

Recycling PET with Containment Utility Bin through Insertion and Tucking Operation (CUBITO) 3D Printed Self-Assembles: 3D Shells

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Abstract

Recycling entails the partial or total transformation of a product that has already served its purpose into another product for subsequent use. Successful recycling depends on many factors. An often-overlooked factor is that the post-recycling product needs to be truly useful for the consumer beyond its label of ‘made with recycled material.’ This work has focused on designing components that can be easily assembled without the need of additional fasteners onto a cube-like structure. Formally, the intention is to design a Containment Utility Bin Through Insertion and Tucking Operations (CUBITO). The prototype of CUBITO was designed using Siemens NX computer-aided design software and it was 3D printed to test its integrity when empty as well as with loads. The prototype is a cube with walls of approximately 75mm side assembled from 3 components. It has its integrity simply by the mechanical interference of its parts and it has been capable of containing 1.5 kilos of steel screws so far. In the future, CUBITO will be built with components molded from recycled PET. An initial estimation is that one PET water bottle could be melted and molded into CUBITO’s parts.

Keywords:

Recycling, 3D-printing, Prototype, and Testing.