

**BACKGROUND:**

Teton Bear Products, LLC, is an entity formed in September 2016 by a Wyoming resident with interests in waste diversion and reduction of human-wildlife conflict. This interest developed from a career in natural resource management, a graduate course in human-wildlife conflict, and personal involvement in composting.



**GOAL:**

To develop a single prototype unit, capable of composting materials including but not limited to food. The unit will be sized for residential and small-scale use. The unit will resist damage and feeding from animals including scavengers and bears, and will be certified as bear resistant by the International Grizzly Bear Committee (IGBC), through testing at the Grizzly & Wolf Discovery Center (GWDC) in West Yellowstone, Montana.

Below is information on the purpose, and testing procedure, for bear resistance testing of containers, at the Grizzly & Wolf Discovery Center.



*Figure 1. Bears attempting to gain access to attractants. Photo credit- Grizzly & Wolf Discovery Center web site.*



Figure 2. Bear attempting to access attractants. Photo credit- Grizzly & Wolf Discovery Center web site.

“In keeping with its continuing effort to educate the public on living and traveling safely in bear country, the Grizzly & Wolf Discovery Center cooperates with state and federal agencies in the testing of bear-resistant food and garbage storage containers. Bears that learn to associate people with food often become dangerous and are ultimately killed or placed in captivity. Keeping bears out of human food and garbage is the best way to ensure their survival in the wild.

The testing procedures start with the manufacturer bringing their product to the GWDC. Then, it is placed in the bear habitat and baited with especially enticing foods. After that, the bears must try to get into the container for 60 minutes for it to be considered tested. If they are unable to open the container or obtain food from it, the container passes as “bear-resistant” and receives certification from the Interagency Grizzly Bear Committee (IGBC). Containers that do not pass can be modified and re-tested at a later date. Containers that pass can be used to help prevent bear-human conflicts.”

(Grizzly & Wolf Discovery Center, accessed June 17, 2018, <https://www.grizzlydiscoveryctr.org/research/product-testing/> )

Teton Bear Products, LLC, has cooperated with the Wyoming Small Business Development Center (SBDC) Network since December 2017 for business advising, support, and resources. SBDC has conducted encouraging market research for this product, and supports working with Montana State University for this step of business development, and is supportive of this product concept. SBDC is a partnership between the University of Wyoming, the Wyoming Business Council, and the U.S. Small Business Administration, offering business expertise, including starting a business.

#### **DESIGN AND SPECIFICATION IDEAS:**

**Materials:** An independent mechanical engineer recommended the use of rotational molding (rotomolding) for the development of the prototype. Rotomolding has reduced tooling costs, short production times, can be less expensive than other plastic molding methods, offers design flexibility for complex shapes, and can offer strength, durability, and corrosion resistant parts. A source for rotomolding information is: <https://rotomoldusa.com/rotomold/>

**Cost:** Production cost of the unit should be affordable to an average consumer. As use of this product increases, the resulting natural resource benefits will correspondingly increase.

**Ease of Use:** End users will regularly add inputs of food and other compostable material to the container. The end user will infrequently (ex. every 4-20 weeks) evacuate the container of the finished product- soil. The container will have 1) a single access point for inputs and evacuation, or 2) separate bear resistant openings for inputs and evacuation. The access for inputs must be adequately convenient for regular use, and may be a relatively small size (ex. 6" diameter hole). The opening for outputs, if separate, shall be a larger size, for easy evacuation of soil, as well as to access the area with an implement such as a shovel for troubleshooting.



Figure 3. Soil, the product of composting. Photo credit- USEPA web site.

"Compost is organic material that can be added to soil to help plants grow. Food scraps and yard waste currently make up 20 to 30 percent of what we throw away, and should be composted instead. Making compost keeps these materials out of landfills where they take up space and release methane, a potent greenhouse gas." (United States Environmental Protection Agency, accessed June 17, 2018, <https://www.epa.gov/recycle/composting-home> )

**Aeration:** A key function of composting is the ability to aerate the unit. Though options for aeration include manual (ex. use of a pitchfork) turning of compost, this unit will be enclosed and able to be manually rotated for aeration. This can be accomplished numerous ways, including use of a crank arm and gearing, manually spinning a cylinder, or having a lever arm or some way to gain mechanical advantage to turn and aerate the unit. The goal is to ensure the unit and any devices developed to rotate/aerate the unit is durable, and requires minimal physical input, to accommodate users with a wide range of physical capabilities.

**Fluid Capture:** The unit may be used in a variety of settings, varying from a rural setting where the unit is physically and visually distal from buildings and end users, to an apartment's deck where space is limited, to a paved area outside a small office. These settings are not all suitable for allowing continuous fluid drainage from the unit, due to aesthetics, odor, etc. The capture and retention of fluids, and the ability to drain the captured fluids, are required. The fluid capture container may or may not be a separate component from the unit holding composting materials.

**Weight:** Utilizing materials that minimize weight can reduce shipping costs, and also can result in a product that is more easily operated by users with a wide range of physical capabilities.

**Color:** Color may affect the interior temperature of the product, and hence the composting process. Aesthetics are also of importance, such as blending in with the home, facility, or surroundings.

**Location:** The product is envisioned for outdoor use. It potentially could be placed in an enclosed garage or unenclosed area, but will be built to a standard for unenclosed outdoor operation, including precipitation, sunlight, freeze melt conditions, and wind.

**Odor resistance:** Odor resistant material(s) will limit the ability of this unit to attract scavengers. Proper composting technique (ex. proper amounts of nitrogen, and carbon, inputs) will reduce odor. However, materials that reduce odor will also be beneficial.

**Production/Fabrication:** This product will be fabricated and produced at a minimum, domestically, and further, as locally as possible. This supports the goals of improving and diversifying local employment opportunities, and to build the product where it is relevant.