₃₀	I ₆₀	R _{3,10}	R _{10,20}	R _{20,30}	R _{30,60}	R _{10,50}	f _{c,3} (MPa)	R _{c,3} (%)
0.20%	0.044	152.9	155.9	29.6	3.63	2.97	4.17	5.97	7.56	11.86	24.0	18.0	15.9	14.3	15.7	0.63	17%
0.33%	0.044	153.0	155.7	29.9	3.68	3.39	5.29	8.44	11.54	20.55	37.8	31.6	31.0	30.0	30.7	1.24	33%
0.50%	0.047	153.9	154.4	30.0	3.74	3.87	6.43	10.99	15.42	28.42	51.1	45.6	44.4	43.3	44.3	1.73	47%

Flexural Strength and Toughness (Compressive Strength: 4,300 psi)

STRUX 90/40 Dosage Rate	Defl. @ 1st crack (in.)	Specimen Cross-section		Max. Load (lbf)	Flexural Strength (psi)	ASTM C 1018-97 Toughness Indices					ASTM C 1018-97 Residual Strength Factors					JSCE*	
		Base (in.)	Height (in.)			I _f	I ₁₀	I ₂₀	I ₃₀	I ₆₀	R _{3,10}	R _{10,20}	R _{20,30}	R _{30,60}	R _{10,50}	f _{c,3} (psi)	R _{c,3} (%)
0.20%	1.732	5.96	6.08	6,645	527	2.97	4.17	5.97	7.56	11.86	24.0	18.0	15.9	14.3	15.7	92	17%
0.33%	1.719	5.97	6.07	6,713	534	3.39	5.29	8.44	11.54	20.55	37.8	31.6	31.0	30.0	30.7	180	33%
0.50%	1.837	6.00	6.02	6,738	542	3.87	6.43	10.99	15.42	28.42	51.1	45.6	44.4	43.3	44.3	250	47%

* Japanese Society for Civil Engineering



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