FREDOSECTION

SUITE OF TOOLS
RELATED TO SECTION PLANES

VERSION 1.4 – JANUARY 2026

BY *FREDO6*

The **home page of FredoSection** is on the Sketchucation web site at:

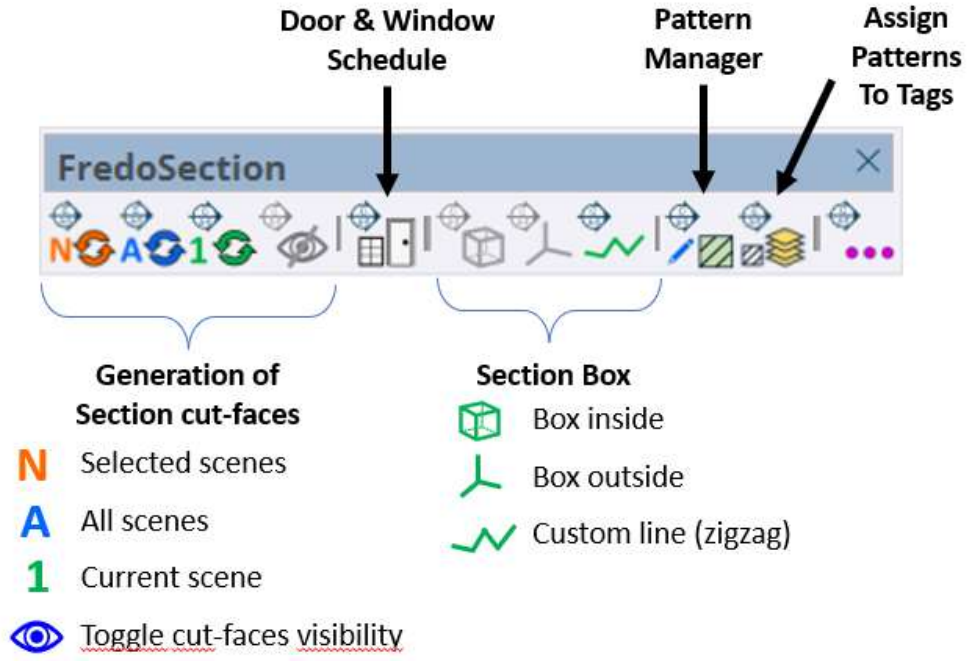
https://sketchucation.com/plugin/2955-fredosection

Contents

1. Introduction

FredoSection provides several tools dedicated to section planes:

- **Generation of section cut faces with hatching patterns at scale** for section planes which are active in scenes.
- **Section box**: create a configurable set of section planes (inside box, outside box, custom section line) for a selection of geometry.
- **Door and window schedule**: create a permanent companion model with selected views of doors and windows, which can then be mapped at scale in a Layout document.
- **Pattern Manager**: This tool is used to create / modify hatching patterns and assign them to groups and components to decorate their cut faces created by the other tools above. FredoSection comes with a set of built-in patterns, but you can create your own. You can also assign patterns to tags and tag folders.



FredoSection is mainly oriented to support a workflow Sketchup + Layout. It only works on Scenes. The hatching patterns are *scaled by scene*, so that they always appear at the *same size when printed on paper*. This requires that you assign a paper scale to each scene processed.

2. Generation of Cut Faces

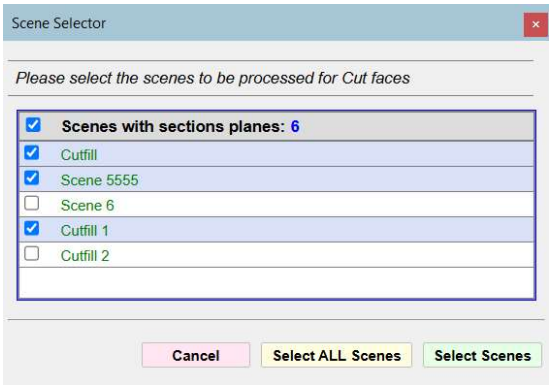
2.1. Workflow

With the native Sketchup tools, you create section planes in your model and activate them in scenes.

- FredoSection requires that there is at least one scene in the model.
- You can have several active section planes in a scene.
- When you activate / deactivate a section plane, do not forget to update the scene. A section plane may appear active in the model although not activated in the scene.
- It is advised to disable the option *'Display Section Fill'* for the scenes that you plan to render with FredoSection. This ensures the visibility of the calculated cut faces.

Then, you can launch the calculation and rendering of cut faces by clicking on one of the toolbar buttons:

- For the ***current*** scene
- For ***all*** scenes
- For ***selected*** scenes. A list of scenes (with at least one active section plane) will be displayed for selection.



A progress bar is displayed during the calculation and rendering.

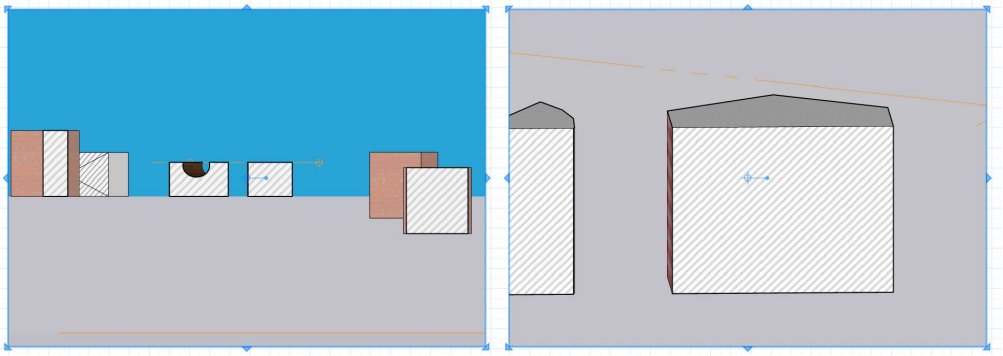
Note that **the calculation of cut faces is not interactive**. So, whenever you make a change to the model geometry or create / modify / activate section planes, you will need to regenerate the cut faces. At least you should do it before saving and rendering the scenes in Layout.

At any time, you can assign hatching patterns to containers and to tags, as described in *Sections 3 and 4* below.

2.2. Scene Parameters: Paper Scale and Pattern Mode

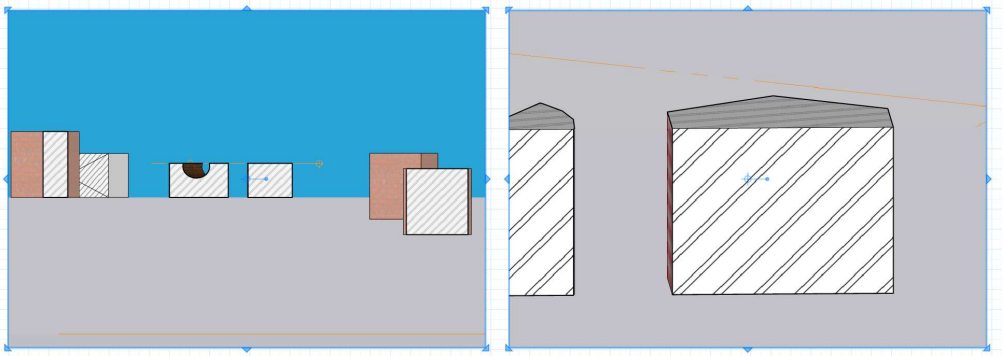
The objective is to ensure that hatching patterns are properly scaled for each scene so that the readability is the same on paper, regardless of the paper scale of each scene.

Consider 2 scenes rendered in Layout with different paper scales. The hatching should be spaced identically on both Layout viewports, as shown below:



Paper Scale = 1:50 ***Paper Scale = 1:10***

If you do not specify a paper scale for scenes, this is what you would get:

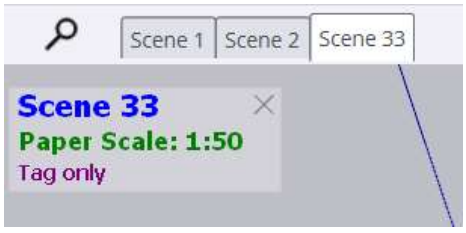


Paper Scale = 1:50 ***Paper Scale = 1:10***

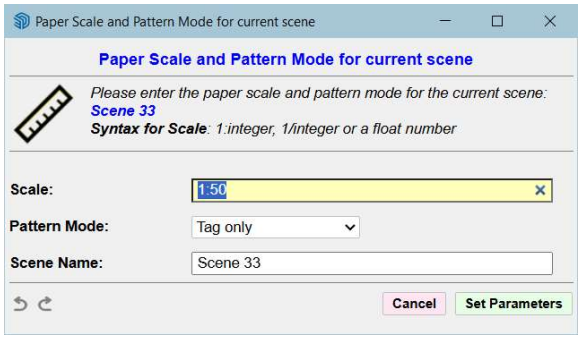
You need therefore to **specify the paper scale for each scene**, at least those which have an active section plane. This will be the paper scale that you would set in Layout for Parallel Projection scenes (for Perspective scenes, just approximate the paper scale).

The scene parameters are displayed as a **banner** within the Sketchup viewport for each scene when the current tool is the Selection tool (it is hidden otherwise). By default, it is in the top-left corner.

To change the position of the Scale Banner, just **Click-Drag-Release**. The new position will be remembered for future Sketchup sessions.

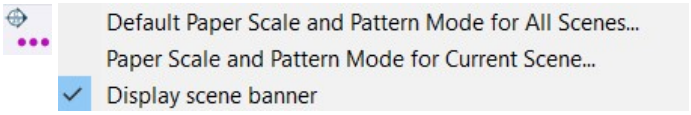


To change scene parameters, just **Click** on the banner. You can set:

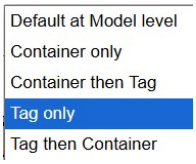


- **Paper Scale**: the value can be entered with the column notation (ex: *1:50* or *2:100*), the fractional notation (ex: *1/50* or *3/300*) or a float number (ex: *0.02*). An empty value will mean 'use the default at model level'.

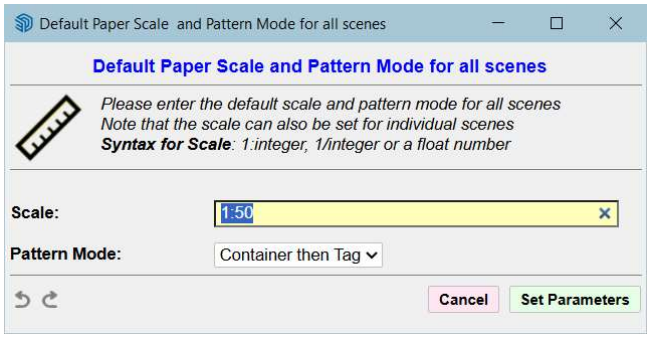
  Scenes receive a default paper scale until one is specified. This default paper scale can be changed for the model. Its absolute default is 1:50. Click on the *Extra Command* icon in the FredoSection toolbar. The popup menu displays 3 commands related to paper scale for scenes.



- **Pattern Mode**: You have the choice between 5 options:



  - ***Container Only***: cut faces are only decorated from the container pattern
  - ***Container then Tag***: cut faces are decorated from containers. However, if a container has no pattern assigned, then the pattern of its tag is used.
  - ***Tag Only***: cut faces are only decorated from the pattern assigned the tag of the container.
  - ***Tag then Container***: cut faces are decorated from the pattern assigned to the tag of the container. If no pattern is assigned to the tag, then the pattern of the container is used.
  - ***Default at Model Level***: The scene uses the Hatching mode defined as the default at model level.

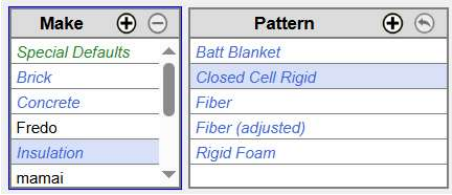


3. Pattern Management

3.1. Patterns

A **Pattern** is a specification of how the cut faces of a container (e.g. group or component) will be rendered.

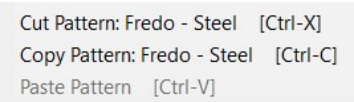
Patterns are designated by a name and organized by families, called **Makes**.



FredoSection comes with a collection of **Built-in patterns** (highlighted in *italic blue*).

You can create your own patterns with the Pattern Browser panel (*see Section 3.3 below*). You can also modify Built-in patterns.

Buttons ⊕ and ⊖ are used to add or remove Makes or Patterns. You cannot remove Buit-in patterns however, but you can restore them to their initial state with ↶You can also cut / copy / paste patterns by right-clicking:

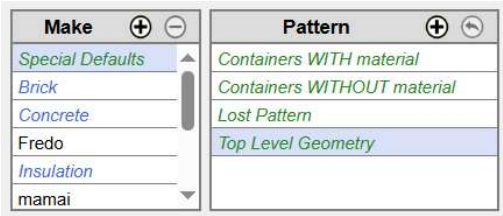


3.2. Pattern Assignment

Patterns are assigned to the definition of containers or to tags. This means that whenever a container is cut by a section plane, its cut faces will be decorated according to the pattern specifications stored in its definition or stored in its layer, depending on the pattern mode of the scene (see *Section 4* below for pattern modes).

Currently, **the assignment of a pattern to a container must be done manually via the Pattern browser**, pretty much in the same way as the Paint mode with the Material Browser (e.g. Select Pattern, click on a face or a cut face of the container). In future versions, FredoSection will partly automate this phase for elements which are generated by third-party plugins.

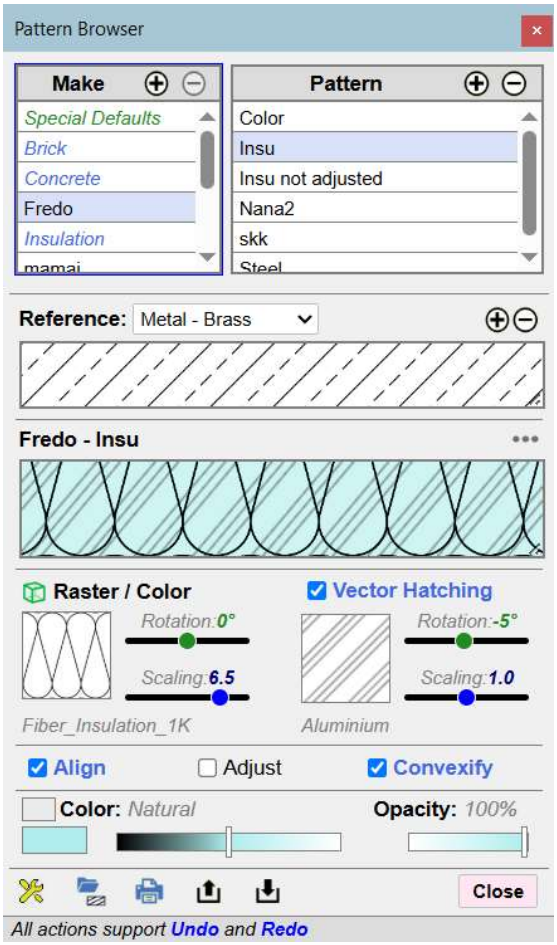
There are **4 Special Default patterns** that apply to special situations (these patterns can also be modified):



- ***Top Level Geometry***, shared by elements at top level of the model (since their container is the model itself).
- ***Unassigned container WITHOUT a material***: white by default
- ***Unassigned container WITH a material***: the cut faces will be painted with the material of the container with a light grayscale mask by default.
- ***Lost Pattern***: this may happen when a pattern has been associated to a container, but the pattern is no longer present in the environment. By default, the pattern has a pink color.

3.3. Pattern Browser and Editor

The **Pattern Browser** is a panel where you can create / modify / manage patterns and assign them to containers. The approach is somehow similar to the Sketchup Material Browser: if you modify a pattern, the effect will propagate to all cut faces of containers assigned to this pattern.

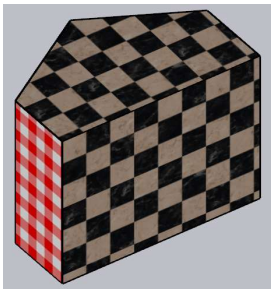


A pattern can be of two types:

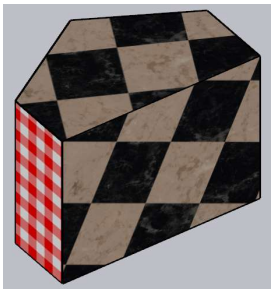
1) **RASTER**: the pattern is based on a Sketchup Material, either a pure color or a textured material.

   For all materials, you can apply a **mask** (darker / lighter) to the color

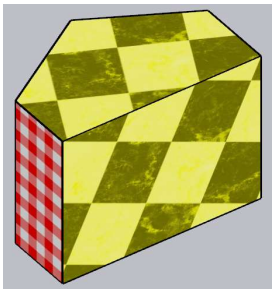
   For texture materials, you can set a **scale** to enlarge / reduce the size of the texture image, as well as **rotate** the texture.



From SU material

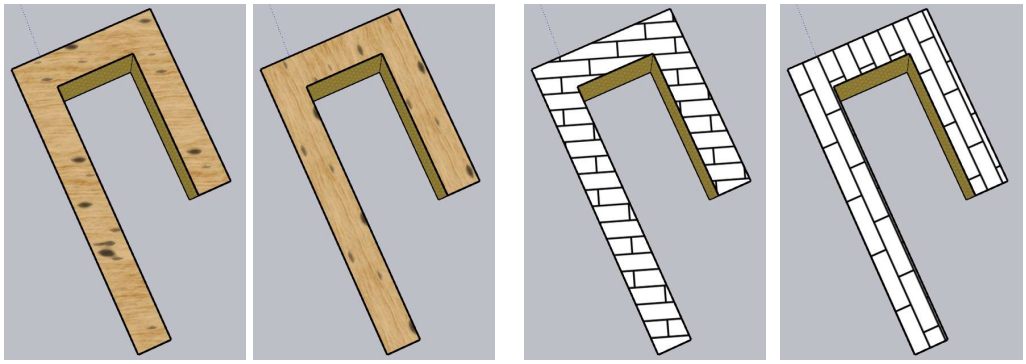


Rotated and Scaled



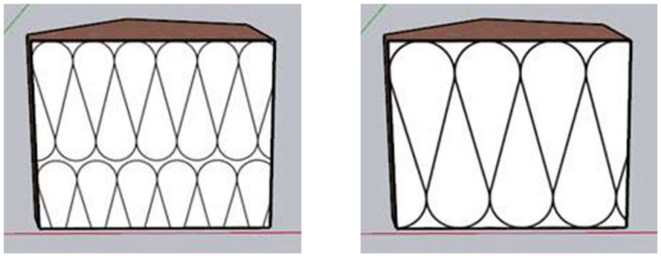
with color mask

You can also **align** the texture orientation along the principal direction of containers:



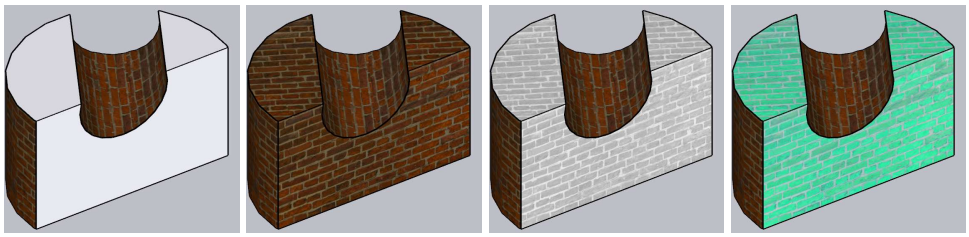
Align: OFF *Align: ON* *Align: OFF* *Align: ON*

You can **adjust** it to the main dimension of the container, like for Insulation:



Adjust: OFF *Adjust: ON*

2) **NATURAL**: The pattern is calculated based on the **Sketchup material of the container** (i.e. assigned to the container by the Paint tool). This can be modified with a **grayscale mask** or even a mask based on color and light.



Raster
White

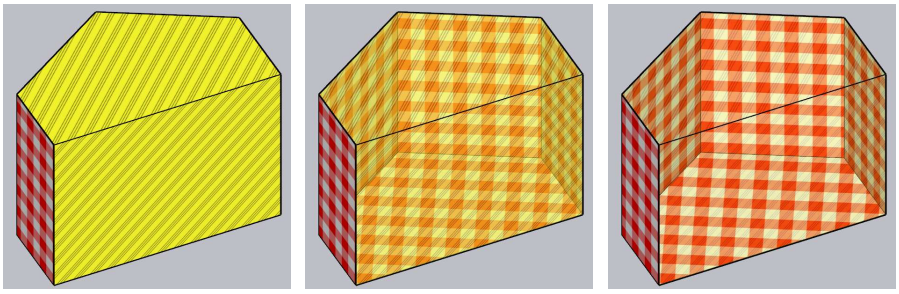
Natural
Same

Natural
Grayscale Light

Natural
Green mask

For both types of patterns, you can:

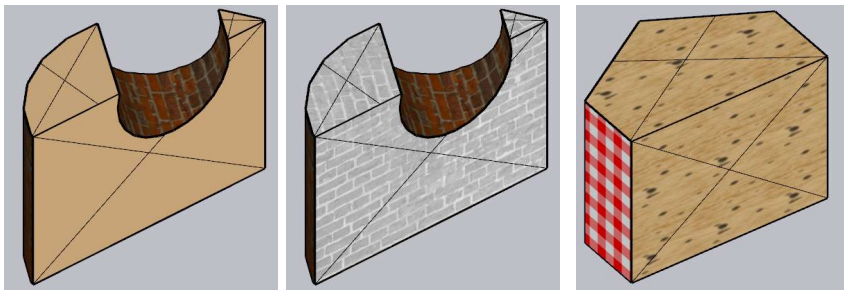
- Set a **Transparency** mask (opacity 0 to 100%)



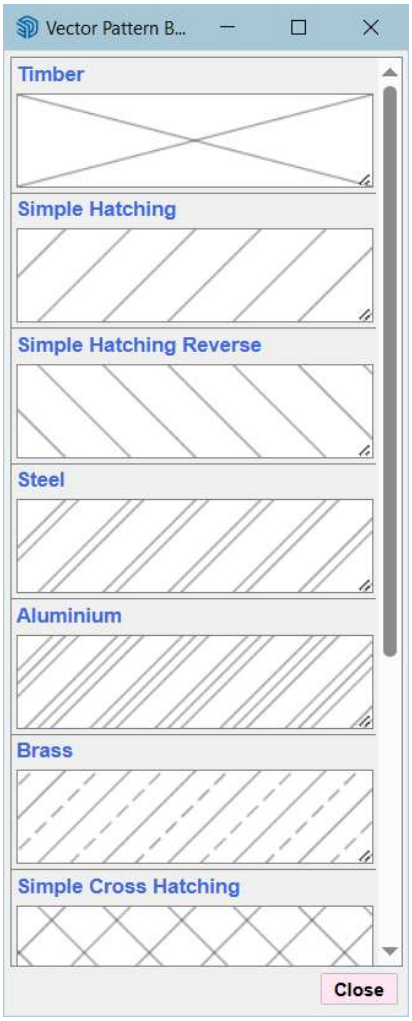
Opacity: 100% *Opacity: 60%* *Opacity: 30%*

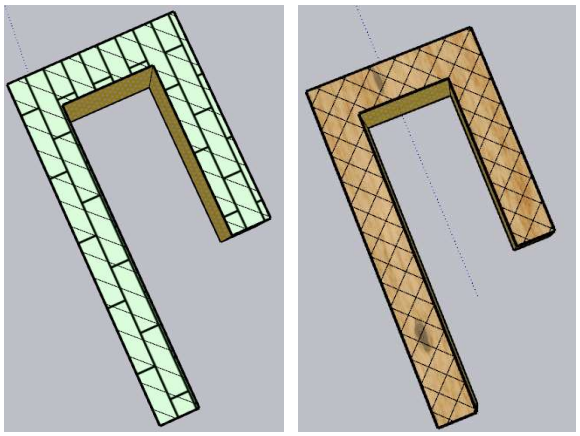
- Set a **Vector hatching**, which will be rendered as true edges. The vector hatching can also be scaled and rotated.

  A special case of vector hatching is the **Timber cross**:

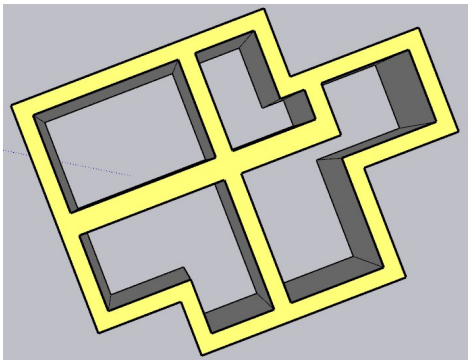


  FredoSection comes with various hatching styles, which you can scale and rotate, as well as combine with Raster textures and colors:

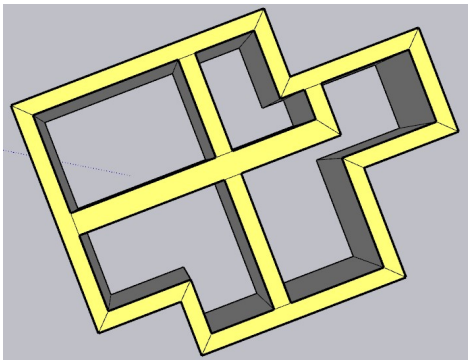




The ***Convexify*** option is used to split individual faces into a set of convex faces. This is typically adapted for walls. *Convexify* is available for all types of patterns:

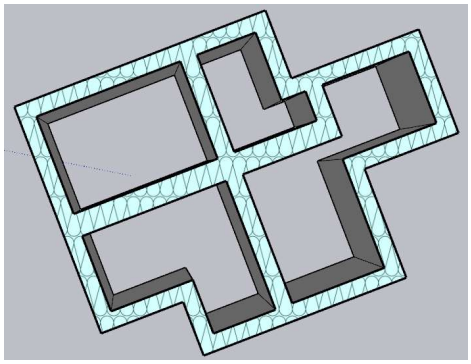


Convexify: OFF

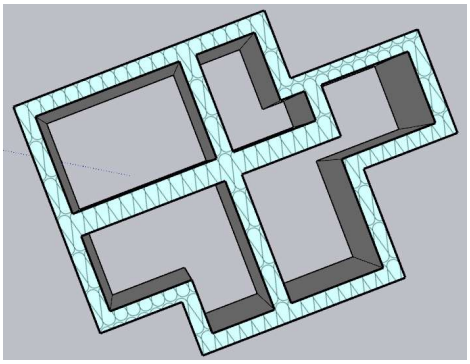


Convexify: ON

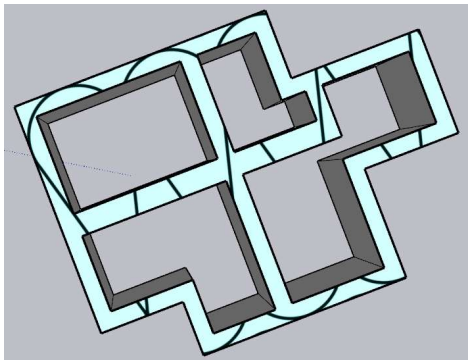
Combining the *Convexify*, *Adjust* and *Align* options, you can ensure that the pattern decoration will adapt to various situations:



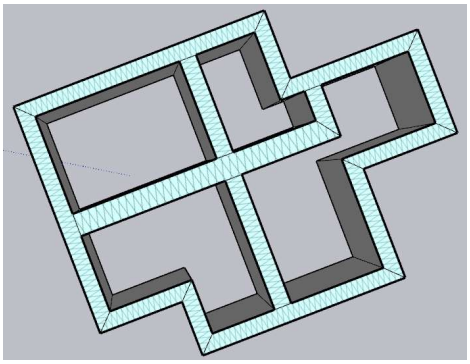
Align: OFF
Adjust: OFF
Convexify: OFF



Align: ON
Adjust: OFF
Convexify: OFF



Align: ON
Adjust: ON
Convexify: OFF



Align: ON
Adjust: ON
Convexify: ON

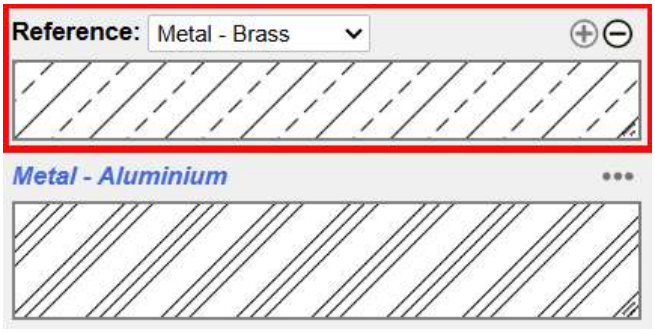
Finally, it is worth noting that:

- When you modify a pattern, the effect is **interactively updated in the model for all scenes**.
- **All actions support the native Undo / Redo of Sketchup** (Ctrl-Z / Ctrl-Y), whether the edition of patterns or assignment to containers.

Reference

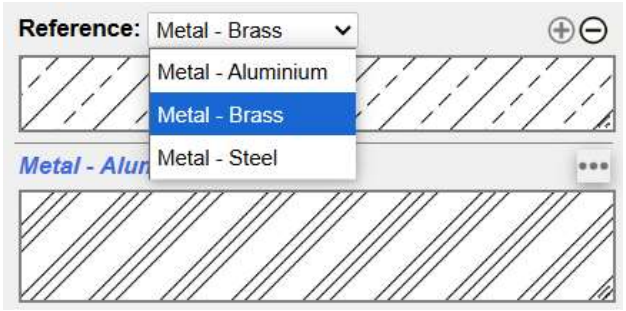
When creating or modifying patterns, it is important to adjust the scale correctly to get the pattern at a readable level in the Layout document, regardless of the paper scale of scenes.

In the Pattern Browser, there is a section Reference showing patterns that you consider correctly scaled.



The objective is to help you adjust the scale, considering that the default size of Sketchup materials is not always readable at scale in Layout.

You can have several reference patterns:



⊕ Click on the Plus to **add** the current pattern to the list of references

⊖ Click on the Minus icon to **remove** the current reference pattern from the list.

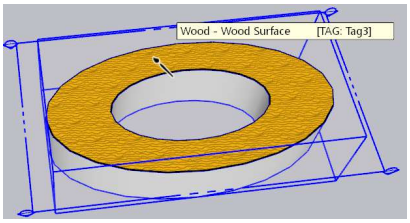
Sampling a pattern from model

If you do an ***Alt-Click*** on a container or a cut face already decorated, you will load the pattern in the pattern browser. You can then assign it to other containers or modify it.

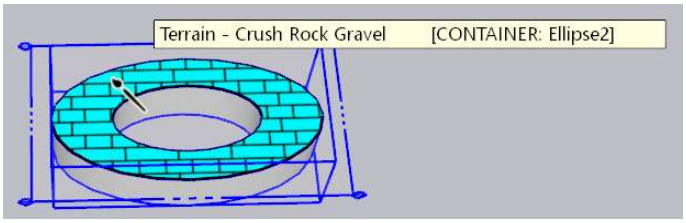
Assigning a Pattern

If you **hover a container or a cut face**,

- the container will be highlighted,
- a preview of the decorated cut face with the selected pattern will be shown,
- the tooltip indicates the current pattern and pattern mode (*container* and/or *tag*).



Pattern Mode: TAG



Pattern Mode: CONTAINER

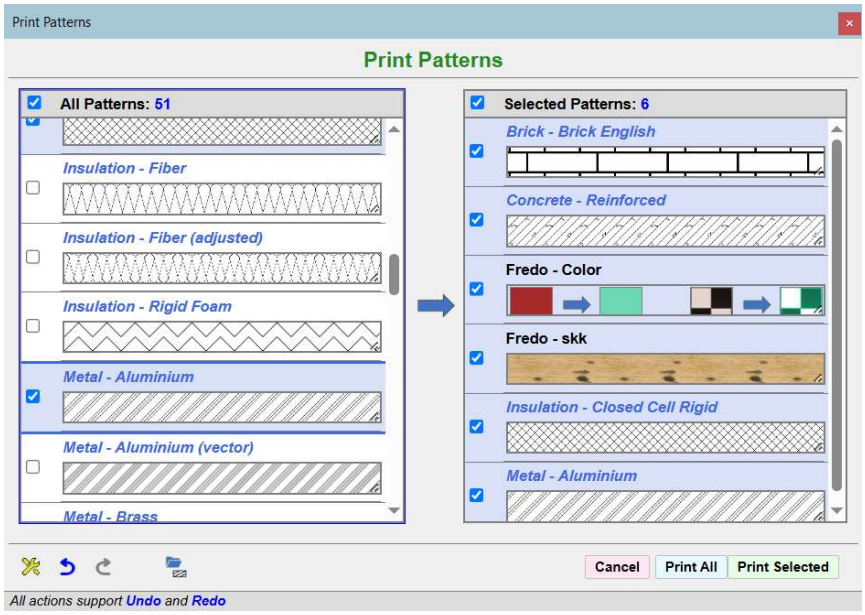
To assign a pattern, select a Pattern in the list and click on a container or its cut faces. Depending on the Pattern Mode of the scene, it will be assigned to the definition of the container or to the tag of the container.

3.4. Printing Patterns

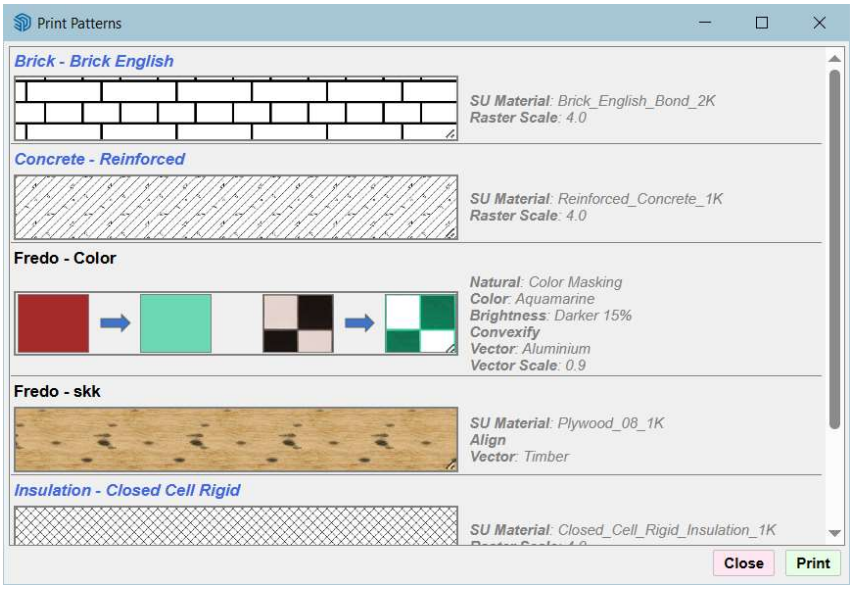
The ***Print*** command is located at the bottom of the Pattern Brower panel as well as under the *Extra Commands* toolbar icon:

Patterns will be printed *at scale*, that is, identical to what you would get from the printing of a Layout document.

The process is in 2 steps: You first select the patterns to be printed:



Then, the **Print window** will be displayed for direct printing or PDF saving.

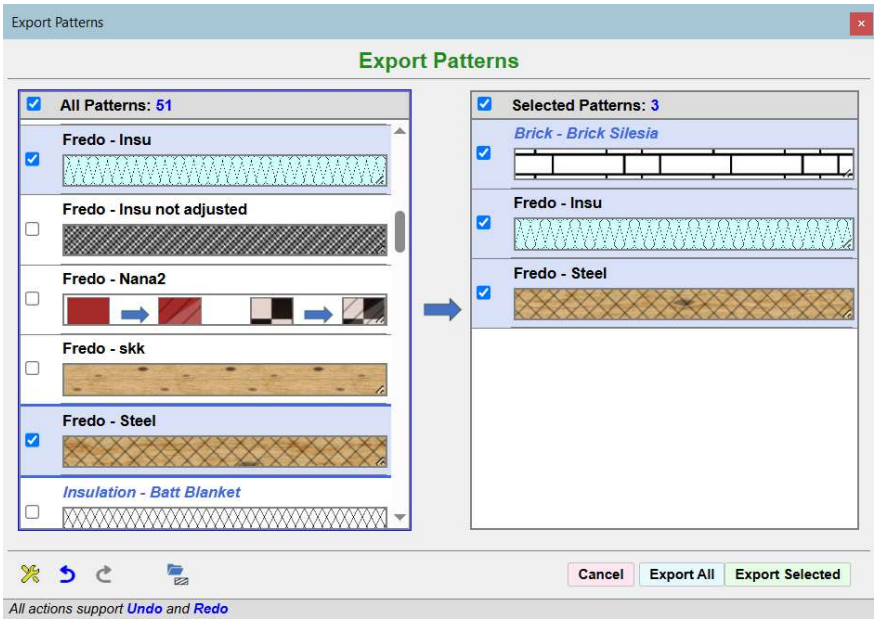


3.5. Exporting Patterns

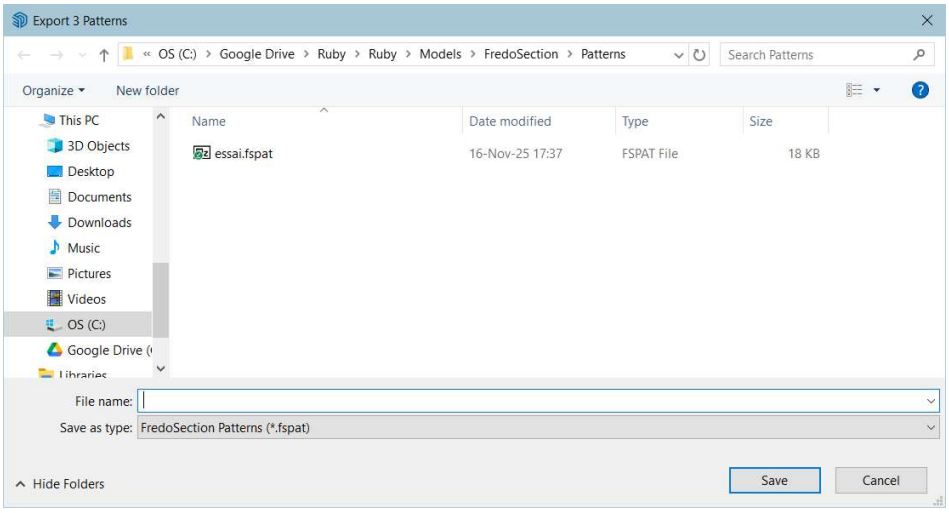
The ***Export*** command is located at the bottom of the Pattern Brower panel as well as under the *Extra Commands* toolbar icon:

Patterns will be exported to a file with extension *.fspat*.

The process is in 2 steps: You first select the patterns to be exported:



Then, you are prompted for the export file:

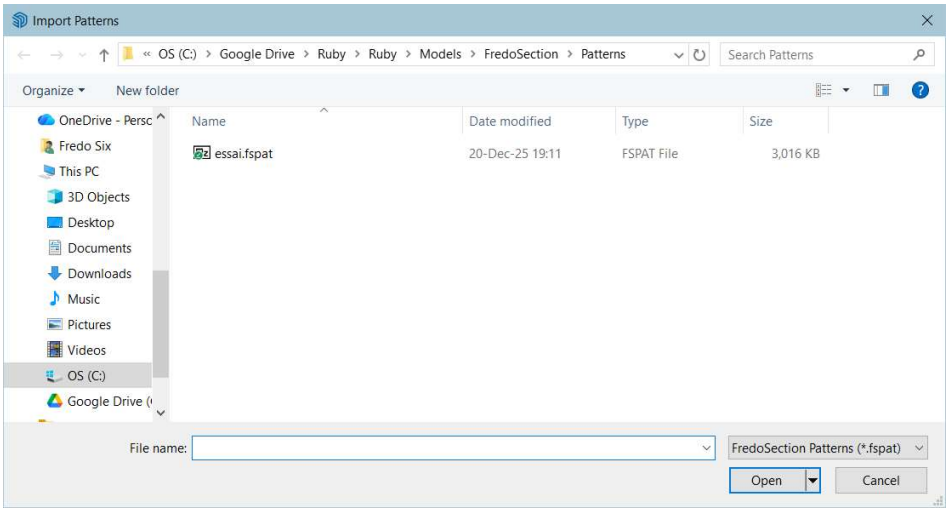


3.6. Importing Patterns

The ***Import*** command is located at the bottom of the Pattern Brower panel as well as under the *Extra Commands* toolbar icon:

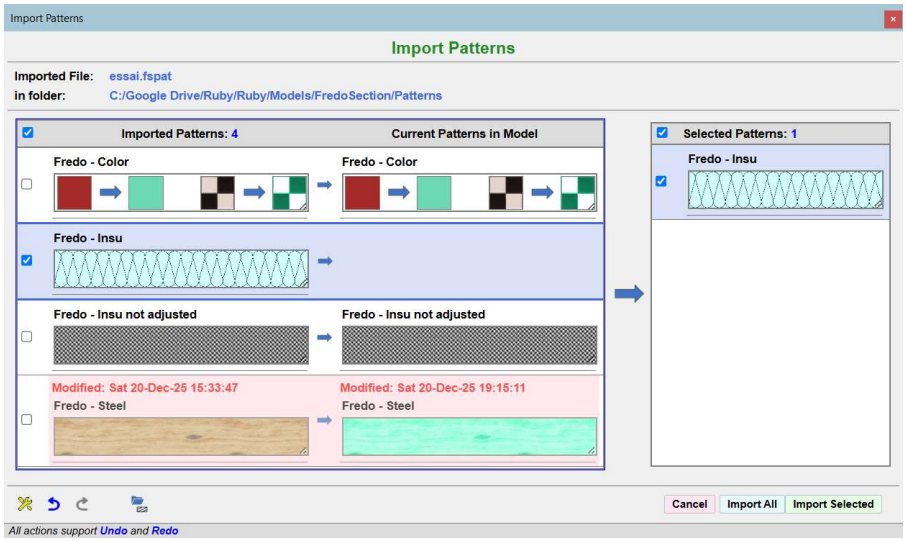
Patterns will be imported from a file with extension *.fspat*.

The process is in 2 steps: You first select the file to be imported:



Then, you get a preview of the patterns which are in the Import file versus the patterns loaded in your environment. This also shows:

- Patterns which are new (ex: Fredo Insu)
- Patterns which you have modified locally (ex: Fredo Steel)



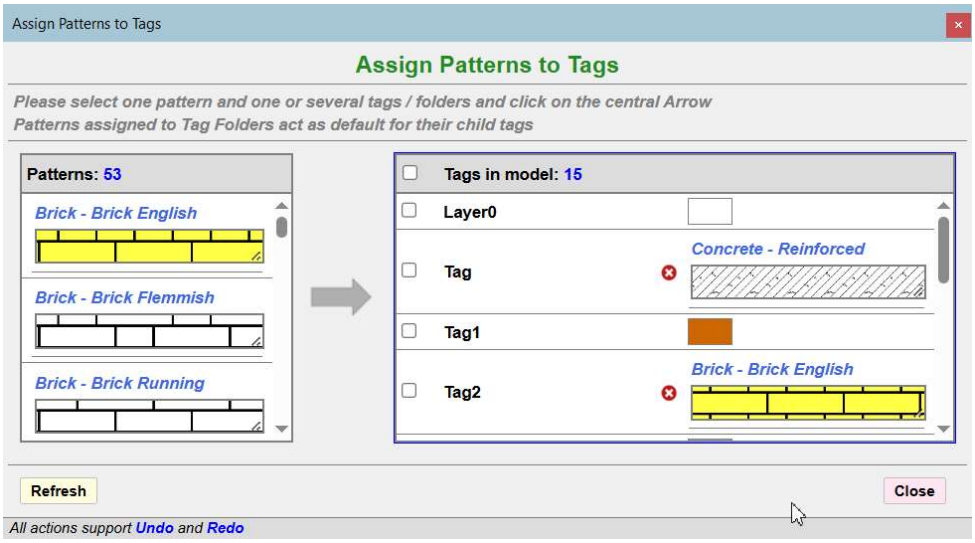
Finally, by clicking on patterns in the list on the left, you select the patterns to be imported.

4. Assigning Patterns to Tags

Scenes can configure cut faces to be decorated from the pattern assigned to the tags of containers (instead of the container itself). This is effective for the two Pattern Modes (as seen in *Section 2.2* above):

- *Tag Only*
- *Tag then Container*

Click on the toolbar icon *'Assign patterns to tags'* to display the main dialog:



The single-selection list on the left displays the available patterns.

The multi-selection list on the right displays the tags and tag folders in the model.

Note that:

1) **When a pattern is assigned to a tag *folder***, it is used as the default pattern for its child tags unless they have their own assigned pattern.
2) **If a scene has a Pattern mode 'Tag Only'**, then cut faces will be decorated by the color of tag, unless they have a pattern assigned.

To assign a pattern to a set of tags and tag folders:

- Select a pattern
- Select one or several tags or tag folders
- **Click** on the big arrow on the center to assign the pattern to the tags / tag folders. Note that a double-click on a pattern or a tag / tag folder will trigger the assignment as well.

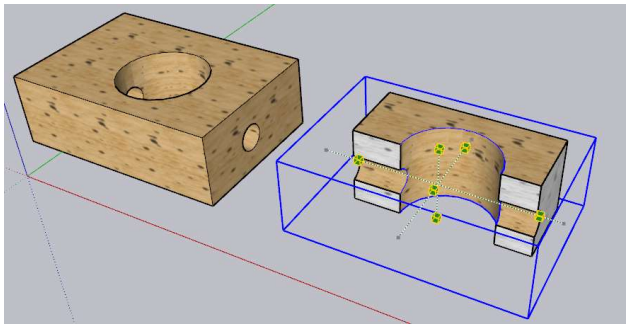
To unassign the pattern of a tag or tag folder, click on the small red cross circle.

Note that all actions support the Undo / Redo of Sketchup.

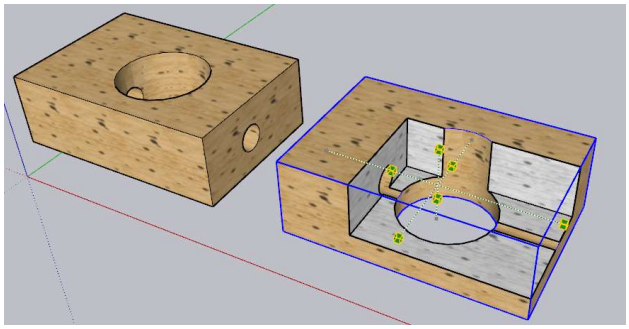
5. Section Boxes

FredoSection provides two **section box** tools, each with 6 configurable section planes.

- **Box Outside**: the cut part is outside the box.



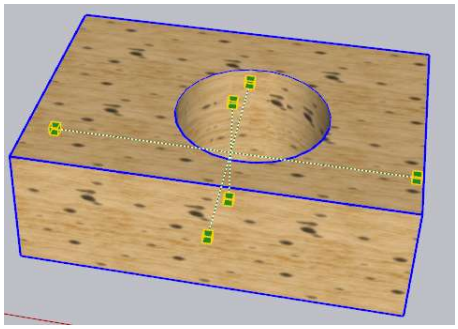
- **Box Inside**: the cut part is inside the box. In general, you will activate a few section planes out of the 6 possible. This is why it is also called Tri-Hedra.



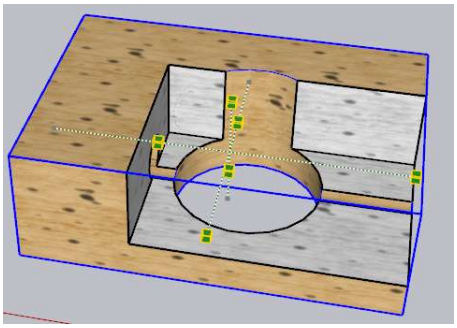
Both **section box** tools are based on the same principle:

1) **Use a dedicated scene**, since the section box will be attached to this scene (and thus will not appear in other scenes)
2) **Select objects and geometry in the current context**. This can be containers and/or faces.
3) **Click on the toolbar icon** for the section box, *outside* or *inside*.

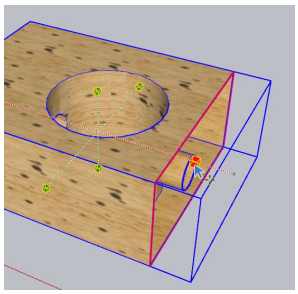
4) **A set of 6 handles** (in yellow) is displayed, along with the first state of the section box. Note that:
   - For Box OUTSIDE, the section planes are not activated initially, and the handles are just on the bounding box of the selection.

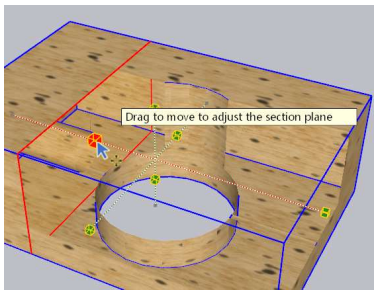


- for Box INSIDE, 3 section planes are activated at 1/3 ratio.



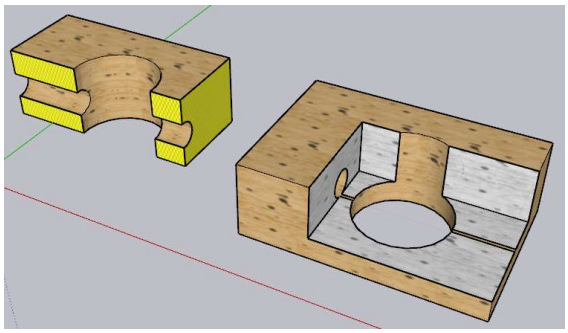
5) **To Move a handle**, just Click-Drag-Release. The corresponding section plane is moved interactively.





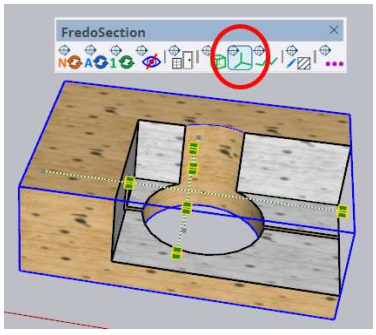
6) **When done**, click outside to go back to the Sketchup Selection tool.

7) **You can launch a rendering of cut faces**. The same rules apply as for Section Planes and the patterns assigned to containers will be used.



8) **To go to the Section Box adjustment mode**, click on an element of the original selection. The handles will be displayed and can be adjusted.

9) **To remove the Section Box**, click on an element of the original selection. The toolbar icon is highlighted and the handles are shown. Just click on the icon to remove the section box.



Note 1: As for the rest of FredoSection, you need to have at least one scene in your model.

Note 2: All actions related to Section Boxes support the native Sketchup Undo / Redo

Note 2: In FredoSection v1.4, the Section Box tools have limited capability. More powerful features may come in the next versions: alignment, rotation, etc….