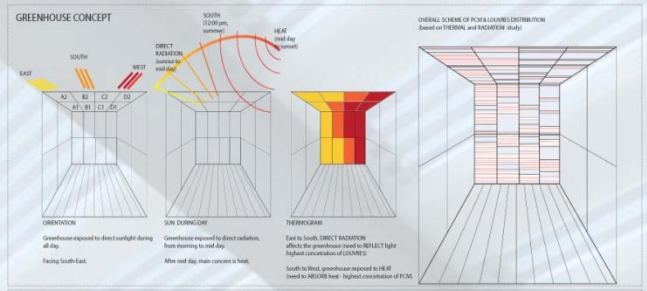
SKIN - Transparent and Translucent building skin as Multilayered & Multipurpose Filtering System
Workshop - Tiranan Architecture Weeks 2014
INSRUCTOR: Laura Pedata ASSISTANTS: Letizia Martinelli, Erdi Myftaraga
Students: Efijeni Kokedhima, Egzon Gacaferi, Renald Kallari

GREENHOUSE CONCEPT

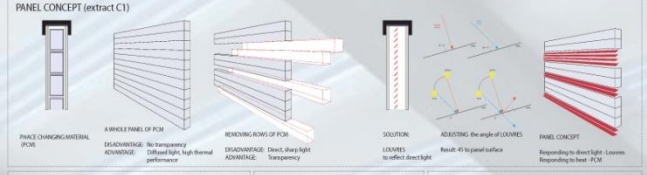


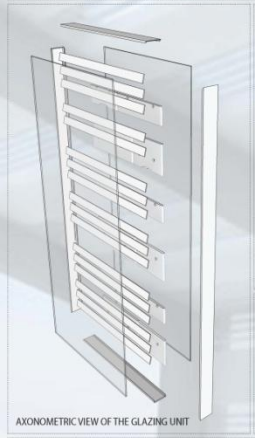
ORIENTATION
Greenhouse exposed to direct sunlight during all day.
Facing South-East.

SUN DURING DAY
Greenhouse exposed to direct radiation, from morning to mid day.
After mid day, main concern is heat.

THERMOGRAM
East to South, DIRECT RADIATION affects the greenhouse (need to REFLECT light highest concetration of LOUVRES).
South to West, greenhouse exposed to HEAT (need to ABSORB heat - highest concetration of PCM)

PANEL CONCEPT (extract C1)





AXONOMETRIC VIEW OF THE GLAZING UNIT

GLAZING UNIT

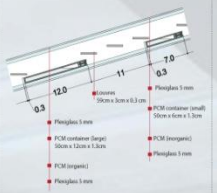
ELEVATION DETAIL
SCALE 1:10

SECTION DETAIL
SCALE 1:10

PLAN DETAIL
SCALE 1:10

SECTION WITH LAYERS

SCALE 1:2



PHYSICAL PROPERTIES OF PCM

Element thickness: 34mm - 38 mm
Minimum fold width: 33mm - 40 mm
Storage temperature: 28 C - 28 C
Light transmition
Liquid PCM: 4 % - 55 %
Crystallow PCM: 0 % - 88 %
Average: 8 hours till heat transferred from outside to inside & vice versa
Total energy transfer ratio of direct radiation
Crystallow PCM: 33 % ± 4 %
Liquid PCM: 37 % ± 4%

THERMAL PROPERTIES

Phace Changing Material improves thermal performance drastically inside the greenhouse. The alterations of temperatures during a day decrease significantly.
Thermal storage capacity to absorb internal and external heat loads
Thus, the energy wasted decreases.

VISUAL PROPERTIES

Translucence for a pleasant daylight a trensphere inside
Seasonally-variant shading
Diffused light

ASSEMBLING INSTRUCTIONS

fill small containers with PCM (inorganic) | fill large containers with PCM (organic) | insulate the gum with silicone | close the container | glue together two containers | assemble the frame and plexiglass | assemble the louvres | put the louvres inside the panel | install the PCM containers

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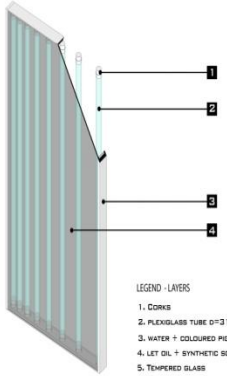
Liquide Glazing Unit

AXONOMETRIC VIEW OF THE GLAZING UNIT



LEGEND - LAYERS

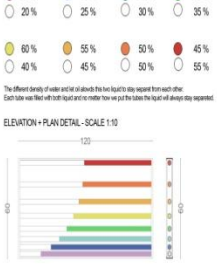
1. CORKS
2. PLEXIGLASS TUBE D=31 MM
3. WATER + COLOURED PIGMENT
4. LET OIL + SYNTHETIC SOLVENT
5. TEMPERED GLASS

SECTION - LAYER

REFERENCES

Brandhorst Museum in Munich, Germany (Hunter Douglas facade)

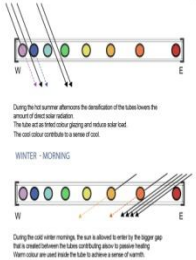
DESCRIPTION OF THE GLAZING UNIT



The different density of water and oil allowds this two liquid to stay separat from each other. Each tube was filled with both liquid and no matter how we put the tubes the liquid will always stay separated.

ELEVATION + PLAN DETAIL - SCALE 1:10

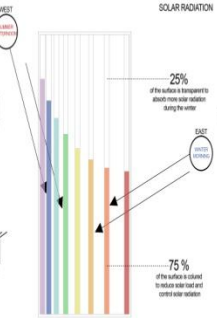
CONCEPT DIAGRAM



During the hot summer afternoons the densification of the tubes lowers the amount of direct solar radiation.
The tube act as tinted colour glazing and reduce solar load.
The cool colour contribute to a sense of cool.

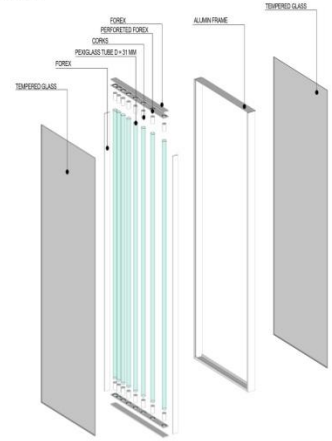
During the cold winter mornings, the sun is allowed to enter by the bigger gap that is created between the tubes contributing alone to passive heating.
Warm colour are used inside the tube to achieve a sense of warmth.

SOLAR RADIATION



SECTION DETAIL - SCALE 1:10

3D EXPLODED VIEW



ASSEMBLING INSTRUCTIONS \ PHOTOGRAPHS

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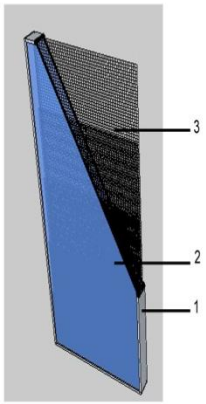
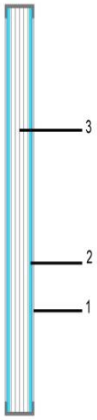
AXONOMETRI



SECTION WITH LAYERS

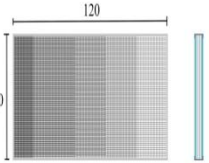


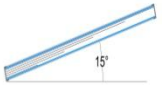
LEGEND - LAYERS

1. FRAME D ' ALUMINIUM
2. TEMPERED PECIGLASS
3. STRAIGHT LINES

REFERENCE

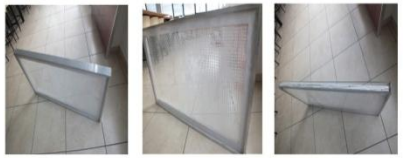
DESCRIPTION SUN EFFECT

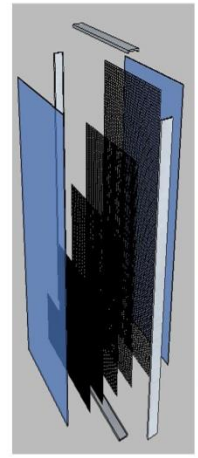




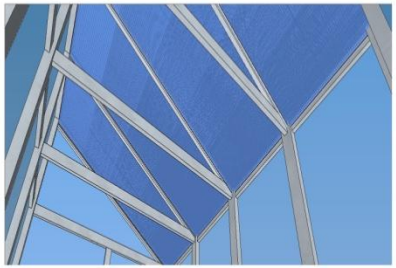
ASSEMBLING INSTRUCTIONS

PANEL CONCEPT





EXPLODE DETAIL



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