

# Modernizing a weather shelter; a design upgrade

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**High demands are placed on having sustainable transportations around the world. Using weather shelters, to isolate the indoor- from the outdoor climate, when (un)loading saves energy and upgrading these to increase efficiency is important.**

On a cold winter day, the local company is in dire need to restock their warehouse. The delivery truck finally arrives but – oh no! When the warehouse opens its doors to unload the truck the warm, climate-controlled air, rushes out and the workers get cold, ruining many peoples' day. To be able to heat the warehouse in a shorter time from closing the doors after the restocking, a more powerful heater is installed, powered by an enormous diesel generator spewing out greenhouse gasses.

When reading about the situation above, one might think “what a waste, of course they need to keep the warm air inside instead of letting it all out”. This is where the weather shelter comes into the picture. Sealing around the sides and roof of the truck can save energy in term of wasted heat.

This Master Thesis has been performed in collaboration with ASSA ABLOY Entrance Systems, which is a global leader in manufacturing industrial doors and docking systems. The goal of this project has been to modernize one of their weather shelters (see Figure 1) with a new motor system to cut costs and environmental footprint.

The result of the project is a physical, 3.5 m wide prototype demonstrating a well worked-through solution on how to integrate the new motor system. The new horizontal roller solution uses less components, seals better, and allows for the motor to be placed in a more serviceable position.



**Figure 1. Inflatable weather shelter (reprinted with permission).**

Instead of unwinding the roller from a shaft attached to the motor, the roller is designed as an accordion. This way, the use of the shaft is removed and with the help of lifting lines the motor can be placed wherever wanted. The lifting lines make it possible to mechanically control the position of the roller, instead of using a digital real time control system.

This upgrade was needed since the old motor often broke down, causing high consumption of motor systems which is not good for either the customer, the company, or the environment. The new system reduces unnecessary waste and increases energy efficiency. The new roller design also allows for better sealing, since the motor can be mounted offset from the plane of the roller. This facilitates a wider roller, therefore sealing better against the insides of the weather shelter.

As a conclusion, even though additional testing and validation remains, this concept provides a promising solution on how to modernize the weather shelter and will hopefully be used by the company in the future.

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