

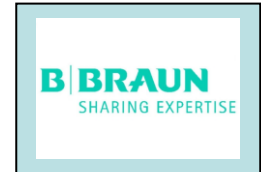


B. Braun Medical: Non-Interchangeable Small-Bore Connectors for Liquids and Gases in Healthcare Applications

Sarah Knupp, Taylor Stine, Taylor Jedrek, Kayla Piehler, Sinead Guerin

Overview

The problem presented by B. Braun was that the universal Luer system currently used in the medical field does not prevent incompatible systems from being accidentally connected to the patient, which may result in injury or death. The project included efficacious part design, manufacturability, cost effectiveness, and compliance to new standards requirements. These standards comprise of a leak-proof connection, dimensions, and minimum pressure and force values needed for connection. The deliverables required included four concepts of non-interchangeable connectors, and a report proving the designs are not interchangeable with each other or with the current Luer design.



Objectives

The team's objective was to develop four concepts of non-interchangeable small-bore connector pairs. Concept generation was a key element in the project to ensure multiple creative ideas for connection. The project was primarily conceptual.

Approach

- ◇ An initial on-site visit to B. Braun's facility was conducted during the first week of the project.
- ◇ Customer needs and requirements were gathered from B. Braun Medical and outside research on the medical industry.
- ◇ Concept generation took place over several weeks to confirm non-connectivity with original ideas.
- ◇ A patent search on the current Luer and non-Luer designs was conducted to find out what was currently on the market.
- ◇ After initial concept generation and concept selection, the team had weekly conference calls with the sponsors for relevant feedback.
- ◇ The final four concepts were chosen based on matrices and the feedback obtained.
- ◇ All concepts were designed in SolidWorks and scaled to the sizes of the current Luer.
- ◇ Concepts were tested in SolidWorks to prove non-interchangeability, and videos of the non-interchangeability were created as a deliverable to B. Braun.
- ◇ The material for the connectors was chosen based on the need to use B. Braun's new injection molding facility.
- ◇ Scaled-up models were made using a rapid prototyping machine.
- ◇ The models, along with the SolidWorks tests validated the fact that all the connectors were non-interchangeable.

Outcomes

- ◇ Four non-interchangeable medical connector concepts were created
- ◇ Verification of non-interchangeability was conducted and documented
- ◇ The project developed new ideas for B. Braun to present towards further FDA regulations

