

Redesign of the rinsing and coating wire unit HSBE-3302

Pavel Topalski
Bachelor Thesis
Industrial Design Engineering
University of Twente
The Netherlands

Public Summary

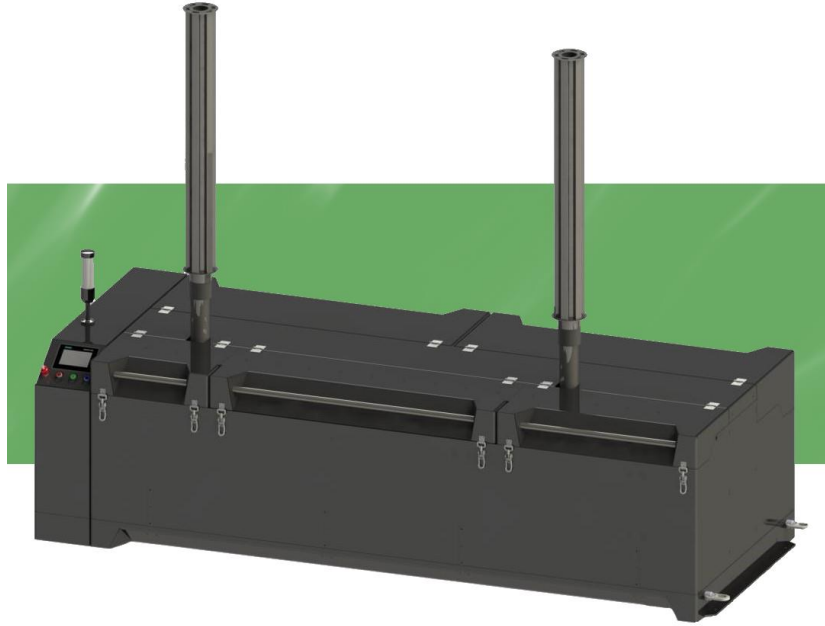
This project's client is WiTechs, a branch of B&S located in Hengelo, Netherlands. Established in 2007, it primarily focuses on innovation, designing machines ranging from wire pay-offs and systems for the mechanical descaling of wire to the coating and cleaning of wire. Over the past few years, WiTechs started with a redesign project of existing machines to build a new brand identity, give the industry a new look, strengthen the relationship with clients, and establish a vital place in the market. So far, only two redesign projects have been completed and released. However, they are eager to redesign more of their machines and make their portfolio larger. One of the machines in line for a redesign is the rinsing and coating wire unit HSBE-3302. Thus, this project is proposed to help them achieve their goal of creating a new design line and strengthening their design identity.

The research questions tackled during the thesis are:

- How can the current design of the HSBE-3302 machine be redesigned without change in performance to fit with the new design line of machines while being able to integrate all of the current internal components that run the machine?
- How can the redesign of the HSBE-3302 be built to fit within the required budget?

The project's first phase, analysis, leads to a broader understanding of the stakeholders involved. It identifies all individuals directly affected by the project or those who can have secondary impacts from the actions. It results in a final requirements list used to evaluate the final design and how well it fulfils them. The second phase, ideation and conceptualisation, explores the differences between the old and new design lines and how the new features can be incorporated into a new design. The ideation resulted in exploring how the redesign can incorporate the characteristic features of the new design line and strengthen the brand identity. The outcome of this is used in drafting different concepts fulfilling the established requirements, which are further evaluated before the final concept is chosen. In the project's last phase, the chosen concept is transformed into a fully functional, detailed design ready for manufacturing. It elaborates on the new design's features, details, and operation.

The results of the processes led to a detailed SolidWorks model of the final design, with all parts modelled with accurate dimensions. The model shows a realistic representation of the final design and how it would look once built, with its details and functions. Manufacturing requirements and guidelines have been followed to ensure the production feasibility of the components. Furthermore, the model is an accurate representation of the assembly process. By following the components and the assemblies, the model shows step by step how everything comes together, achieving the final design. Although the redesign successfully extends the new design line and client portfolio, it does not provide detailed enough cost estimations to acknowledge whether or not the redesign fits within the given budget.



The final design proposes how the HSBE-3302 can be redesigned to have a more modern look and how it can fit in the new portfolio of WiTechs currently being built. It solves the problems of the old design while showing how all internal components will fit inside without interfering with the machine's performance. Along with the redesign proposal, a cost estimation evaluates the project's feasibility. Even though shallow, it argues about the possibility of fitting within the given budget.

Further steps are required for this design to be fully ready to extend the portfolio of the new design line. One necessary step is optimising the components, as further testing and calculations could reveal that some components can be made thinner or removed. Another recommendation is a more in-depth cost estimation, which will better compare the feasibility of the new design with the budget requirements. And lastly, some recommendations are made on the appearance and how it can better match the design language.