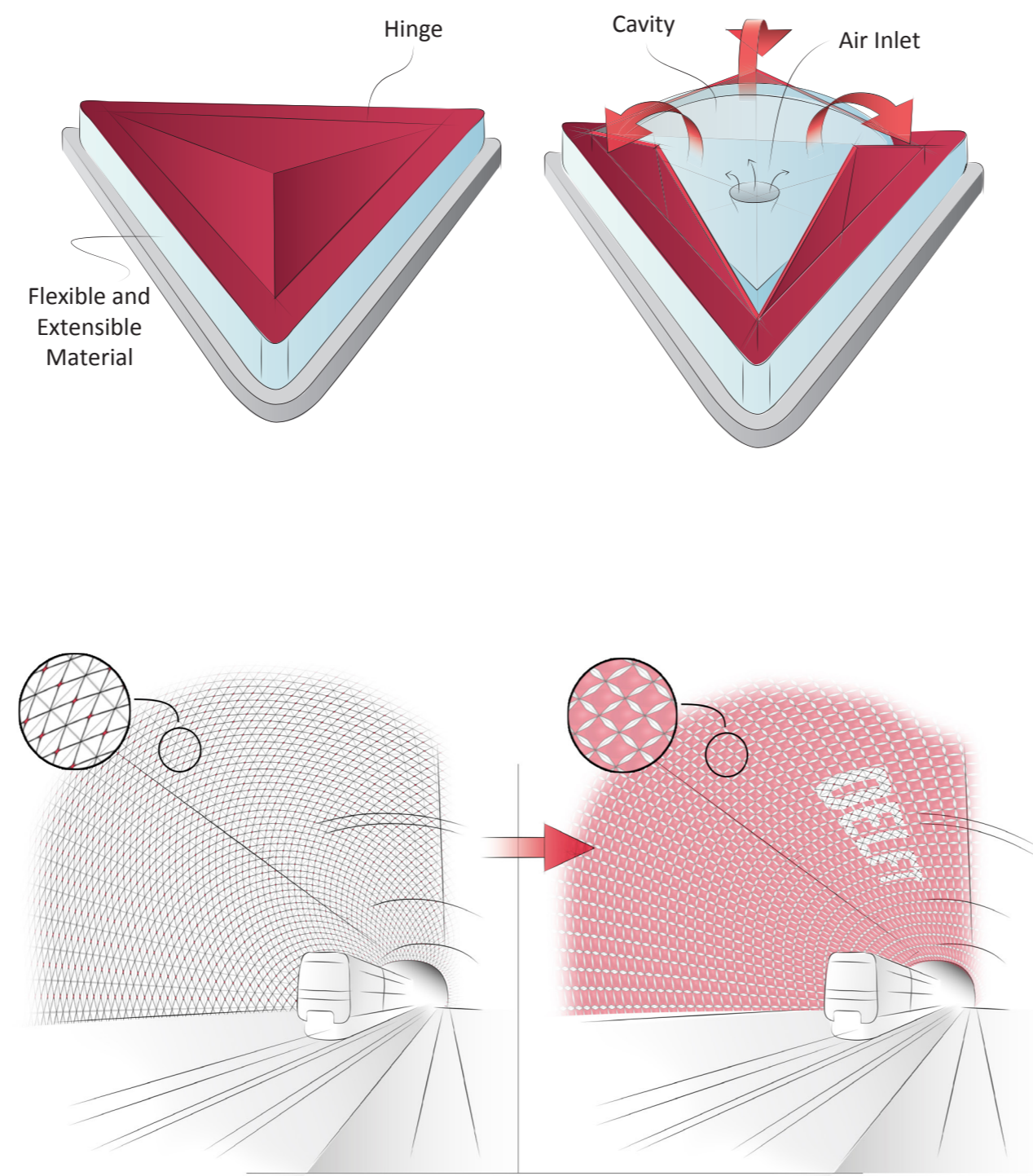


# COLOR ADAPTIVE WALL PANEL

ACTIVE COLOR CHANGE REALIZED WITH A PNEUMATIC MECHANISM

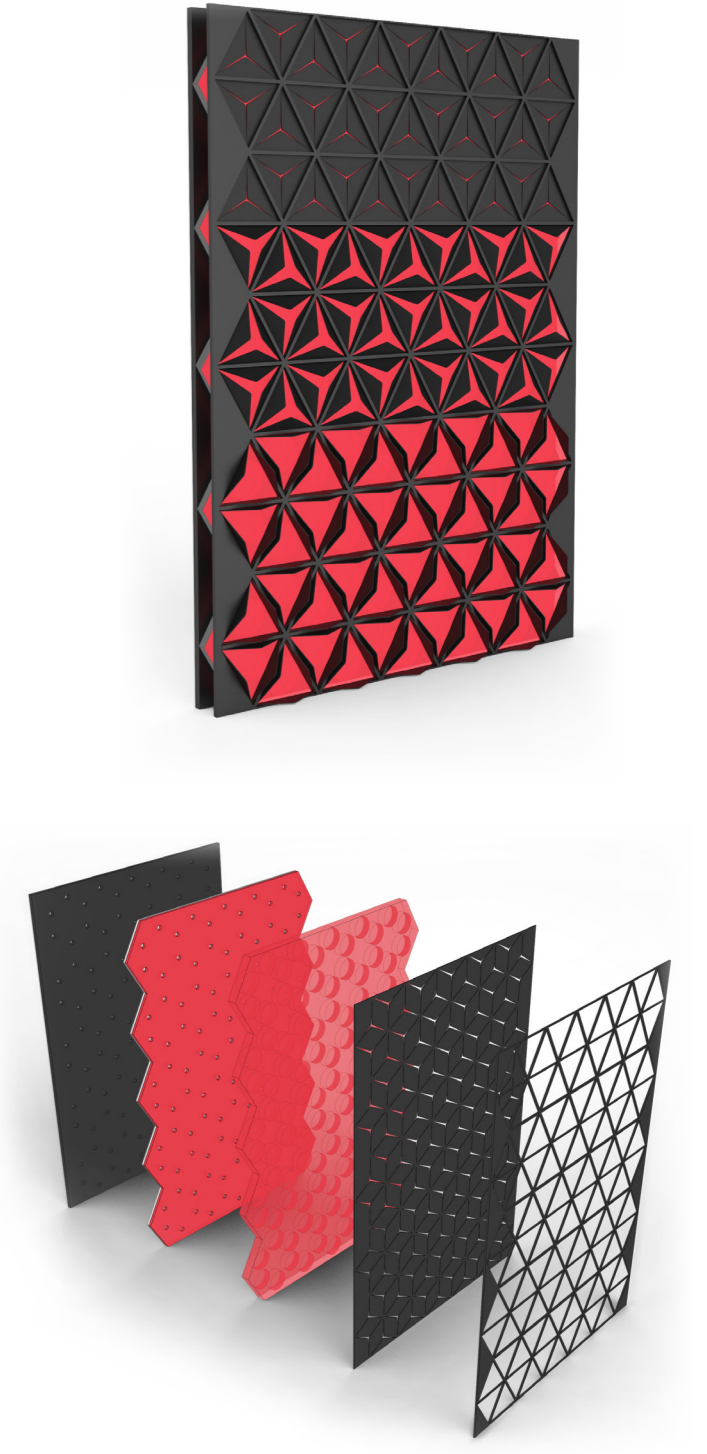
## CONCEPT

The goal of this project was to achieve an appearance transformation with a simple, low-tech and mechanical solution. An iterative process of ideation and prototyping has led to a mechanism which folds open after being inflated with air, resulting in a clear change of color. Numerous of these mechanism units can be integrated into panels, which can be applied to the inner or outer walls of public buildings. Then, by controlling and actuating the mechanisms individually, patterns and messages can be created in order to communicate information and instructions to users of the building.



## DESIGN

The final design consists of a panel of five layers. The front layer includes a steel sheet which ensures reinforcement and enhances the rotational movement of the lids. The second layer includes a rubber sheet with a cut-out pattern of lids which can fold open after actuation. The third and fourth layer include two sides of silicone with cavities which can be inflated with air. The fifth layer includes a steel plate on which all other layers are fixed. This plate involves holes through which air tubes are inserted. These air tubes lead to a central point from where the mechanisms are actuated and controlled.



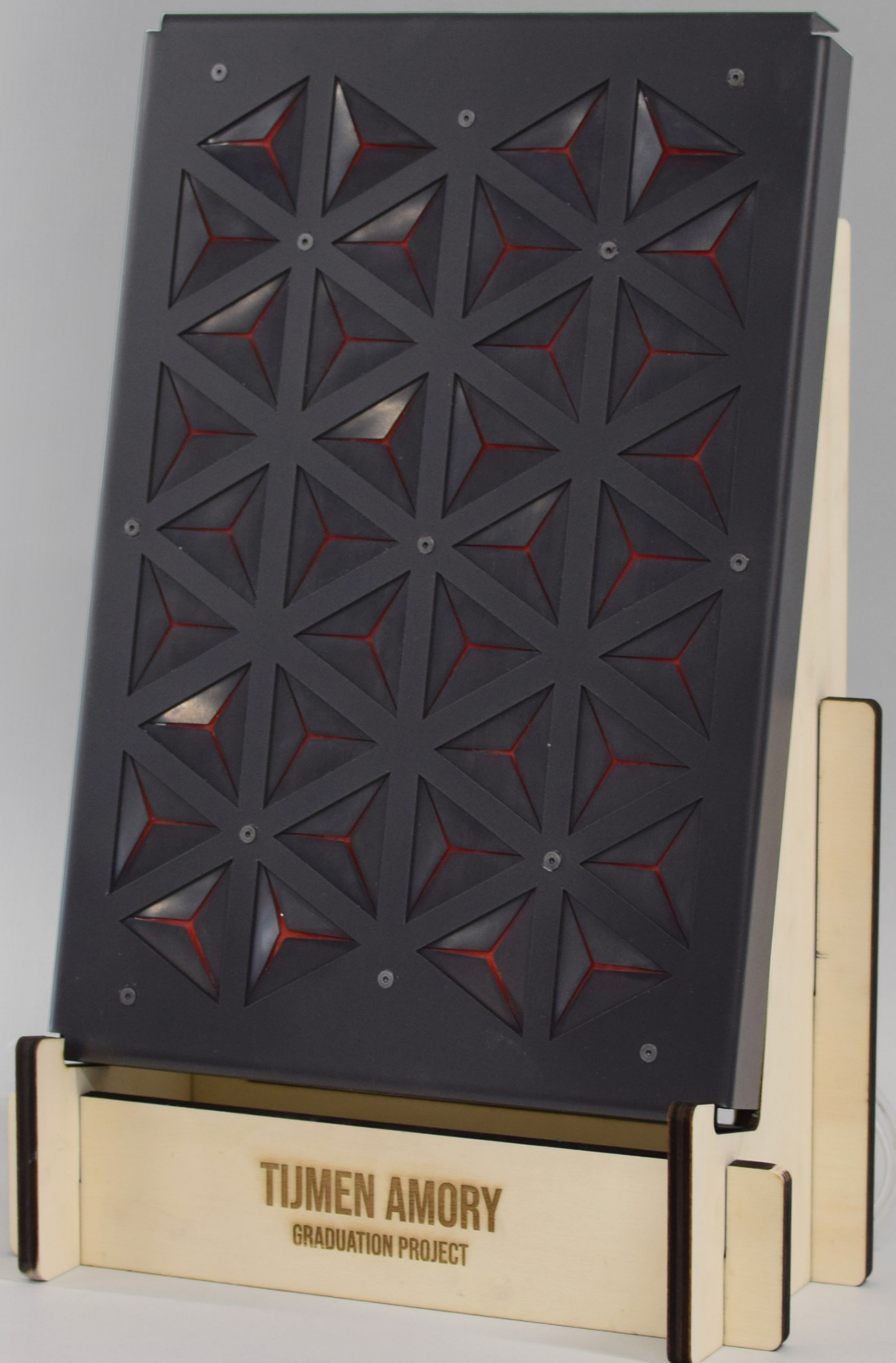
## PROTOTYPE

An iterative process of many physical prototypes and mock-ups has led to the production of a final prototype. This prototype is built-up out of wood, PLA, casted silicone, rubber and steel and can be actuated manually through two air pumps. The purpose of this prototype was mainly to demonstrate the intended working principle and visual effect of the developed technology. The prototype shows a clear color change of the mechanism units from black to bright red, after being inflated with air. Therefore, the priorly defined goals were achieved, but further development is needed before the product can be implemented in a realistic environment. This development mainly involves optimization of the design and fabrication process and the production of a control system to actuate the units individually and thereby create patterns and messages.



BEFORE ACTUATION

AFTER ACTUATION



Tijmen Amory  
Mimicking the Appearance Changing Abilities of  
Cephalopods with a Pneumatic Mechanism  
06-04-21  
Integrated Product Design

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