Learning from nature: Thermoregulation Envelope - Building Technology: facade design

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1 - Ext Rusted/3d print stoma brick section
2 - Water "irrigation system" embedded in brick
3 - Porous sponge
4 - Insulated hepa filter or glass in metal frames
5 - Steel frame
6 - Mounting shoe
7 - Double acrylic glass
8 - Wooden veneer - responsive to humidity
9 - Outer air intake
10 - Floor system
11 - Weather proof translucent membrane.
12 - Concrete top coping
13 - Water supply system
14 - Waterproof mat + filter layer and drain pipe
15 - Water pump
16 - Air flow
17 - Stoma bricks - DETAILS

A heat pipe is a device that combines phase change and convection. A liquid vaporizes at the warm end, absorbing heat. Vaporization produces a pressure difference that drives gas toward the cool end. There it condenses, releasing heat. Liquid then returns to the warm end by capillarity through some wicking material lining the pipe.

Direct phase-middle sweating ceramic container is disconnected from the indirect duct by insulation.

Indirect phase-Outer sweating side to the surroundings is disconnected from the inner duct and the heat pipe exchangers by insulation.

Water tubing system-"irrigation system"  

Outside  

Inside  

Outside  

Inside

Desert "hairs" against sand and dust

Irrigation holes for humidity

Wetted porous part for evaporation cooling

3D print • The 3d printed stoma blocks and details are made of porous material. The part for the evaporator can act as an insulator when it is dry. • The Vanier wooden door is a self responsive material which shrinks and expands depending on the dryness or humidity of the air.