



Established 1980

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## **Dynawest Ltd Quality proven Tested R- PAVE PRODUCT**

***Quality at it's Best from Dynawest Ltd est.2980***

### **University of Portsmouth Enterprises**

### **Limited Test report on Load Testing of R-**

### **Pave Product.**

Samples of R-Pave permeable paving were provided for load testing. As no standard test exists for this product, reference was made to reported testing of competitor products which referred to testing according to BS EN 124:1994 (British Standards Institution, 1994). This standard applies to type testing of gully and manhole tops. The test therefore involves testing with the specimen supported around all four sides with a clear opening across the central section. For the R-Pave product, which is 370 mm square, a clear opening of 250 mm was decided on. According to the standard, for a clear opening of 250 mm, a loaded area of 150 mm diameter was required. To carry out the test, the sample was supported on I-beams around the perimeter and loaded using a 6" (152 mm) loading platen, as shown in Figure 1.

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***Motto Floreat qui laborat***

*(He who labours prospers)*



**Figure 1 – Two-way 250 mm span test setup**

However, since this standard does not represent the loading conditions of the product in service, it was decided that the product should also be tested in a fully supported condition, with the same loaded area. The test setup is shown in Figure 2



**Figure 2 – Fully supported loading test setup**

In both cases, three samples were tested. The tests were carried out with a constant crosshead speed of 1 mm/min.

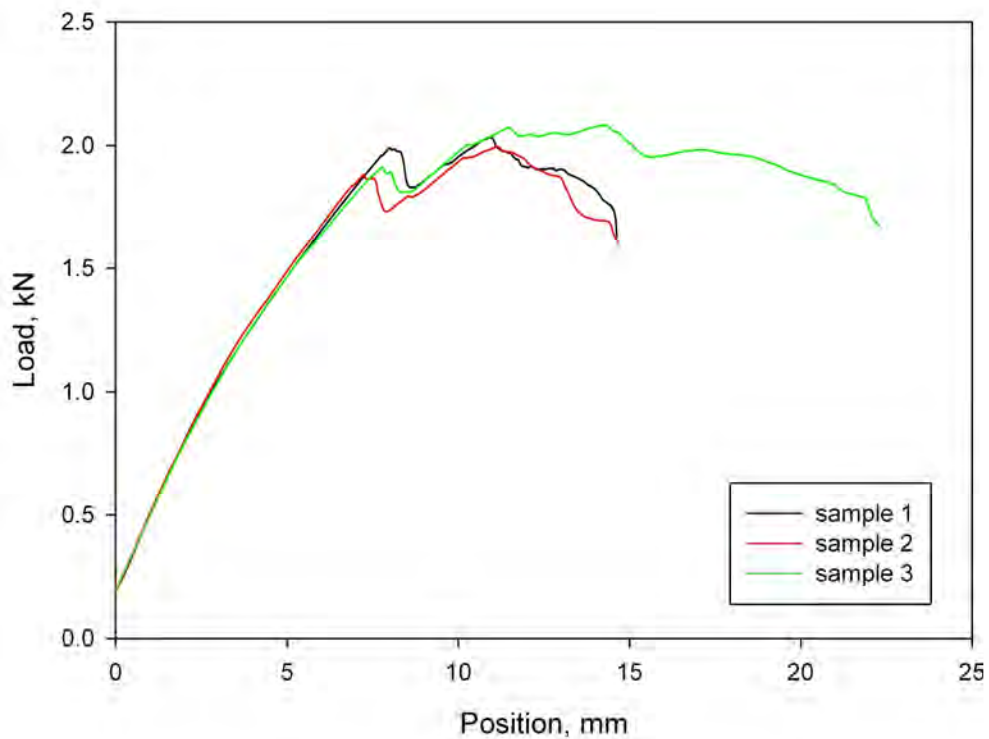
### **Results and observations**

The results of the tests are shown in Figures 3 and 4. The position axis in Figures 3 and 4 represents the movement of the crosshead of the testing machine. This provides a rough estimate of sample deformation, but it overestimates the true deformation.

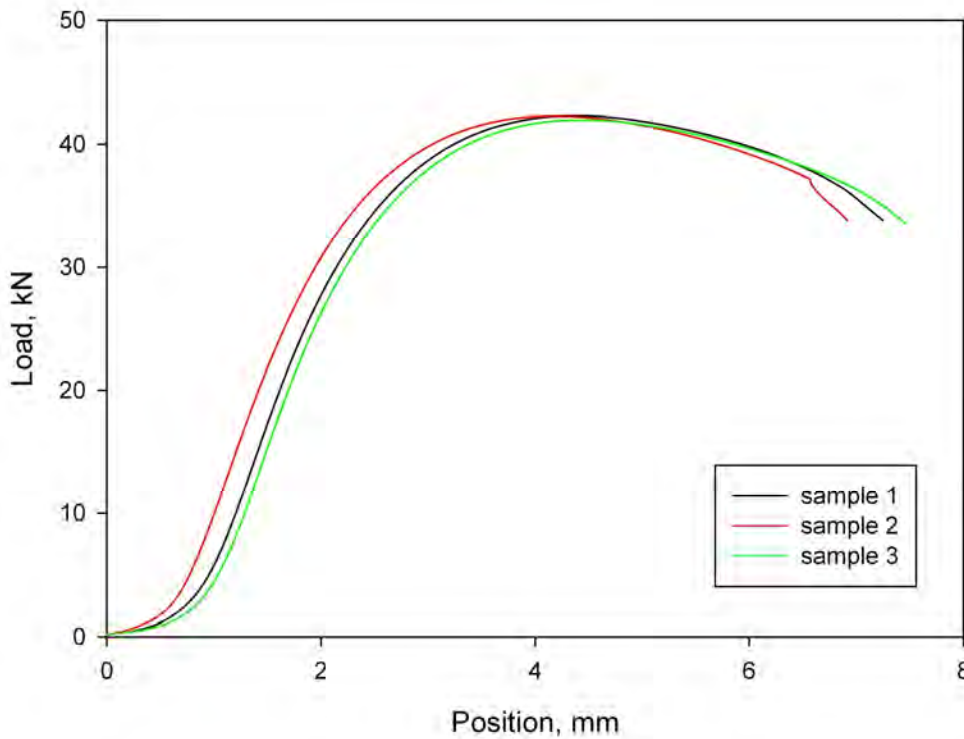
Table 1 shows the maximum load recorded for each sample, along with the calculated load per unit area based on these test results.

Samples tested in the fully supported condition failed by compression with localised buckling of the cylindrical cells of the product. Samples tested with a clear opening had a different failure mechanism with cracks visible on the underside of the samples, as shown in Figure 5.

The two test conditions clearly gave very different results with the true load capacity in service likely to be somewhere in between these two extremes.



**Figure 3 – Load versus position for R-pave samples tested with 250 mm clear opening**



**Figure 4 – Load versus position for R-pave samples tested in fully supported condition**

Table 1 – Maximum load of the tested samples

Load condition	Sample no.	Maximum load, kN	Failure load per unit area , kN/m <sup>2</sup>	Failure load per unit area **, tonnes/m <sup>2</sup>
Fully supported, 152 mm diameter loaded area	1	42.29	2318	236
	2	42.27	2317	236
	3	41.96	2300	234
	Average	42.2	2312	236
250 mm square span, 152 mm diameter loaded area	1	2.034	111.5	11.4
	2	1.996	109.4	11.2
	3	2.084	114.2	11.6
	Average	2.04	111.7	11.4

\* kN/m<sup>2</sup>=maximum load divided by loaded area in m<sup>2</sup>.

\*\* tonnes/m<sup>2</sup>=kN/m<sup>2</sup> divided by 9.81 m/s<sup>2</sup>



**Figure 5 – Underside of sample tested with clear opening below, showing cracking of the sample**

### **Reference**

British Standards Institution (1994). BS EN 124. Gully tops and manhole tops for vehicular and pedestrian areas – Design requirements, type testing, marking, quality control. London: Author.

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