SUSTAINING
STEEL SLAG

A by-product of the steel industry, steel slag has a high lime content and excellent heat storage capacities. However, more than a third of the steel slag that is produced over a year is disposed in landfills. Due to its high lime content, it can be used as a binder for concrete mixes. By designing a brick that uses steel slag as a stabilizer, we aim to reduce the environmental impact and waste consumption of the building industry. We researched and tested different possiblities for the optimal composition of the brick using earth, steel slag and cement.

The results are interlocking v-shaped rammed earth bricks which can be used in a trombe wall, a passive heating and cooling system, and many other indoor applications. By lowering the cement ratio used in the rammed-earth technique and replacing it with steel slag, we lower the carbon footprint of the material and increase its thermal capacity value.

High thermal capacity

Reuse of waste materials
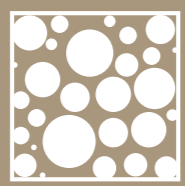
High density

Aesthetic variety

HOW IT WORKS

A trombe wall is a passive solar heat gain system consisting of a glass plane placed 2-5 cm before a massive thermal capacity wall. The excellent heat storage capacity and high density of steel slag and earth make it an optimal material for the system. The natural dark surface of the brick increases the absorption of heat in the wall.
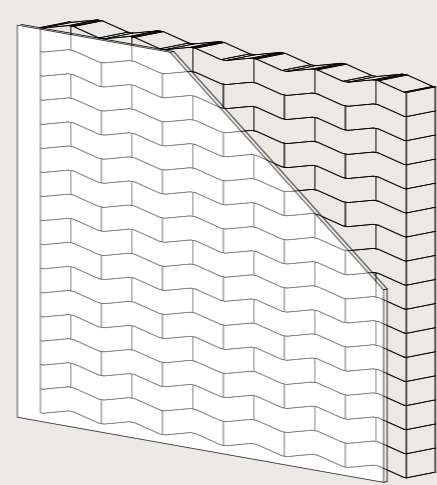
WINTER

In winter, the sun heats up the air gap between the glass panel and the massive, south facing wall by the greenhouse effect.
The heat is stored in the wall and released evenly to the room over the whole day, providing comfortable indoor climate. An insulating curtain is pulled down at night to prevent heat loss.
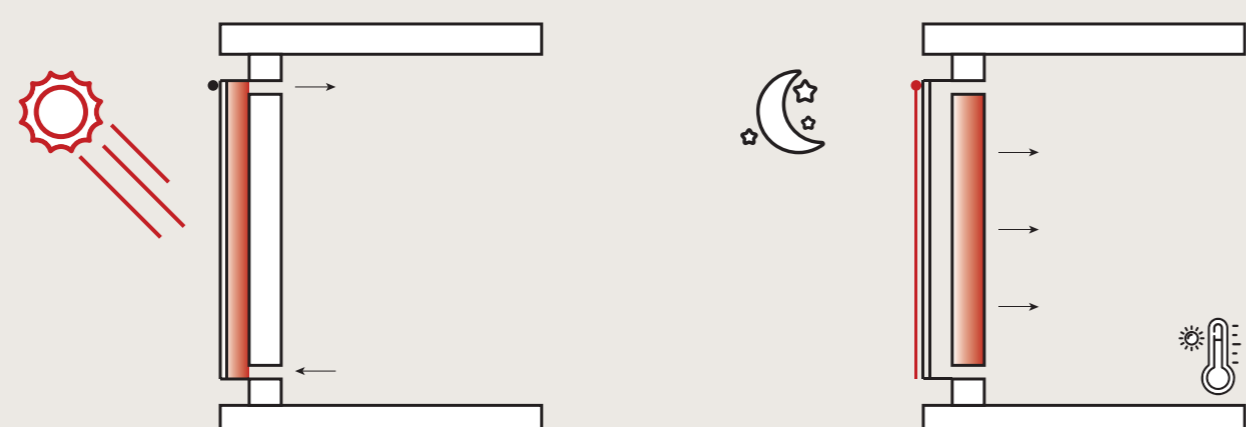
SUMMER

In summer, the same curtain is pulled down during the day to prevent the air gap from overheating. In addition, vents ensure a continous ventilation of the air gap. At night, the outside air cools down and is stored in the wall. It is again passed on to the room and provides a cool room temperature during the day.