

Developing a heating solution for people that are being showered on a bathing stretcher.

Jorik Burghardt, Industrial Design Engineering, University of Twente

This thesis aims to research and develop a solution which can ensure that the clients at s Heeren Loo do not get cold after showering on a bathing stretcher. This makes the experience of showering more pleasurable for the client, makes it easier for the caretaker to clean the client properly and prevents blemishes or mould growth. A stakeholder analysis was done and the main stakeholders are Jan Jakob, the caregivers and the clients of s Heeren Loo.

The research identified the ways the human body exchanges heat with its environment. This happens via radiation, convection, conduction and evaporation. Market research showed that there are two products on the market designed for use during the drying of patients. One does not work with a bathing stretcher and the other is uncomfortable for the caregiver. All other products that could keep the client warm, have their specific drawbacks and are not suitable for use at 'S Heeren Loo. The market research also showed that using a circulating water heater would be the best heating method at s Heeren Loo. Two concepts with separate ways of heating and transporting the water were made. Concept selection happened together with s Heeren Loo and the selected concept was further developed.

The designed solution consists of an altered bathing mattress with a water tube built into it. This water tube is connected to the shower faucet with help of a hose coupling and a diverter valve. The diverter valve allows the caregiver to heat the client while showering. Water from the faucet runs through the tube which heats the mattress and should help keep the client warm. Cost limited the options for the selection of parts and was often the deciding factor. With all the parts selected and modelled, a prototype was built. The built prototype closely resembled the model and functioned as expected, it gets warm. The prototype is tested with the help of a thermal camera and a physical test with a person on top. The actual use case with a person who has just been showered has been tested but will need further testing as the results were conflicting.

Concluding, a solution that should keep clients warm after showering on a bathing stretcher has been designed. The prototype will require further testing to be able to conclude if the solution is capable of keeping the client warm for 20 minutes as this has not yet been proven with the tests that have been done. All in all, a solution has been designed and built but further testing is required.

