

STRUX[®] 85/50 Synthetic Macro-Fiber

Synthetic macro-fiber reinforcement

Product Description

STRUX[®] 85/50 synthetic macro fiber reinforcement is a unique form of high strength, high modulus synthetic macro reinforcement that is distributed throughout the concrete matrix. It consists of synthetic macro fibers 50 mm (2 in.) in length with an aspect ratio of 85 that have specifically been designed to ensure ease of use and rapid dispersion in concrete. STRUX[®] 85/50 is used in concrete to improve the material properties including toughness (post crack energy absorption), impact and fatigue resistance.

Uses

STRUX[®] 85/50 may be used in a variety of ready mix, precast and shotcrete applications including: bridge decks, overlays, whitetopping, pipes, vaults, septic tanks, tunnel linings, slope stabilization, and swimming pools.

Advantages

When added to shotcrete and concrete, the primary benefit of STRUX[®] 85/50 is a significant improvement in flexural toughness as outlined in Table 1.

Product Advantages

STRUX[®] 85/50 has been designed to provide:

- Safety
- Ductility
- Durability
- Crack Control
- Energy absorption
- Stain free concrete surfaces
- Quick, easy and safe application
- An efficient and effective secondary reinforcement alternative

Addition Rates

STRUX[®] 85/50 addition rates are dependent on the specific application and desired properties and will typically vary between 3.0 to 9.0 kg/m³ (5.0 to 15.0 lb/yd³).

Mix Design and Mixing Requirements

The utilization of fibers generally requires the use of a superplasticizer such as ADVA[®] to restore the required workability to fiber reinforced concrete. STRUX[®] 85/50 may be added to concrete at any point during the batching or mixing process. STRUX[®] 85/50 should be added at a maximum rate of one bag every 30 seconds. After fiber addition the concrete should be mixed at the recommended mixing speed for a minimum of 70 revolutions to ensure adequate fiber dispersion. Please contact your GCP representative with any questions.

Compatibility

STRUX[®] 85/50 is compatible with all admixtures. Their action in concrete is mechanical and will not affect the hydration process of the cement and therefore will not affect the compressive strength. Each liquid admixture should be added separately to the concrete mix.

Packaging

STRUX[®] 85/50 is available in 4.5 kg (10 lb) bags.

U.S. Patent No. 6,569,525

U.S. Patent No. 6,569,526

U.S. Patent No. 6,758,897

Table 1

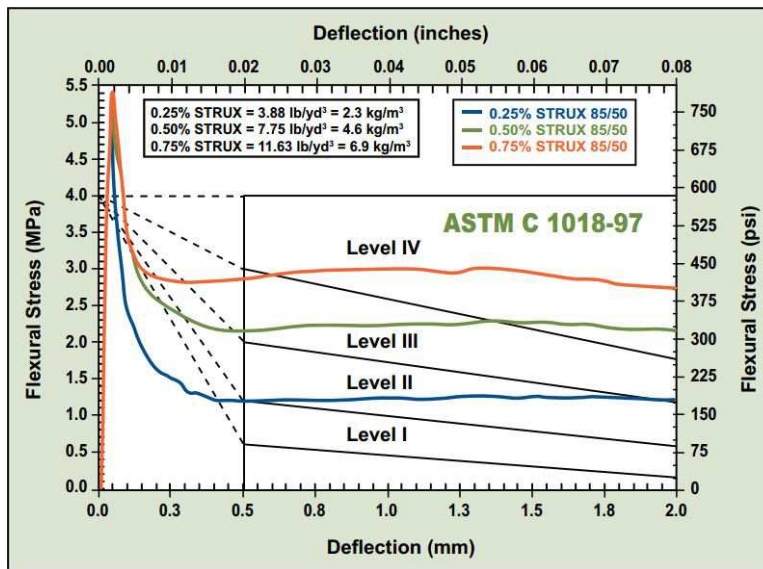
Typical Flexural Strength and Toughness results that can be expected from a 40 MPa (5800 psi), air entrained, concrete at 28 days

STRU X [®] 85/5 0	DEFL @ 1 IN. CRA CK	SPECIMEN CROSS SECTION	MAX. LOAD (kN)	FLEX URAL STRE NGTH (MPa)	ASTM C 1018-97 TOUGHNESS INDICES					ASTM C 1018-97 RESIDUAL STRENGTH FACTORS					JSCE ® (MPa)	
					I ₅	I ₁₀	I ₂₀	I ₄₀	I ₆₀	R _{5,10}	R _{10,20}	R _{20,30}	R _{30,60}	R _{10,50}		
DOSAG E RATE	(mm)	Base (mm)	Height (mm)													
Cont	0.03	102.	102.	19.2	5.50	2.88	3.94	4.89	5.30	5.73	21.3	9.5	4.1	1.4	4.3	0.35
rol	8	1	0	0	5.19	3.15	4.76	7.12	9.17	15.3	32.1	23.6	20.5	20.7	21.4	1.44
0.25	0.03	101.	103.	18.6	5.37	3.51	5.63	9.24	12.6	7	42.4	36.1	33.6	34.9	34.7	2.42
%	7	8	5	0	5.60	3.49	5.72	10.0	0	23.0	44.5	42.8	43.6	45.2	44.2	3.07
0.50	0.03	102.	103.	19.3				0	14.3	7						
%	8	0	8	0					6	27.9						
0.75	0.03	102.	103.	20.2						3						
%	9	1	7	0												

STRU X® 85/50	DEFL @ 1 IN. CRA CK	SPECIMEN CROSS SECTION	MAX. LOAD	FLEX URAL STRE NGTH	ASTM C 1018-97 TOUGHNESS INDICES	ASTM C 1018-97 RESIDUAL STRENGTH FACTORS	JSCE ®
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DOSAGE RATE	(mil)	Base (in)	Height (in)	(lbf)	(psi)	I ₅	I ₁₀	I ₂₀	I ₃₀	I ₆₀	R _{5,10}	R _{10,20}	R _{20,30}	R _{30,60}	R _{10,50}	(psi)
Control	1.50	3.98	3.98	4316	798	2.88	3.94	4.89	5.30	5.73	21.3	9.5	4.1	1.4	4.3	51
0.25%	1.46	3.97	4.04	4181	753	3.15	4.76	7.12	9.17	15.3	32.1	23.6	20.5	20.7	21.4	209
0.50%	1.50	3.98	4.05	4339	779	3.51	5.63	9.24	12.6	7	42.4	36.1	33.6	34.9	34.7	351
0.75%	1.54	3.98	4.04	4541	812	3.49	5.72	10.0	0	23.0	44.5	42.8	43.6	45.2	44.2	445

* Japanese Society for Civil Engineering



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Last Updated: 2018-08-24

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