Finding Natural Ground: Sustainable Residential Flooring

**INTRODUCTION:**
Buildings have a large environmental impact because they consume raw materials, emit greenhouse gasses, produce waste, and involve synthetic materials. One opportunity to significantly reduce the environmental impact of buildings is with flooring. Carpet and laminate are the most popular choices for residential flooring. However, consumers are unaware of the environmental and health risks. With the recent movement to lower human environmental impact, flooring companies are providing more sustainable flooring options. The flooring market may be difficult to maneuver provided deceiving or misleading labels, lack of environmental assessment information provided to consumers, and overall lack of education on sustainable materials presented to consumers. While considering new flooring, consumer goals must also be factored into the decision. This research attempts to find which sustainable flooring material is the best solution for residential homes depending on the goal of the consumer.

**METHODS:**
To answer my research question, I conducted an extensive literary review along with semi-structured interviews with an architect, carpenter, and sales specialist. To better understand flooring materials, I reviewed characteristics of carpet, laminate, domestic hardwood white and red oak, bamboo, cork and engineered flooring. I used product descriptions from flooring companies, industry magazines and newspapers, and books. To understand the environmental impacts involved with common flooring materials that had the most recent data, I reviewed case-studies, industry reports, company reports, trade journals, life-cycle analysis, and material comparison reports. I sought out material tests to distinguish each material’s performance. To apply my findings, I compared material characteristics and related them to consumer goals that had been identified.

**RESULTS:**
Domestic hardwood oak, engineered, bamboo and cork materials each affect the environment to a different degree ranging in renewability, harmful chemicals, embodied energy, and waste, but all materials are better for the environment than laminate and carpet. At least one of the four materials included in the studied can replace some characteristic that make carpet or laminate appealing, while posing a smaller impact on the environment. Bamboo’s performance in relation to consumer goals is the most successful of the four materials. Because bamboo is imported to the U.S. from China, it emits more Greenhouse Gasses into the atmosphere than domestic flooring options. Therefore, the single material that emulates both consumer goals and sustainability most successfully is domestic hardwood oak.

**WORK CITED:**

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**MATERIAL AND GOAL COMPARISON**

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>COST</th>
<th>DURABILITY</th>
<th>AESTHETICS</th>
<th>AIR QUALITY</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Oak</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Engineered</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Bamboo</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Cork</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>8</td>
</tr>
</tbody>
</table>

Materials rated performance for top four consumer goals. The higher the rating the more successful of a performance.

**JANKA HARDNESS TEST**

Materials rated performance for top four consumer goals. The higher the rating the more successful of a performance.

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**DOMESTIC HARDWOOD**

**ENGINEERED**

**BAMBOO**

**CORK**

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The higher the Janka scale rating, the harder the material. Thus, Bamboo is the hardest, then engineered, white oak and cork respectively.