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## **Study comparing WoodCarpet® engineered wood fiber installed over drainage versus no drainage: Final Report**

### **I. Introduction to the Study**

#### **Purpose**

Zeager Bros., Inc. has been recommending to our customers the need to install WoodCarpet® engineered wood fiber (EWF) over a recommended drainage system for several reasons. Some of these reasons has been to extend the life of the EWF, limit mold & fungus growth, and to limit the EWF from freezing therefore making the surfacing less resilient during freezing temperatures. This study focused on the decay rate of the EWF.

#### **Background**

Although it seems reasonable that adding drainage underneath WoodCarpet® (EWF) surfacing to eliminate water would extend the life of the surface, we felt it was necessary to try to back up our claim.

### **II. Limitations**

The study is limited in the following ways:

1. The study was conducted on 3 beds of compacted WoodCarpet® engineered wood fiber, not actual playgrounds.
2. We used a hand tamper to compact the surface periodically before each measurement to replicate kids running over the surface. Playground use will affect surfacing conditions.
3. The site was located at our Middletown, Pa office. Climate and weather are common factors as well as location of the playground in particular the amount of sun and shade will affect decay rates in different parts of the country.

### **III. Data collection procedures**

1. Three beds approximately 6 feet by 6 feet were prepared for the test. One bed had Duradrain® foam drainage panels installed which specified 9” of WoodCarpet® engineered wood fiber installed and compacted over it. The second bed had fabric and drainage stone installed at approximately 3” depth and 12” of WoodCarpet® installed and compacted over it. Each of these 2 beds had drainage pipes installed at the low end of the bed. A third bed was installed with just a layer of fabric over the soil with 12” of WoodCarpet® installed and compacted over it.



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## Data collection procedures – (cont)



2. To measure decay rates a string was placed over the surface in three areas of the beds and a measurement was taken between the string and the top of the surface on the first day of installation in July of 2009. The beds were left to weather until April of 2011.



3. In April of 2011, the surface was compacted by using a hand tamper and dropping it approximately 24” from the surface.





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4. Measurements were taken in April, May and July of 2011 in each bed.



## IV. Results

Each measurement was recorded and an average depth loss was taken for the lower, middle and upper section of each bed. The following results were observed:

### Average WoodCarpet® percentage remaining:

**Bed with Duradrain foam drainage: 80% remaining**

**Bed with Gravel drainage : 78% remaining**

**Bed with no drainage installed: 71% remaining**

The bed with the Duradrain® foam drainage performed best with a 20% loss of surfacing material while the gravel drainage was nearly the same at 22% loss. The bed without the drainage had nearly 30% loss of material.

## V. Other Observations

Impact testing was performed using a Triax 2000 impact tester to measure the Gmax and HIC (head injury criteria) of each bed in. No significant difference was observed between the beds. All had met the pass/fail criteria easily. The only difference we observed was the apparent breakdown of wood fibers and some mold that was forming in the bed with no drainage. By May of 2011, mold had formed on the bed with no drainage.



This is not to say that drainage will totally prevent mold and fungus from forming on the surface of EWF. Climate conditions, lack of sunshine and use will also effect the growth of molds on the surface of EWF but it was apparent that lack of drainage may have had something to do with the appearance of mold in just this one bed and not the other two.

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## VI. Conclusion

Preliminary results indicate what we first believed that adding drainage will help to slow down the rate of decay of Engineered Wood Fiber. Depending on the size and quantity of your playgrounds, 10% could add up to some significant savings. What is unknown is how much will it save the consumer over the life of a typical playground surface after several years top offs and the lower levels of the wood fiber break down as the years go on. Will the decay rate increase as the playground ages?

Maintaining your playground surfacing thickness to proper levels is very important at any rate and we will share more information as the knowledge becomes available.

Jeff Mrakovich

A handwritten signature in black ink, appearing to read "Jeff Mrakovich", written over a horizontal line.

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