STEEL-REINFORCED HEAVY-DUTY MATS

STRUCTURAL POLYMER COMPOSITE WITH A36 STEEL PLATE REINFORCEMENT AND MATLOK® HARDWARE SYSTEMS

Patent Pending

AXION™
STRUCTURAL INNOVATIONS

STRUXURE® SR Heavy-Duty mats are constructed from AXION's proprietary structural polymer composites. When combined with reinforced ¼" or ½" steel flitch plates and MatLok® hardware systems, STRUXURE SR HD mats are strong, tough, and durable. They are an engineered alternative to 12" hardwood lumber mats and maintain structural integrity in any service environment, wet or dry.

Products	Weight *(lbs)*	Fc Perp Compression Perp. Grain *(psi)*	Imat *(in^4)*	MOE Elastic Modulus *(psi)*	EI *(kip*in^2)*	Fb Allowable Stress *(psi)*
11 ½" x 4' x 20' & 24' Select Structural Red Oak Dry Wood (12%)[1], Limited Availability	20'/4,000 24'/4,800	550	6,100	1,100,000	6,700,000	1,150
11 ½" x 4' x 20' & 24' No. 2 "Mixed Hardwoods" Dry Wood (12%)[1], New & Used in market today	20'/4,000 24'/4,800	480	6,100	720,000	4,400,000	765
7" x 46" x 20' STRUXURE® SR Heavy Duty Mat (5) pcs SPC, (4) ¼" Flitch Plates, (8) Matlok® Sets	2,755	4,500[2]	1,315	1,400,000[3]	1,840,000	3,000[4]
7" x 47" x 20' STRUXURE® SR Heavy Duty Mat (5) pcs SPC, (4) ½" Flitch Plates, (8) Matlok® Sets	3,200	4,500[2]	1,315	1,600,000[3]	2,100,000	3,200[4]
9" x 50 ½" x 20' STRUXURE® SR Heavy Duty Mat (7) pcs SPC, (6) ¼" Flitch Plates, (8) Matlok® Sets	4,130	6,000[2]	3,030	1,500,000[3]	4,550,000	3,000[4]
9" x 51" x 24' STRUXURE® SR Heavy Duty Mat (7) pcs SPC, (4) ½" Flitch Plates, (9) Matlok® Sets	5,300	6,000[2]	3,030	1,700,000[3]	5,150,000	3,200[4]

1. Hardwood Lumber Information Source – American Wood Council NDS Supplement 2015 Edition for 5"x5" and larger timbers. Wet Use Adjustment Factors applied – Fb @ .85, Fc perp @ .67, E @ .90. Mats are not tested before use in the market and structural integrity declines over time.
2. Number calculated for structural polymer component only as steel plates are isotropic and have no grain. Figures shown assuming standard load distribution between SPC (Perp. Compression = 1,200 psi) and steel plates.
3. Calculated from loading/deflection data (tested Nov. 2012) assuming steel plates as primary load carrying members.
4. Assuming a factor of safety of 2/3 from yield stress determine via testing Nov. 2017. Stress vales are assumed to be equivalent across bottom flange of mat cross section across all materials.

STRUXURE®
CONSTRUCTION MATS

Minimum Allowable Soiling Bearing Capacity, 7" Thick Steel Reinforced Mat (1/4" x 4) with MatLok® Hardware

Width Tire or Tread on Mat (in)							
Load (lb)	6"	12"	18"	24"	30"	36"	45"
100,000	3500 psf	3100 psf	2900 psf	2700 psf	2500 psf	2300 psf	2100 psf
140,000	6500 psf	5900 psf	5100 psf	4700 psf	4300 psf	3900 psf	3500 psf
200,000	13,000 psf	10,500 psf	9000 psf	8200 psf	7300 psf	6500 psf	5800 psf

Minimum Allowable Soiling Bearing Capacity, 7" Thick Steel Reinforced Mat (1/2" x 4) with MatLok® Hardware

Width Tire or Tread on Mat (in)							
Load (lb)	6"	12"	18"	24"	30"	36"	45"
100,000	3200 psf	2800 psf	2600 psf	2400 psf	2200 psf	2000 psf	1800 psf
140,000	5700 psf	5100 psf	4300 psf	3900 psf	3500 psf	3100 psf	2700 psf
200,000	11,000 psf	9500 psf	8000 psf	7200 psf	6300 psf	5500 psf	4800 psf

Minimum Allowable Soiling Bearing Capacity, 9" Thick Steel Reinforced Mat (1/4"x6) with MatLok® Hardware

Width Tire or Tread on Mat (in)							
Load (lb)	6"	12"	18"	24"	30"	36"	48"
100,000	2500 psf	2300 psf	2200 psf	2100 psf	2000 psf	1800 psf	1600 psf
140,000	4900 psf	4200 psf	3800 psf	3500 psf	3200 psf	3000 psf	2700 psf
200,000	9000 psf	8100 psf	7000 psf	6200 psf	5700 psf	5300 psf	4500 psf

Minimum Allowable Soiling Bearing Capacity, 9" Thick Steel Reinforced Mat (1/2"x4) with MatLok® Hardware

Width Tire or Tread on Mat (in)							
Load (lb)	6"	12"	18"	24"	30"	36"	48"
100,000	2500 psf	2300 psf	2200 psf	2100 psf	2000 psf	1800 psf	1600 psf
140,000	4900 psf	4200 psf	3800 psf	3500 psf	3200 psf	3000 psf	2700 psf
200,000	9000 psf	8100 psf	7000 psf	6200 psf	5700 psf	5300 psf	4500 psf

Note on Soil Bearing Capacity Tables

- Mat loading tables are derived using a standard design method based on the soil bearing capacity.
- The required crane mat area is calculated by dividing the crane load plus the weight of the mat by the allowable ground bearing pressure.
- Divide this area by the width of the mat to develop the required effective bearing length.
- The mat length is then used to calculate bending (which typically controls the mats design) and shear stresses in the mat, based on the assumption of a uniform pressure equal to the crane load divided by the bearing area acting upward on the bottom of the mat.
- Using a traditional wood mat design as a guide, we utilize published allowable flexural stresses for the composites to check the members in the mat against the applied stress due to the ground bearing.

MEMBER S&RA

PROUDLY ENGINEERED AND MANUFACTURED IN WACO, TEXAS USA