

Design of a new single-use mineral water bottle

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Since people start to pay more attention to plastic pollution, how to improve single-use mineral water bottles to reduce the stress of the environment has become a focus of attention. The PUMA MANIFESTO initiated by NVC Netherlands Packaging Centre aims to “end packaging as an environmental issue worldwide” by gathering the efforts of packaging communities worldwide and inspiring future generations to solve the environmental issues associated with packaging. NVC is highly interested in integrating Chinese insights and views in the PUMA project and so provided this assignment. Thus, the goal of this project is to create an improved single-use mineral water bottle for the Chinese market that has fewer effects on the environment than the current ones, while taking the PUMA MANIFESTO as a starting point. In order to achieve this, two design goals are proposed. Firstly, the product should first be able to provide a suitable amount of water to users with less material, in another word, have a higher utilization ratio. Secondly, the product should guide the users to dispose of the bottle properly after drinking up the water to support the Collect-Control and further backend processing of the emptied packs.

As an approach to answer the main question, “How can the design of the single-use mineral water bottle encourage users to dispose of the packaging correctly as well as increase the utilization ratio of each bottle”, the first step was to analyze the backgrounds of current single-use mineral water bottles by literature research. With the literature review, the following topics were investigated: 1) why there is pollution caused by these bottles, the environment of the Chinese market, 2) the existing products, 3) current garbage classification regulations and 4) current technologies of making and recycling single-use mineral water bottles. Through these topics, the problems of current single-use mineral water bottles in China and possible design directions can be investigated. Besides the literature researches, there are 12 interviews with Chinese people to analyze the target group of the project. The result of these interviews is to find what can be improved to reduce the adverse effects of single-use mineral water bottles on the environment based on the interaction between the bottle and user, as well as narrow down the target group to students and employees.

After the literature researches and the interviews, a requirement list for the design was created. Based on the requirement list the design process was followed up by the ideation phase. The ideation was divided into three directions, each of them linked to problems found during the analysis phase and matched a part of the design goal. The concepts chosen were based on the consideration of the balance between new changes, the cost and the amount of material saved by the design. As a result, the

Zeigarnik effect, a psychological effect that states that people tend to remember the tasks they do not finish more than the tasks they have already done, is used to encourage users to drink up water. This is achieved by links drink up water in the bottle to drink enough water during the day. Besides, a model of the bottle is floating inside the bottle with the horizontal line of the water, thus, users could actually see the bottle goes into a recyclable garbage bin printed on the bottle. In this way, the product is able to remind them how to dispose of the bottle. Finally, the shape of the bottle is decided to be a round shape instead of a cylinder shape to reduce the material.

The detailing phase focused on the shape, size and outlook cover of the single-use mineral water bottle. During this phase, a CAD model was made to find the best size and shape of the design. The relation between the capacity and the surface area of the bottle is the main consideration, furthermore, the ergonomics of the bottle was considered.

For future development, a physical prototype of the final design is highly recommended for a usability test and based on the improvements after the test the manufacturing process should be planed. Furthermore, the market strategy could be considered, such as a cooperative brand in China could be chosen and an advertisement could be used in order to communicate the environmental intention of this product to people.

Reference

The Puma Manifesto. (2020, June). Retrieved from: <https://www.en.nvc.nl/puma-the-end-of-packaging-as-an-environmental-issue/>