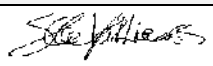
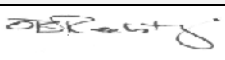
REPORT

CPT2998

CENTRE FOR POLYMER TECHNOLOGY

Prepared for: Portable Event Infrastructure
Attention: Martin Van Wyk
Address: 22 Tungsten Industrial,
7 CR Swart Drive,
Strijdom Park,
Randburg, Gauteng
2195

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	S. De Villiers	
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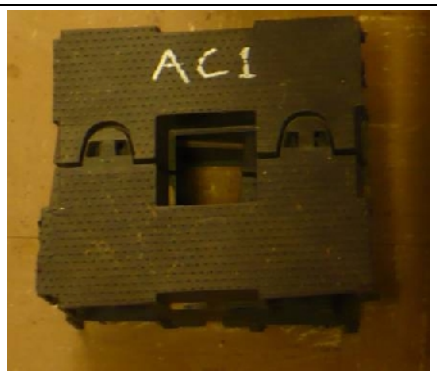
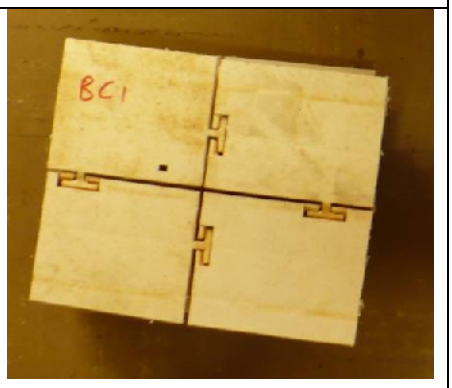
1. INTRODUCTION

The purpose of the analysis is to determine and evaluate the compressive strength of two different samples. The samples are referred to as Composite Base Rig Mats that are made up of sections that interlock to form a platform, thus allowing the user to increase the surface area as required. Prior to installation, the ground is prepared to accommodate the matting. The matting is then compacted into the ground, thus the matting is also structurally supported by the ground.

The compressive strength across the clip-on sections of the samples was investigated, with a difference to the application in that it does not consist of the support provided by the ground. It was therefore tested as is.

2. SAMPLE DESCRIPTION

Table 1 – Detail of the Samples Received

	Samples	**CPT Reference code**
Sample Type:	Base rig mat AF/PP (Area across the Clips)	CPTI - 425AC
	Base rig mat Pro GRI (Area across the Clips)	CPTI - 425BC
Image of sample:	 Specimen 1 – CPTI425AC	 Specimen 1 – CPTI425BC
Samples Received on:	22/08/2014	
Sample Storage:	22/08/2014 – 22/11/2014	
Comment:	Only the areas surrounding the clips were evaluated as they may be a point of ‘weakness’.	

3. TESTS CONDUCTED

- Compression testing as per the method specified within section 4. Method of Test

4. METHOD OF TEST

4.1. Compression Strength

Each specimen from the three samples was prepared to consist of the following dimensions:

Table 2 – Dimensions for samples CPTI425-AC and CPTI425-BC

Sample	Dimensions
CPTI425AC	Length: 0.177m Width: 0.176m Area (m^2): 0.031
CPTI425BC	Length: 0.195m Width: 0.166m Area (m^2): 0.033

The following test parameters were used:

Speed: 10mm/min

Test Termination: When the sample is complete flattened

Note that the samples individually compressed between two parallel plates, which are even and not on a supporting base that are angled with irregular surfaces that one may come across in the field.

5. RESULTS

Table 3 – Compression strength results (Maximum Load)

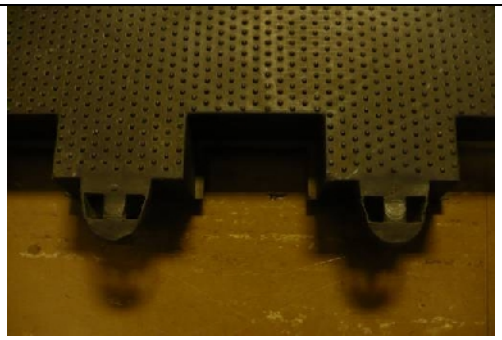
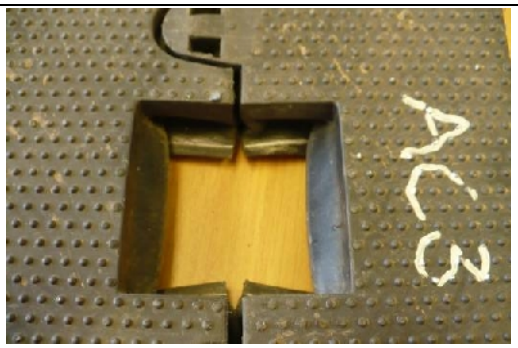
SAMPLES	MAX. LOAD		80% CONFIDENCE VALUE (tons/m^2)
	N	Tons/m^2	
CPTI - 425AC	18891	62.1	50
CPTI - 425BC	34735	107.3	86

***NOTE: Conversion factor Newton to Tons: 9806.88**

Table 4 – Displacement results

SAMPLES	DISPLACEMENT AT FIRST YIELD (mm)
CPTI - 425AC	2.9
CPTI - 425BC	1.8

Table 5 – Observations

Sample CPTI425-AC	Sample CPTI425-BC
Before Compression	
	
After Compression	
	

6. DISCUSSION OF RESULTS

6.1. Terminology

Yielding: The point at which the structural integrity of the sample is compromised as a result of buckling

Buckling: Folding / critical change in shape of the sample

6.2. Discussion of the results for sample CPTI425-AC

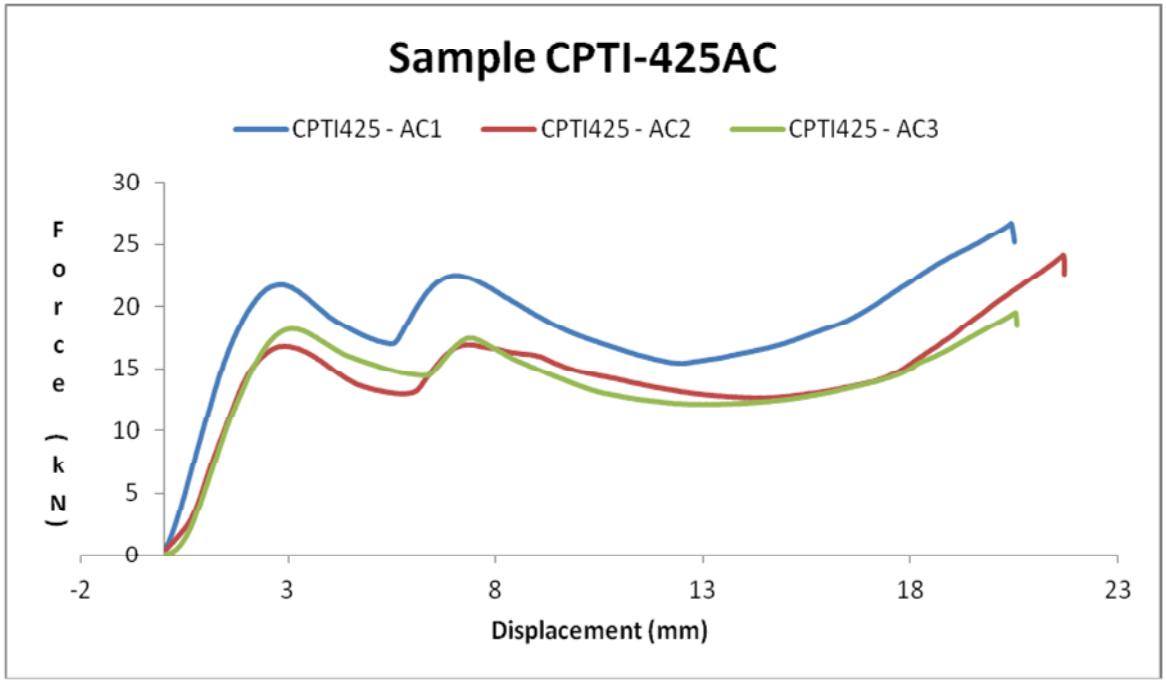


Figure 1 – Load (kN) vs. displacement (mm) curve for Sample CPTI-425AC

Evaluation of the compression curve for the CPTI425AC sample, the samples all yield near 3mm displacement. A secondary yield was observed for all the specimens from sample CPTI425AC, near 7mm. The curve then forms a plateau after which the force again increases near 20mm displacement. This is due to the sample flattening completely.

The forces in the Figure 1 for the sample CPTI425AC, was applied across an area of 0.031m^2 and when converted to Tons per meter squared area, an average value of 50 Tons/m^2 is obtained for the first yield point. This point is selected as the maximum load bearing capacity of the sample, since the structural integrity of the sample is now compromised. See table 5 – Observations.

6.3. Discussion of the results for sample CPTI425-BC

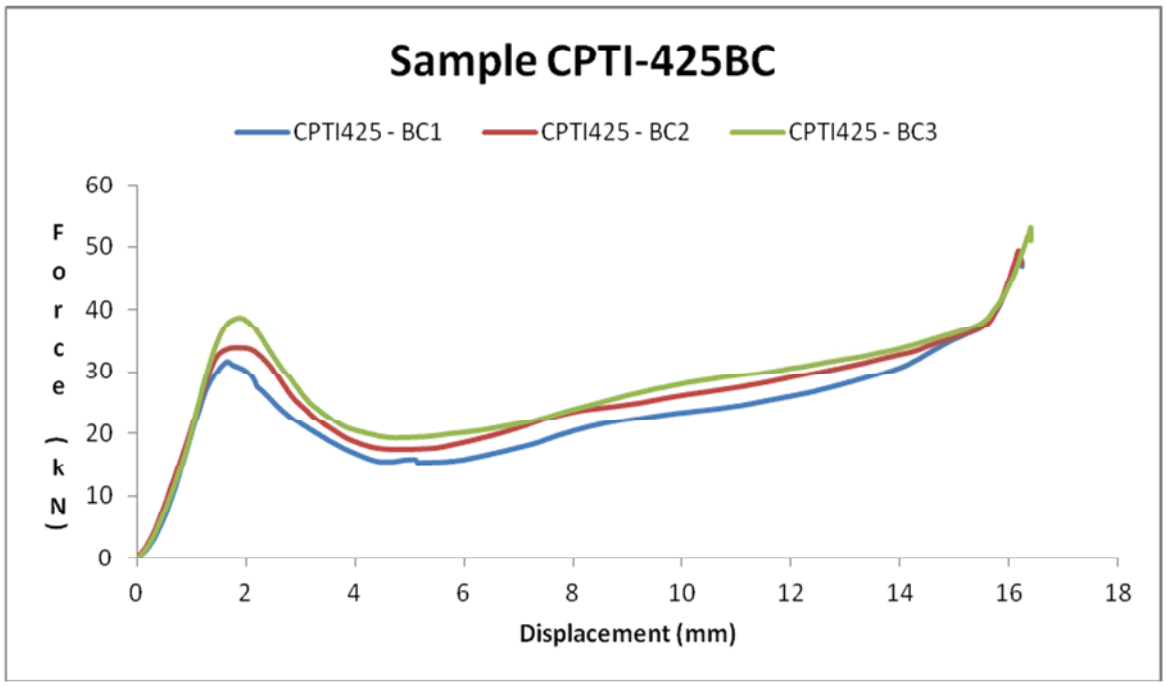


Figure 2 – Load (kN) vs. Displacement (mm) curve for Sample CPTI-425BC

The sample CPTI425BC does not show a second yield point as was observed for sample CPTI425AC. It yielded only once near a displacement of 2mm.
The clips on each of the samples CPTI425AC and CPTI425BC did not show any signs of failure or relating defects. This appears to be due to a sound supporting structure from the design of the samples.

6.4. Confidence levels

It may be favourable to incorporate a ‘safety factor’ or ‘confidence limit’ to ensure the product is not overloaded. An 80% confidence limit is recommended which is determined from the minimum strength value obtained during the tests. Therefore by multiplying the load obtained with 0.8 will give a ‘safe’ load. Converting this to Tons per meter squared we find a value of 50 tons/m^2 for sample CPTI425-AC and 86 tons/m^2 for sample CPTI425-BC. See table 5 – Observations.

6.5. Observations

Referring to Table 5 of the results, the clips on sample CPTI425AC remained in position and was free of any visible defects after compression. The clips on sample CPTI425BC also showed no signs of deformation or any visible defects after compression.

7. CONCLUSION

- Sample CPTI425BC has the larger load bearing capability between the two samples evaluated.