Design for and from Recycling

Sanne Meijer

In this modern day it is nearly impossible to imagine a life without plastics. But that does come with an environmental concern of plastic waste polluting our nature. Therefore, environmental concerns have been raised all around the globe and as a result, recycling systems have been put in place. That way the material is retained within the system and prevented from harming eco-systems.

Also, in the design world there is more and more attention for recycling, with many companies improving their designs to be more recyclable. Where this is a very good first step, another step needs to be taken to close the material loop. This recycled material must also be used, ideally for a similar application.

This thesis aims to provide designers with enough information to design plastic packaging products made from recycled materials, while still being recyclable. This goal is achieved by a literature review on what the recycling chain looks like, what makes a packaging recyclable and what the properties of recycled plastics are. Besides, interviews with chain experts are performed to fill in the gaps of information that could not be found in literature. Based on this information, guidelines are proposed for Design for Recycling and Design from Recycling. These are then used during a design process to verify the guidelines and add guidelines that were still missing.

This has resulted in a tool for Design for and from Recycling (Df2R), where a list of guidelines tells designers which design choices should be considered, and a framework that tells when to consider those choices. In this framework, the trade-offs have been considered, meaning this tool ensures that the design can be both made of recycled material.

The redesign of the AXE shower gel bottle not only pointed at possible improvements of the design tool, it also shows that it is indeed possible to use these guidelines to get a result that is both attractive as well as suitable for use of recycled plastics and recyclable. This design tool and knowledge will make design for and from recycling a lot easier and this should incentivise companies to change their designs to implement recycled materials.

When performing the research for the design tools, the observation was made that recycled materials are currently used very infrequently. That is why the barriers are investigated that currently retains packaging companies to use recycled material for their packaging designs. It seemed that much of these reasons could be explained by the immaturity of the recycling chain.

Having done research into the barriers, it can be said that this thesis helps overcome two. According to brand owners, the quality of the recycled plastics is too low, which can be resolved by using the Design for Recycling standards. The guidelines for Design from Recycling provide the brand owners with enough knowledge to implement recycled material, bridging the gap of knowledge that companies currently experience. However, this thesis alone cannot bridge the gap fully, more research into the material properties or recyclate remains necessary, as well as the translation to designer guidelines based on the findings of the grounding research.