

Keeping doors closed by mechanical force

Many sliding doors use motor power to keep their doors closed. This is seen as an unnecessary use of power. Also, in some cases, the motors overheat, requiring a larger motor than otherwise needed. By finding a mechanical solution instead you can minimize the power consumption and even reduce the size of the whole operator.

In this thesis the possibility for a mechanical hold force on automatic sliding doors has been investigated. Doors existing on the market today are kept closed by applying a constant force, a hold force, from the motor. This is wasteful energy consumption and in many cases the need for applying a constant force requires a larger motor than otherwise needed.

The hold force on sliding doors is crucial to ensure that the doors are kept closed. Entrance doors are usually the most affected and in need of a hold force. A door without a hold force could be forced open by, for example, strong winds or air pressure differences between indoors and outdoors, among other things. The hold force needs to be large enough to withstand these outer forces. On the other hand, the hold force cannot be too large. To comply with legal requirements regarding emergency exists, a door cannot require a

force larger than 220 N to be opened manually.

By thorough research and testing of different concepts one has been decided upon. This concept has been done into a working prototype and its parts and functions are described in the report. The concept chosen can with some adjustment be combined with a night lock and is also seen as possible to place in doors that are already in use by customers today.

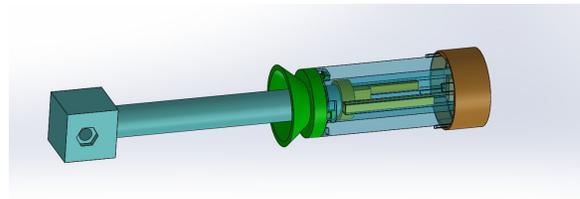


Figure 1: This figure shows the final prototype for this project. Magnets and springs are placed inside the see through housing in order to get the intended function.

The suggested solution varies somewhat depending on the usage of the doors by the customer. Doors that are opened more frequently are seen as better left as they are, no changes needed. Though doors that are closed a majority of the time could become more energy efficient by changing to a mechanical hold force.