Avonlea
INTERIOR PRODUCTS

Structural Fiberglass Rebar

CODE APPROVED IN U.S. & CANADA

UP TO 3x
STRONGER THAN STEEL

75%
LIGHTER THAN STEEL

100%
CORROSION RESISTANCE

Avonlea INTERIOR PRODUCTS

THE #1 GFRP SOLUTION FOR CONCRETE REINFORCEMENT

A GREENER SOLUTION

LESS THAN 1KG PER BAR

100% CORROSION RESISTANCE

#3 (10mm) Horizontal Bar™ Slab On Ground

#3 (10mm) Horizontal Bar is the best in class GFRP (Glass Fiber Reinforced Polymer) rebar from MST-BAR. Engineered for concrete slab on ground, #3 (10mm) Horizontal Bar is manufactured with long-lasting resin and corrosion-resistant glass to reinforce your concrete with a superior grade.

MADE IN CANADA

Quick & Simple Installation

Up to 50% labour savings compared to traditional steel rebar. Easy to transport and to move on site.

200+ Years Service Life

Engineered to last for generations.

Reduced Environmental Impact

MST-BAR is manufactured in Canada using only electric power and achieves a zero emissions standard that is natural to its mode of production.

Corrosion Resistant

Impervious to corrosive affects due to coastal salt-water spray and full salt-water submersion.

Nonconductive & Nonferrous

Ideal for projects with electromagnetic sensitivity.

Physical & Mechanical Properties

Nominal Bar Dimensions	#3 (10mm) Diameter / 20ft (6m) Length
Nominal Cross-Sectional Area	2.79in² (71mm²)
Bar Composition	Vinyl Ester Resin & ECR Glass Fiber
Bar Profile	Integral Rib Design (No Sand-Coating Required)
Guaranteed Tensile Strength	145 ksi (1000 MPa)
Elastic Modulus	6380 ksi (45 GPa)
Transverse Shear Strength	23 ksi (160 MPa)
Guaranteed Pull-Out Capacity	2900 psi (20 MPa)

MST-BAR Slab On Ground design for shrinkage.

In this design the following assumptions have been used:

- Soil to have a good compaction
- Bars to be placed properly
- Control joint to be cut properly
- Expansion joint to be considered properly
- Spacing between bars to be accurate

Design Aid for Slab on Ground with GFRP

Slab Thickness	Temperature Zone	GFRP Required in each Direction
4 inches (100mm)	Subzero to +100° C	Mid-strip: #3 (10mm) Horizontal Bar @300mm Edge-strip: #3 (10mm) Horizontal Bar @400mm
6 inches (150mm)	Subzero to +100° C	Mid-strip: #3 (10mm) Horizontal Bar @300mm Edge-strip: #3 (10mm) Horizontal Bar @400mm
6 inches (150mm) (12 kPa loads)	Subzero to +100° C	Mid-strip: #3 (10mm) Horizontal Bar @200mm Edge-strip: #3 (10mm) Horizontal Bar @400mm -Plus 2-Bar @400 Top all along exposed joints
8 inches (200mm)	Subzero to +100° C	Mid-strip: #3 (10mm) Horizontal Bar @ 300mm -Plus 3-Bar @300 Top all along exposed joints

NOTES:

- Sawcut control joints at 13ft (4m) to 16ft (5m) spacing maximum, depth of sawcut shall be 25% of slab thickness.
- If you wish to use MST-BAR #3 (10mm) bars, you can increase the spacing accordingly based on tensile capacity of the MST-BAR, capacity between the two is 26%, therefore spacing can be increased by 26%.
- Expansion joints shall be at maximum spacing of 50ft (15m).
- Mid-strip is 50% of width of panel between joints
- Edge-strip is 25% of width of panel along all joints
- All #3 (10mm) Horizontal Bar rebars are placed at mid-depth of slab unless otherwise noted
- Cover to additional top rebars shall be 30mm to 40mm minimum

Applications*

- **RESIDENTIAL DRIVEWAYS**
- **FOOTPATHS & WALKWAYS**
- **CONCRETE SLABS**
- **PAVING** · **DIY**

**Not for vertical installation.*

Handling & Installation

Always wear gloves when handling #3 (10mm) Horizontal Bar™. Direct contact to skin can cause irritation.

Use a diamond blade when site-cutting #3 (10mm) Horizontal Bar™. Do not shear the bars. If lap-slicing is necessary, use contact lap slices. Lap length should be no less than 38cm.

Tie and chair #3 (10mm) Horizontal Bar™ as you would steel rebar. Tie wire, rebar clips, and plastic zipties are acceptable methods of securing the bar. Beware of settlement of floating when using #3 (10mm) Horizontal Bar™ with high slump concrete or when vibrating.

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Dominion City, MB ph: (204) **427-3405** fax: (204) **427-3413**
email: **avonlea.interior.products@gmail.com**
contact: **Clinton Hofer** **www.avonlea-ip.ca**

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MAXIMUM STRENGTH GFRP

DIRECT COMPARISON BETWEEN STEEL & MST BAR

MAXIMUM STRENGTH GFRP

MATERIAL PROPERTIES	UNITS	MST BAR MAXIMUM STRENGTH GFRP	STAINLESS STEEL (ASTM A955)	STEEL (ASTM A615)
Tensile strength [1]	PSI	145,000 - 200,000	60,000	60,000
	MPa	1000 - 1200	420	420
Modulus of elasticity	KSI	8800	29,000	29,000
	GPa	60 - 63	200	200
Bond strength	PSI	3500	1450 [2]	1450 [2]
	MPa	24	10 [2]	10 [2]
Thermal conductivity	BTU/(hr·ft·°F)	< 0.6 [2]	10 [2]	32 [2]
	W/ (m·°C)	< 1 [2]	16 [2]	54 [2]
Electrical resistivity	Ω·in	$>10^{11}$ [2]	$4x10^{-5}$ [2]	$6x10^{-6}$ [2]
	Ω·cm	$>10^{11}$ [2]	$1x10^{-4}$ [2]	$1.5x10^{-5}$ [2]
Unit weight	lb/ft³	130	485 - 500	490
	kg/m³	2100	7800 - 8000	7850
Required concrete cover [3]	in	3/4	11/2-3	11/2-3
	mm	20	40 - 75	40 - 75
Shear Strength	PSI	35,000	36,000	36,000
	MPa	240	250	250

[1] Guaranteed tensile strength for MST bars, yield strength for stainless and black steel bars
[2] Approximate value
[3] For exposed conditions, as per ACI 440.5 and ACI 318

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