



УДК 7.012.185

EXPLORING SUSTAINABLE PACKAGING: REUSE DESIGN

TANG Cong¹, PASHKEVYCH Kalyna²

¹ Hunan University of Technology, Zhuzhou, China

² Kyiv National University of Technologies and Design, Kyiv, Ukraine
cong tang122@foxmail.com, pashkevich.kl@knuatd.edu.ua

The article is devoted to the problem of sustainable packaging design that reduce packaging waste to recycle in the stage of design. The rules of 3R is discussed at the beginning as a design concept. This study only focus on Reuse of 3R to packaging design. Materials, manufacture, structure and aesthetic for hard containers' packaging for sustainable development have been analyzed. The use of hay which can be easily shaped and planted into a potted plant is recommended. More reuse packaging can be designed with the concept of sustainability, in order to save resources and reduce waste.

Key words: *sustainable packaging, reuse design, packaging design, reduce waste, 3R policy.*

INTRODUCTION

Increasingly serious environmental damage has made people gradually realize the importance of sustainable development, among which the problem of the large amount of packaging waste generated every year has become one of the major environmental problems in the 21st century [1]. However, in terms of sustainable packaging design, many designers and researchers put forward a different understanding. To understand the sustainable development in packaging design, we have to understand the rules of 3R which was proposed by the European Union, which is applicable to packaging design and manufacturing, waste recycling and classification. Specifically, It means Reduce, Recycle and Reuse [2, 3]. This rules have long been widely used in European countries. According to a survey by Wang et al., countries implementing the rules of 3R can reduce packaging waste by 3% and corrugated board waste by 12.4% [4]. Therefore, to decrease the burden of packaging waste to the environment, carrying out reduce, recycle and reuse to sustainable packaging design is more strategic and feasible.

PURPOSE

The purpose of the study is exploring a kind of packaging based on the Reuse concept under the rules of 3R to promote sustainable development.

RESULTS AND DISCUSSION

The mission of packaging is to provide functions to the products. its main ranges include protection, convenient to load, unload and handle, communication. Moreover, containing, reducing environmental pollution and recycling resources



have also been proposed by most scholars [5]. Therefore, the premise of reusable packaging design is to meet the basic functions of the product.

Reuse means that the packaging will not be discarded as garbage after the packaging has completed its transportation mission that delivered the product to the consumer in good condition, but begins its new mission which is applied to other purposes to expand its use value. Gradually, reuse packaging design is closely related to the packaging materials and the packaging structures. The most important thing is that the functional requirements between the packaged product and the reused purpose are met simultaneously with appropriate packaging materials and suitable packaging structures.

A packaging for hard containers, such as ceramic and glass, with the concept of reuse was studied and designed (Fig. 1). It is named "Life Cycle Box". The packaging material is dried grass that can be pressed to fit the shape of the item by harvesting, powdering and drying, then cutting and arranging, finally mixing with adhesives, pressing and drying. The advantage of the packaging design is material of hay is fast growth, low cost, biodegradable, which is environmentally friendly and pollution-free to the nature. Because pressed hay has a certain elastic space, it can provide strong cushioning properties to package different shapes of hard containers.

In the aspect of aesthetic, the touch and smell of hay are associate with nature, so the packaging gives a bright and fresh visual atmosphere. In addition, the combination between hay box and white and green covers creates visual hierarchy which attracts more people's eyes.



Fig. 1. Life Cycle Box – Sustainable Packaging Design [2].

After the product is delivered to the consumer successfully, reuse value will be realized. Fig. 2 shows a process of the Life Cycle Box. People can water the Life



Cycle Box according to the instructions in the back of covers. The pre-planted seeds will grow plants in about one week as ornamental potted plants.



Fig. 2. Reuse Design Diagram with Life Cycle Box.

In spite of Life Cycle Box is a kind of reuse packaging design. More product packaging can follow this environmental concept and design thinking, which will contribute to reducing the environmental burden.

CONCLUSIONS

The reuse function of packaging needs to be planned at the stage of concept and design, as it involves product attributes, packaging materials, structural design and ideas. For different products, packaging forms are different, reuse purposes are not the same. However, a good reuse packaging design should not only protect the product, but also be reasonable and appropriate for reuse. The aim is to reduce packaging waste and avoid generating burdens on the environment.

REFERENCES

1. Grönman K., Soukka R., Järvi-Kääriäinen T., Katajajuuri J.-M., Kuisma M., Koivupuro H.-K., Linnanen L. Framework for Sustainable Food Packaging Design. *Packaging Technology and Science*, 2012. 26(4), 187–200. <https://doi.org/10.1002/pts.1971>
2. Rutkowski J. E. Inclusive Packaging Recycling Systems: Improving Sustainable Waste Management For A Circular Economy. *Detritus*, 2020. 13, 29–46. <https://doi.org/10.31025/2611-4135/2020.14037>
3. Oloyede O. O., & Lignou S. Sustainable Paper-Based Packaging: A Consumer's Perspective. *Foods*, 2021. 10(5), 1035. <https://doi.org/10.3390/foods10051035>
4. Wang G., Zhu J., Cai W., Liu B., Tian Y., & Meng F. Research on packaging optimization in customized panel furniture enterprises. *BioResources*, 2020. 16(1), 1186–1206. <https://doi.org/10.15376/biores.16.1.1186-1206>
5. Lindh H., Williams H., Olsson A., & Wikström F. Elucidating the Indirect Contributions of Packaging to Sustainable Development: A Terminology of Packaging Functions and Features. *Packaging Technology and Science*, 2016. 29(4-5), 225–246. <https://doi.org/10.1002/pts.2197>