

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/ft ³	130	485 – 500	490
	kg/m ³	2100	7800 – 8000	7850
Required concrete cover ⁽³⁾	in	3/4	1 1/2-3	1 1/2-3
	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