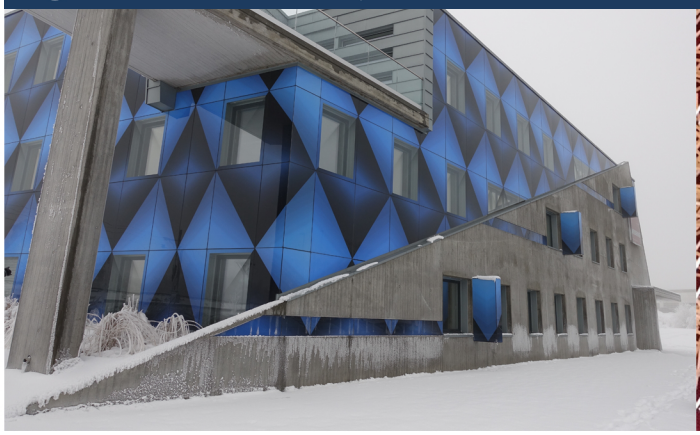
Product Data Sheet

MiniBars™

High Performance Composite Macrofiber For Concrete Reinforcement

AIT COMPOSITES
A DIVISION OF BASALT INTERNATIONAL INC.



Description

MiniBars™ are a high-performance Fiber Reinforced Polymer (FRP) composite macrofiber, using Basalt or Alkali-Resistant Glass and engineered to provide high tensile, post-cracking strength to concrete while at the same time increasing toughness, impact and fatigue resistance of concrete. MiniBars™ are a structural synthetic macrofiber that can be used as secondary and/or as primary reinforcement. MiniBars™ disperse quickly and evenly throughout the concrete matrix. They stay suspended in mix due to the specific gravity being similar to concrete. This promotes uniform performance throughout the concrete cross section without fibers showing on formed or finished surfaces unless cement paste is removed.

Benefits

- Improves post-cracking mechanical properties of hardened concrete
- Fast and uniform dispersion during mixing
- Does not affect concrete pumpability when following recommended practices
- Allows for high dosages with workability in HPC and UHPC mixes
- Does not corrode
- No additional water demand
- Easy to handle

Applications

MiniBars™ have been specifically designed to reduce or replace secondary and/or primary steel reinforcement in many structural applications requiring flexural tensile and post-crack performance (wall panels, pipes, water tanks, tunnel segments, marine structures, raft foundations, etc.)

How To Use

MiniBars™ can be added to the wet mix at the batching plant or into the concrete truck at site. For optimum dispersion and performance, it is recommended to add the fiber gradually and not to mix too long. Dosage rates are dependent on the application and desired performance levels. Please refer to the Instruction Sheet for specific details on dosing and mixing on site, in a batch plant or laboratory.

Quality Standards – Certification

MiniBars™ are manufactured under a quality Management System approved to ISO 9001 and have DIBt and CE mark certifications recognized worldwide.

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Packaging & Storage

MiniBars™ are available in two lengths. The 43mm length is packed in 22 lb. (10 kg) cardboard boxes. The 24mm length uses the same boxes, but contain 44 lbs (20kg) each. There are 12 boxes on a pallet. MiniBars™ should be stored away from moisture in their original packaging

Material Properties

Material	Fiber Length	Fiber Diameter	Specific Gravity	Modulus of Elasticity	Tensile Strength
Basalt or AR Glass + Thermoset Resin	43 or 24mm +/-2 mm* 1.7 or 0.94 +/- 0.08 in.	0.70 mm 0.03 in.	2.1 ± 0.1	42 GPa 6,091,585 psi	> 1000 MPa / 145,038 psi

* Shorter or longer fibers are available on request

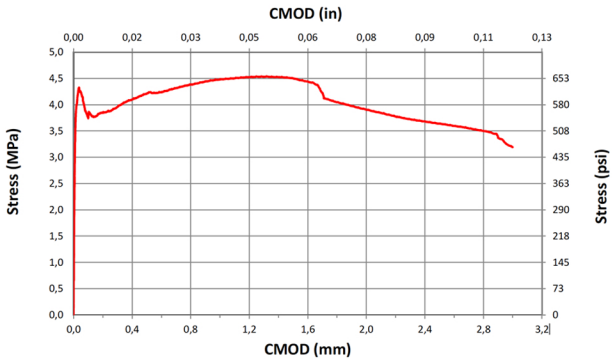
Mechanical Performance

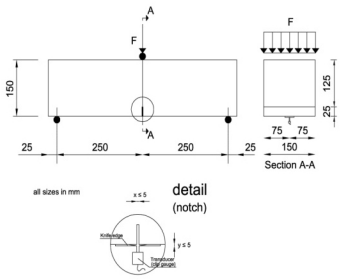
The fundamental mechanical performance of Fiber Reinforced Concrete (FRC) can be obtained from a three-point bending test performed on a prismatic beam of 150×150×550mm (6×6×22in.) including a notch at mid-span per EN 14651. The displacement-controlled testing system introduces a specific deflection or CMOD (Crack Mouth Opening Displacement), and records load and displacement up to a CMOD limit of 3.5 mm (0.14 in). FRC performance is evaluated by means of residual flexural strength values at a CMOD of 0.5, 1.5, 2.5, and 3.5mm (0.02, 0.06, 0.10, and 0.14 in.), namely f_{R1}, f_{R2}, f_{R3} and f_{R4}, respectively.

According to the *fib* Model Code 2010, the constitutive law of the material in tension is defined by means of the tensile stresses f_{Fts} and f_{Ftu}, calculated from f_{R1} and f_{R3} for service and ultimate limit state, respectively. The ACI 544.4R-18 Design Guide for FRC also references this procedure in addition to using ASTM C1609.

The following curve shows a typical Load-CMOD response of a 4400-psi (C30/37) concrete reinforced with 17 lbs/yd^3 (10 kg/m^3) of MiniBars™. The table presents the mean values of residual strength.

Concrete Description:
EN206-1 C30/37 XC3/XC4 Dmax20 S4 CL 1.00, Slump=22 cm
ACI 211| 4400 PSI Concrete, C1/F1 exposure class, 8 ½" max. aggregate, 8 ¾" slump





The sketch shows the basic configuration of the test.

Mean flexural performance (prism 100x100x400mm | 4x4x16 in)	MPa (Mean)	psi (Mean)
fc (100 mm / 4 in cube)	46.9	6800
f_L	4.35	631
f_{R1}	3.67	532
f_{R2}	3.99	579
f_{R3}	3.61	524
f_{R4}	3.12	453
ARS=(f_{R1}+f_{R2}+f_{R3}+f_{R4})/4	3.60	520

Note: using a 100×100×400mm (4x4x16 in), fR1, fR2, fR3, and fR4, are calculated at 0.4, 1.2, 2.0, and 2.8mm of CMOD, respectively

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