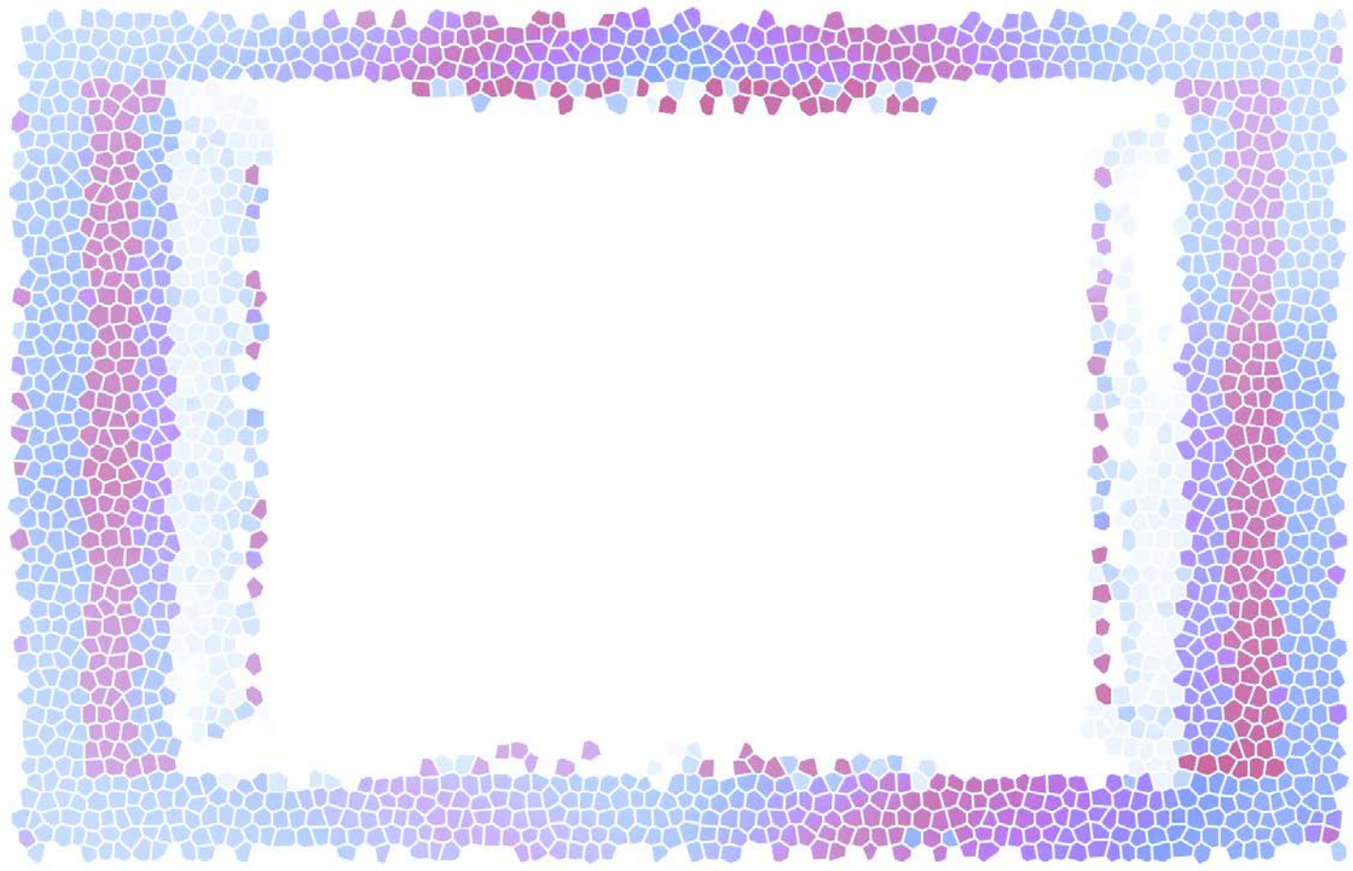
Window System



Under the guidance of Prof. V. Bapat
Co-guide: Prof. Kumaresan

Baisampayan Saha | 136130004

Window

The word ‘**window**’ is derived from a old Norse word ‘vindauga’ [1]. The word vindauga is made of two separate world - Vindr means wind and auga means eye.

Window Types

There are various types of windows available in the market. Starting from the ubiquitous casement window to bay-windows and skylights.

Some of the common types of windows are :

- Fixed windows
- Casement windows
- Slider windows
- Pivoted windows
- Double hung windows
- Louvered windows etc

Limitations of existing windows

One of the windows found inside IIT Bombay campus

- Every window comes with peripheral systems like curtains, mosquito nets, grills etc. which are sometimes difficult to attach with the window
- Cleaning of mosquito nets becomes very messy when the mosquito nets pores get clogged by dirt and debris
- Structural members of a window is often of different sizes which creates a visual noise

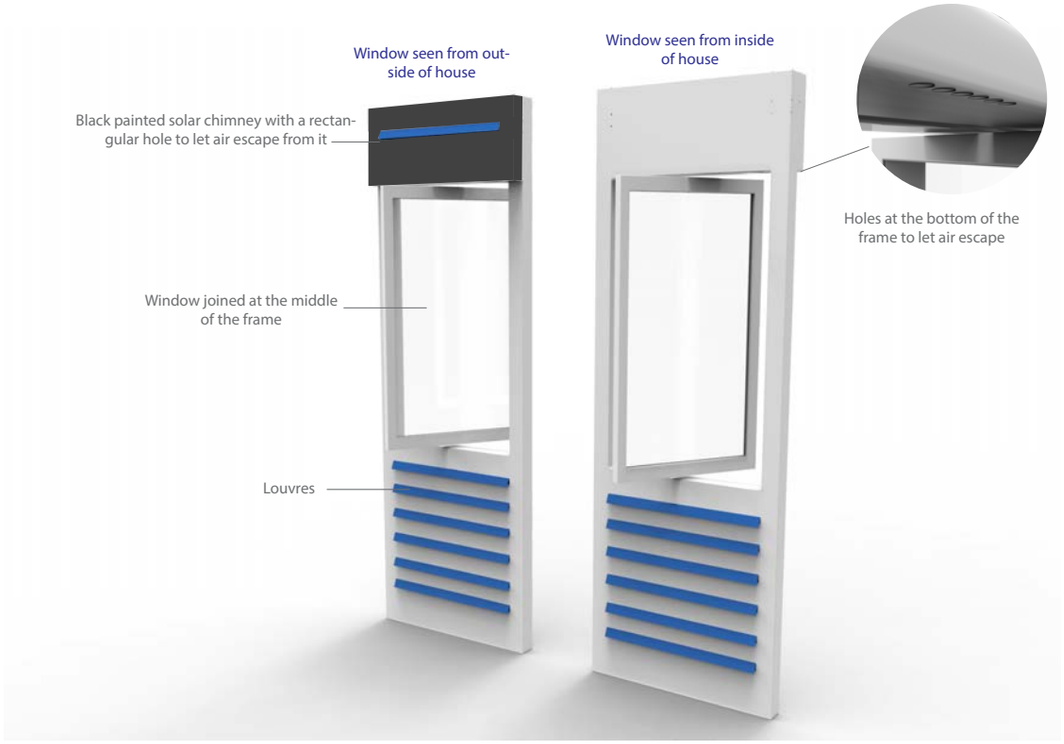
Design Brief

“To design a window and hardware details for ease in fabrication and improved aesthetics.

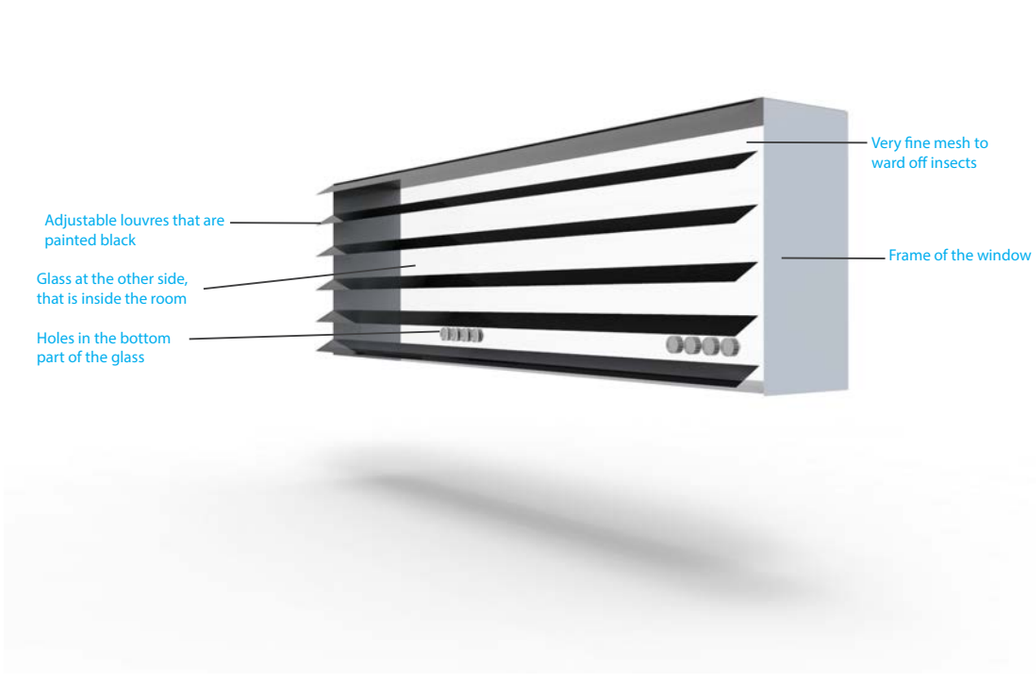
Design to give maximum view of outside with less / no visual noise and addressing improved functionality and user interaction of the product

To create an integrated window with homogenous aesthetics with grill and mosquito net added even at later stage”

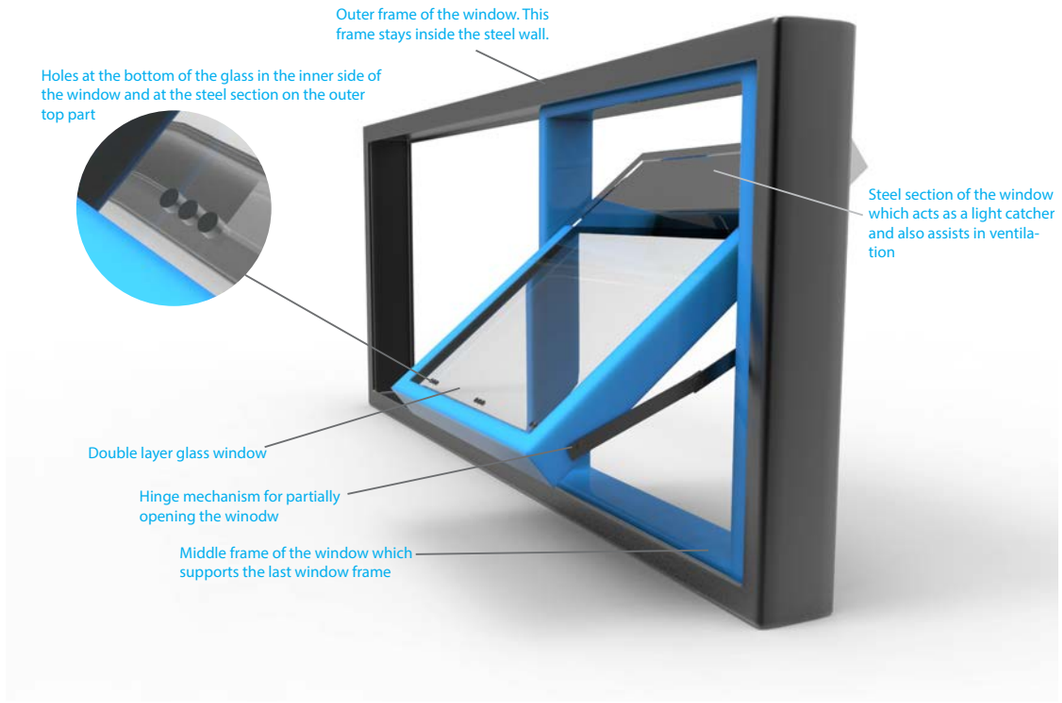
Initial Ideation



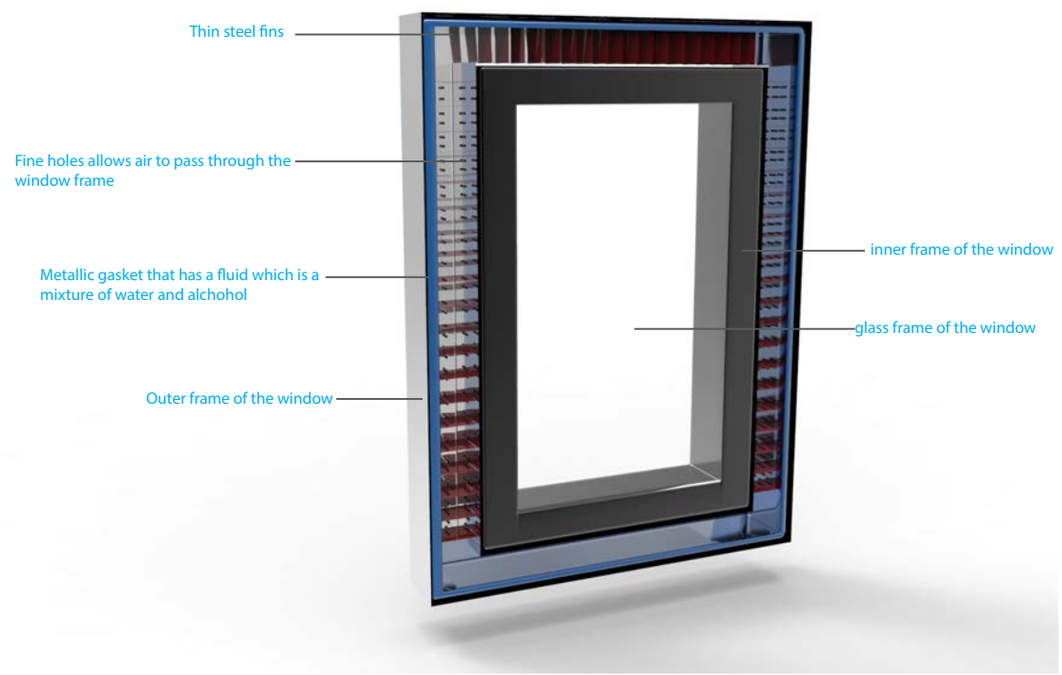
Long modular window



Louvered window



Passive cooling window

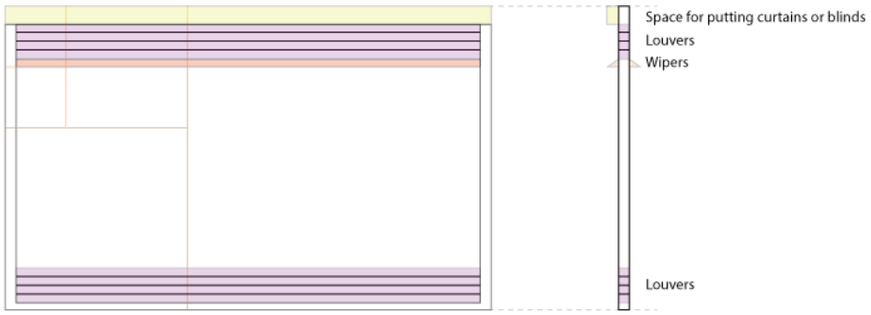


Natural air conditioner window

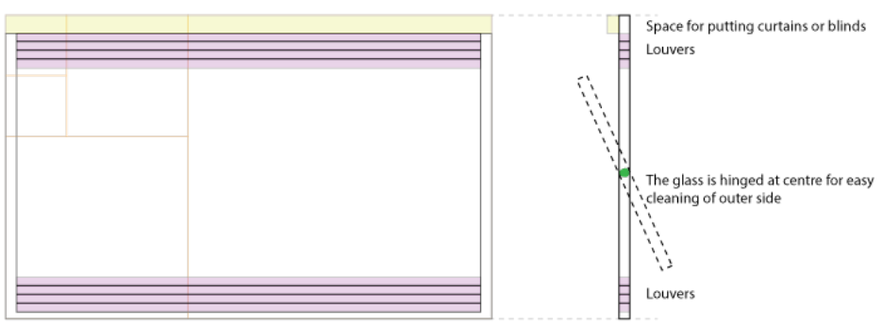
Lacunae in the ideation

The ideations were more technically biased and may require too many calculations and experiments and might result in a hypothetical solution.

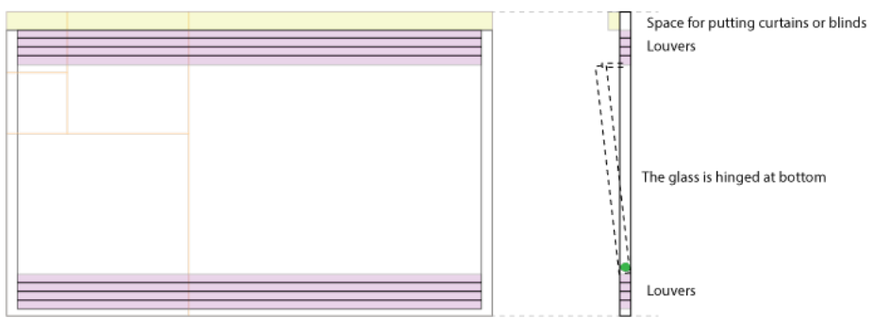
Ideation based on window opening orientation



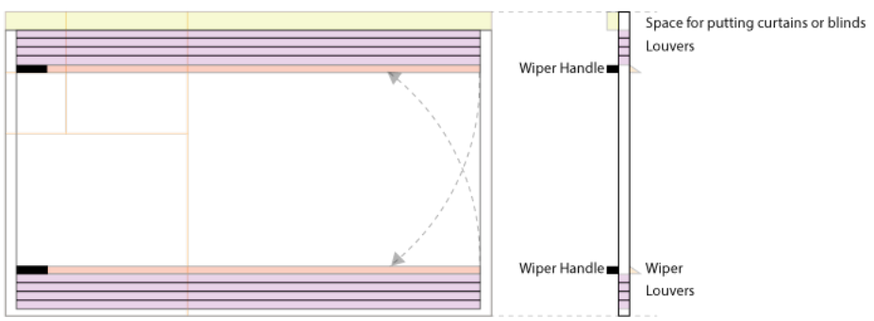
Fixed window



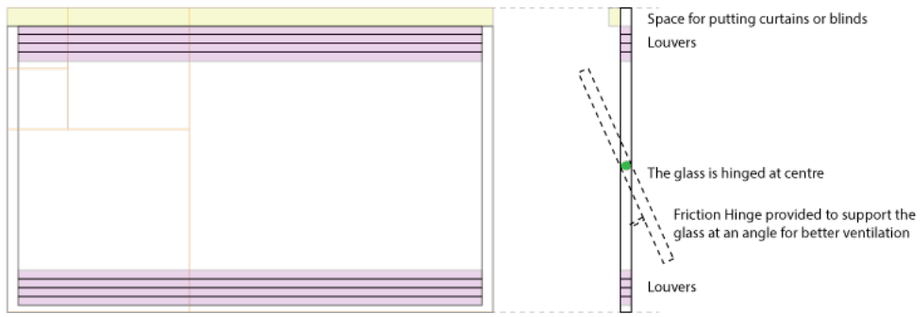
Centre pivoted window



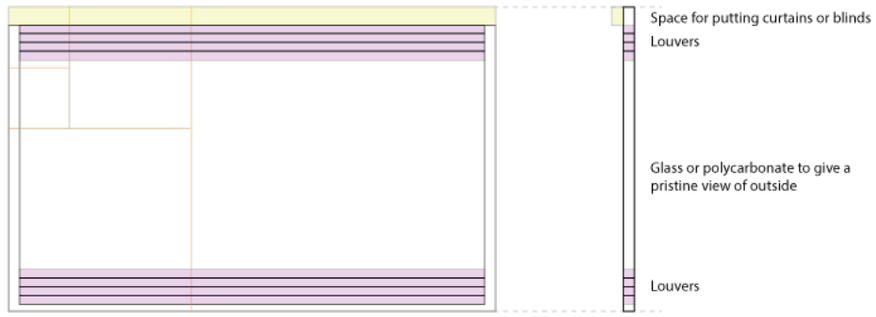
Bottom pivoted window



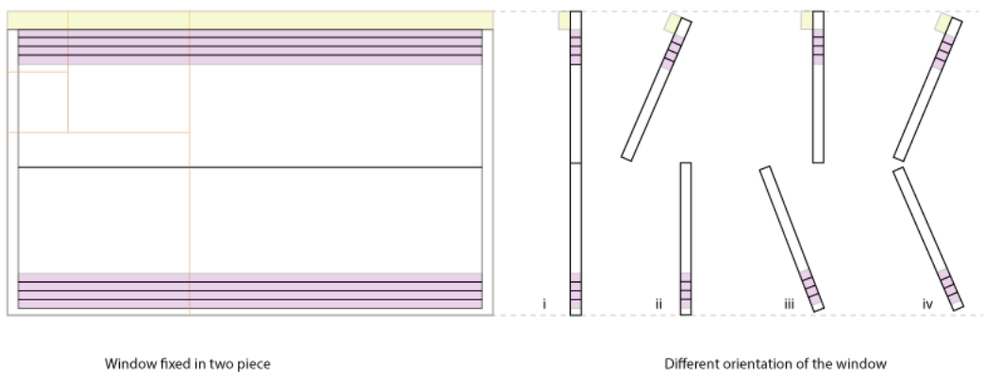
Wiper for easy cleaning



Centre pivoted window with a restricted degree of freedom

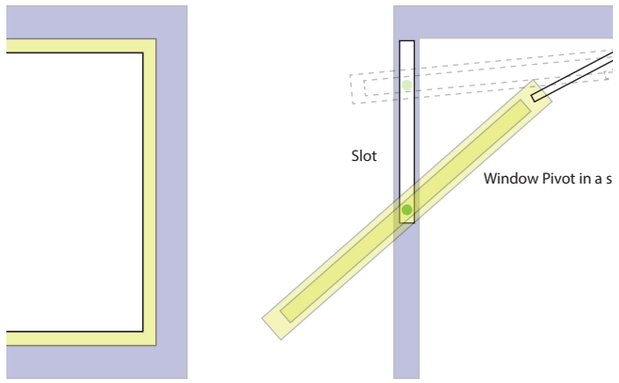


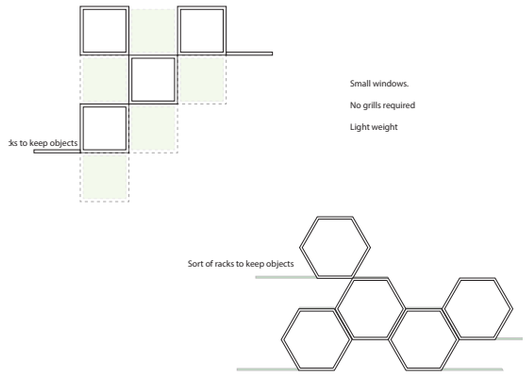
Fixed window with louvers

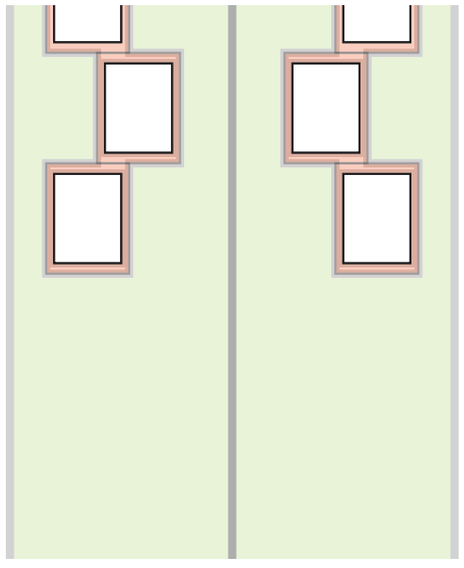


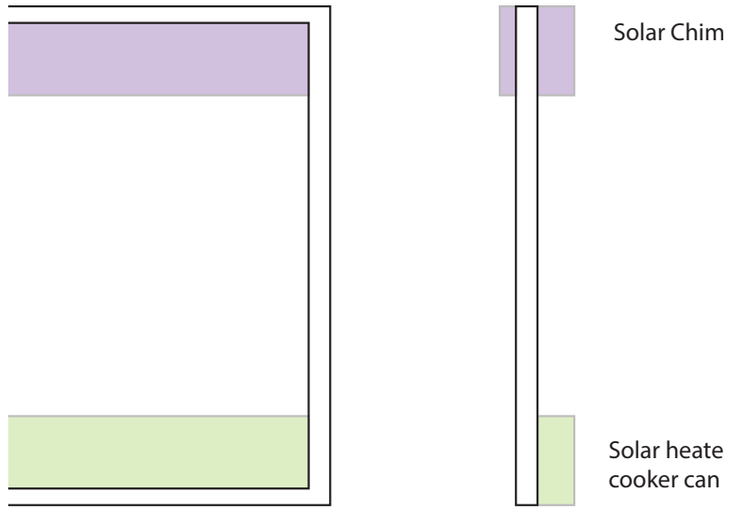
Windows that open from centre in different orientation

Ideation based on window shapes and functions

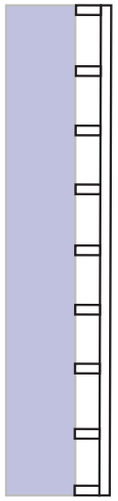




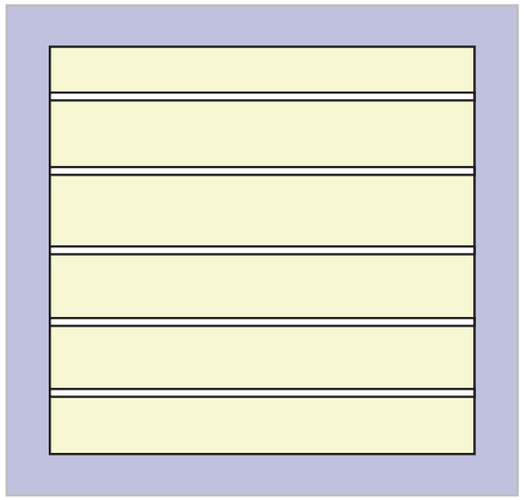


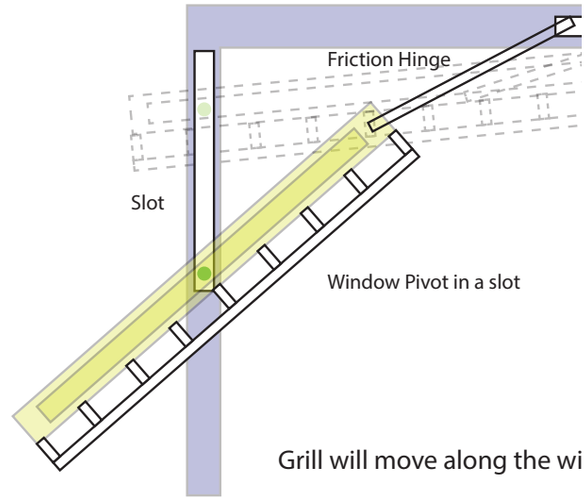


Ideation on grill types

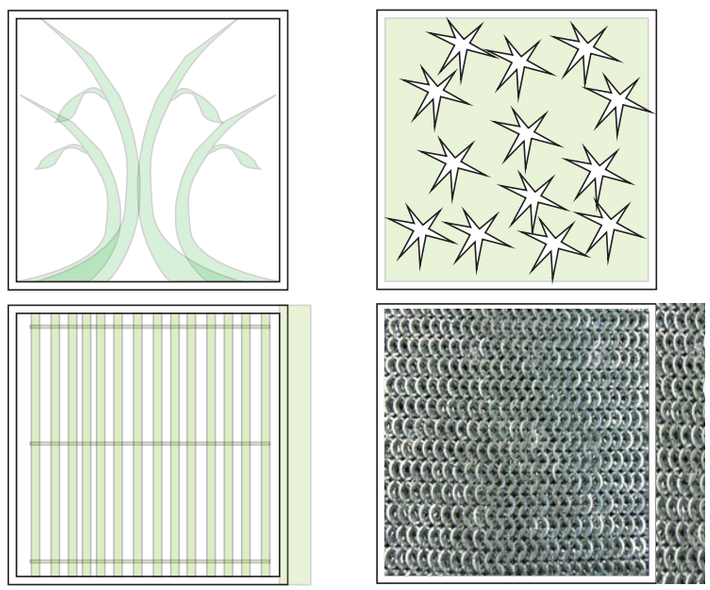


Grill bolted or welded to the frame





Grill will move along the wi

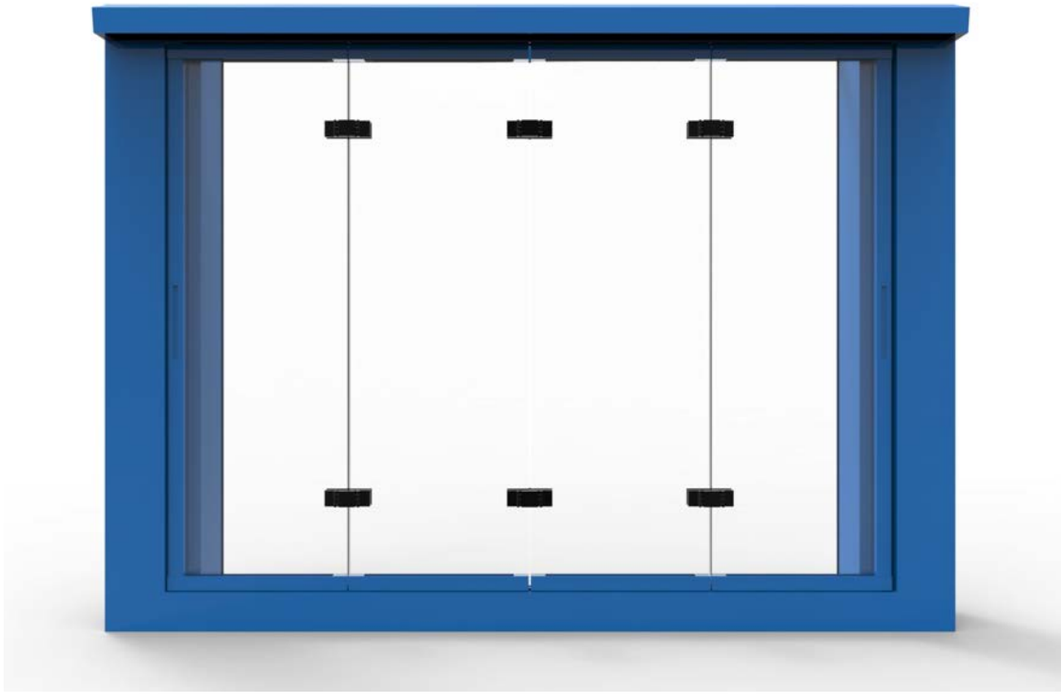


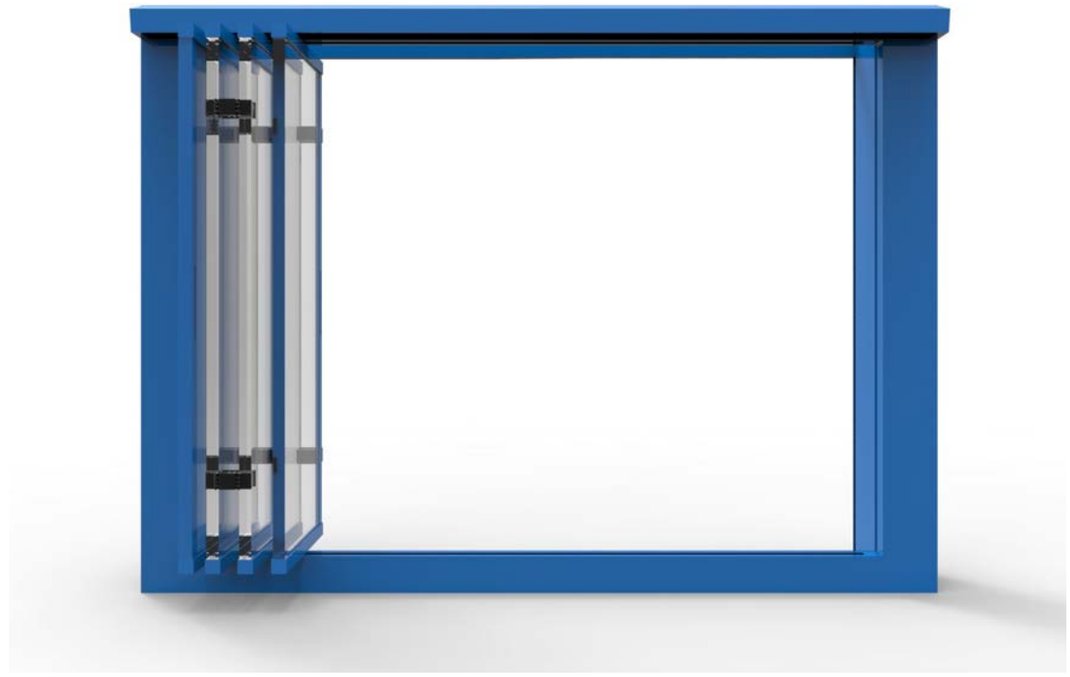
Lacunae in the ideation

The wow factor was found missing when the ideation were compared to some of the existing windows available in the market

We wanted to design a window system having homogenous aesthetics in every detail of it and also render it as a modular product. So the next phase of ideation began…

Sliding and folding window 1



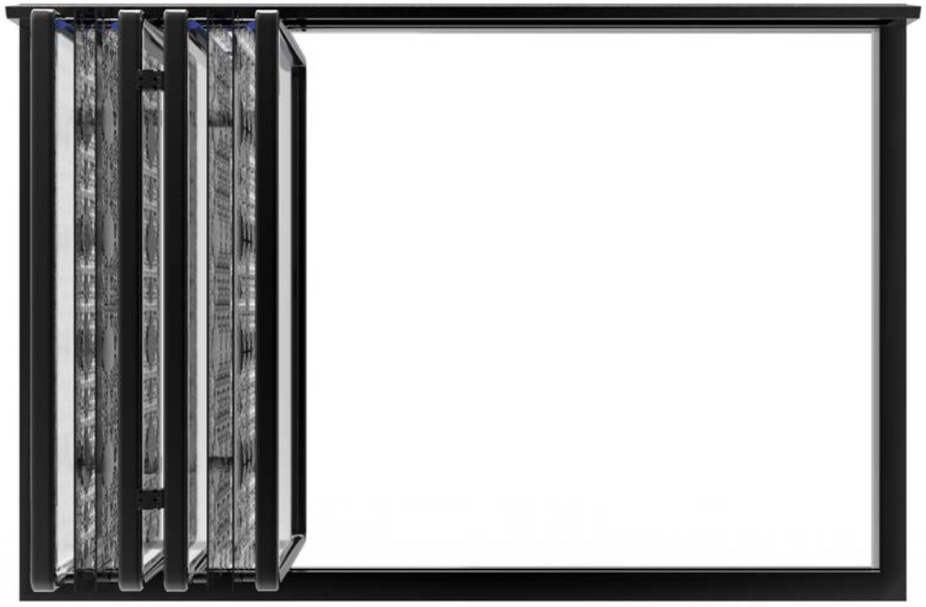


Lacunae in the ideation

A heavier glass has to be used as the window is frameless, thus making it more costly.

The grill system provided was not fool proof.

Sliding and folding window 2



Lacunae in the ideation

Cleaning the glass panes was an issue as the new design has grills attached to it.

It still occupied some portion of the inside of house when opened up.

A Revised Brief

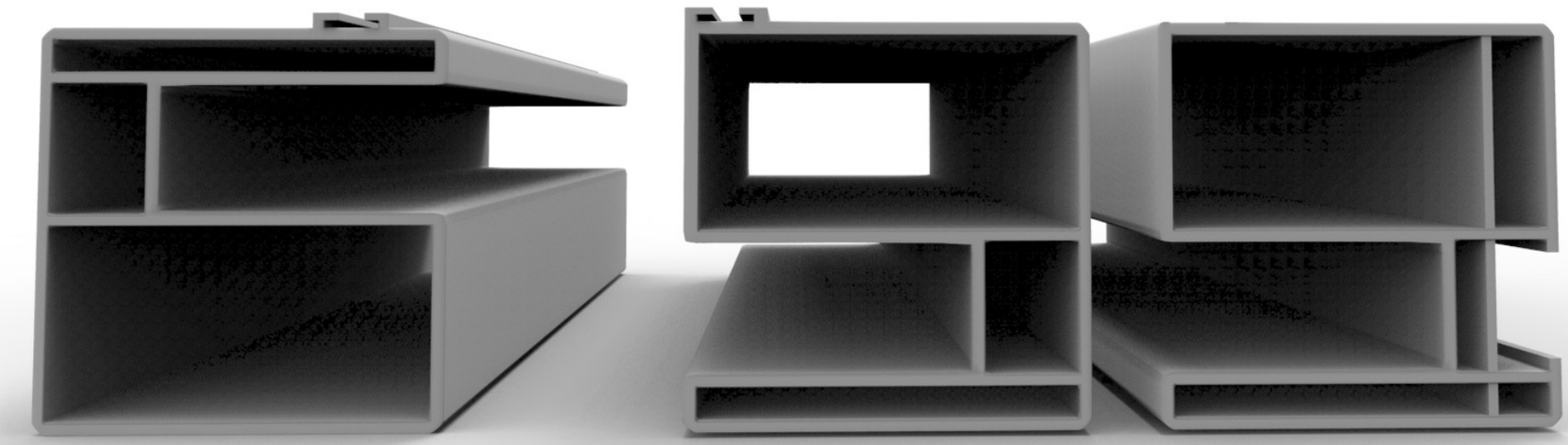
- No visual noise
- Grill as a part of the window
- Easy installation and removal of mosquito net.
- Easy cleaning of mosquito net
- New design of rails
- Aesthetics of the window pane channels
- Locking mechanism
- Opening mechanism

What creates Visual Noise in a window system?

- Various sections (vertical and horizontal) of not homogenous dimensions
- Too many planes or steps when the window is observed carefully
- Bad workmanship at the corners

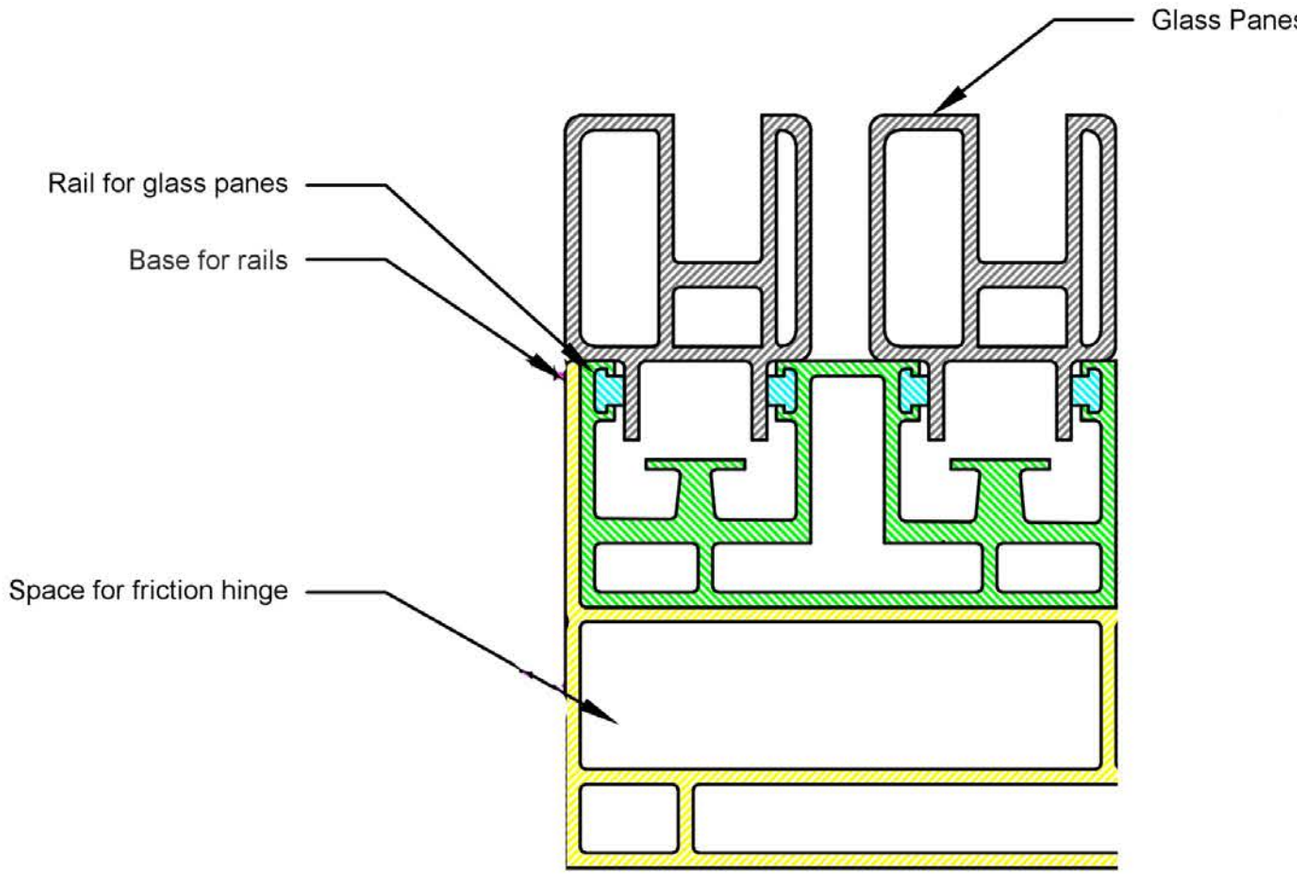
Window sections

Various sections of a pane



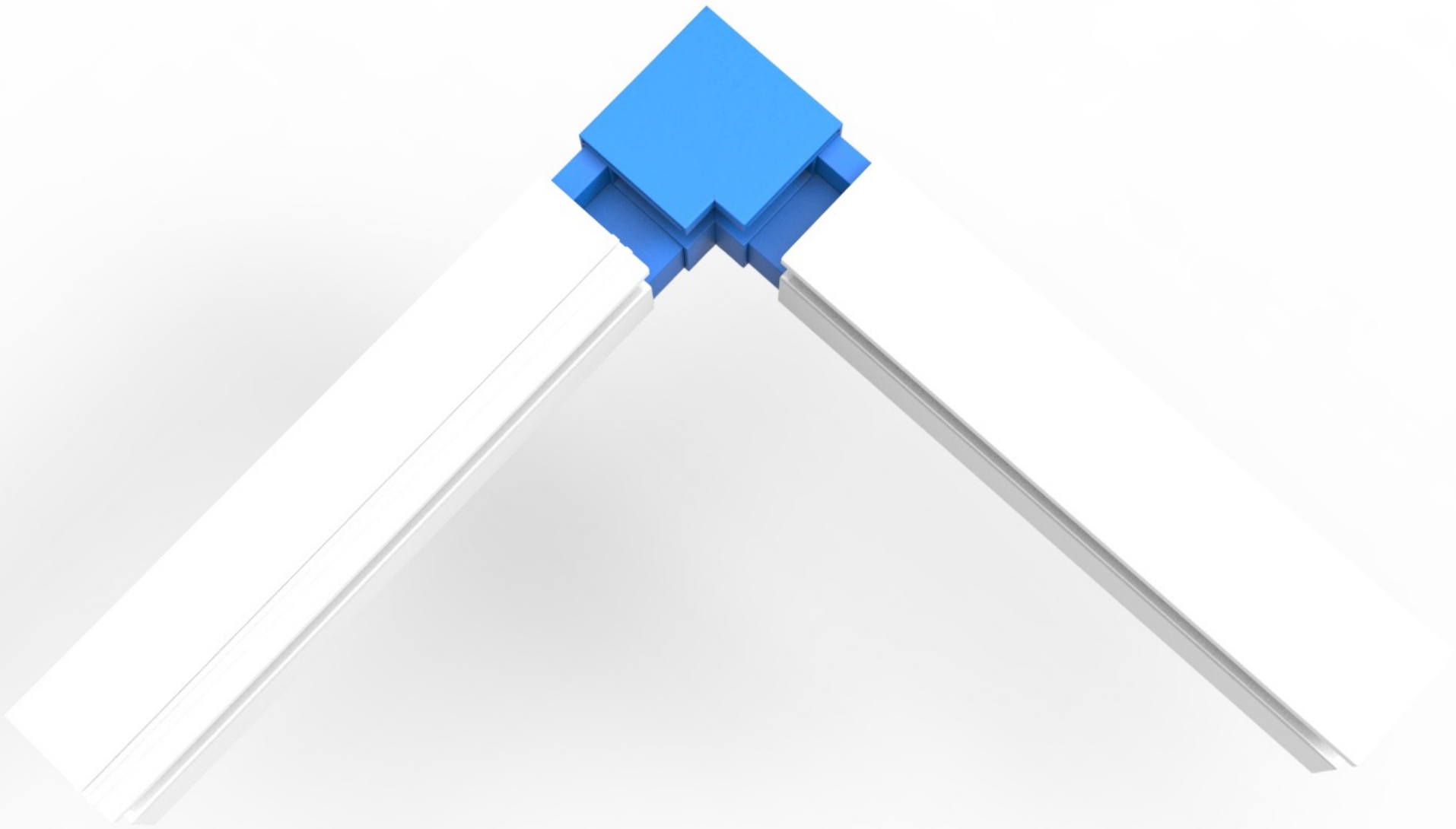
Window sections

Various sections of a window assembly

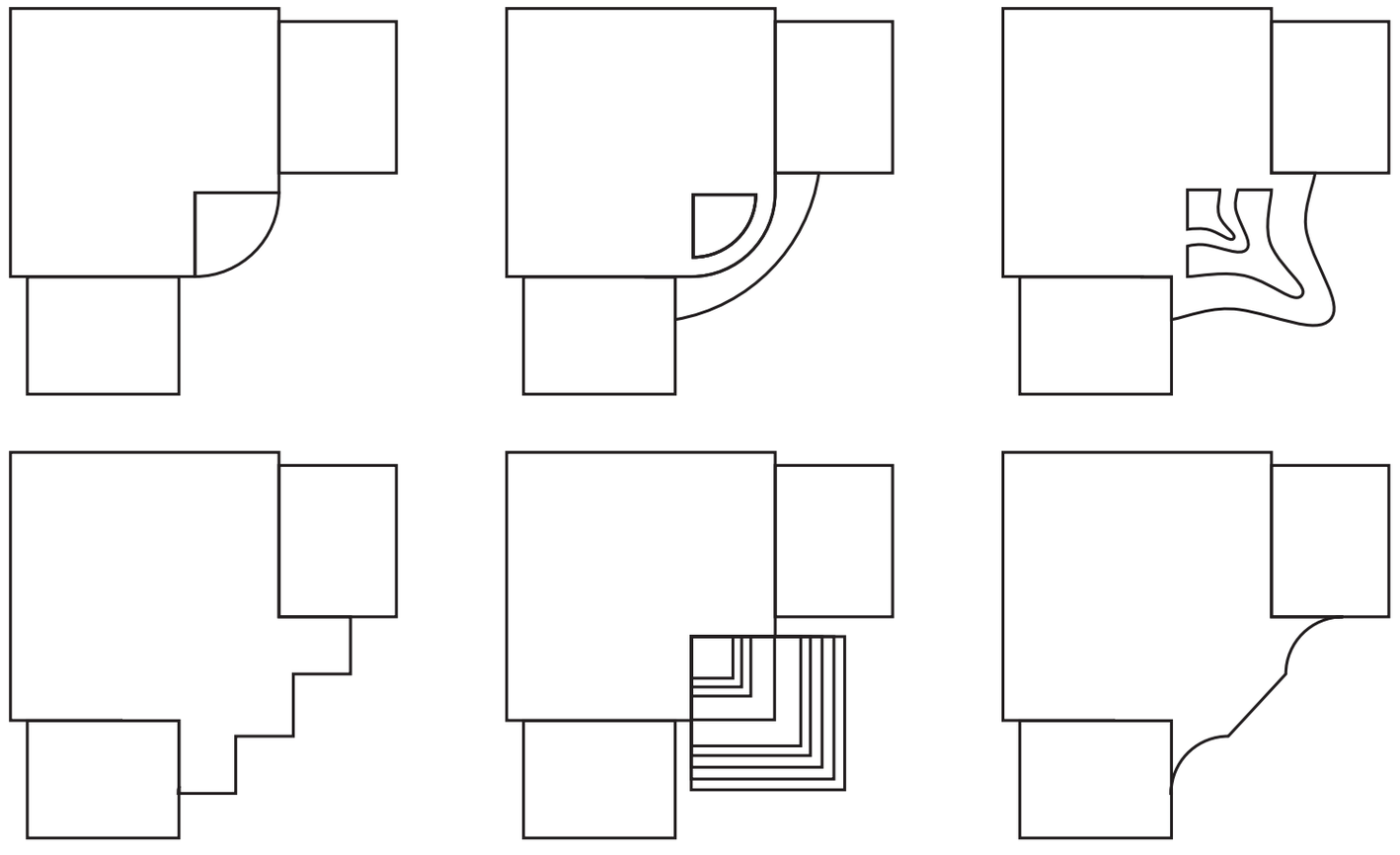


Window sections

Joining detail

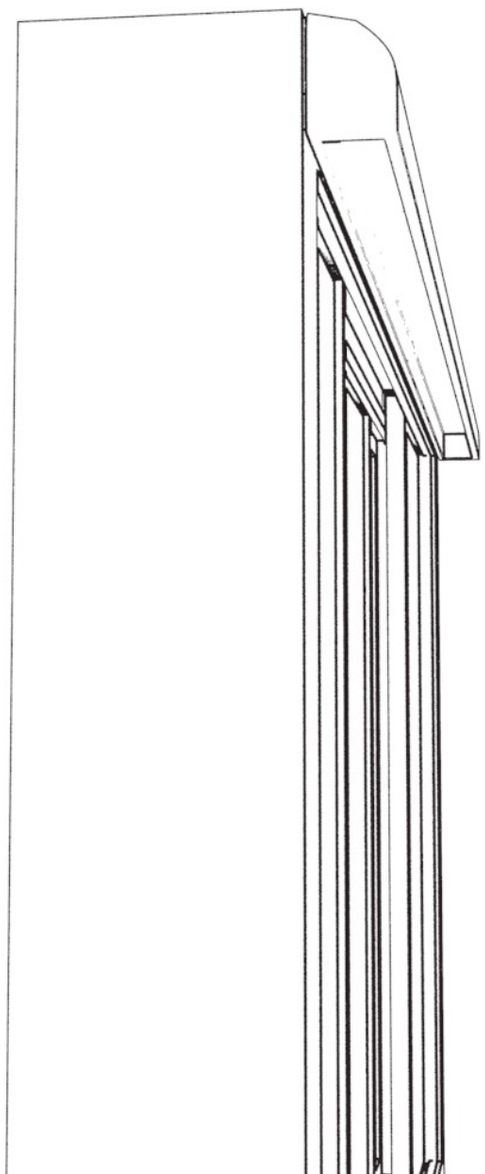


Aesthetic treatment of the corner joint



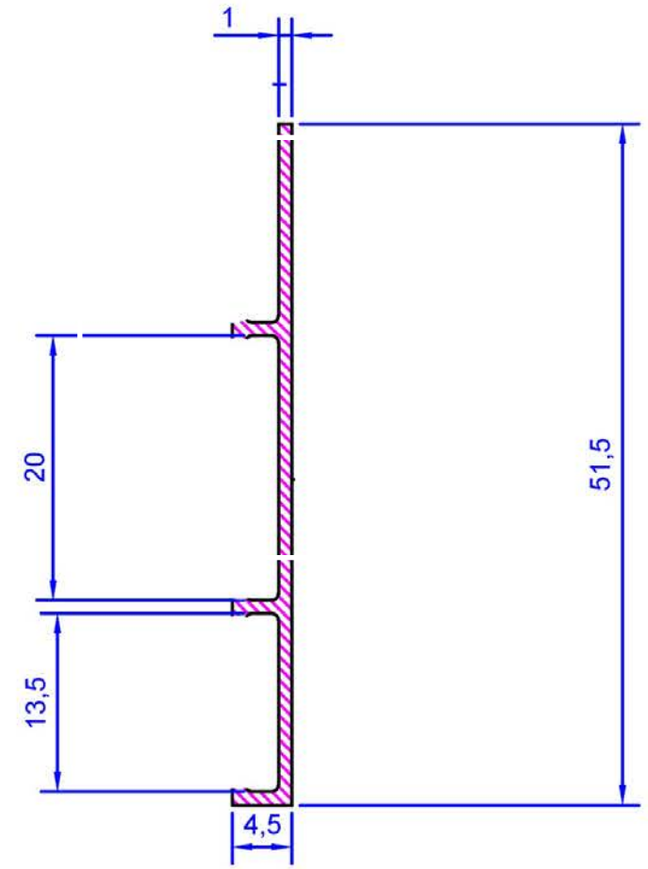
Aesthetic treatment of the corner joint

Provision for Mosquito net



Provision for Mosquito net

A channel for putting the net

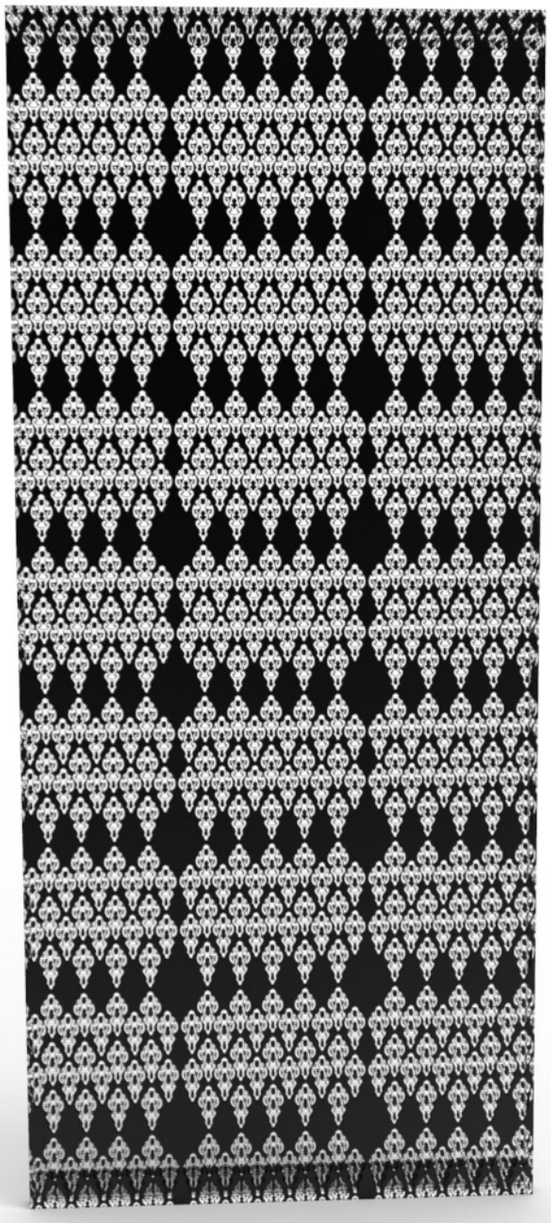


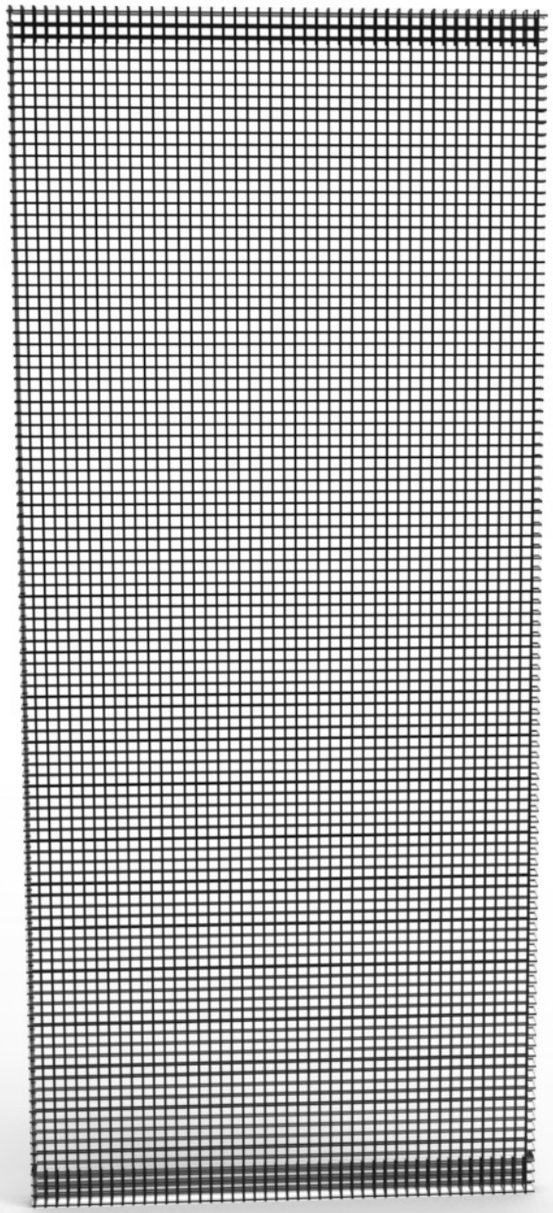
All Dimensions are in mm

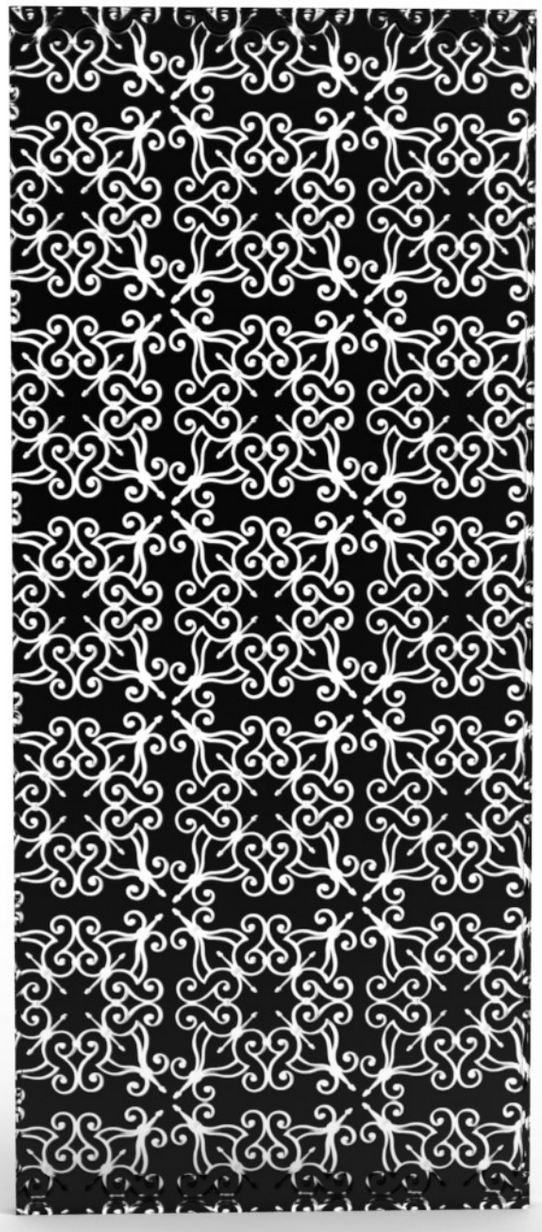
Joining detail for Mosquito net

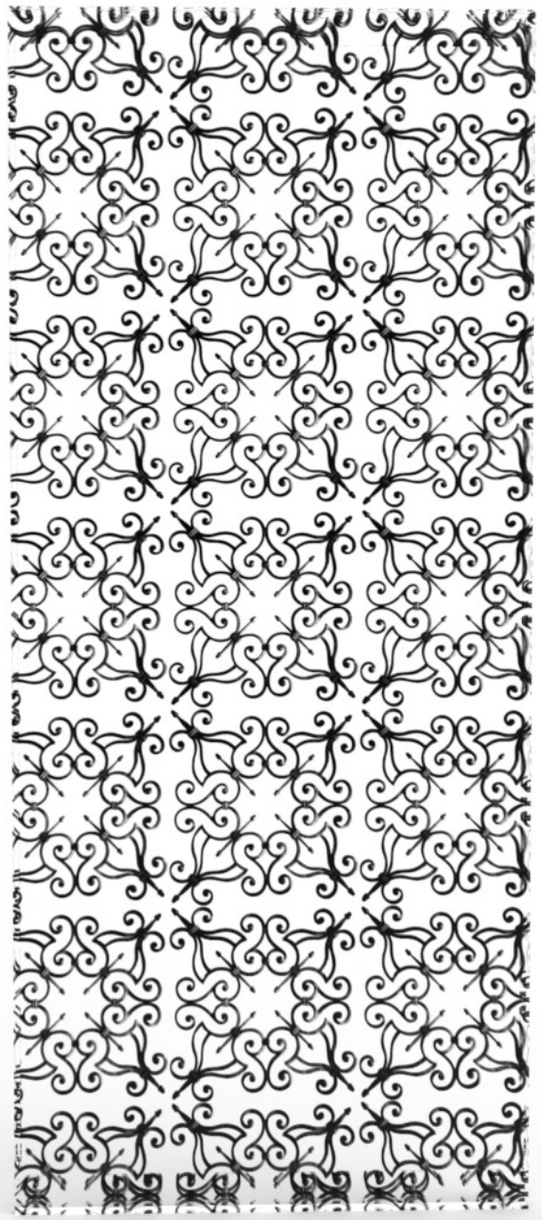
Grills

Various possibilities for grills



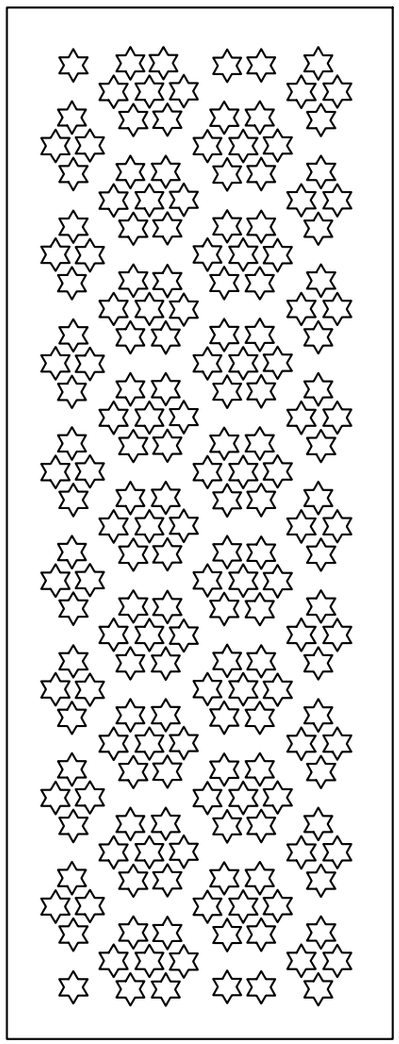


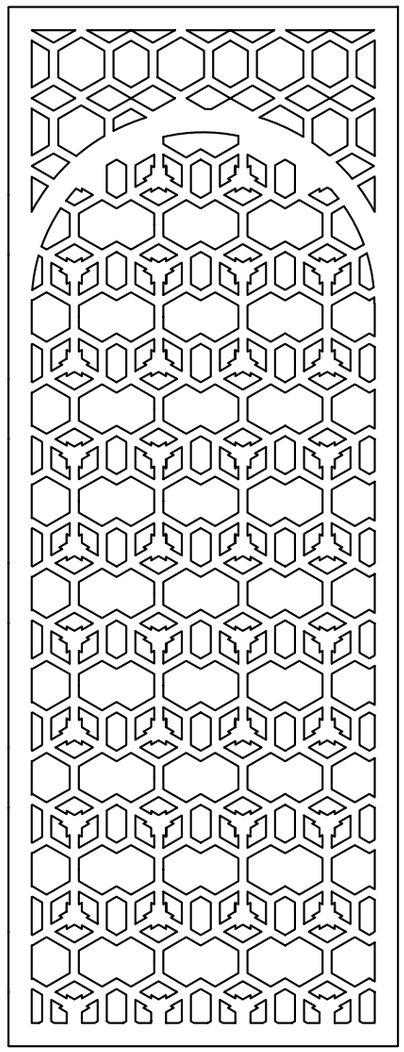




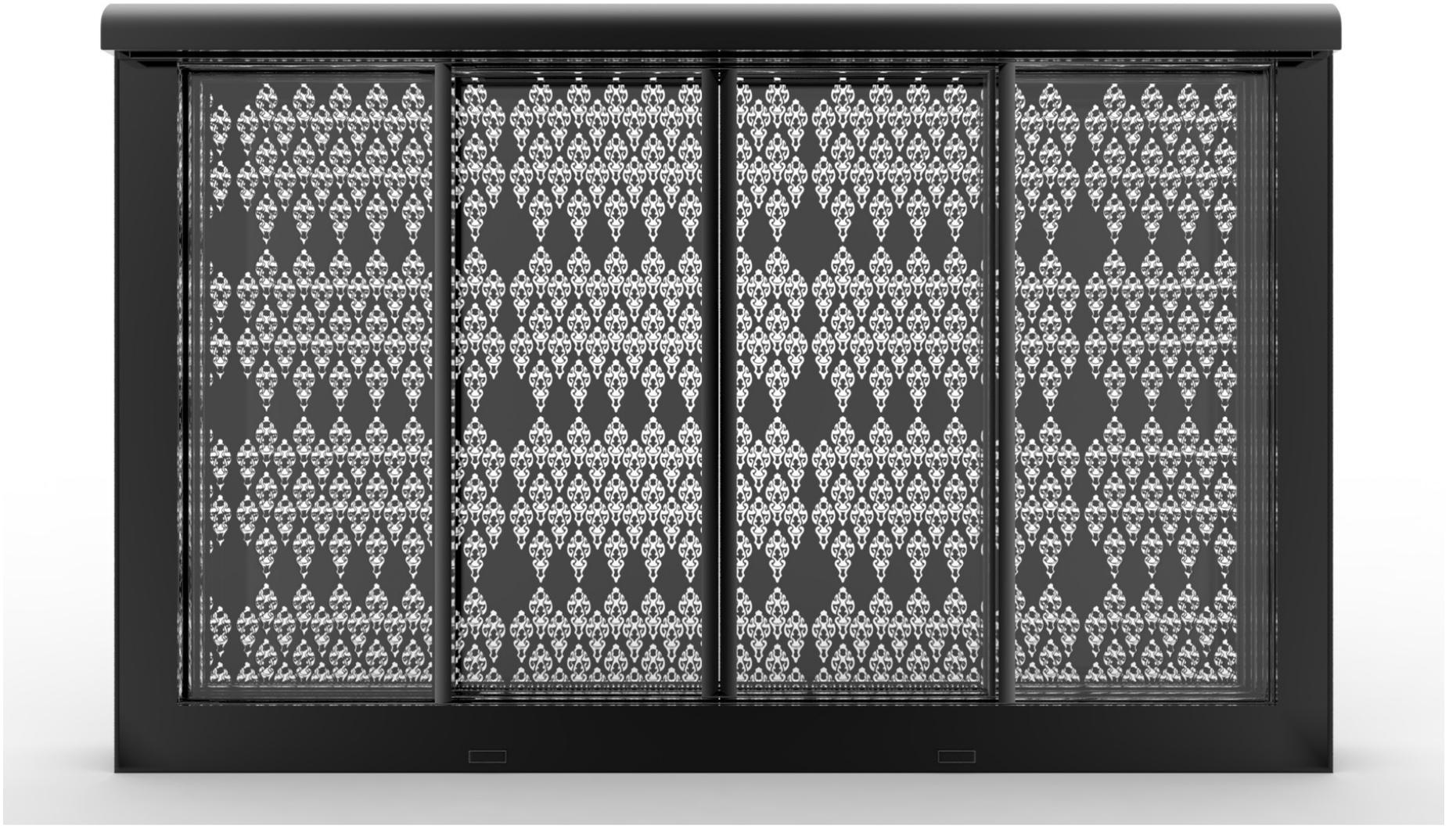
Grills

Various possibilities for grills



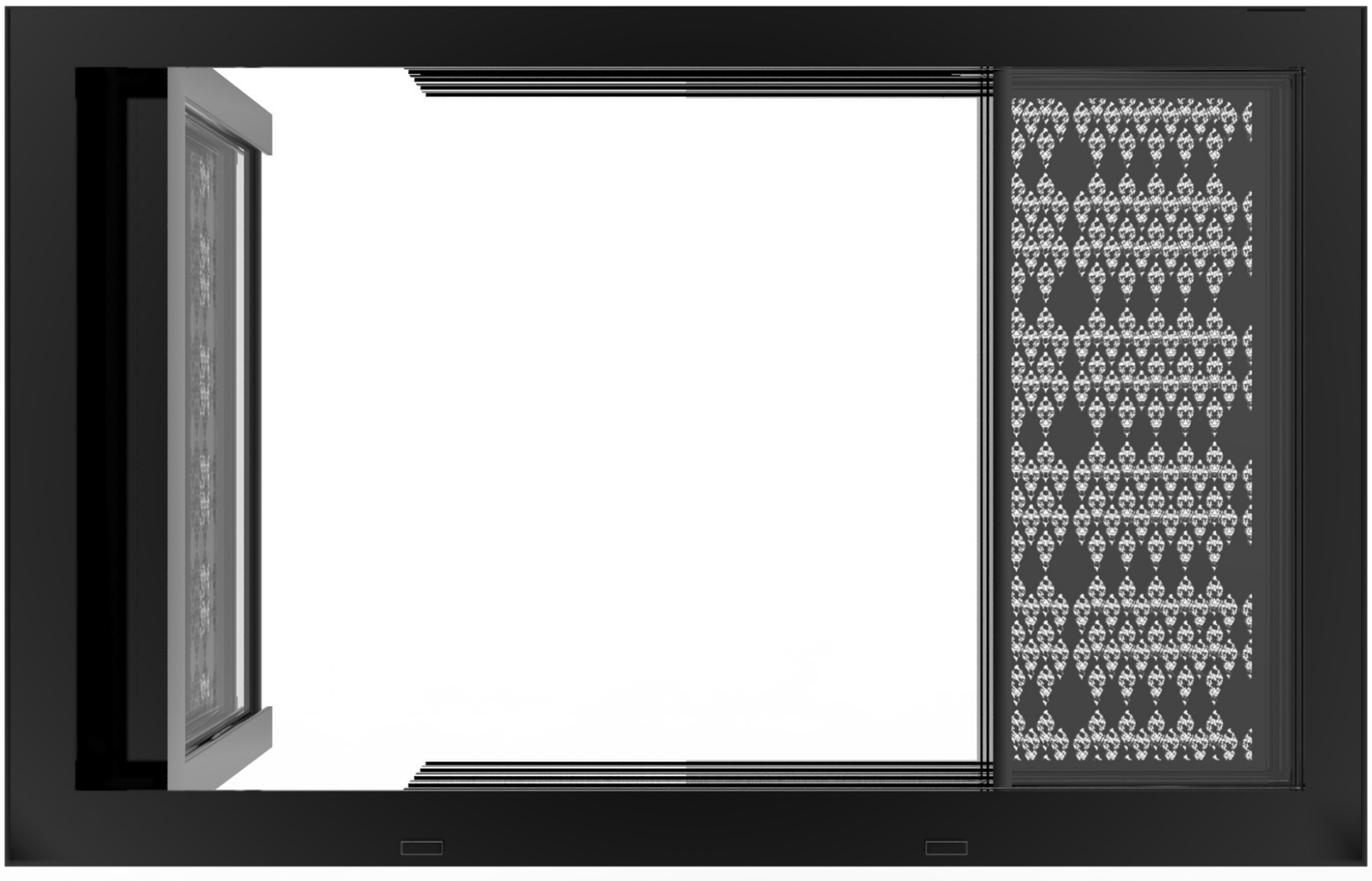


When fully closed



When half opened

A marriage of casement and sliding window

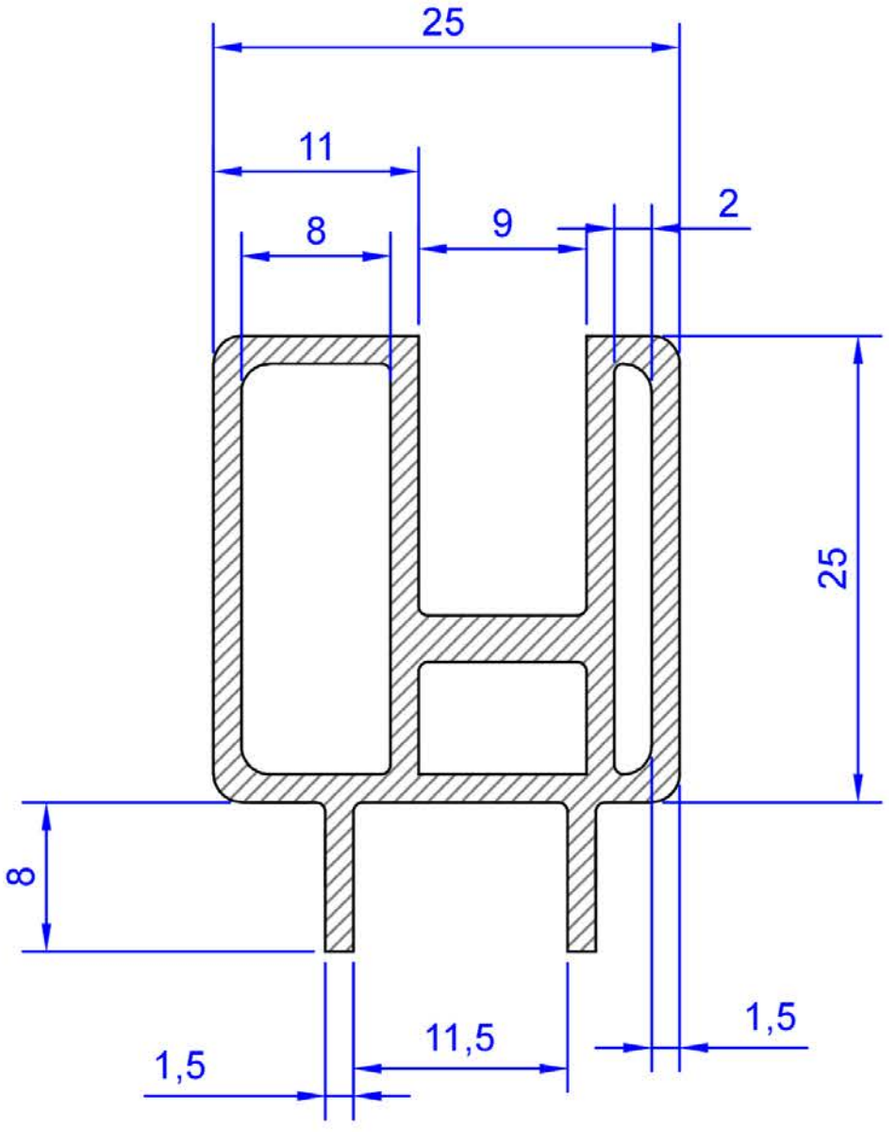


Fully opened window : View from outside

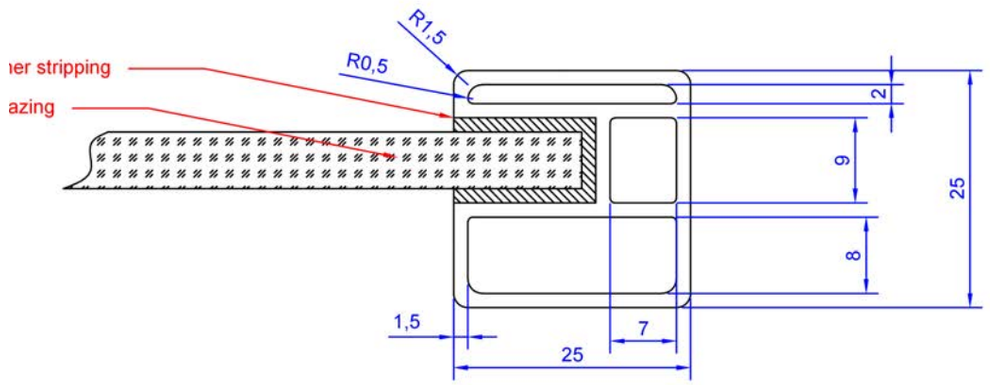
Ease of cleaning

Cleaning is now easy

Technical details



All Dimensions are in mm



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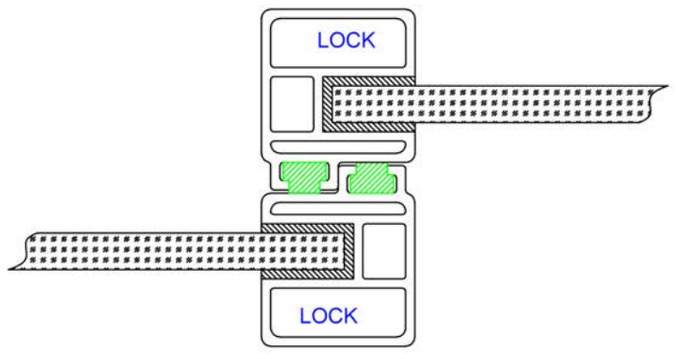
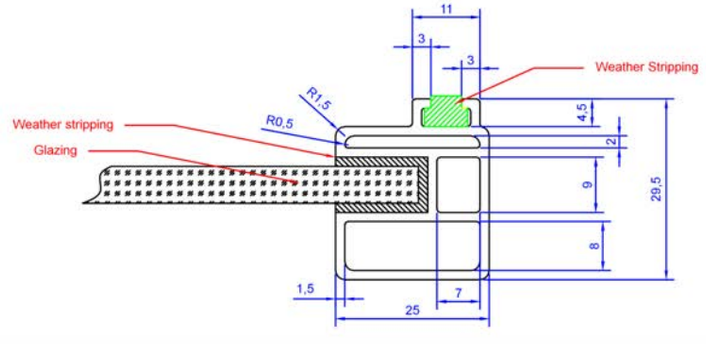
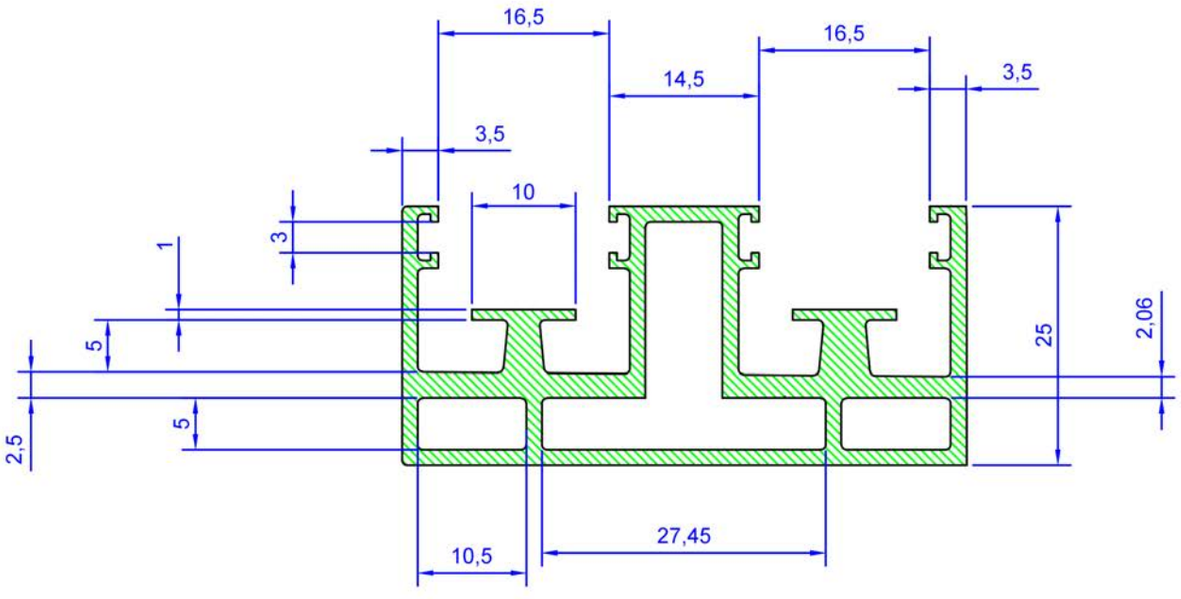
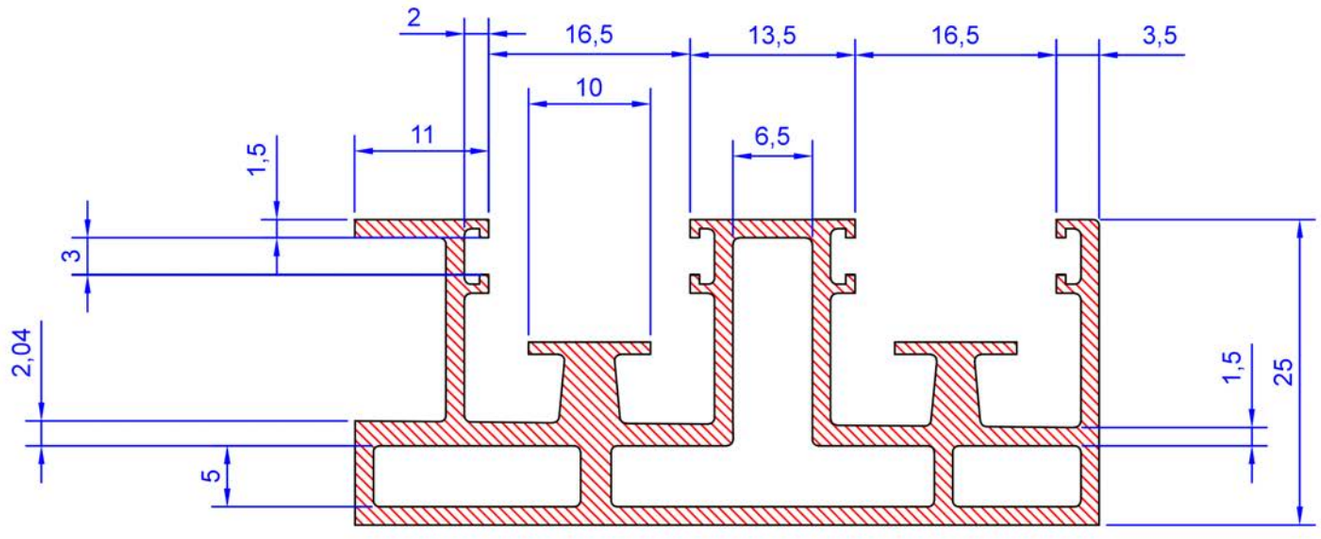




Bottom Rail sections

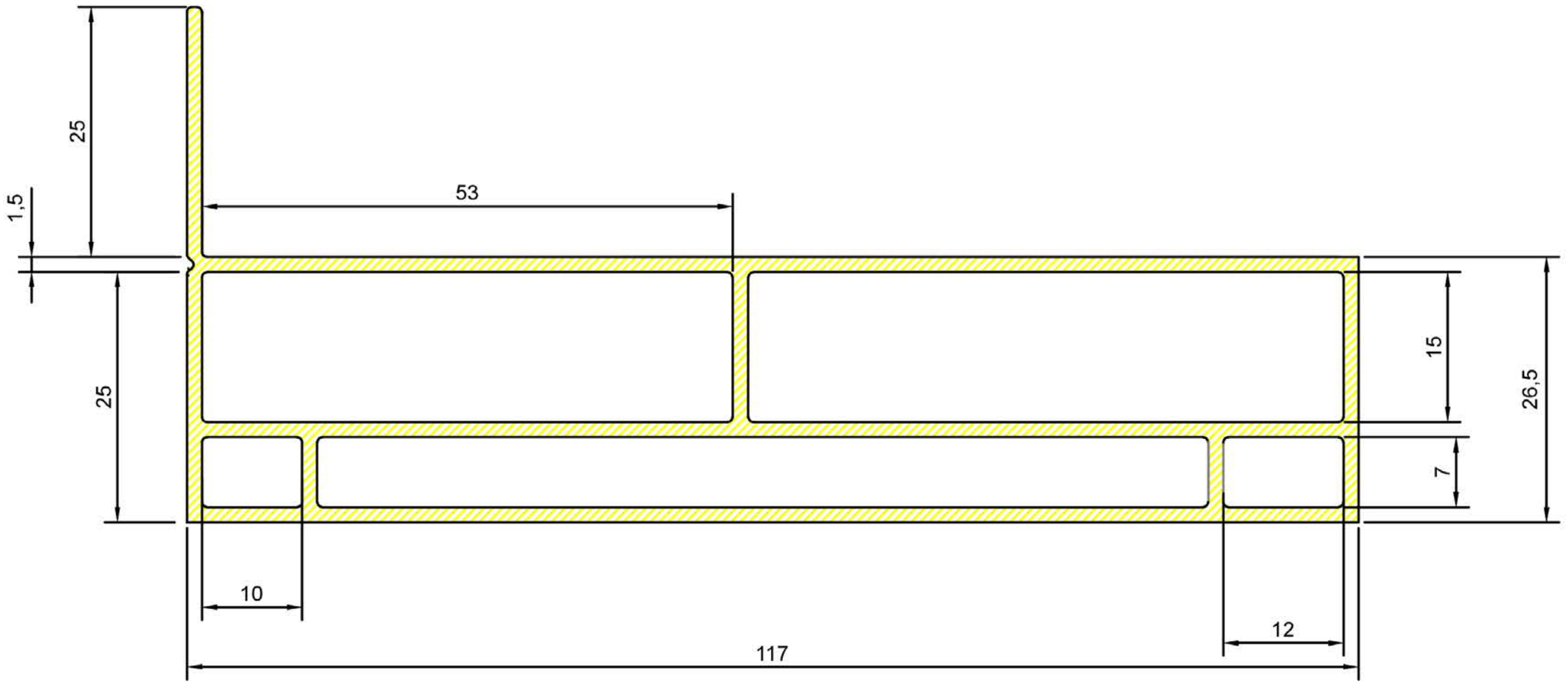


All Dimensions are in mm



All Dimensions are in mm

Bottom frame section



All Dimensions are in mm

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[1] WIKIPEDIA

Window

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Timber versus aluminium

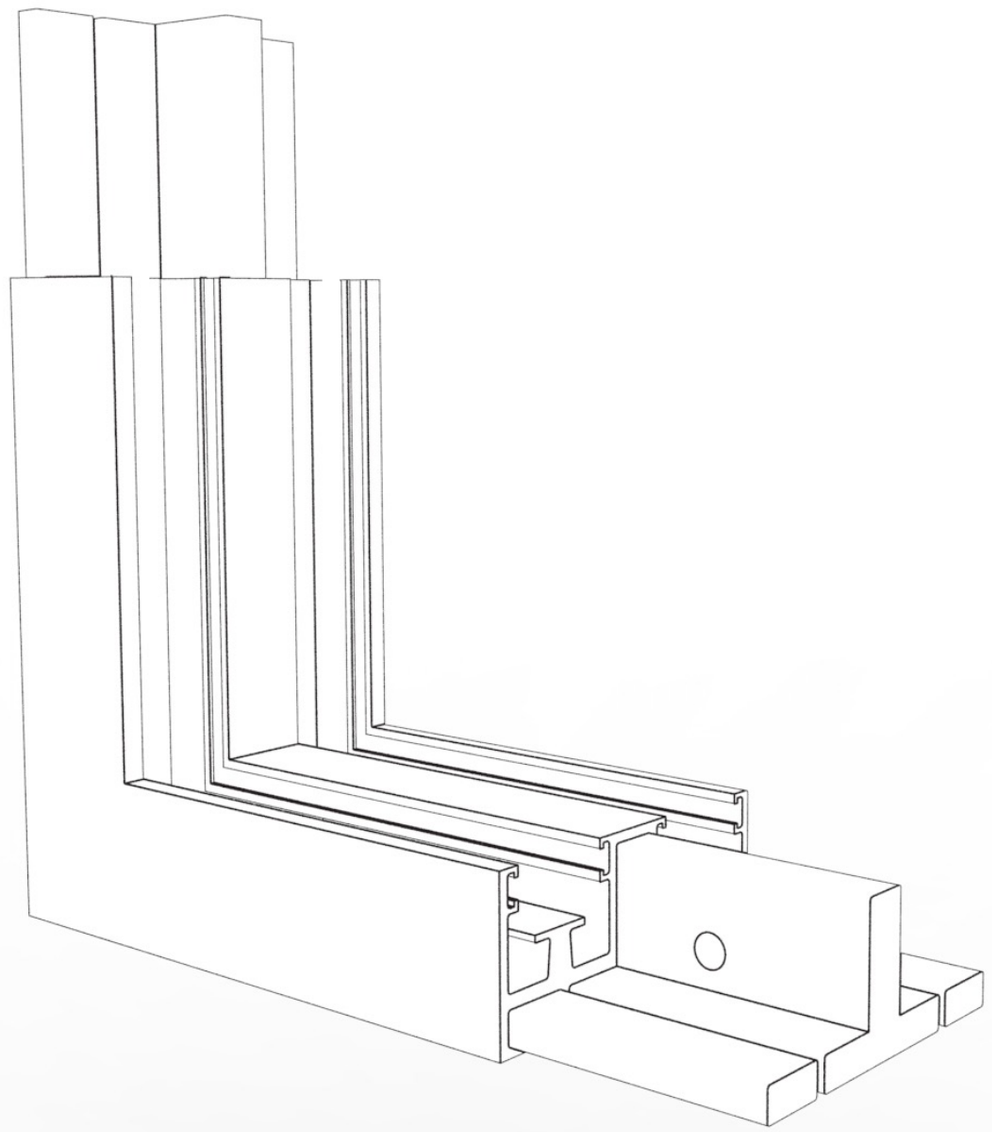
In-text: (Architecture And Design, 2008)

Bibliography: Architecture And Design, (2008). Timber versus aluminium. [online] Available at: *http://www.architectureanddesign.com.au/news/industry-news/timber-versus-aluminium* [Accessed 10 Oct. 2014].

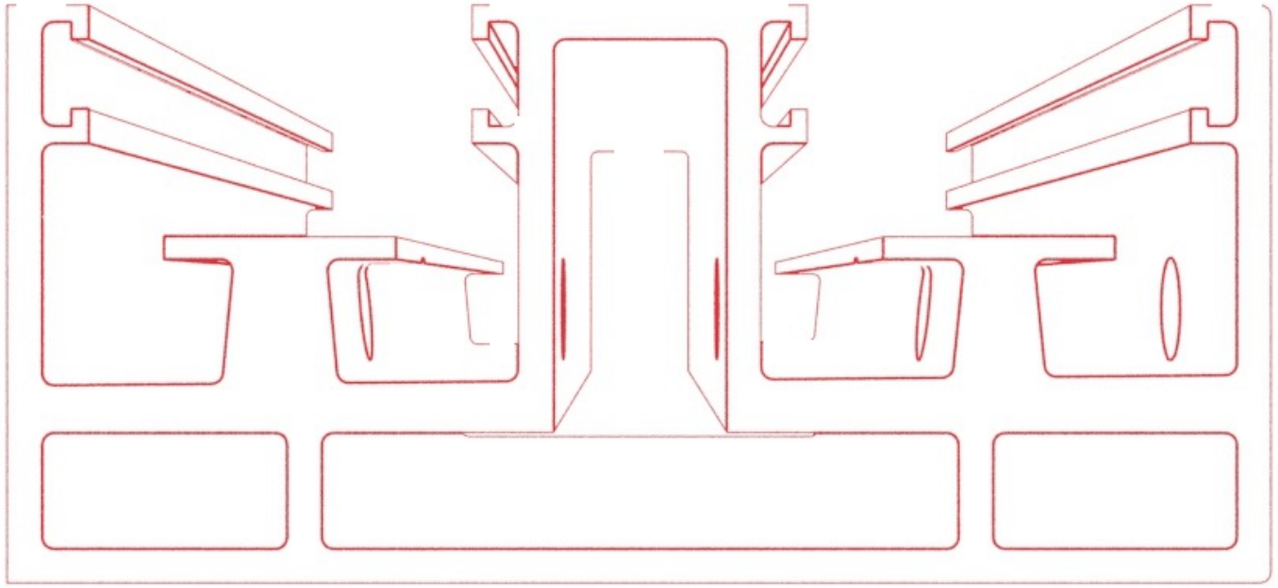
Thank You

Bottom Rail sections

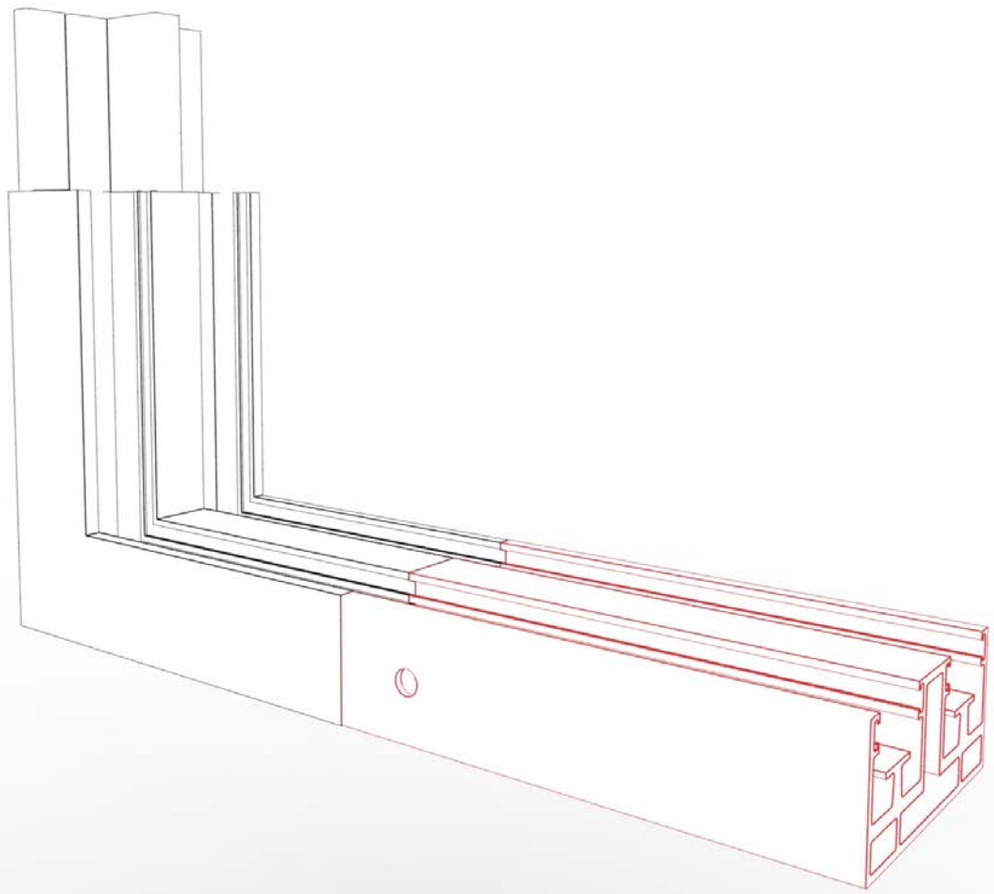
Corner joining detail

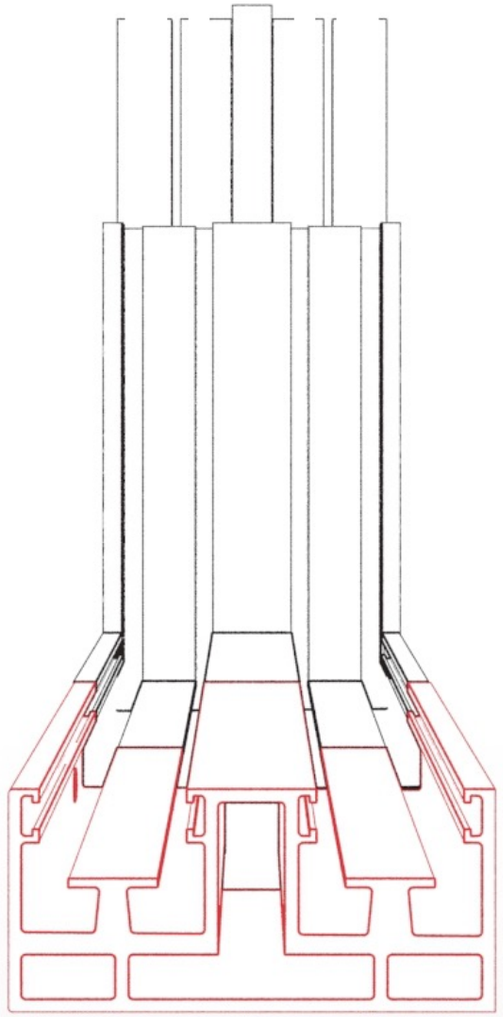


Bottom Rail sections



Bottom Rail sections





Joining detail: Rails