

Redesign injection molded multifunctional product housing

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Subject: Redesign product housing specified for injection molding.

This Bachelor assignment is executed for Trending Industries. Trending Industries is a company that helps entrepreneurs to realize product ideas by making plastic prototypes, components or products in small runs. In some cases, the customer provides a CAD model of the product to be produced, but usually the design of the product is also done by Trending Industries. Depending on the situation, the designs are based on requirements and sketches of the customers. In general, the production process is aimed at the fastest and shortest route to a promising end product.

A redesign has been made for a housing produced by injection molding. The product housing protects and positions the components, this components and the product housing together will form the product. The housing connects all components to a product. The product is used by care organizations in the Netherlands. The product monitors clients like elderly, e.g. when they falling or when they scream loud. Most of the time the product will be a static product and nobody should interact with the product itself. The only interaction with the product is by installing the product, cleaning or when maintenance is required. Interaction between caregivers and clients will be in combination with an application, this application get its information from the product.

Especially the functionalities of this product are important for the redesign of the product. Weak aspects of the previous product should be detected and improved in the new design. The customer of Trending Industries, the developer of the product has an important role in the design process. The product housing should fulfill their requirements and expectations.

One of the requirements have to do with improvement of the stiffness of the product. The original product housing is quite flexible. Other requirements are about improving the installation process of the product. The original product has to be disassembled before installing, which has adverse effects. For example it could damage the components and delays the installation time.

Decisions which are made during the design process are based on research to injection molding and stiffness. Particularly the combination of these subjects is interesting. The stiffness improvements are mostly focused on geometrical design decisions. Because a compact product is wished by the customer, the positioning of the components and the positioning of stiffness improved geometry is



Figure 1

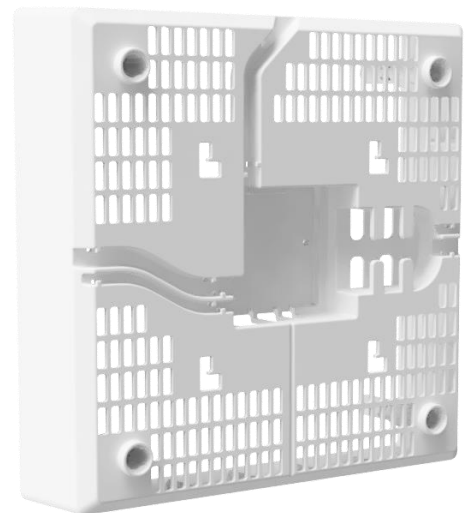


Figure 2

fairly a challenge. The redesign replaces multiple components, which were used with the original product to attach components to the housing.

In addition, connectors can be reached from the rear of the product, this will improve the installation of the product. A fixation bracket has also been designed with which the product can be attached reliably to a wall or ceiling. Thereby the housing offers solutions for other aspects such as assembly and cable entry. During the design process new customer wishes and requirements were added. This delayed the design process but improved the product quality.

During the process many little aspects changed, all these changes together form the design process. Beside 3D CAD models also 3D prints are used to check the geometry of the design.

The 3D model of the final design is visible in figure 1 and 2. There are also done several simulations during the design process, for instance to check the fill time and fill flow of the product, during injection molding. In figure 3 the fill time of the final product is shown.

At the end of the design process the customer is satisfied about the redesign of the product housing. The design requirements are translated in final design with support of several researches. The start of the production of 3000 products will be in August at TrendingIndustries.

