

XtremeMat[®]

Engineering





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Transport Quantities

20ft ISO Calendar	20 Mats
40ft ISO Calendar	40 Mats
Triaxle Truck	52 Mats
Super B Truck	80 Mats
Closed Van Truck	52 Mats

Specifications

Shipping Length	4.34m / 14.25ft	Color	Deep Orange
Shipping Width	2.29m / 7.5ft	No. of Connectors	12
Usable Length	4.11m / 13.5ft	Temperature Rating	-34°C / -29°F to 60°C / 140°F
Usable Width	2.06m / 6.75ft	Load Capacity	~ 40kg/cm ² / 600 PSI / 400 Ton/m ²
Area	8.46m ² / 91.13ft ²	Observed Comp. PSI	Over 70kg/cm ² / 1000 PSI
Thickness	100mm / 4in	Static Dissipative	Yes
Weight	385kg±10kg / 860lbs ±22lbs	UV Protection	Yes
Material	High Density Polyethylene	Internal Core	Solid Filled HDPE Closed Cell

Impact vs Temperature



The results in this reported where obtained by COREngineering Ltd during on-site testing at the Xtreme Mattings Corp. facility, in September of 2017.

Typically for impact testing of plastic the IZOO method is used, using the ASTM 0256 as the standard. Test pieces are notched (as per ASMT 0256) to help in breaking the part. After being notched, the samples are cooled to the desired testing temperature, since plastic will become brittle after certain temperature. They are then clamped down in the test rig and a pendulum of different weight is used to impact the part and find the breaking point for different temperatures.

Since the Xtreme Mats are filled with foam and not solid plastic, making a notch in the sample for testing would not be a viable option as it would cut through thin outer plastic shell completely and only the foam would be left to take the impact. A different testing system had to be put in place to test the reaction/brittleness of the mats at low temperatures. A long pipe with holes was set up in the plant for testing purposes. A hammer of 38.8 lbs (17.6 kg) was inserted into the pipe and raised to a predetermined height where a pin would safely hold it in position. Once the test piece is set up directly under the pipe, the pin is pulled and the hammer slides down and impacts the mat sample. Tests were done at varying drop heights to find the breaking point for all the different temperature samples. The results are listed below.

Temperature (F°)	Breaking height (ft)	Kinetic Energy (KJ)	Strength (%)
-62	11.5	60.6	92
-44	8.5	44.8	68
-4	11.5	60.6	92
59	12.5	65.9	100

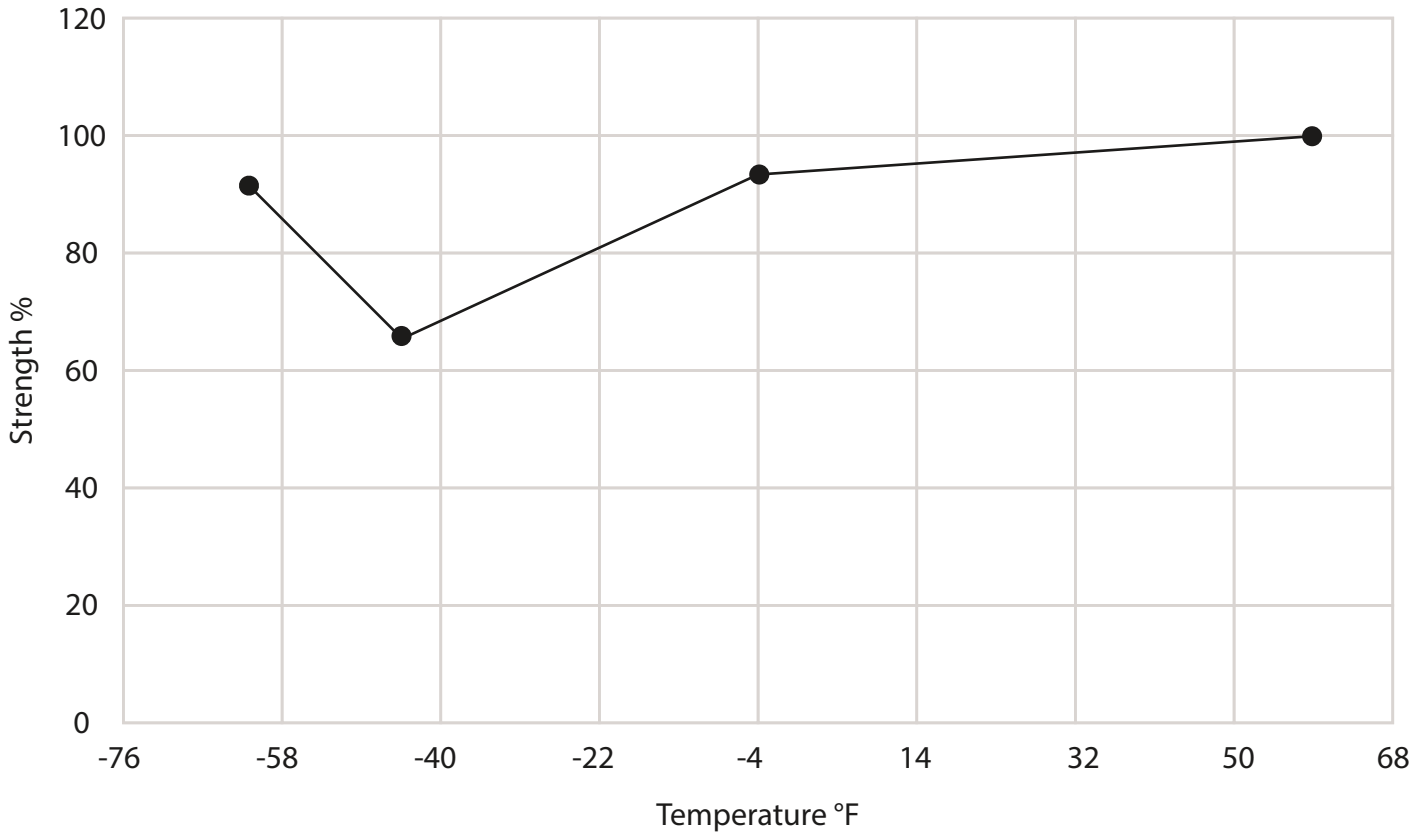


Test Results at -43.6°F
Hammer Dropped at 8.5ft



Test Results at 59°F
Hammer Dropped at 12.5ft

Temperature vs Strength Chart



It was noticed that during the test at room temperature (59°F) that there was no cracking of the mat's plastic surface upon impact as with the colder tests. The impact force would deform the mat to the shearing point of the plastic.

It is also worth noting that the test results done at -62°F show more breaking resistance than the test done at -44°F. We believe the reason for this is because at those cold temperatures, the foam inside the mats becomes rigid and thus harder. Since the foam is harder, it offers better support to the plastic shell, and a larger impact force is then required to deform the plastic to the point of breaking.



Deflection vs Load Bearing

The results in this reported where obtained by COREngineering Ltd during on-site testing at the Xtreme Mattings Corp. facility, in September of 2017.

Test Method

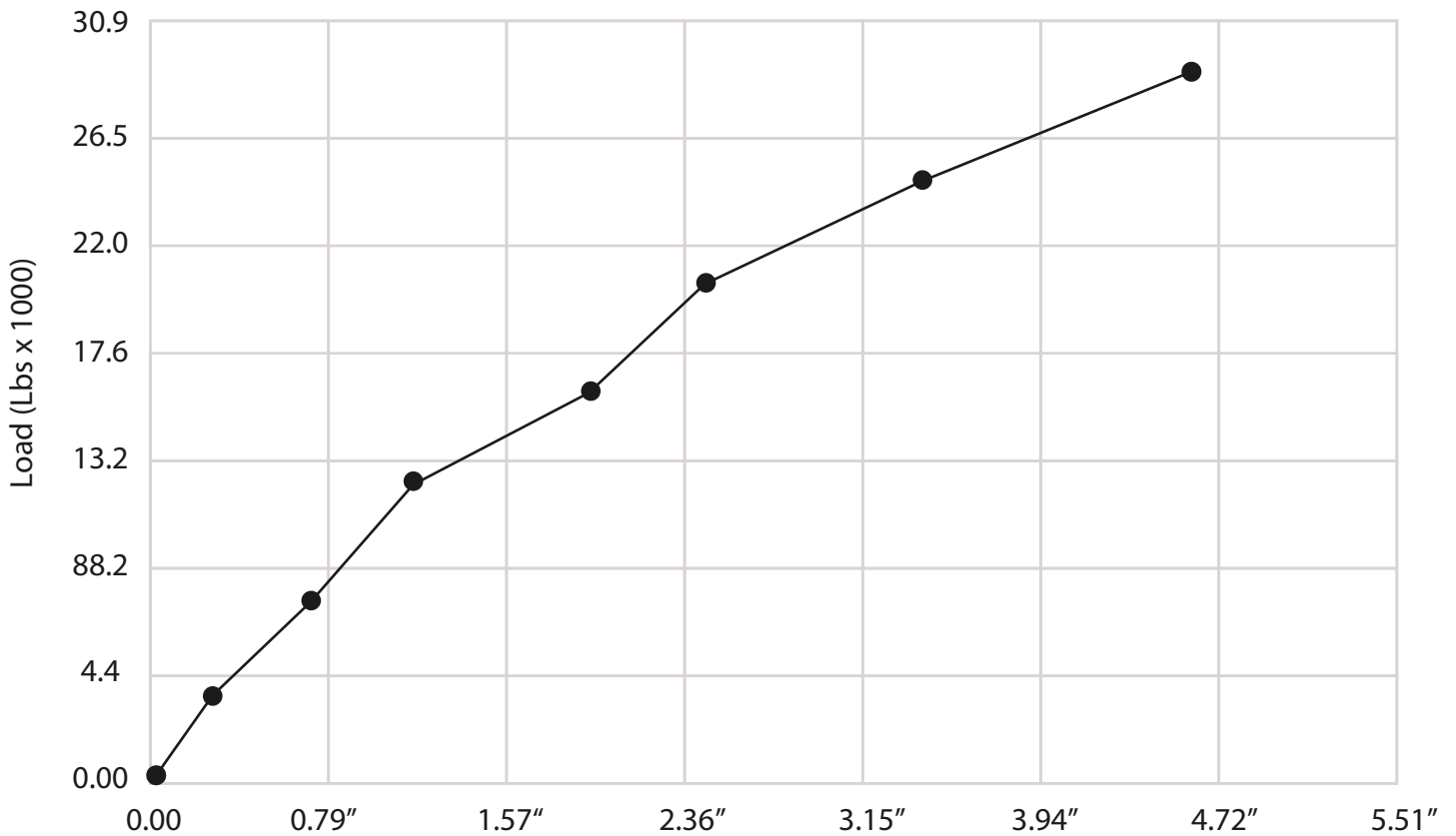
For on-site strength testing a guided frame was loaded up with pre-weighted concrete blocks and slowly lowered onto the mat. An 8" steel pipe was used to transfer the load onto the mat and two 8" steel pipes were used as bottom support. The bottom supports were set up at 4' center to center.



Test Results

Weight (lbs)	Deflection (in)
3600	0.3
7456	0.7
11579	1.14
15743	1.97
20042	2.52
24350	3.46
28552	4.65

Displacement vs Load Chart



Coefficient of Friction

The results in this reported where obtained by COREngineering Ltd during on-site testing at the Xtreme Mattings Corp. facility, in September of 2017.

During in-house testing we found that the Xtreme matting system had a coefficient of friction of 0.73. The testing was done using 40A durometer Neoprene rubber and the Xtreme matting system.



Compressive PSI Testing

The results in this reported where obtained by Cube Automation during on-site testing at the Xtreme Mattings Corp. facility, in October of 2016.

Test Method



This test was done using a manual press. The press has a digital indicator for load. A digital indicator was added to the setup to measure displacement. A steel plate 8" x 8"- 1" thick was use to distribute the weight onto the product. The sample dimension was approximately 12" x 16". The plate was position onto an area where the mat was completely full of material (no void).

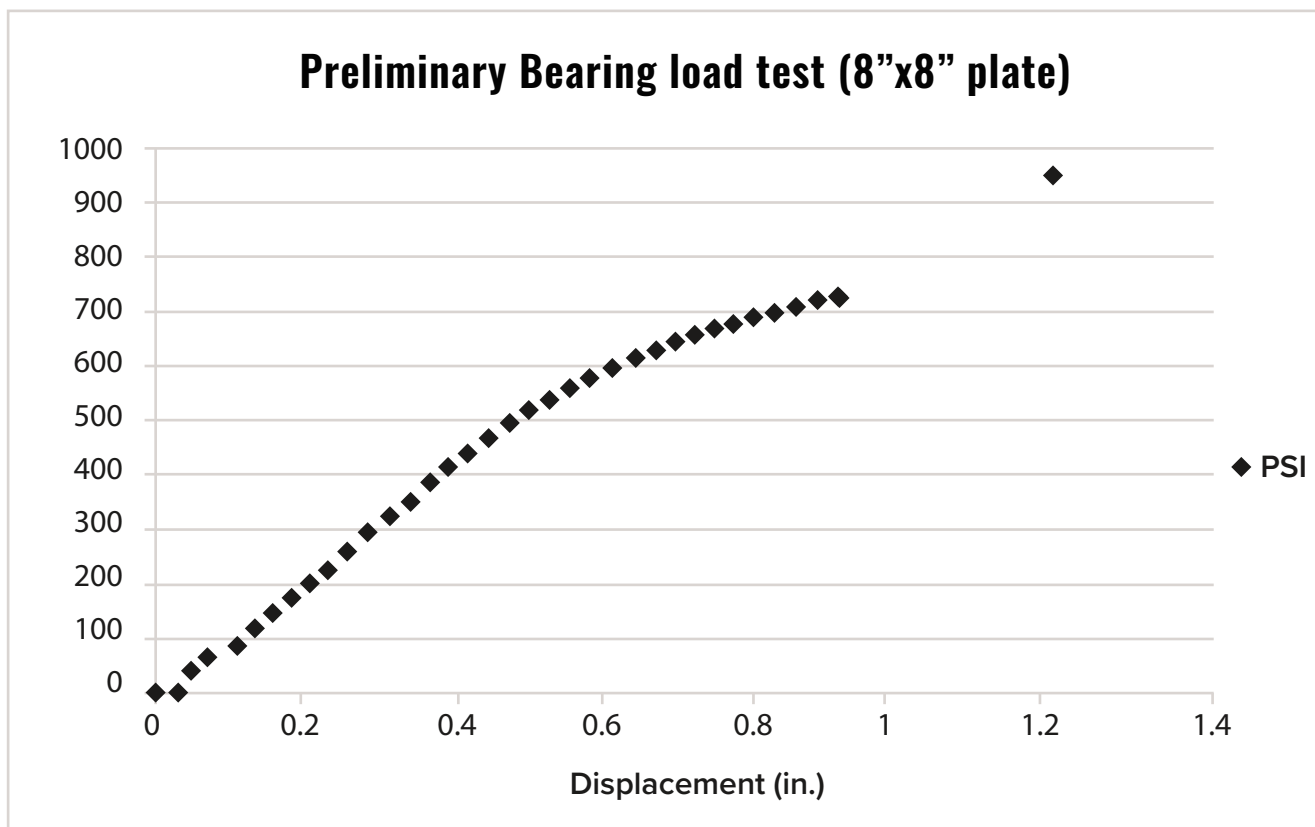
The force was applied slowly & consistently. Manual readings of force were taken every 0.5mm of displacement.

Test Results

The measurements were taken until the dial indicator for displacement was at its maximum. At that point (.88 in) the force reading was indicating 235.6 Kn or approximately 53,000lbs. Equivalent to 828 PSI.

The press kept applying pressure although displacement could not be certain at this point Prior stopping the test, the force had reached 270 Kn or approximately 60,700 lbs. Equivalent to 948 PSI.

The sample was removed, although the plate left an imprint into the sample the first plastic layer had no tear in it.



Static Dissipative Testing (Resistance)

The results in this reported where obtained by Cube Automation during on-site testing at the Xtreme Mattings Corp. facility, in October of 2016.

Objective

Determine the Resistance, Point to Point (Rtt) of Industrial mat manufactured by Xtreme Mattings Corp.

Introduction

This work was conducted under a mandate entrusted to Cube Automation. Tests were performed indoor at client facility. A total of 5 tests have been performed on the plastic mat.

Point-to-Point Resistance: Also referred to as Resistance Top to top or Rtt, it is a measurement between defined electrodes placed at two points on the floor (or in this case a Mat) at 36 inches apart.

The Rtt measurement is mostly used to assess the electrical consistency of installed floor surfaces and finishes. Rtt also gives the user a good indication that if a charge is generated on the floor, it may be dissipated across the floor's surface.

Specimen and Apparatus

The Specimen is an industrial Mat.

Product Commercial Name: Xtreme HDPE Rig Mat
MatNo. :2016100304

The apparatus used for testing is the Following:
Prostat PRS-812 Resistance Meter & accessories
Serial No.: 912A033
Calibration Date: 2016-09-23
Calibration Due: 2017-09-23

Raytek Mini temp: Surface temperature measurement
Reed LM-8000: Air temperature and Relative Humidity

Test Method

A mat was bought indoor and left several hours to have a stable temperature.

After finding the center of the mat the electrodes were positioned around the center per test format below.

Five tests in different location (Rtt #1 to #5) were done as per test format below. Resistance Point to Point was measured.

Due to anti-slip nature of the mat, the surface is rough. In order to have good conductivity from the probe to the mat slight pressure had to be applied.

Test Results

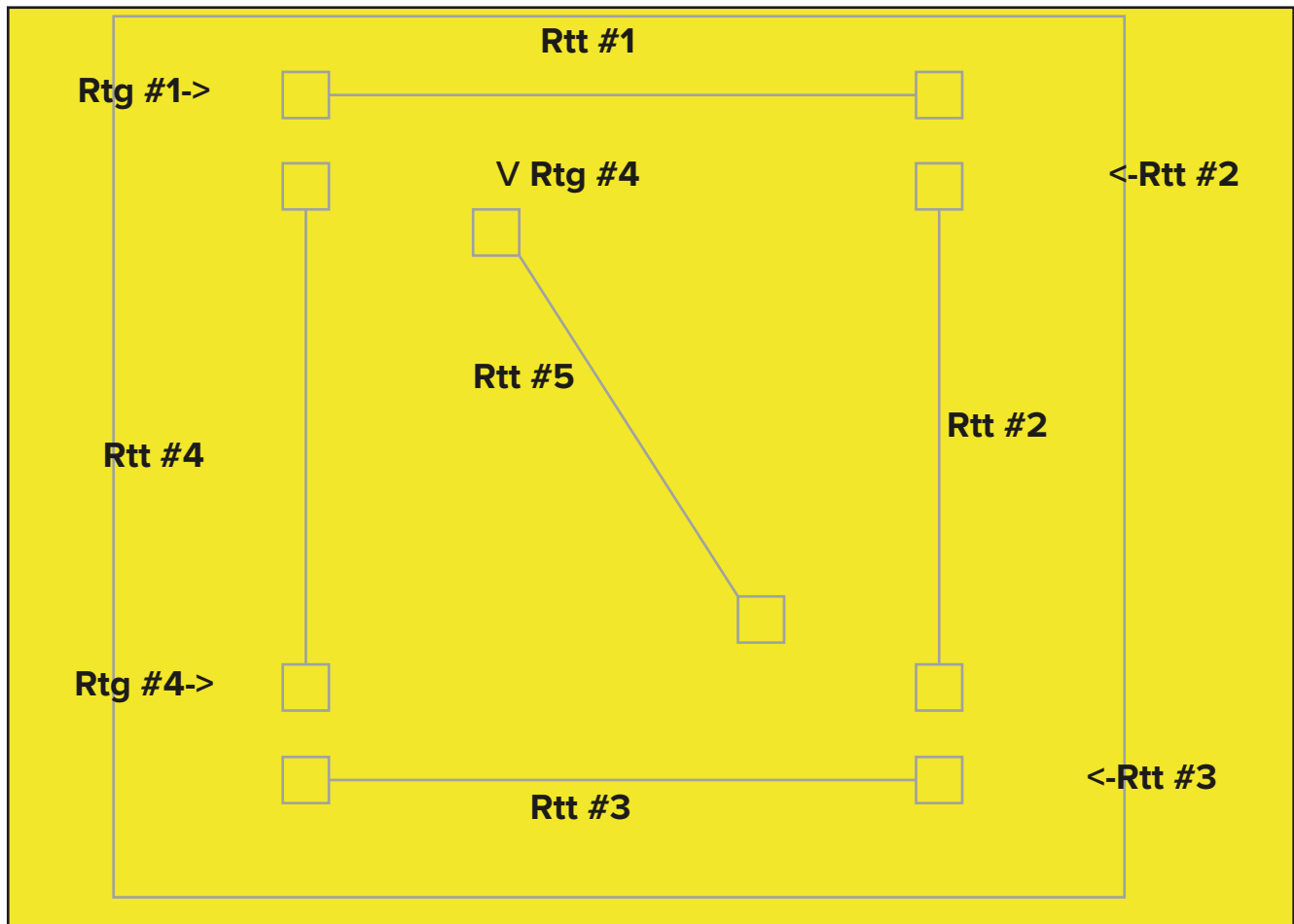


Figure 1: Test Format

Test Results Cont'd

Results

Operator: Louis DeGrace, P.Eng.
Date: 2016/10/05

Test Voltage: 100 Volts (Automatic Mode) Air Temperature: 75°F
Relative Humidity: 25-30%
Surface temperature: 74.3 °F

Position	Ohms
#1	6.60E+10
#2	1.73E+10
#3	2.50E+10
#4	1.73E+10
#5	1.07E+10
Average	2.73E+10
Min	1,07E+10
Max	6.60E+10

The average resistance measured during this test is 2.73 E¹⁰ Ohms.



California Bearing Ratio (CBR) Testing

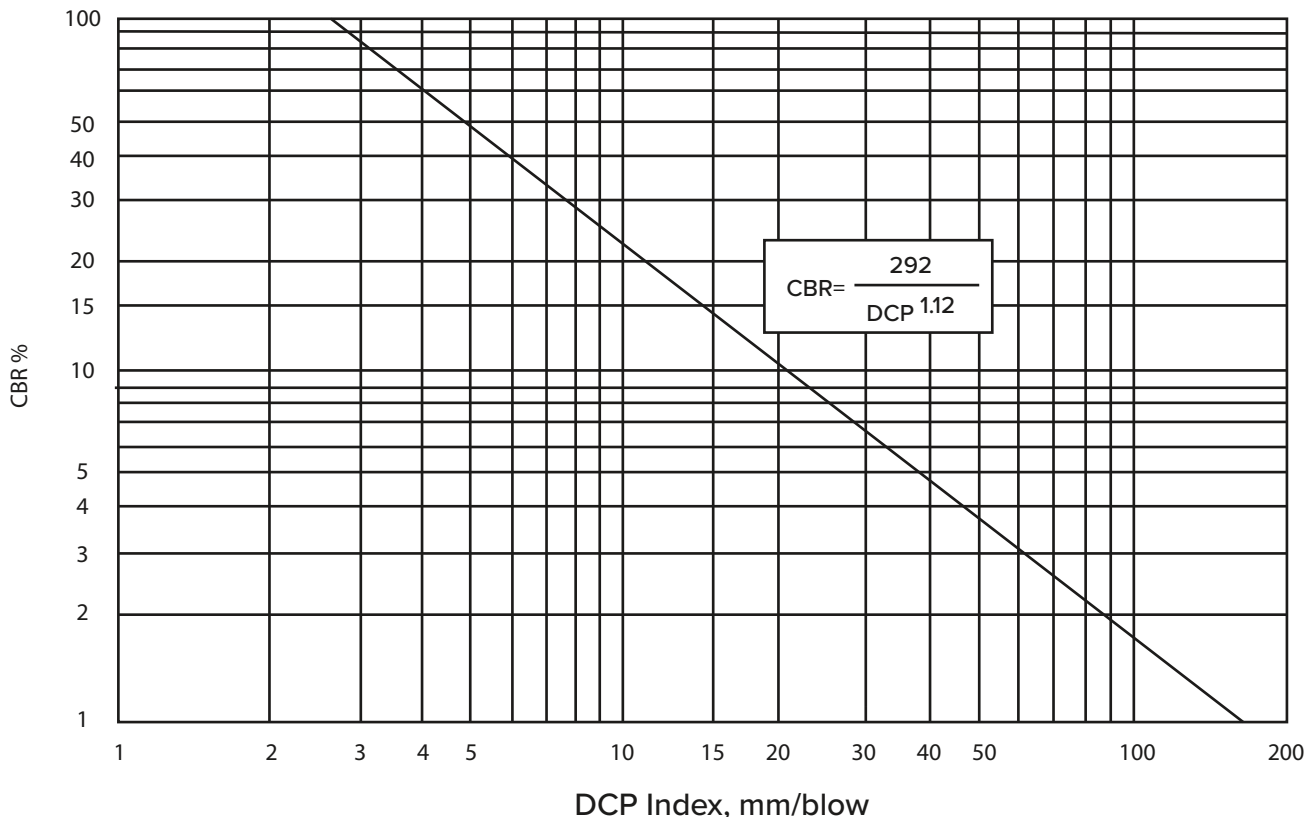
The results in this report were obtained by **COREngineering** using FEA simulation while testing the Xtreme Matting System.

Soil Strength vs California Bearing Ratio (CBR)

$$\text{CBR} = \frac{\text{Penetration resistance of sample}}{\text{penetration resistance of crushed rock}}$$

A California Bearing Ratio (CSR) test as per ASTM standard D4429 will have to perform on site to determine the proper CSR to use for maximum loads.

A Dynamic Cone Penetrometer (DCP) test as per ASTM D6951 can also be performed on site and converted to CSR using the chart below.

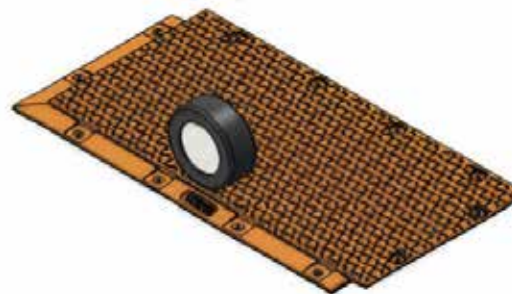


Constant Pressure Load

To test the safe operating limits of the Xtreme Matting System, the method used constant pressure loads of various track & tire systems of different sizes over simulations of various grades of CSR soils.

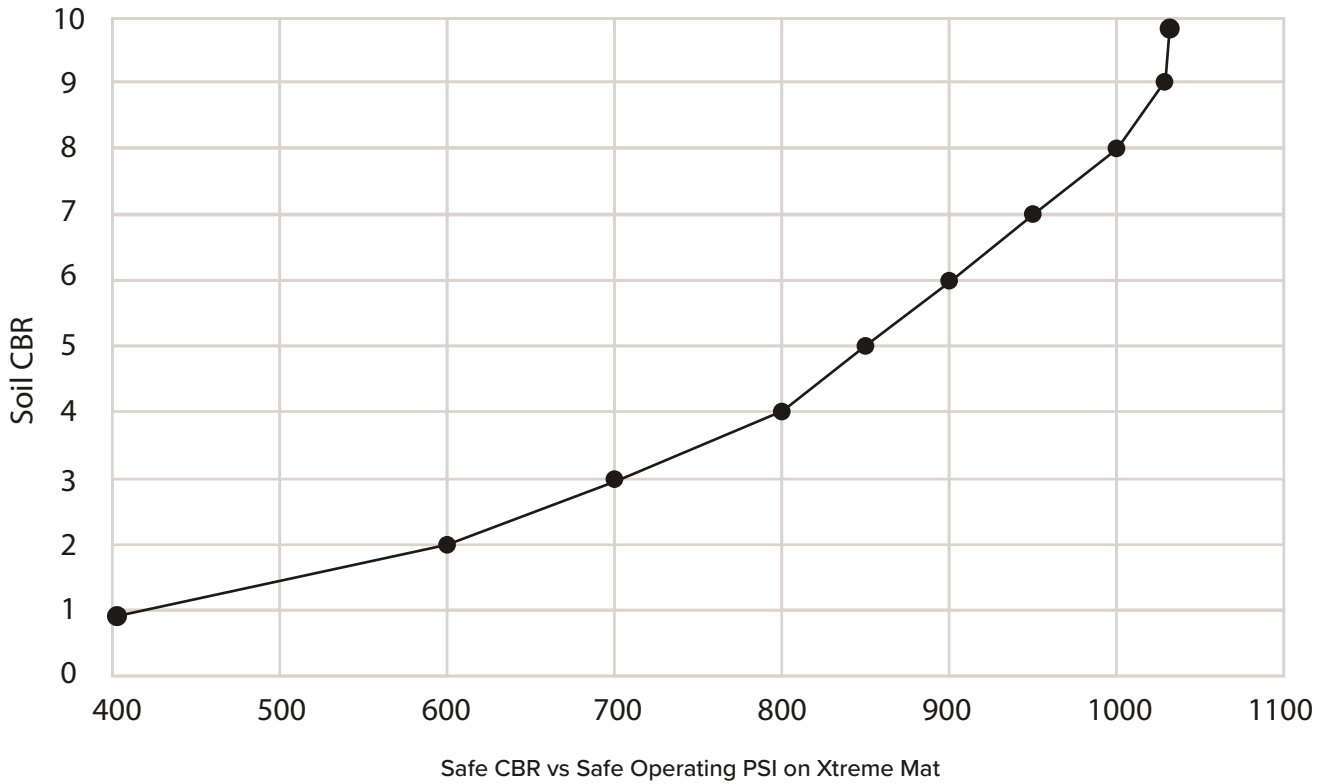


Track System

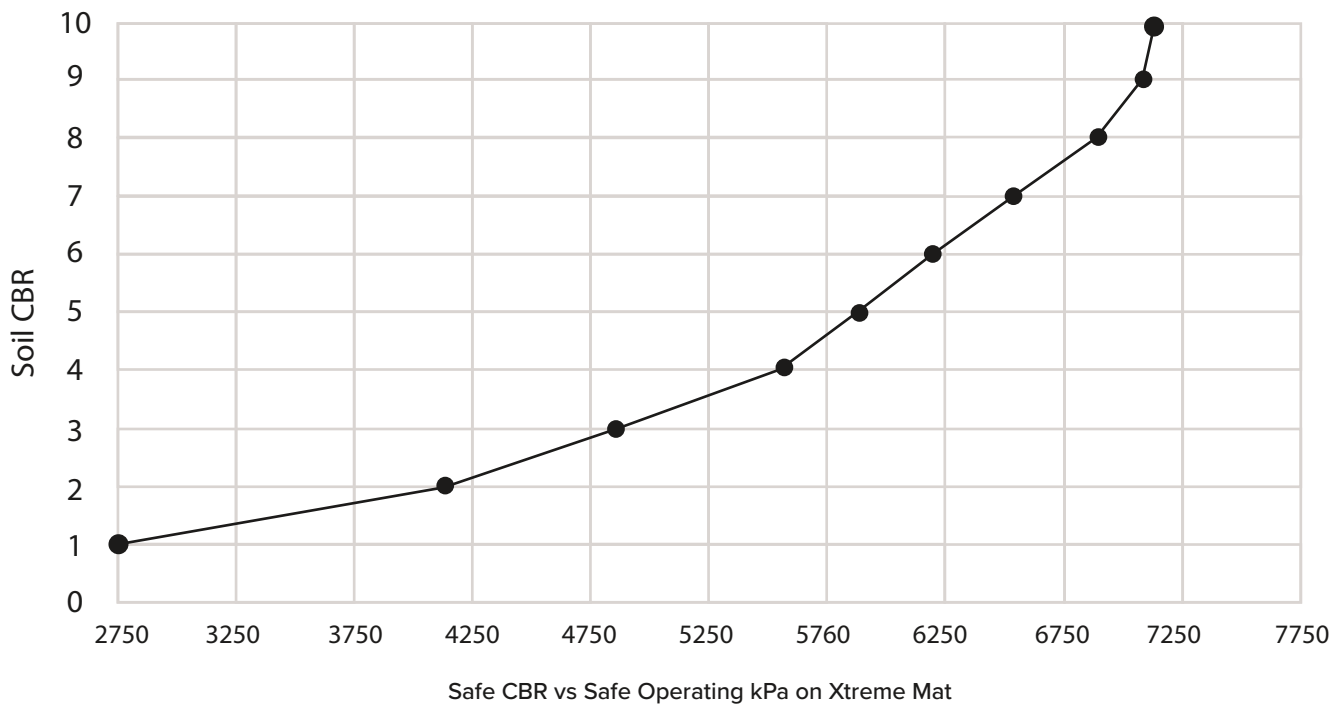


Rubber Tire System

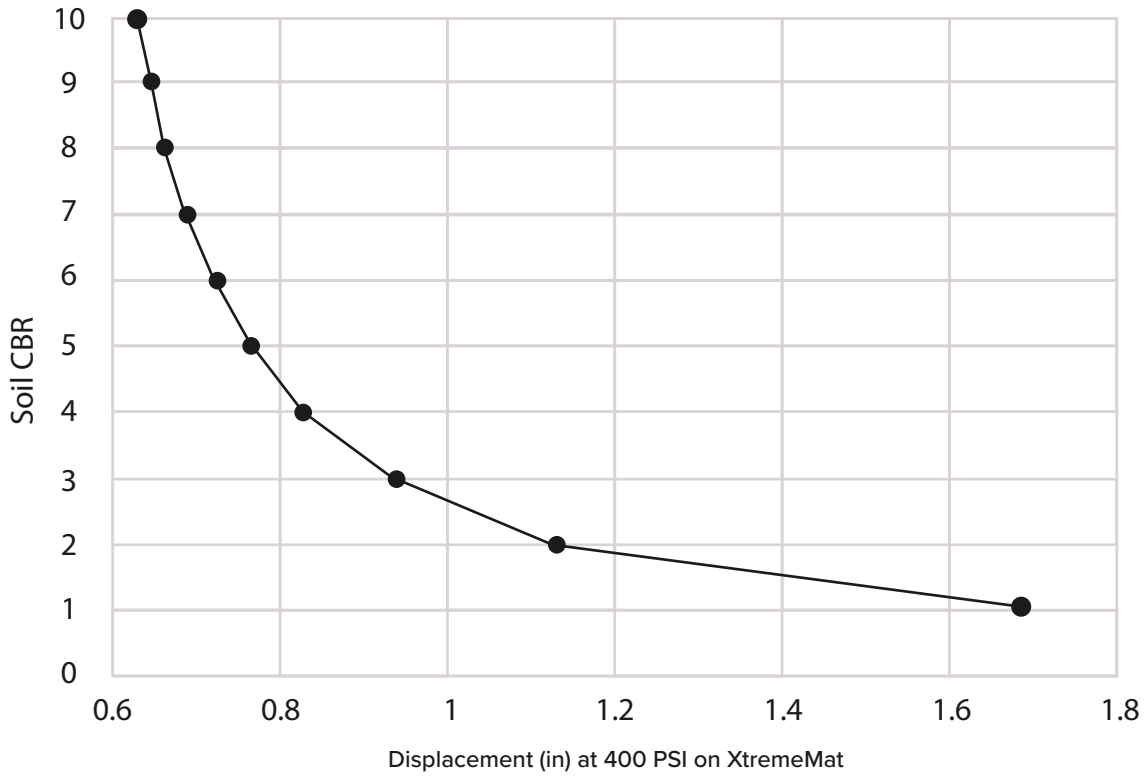
Soil CBR vs Safe Operating PSI Limit on XtremeMat



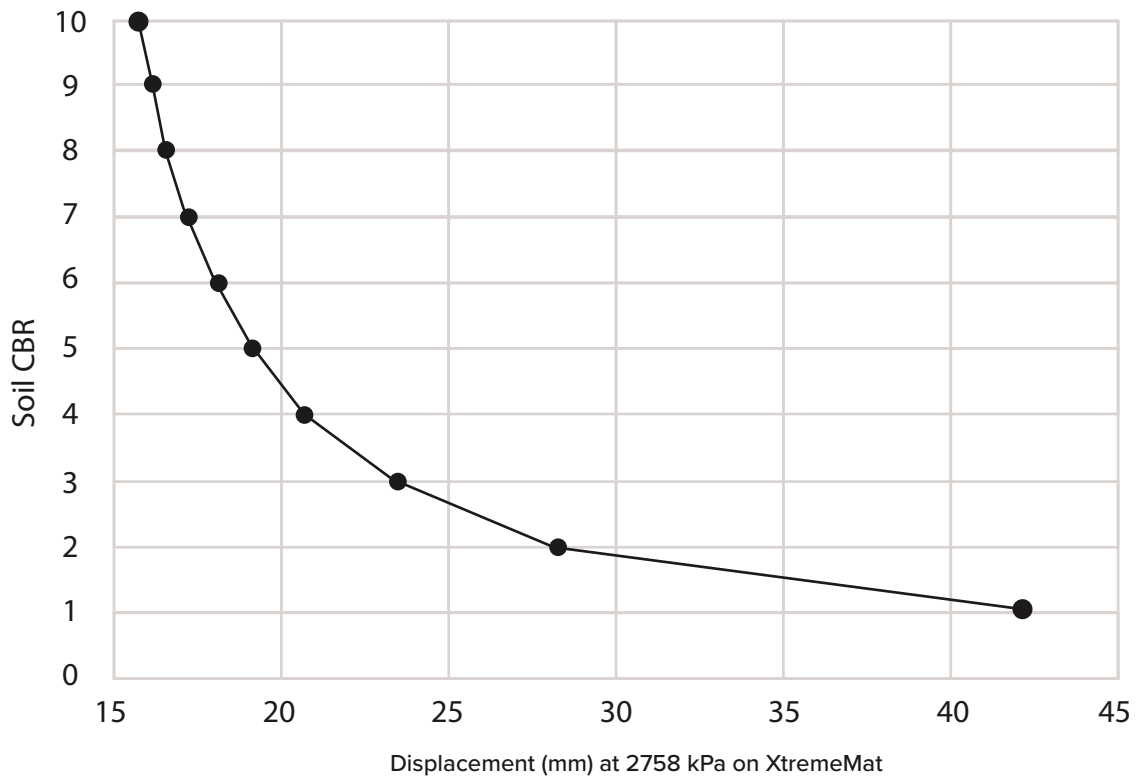
Soil CBR vs Safe Operating kPa on XtremeMat



Soil CBR vs Displacement at 400 PSI on XtremeMat



Soil CBR vs Displacement at 2758 kPa on XtremeMat



XtremeMat®



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