



ESCHERLIKE 1.3.2

developed by Géraud Bousquet

User's manual

EscherLike is a software program that makes it easy to draw all the regular tilings of the plane. There are 93 different tilings (and 17 variations) so you can work with 110 tilings. You can draw your own tilings «à la Escher» way or create your own seamless patterns for textile, laser cutting machine, wood cutting machines ... Once you have drawn your tiling, it can be exported in vector format (. SVG usable with **Illustrator**, **Inkscape**, **GIMP**, **Firefox** and **Safari**) or bitmap (. TIFF usable with all image editing software as **Photoshop**, **GIMP**, **CorelPaintShopPro**) . The drawing can be exported in whole or in part (**seamless pattern**). Escherlike is available for Mac, Windows and Linux platforms and can be downloaded at the following address <http://www.hypatiasoft.fr>

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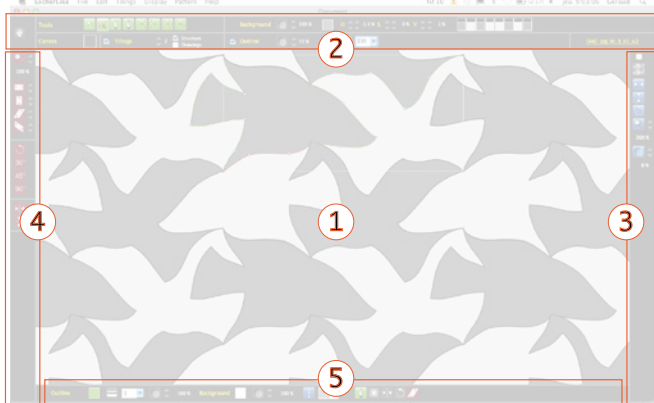
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Chap 01 THE BASICS

C01-01 THE INTERFACE

1 • Click on the icon Escherlike application to launch the application. The interface consists of five parts:



Area 1 The drawing space: this is where you create and modify the tiling using Bezier curves.

Area 2 The toolbar (adding points, moving points, choice of colors ...)

Area 3 Tools to import and manipulate an image on which you can draw.

Area 4 Tools for manipulating the tile (rotation, expansion, shear, axial symmetry).


Area 5 Tools to add editable graphic elements on the tile.

2 • Escherlike is available in French, English or Spanish via the menu *EscherLike > Preferences*.

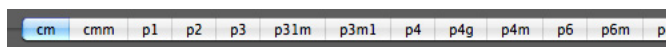
C01-02 SELECTING A TILING



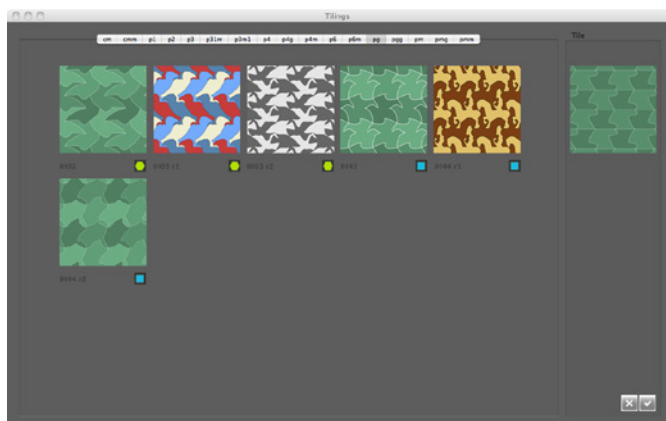
Click on the icon to launch the video.


1 • Click on the four colors button  to open the tilings window.

2 • Click on one of the 17 tabs representing the 17 plane symmetry group (cm, cmm, p1 ...).




3 • Select a tile from among the 110 available.

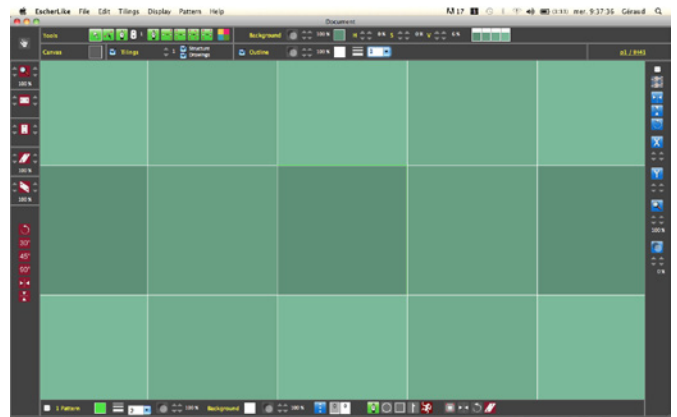


4 • Click the button in the lower right  to confirm your choice.

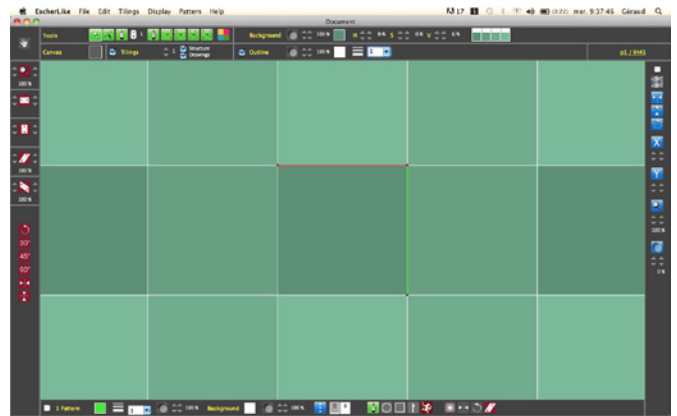
C01-03 SELECTING A CURVE

1 • Click on the select curve tool .

2 • Click on a green line to select it. When it is selected it becomes red or yellow. For tiling without spaces the yellow curves should not be changed. The yellow curves can be changed to create spaces that show the background colour.





Before selecting the curve is green.




After selecting the curve turns red (or yellow)

C01-04 ADDING A POINT TO A CURVE

1 • Select the curve on which you want to add a point .

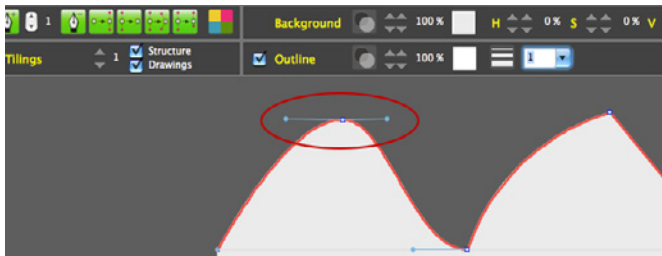
2 • Click on the *add point* button .


3 • Adjust, with up/down arrows next to the *add point* button, the number of points to 1 .

4 • Click on the selected curve (red or yellow) to add an anchor point where you clicked.

Three options are available :

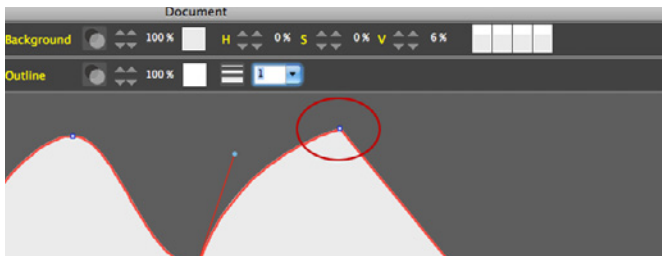
- **click** : the anchor point will have parallel tangents
- **alt+click** : the anchor point will have independant tangents (they can do any angle between them)
- **cmd+click** : the anchor point will not have a tangent at all (usefull to make straight line segments)




 click = parallel tangents





 alt+Click = independant tangents






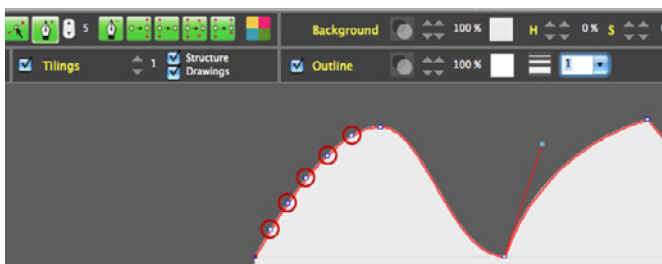
 cmd+Click = no tangent

C01-05 REMOVE A POINT ON A CURVE

1. Select the curve on which you want to remove a point .
2. Click on the *remove point* button .
3. Click on the point to remove (on a anchor point and not a control point)

C01-06 ADDING SEVERAL POINTS

1. Select the curve on which you want to add a point .
2. Click on the *add point* button .
3. Adjust, with up/down arrows next to the *add point* button, the desired number of points  (here 5).
4. Click on the selected curve (red or yellow) to add the anchor points. The added points are inserted between the two closest points and are regularly spaced.



Adding five anchor points regularly spaced.



The three options are still available :

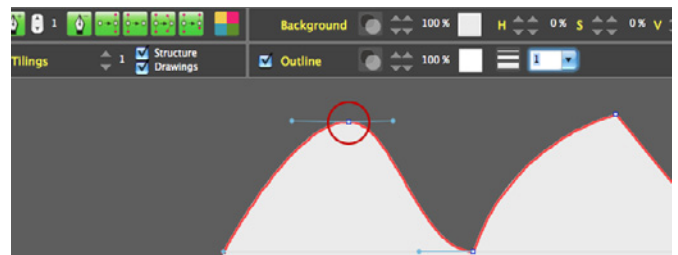
- **click** : the anchor point will have parallel tangents


- **alt+click** : the anchor point will have independant tangents (they can do any angle between them)

- **cmd+click** : the anchor point will not have a tangent at all (usefull to make straight line segments)



C01-07 MOVING A POINT

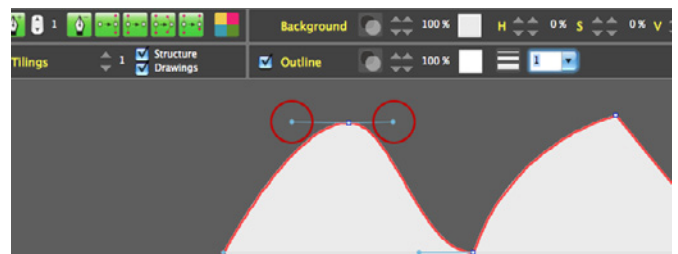
1. Select the curve on which the point is .
2. Click on the tool *modify point / tangent* .
3. Click on one anchor point of the selected curve without releasing the mouse button and move the point.




 moving an anchor point.







C01-08 MODIFYING THE TANGENTS


1. Select the curve on which the point is .
2. Click on the tool *modify point / tangent* .
3. Click on one anchor point of the selected curve (the tangents, if the point has tangents, must appear).
4. Click on one of the two extremities of tangents (control points - blue points) of the selected point without releasing the mouse button and move the control point.





 modification of the tangents.


C01-09 CHANGING A POINT

1. Select the curve on which the point is situated .
2. Click on one of the following tools    .
3. Click on an anchor point of the selected curve to change it. If you choose , you have to click and drag the mouse without releasing the button to make the tangents appear).

 an anchor point without tangents becomes an anchor point with parallel tangents of the same length.

 an anchor point with tangents becomes an anchor point without tangents

 an anchor point with parallel tangents becomes an anchor point with independant tangents

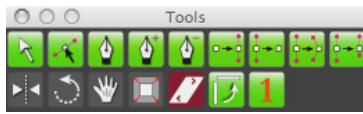
 an anchor point with parallel tangents of the same length becomes an anchor point with parallel tangents of different

lengths.

Chap 02 WORKING METHOD

C02_01 TOOLS

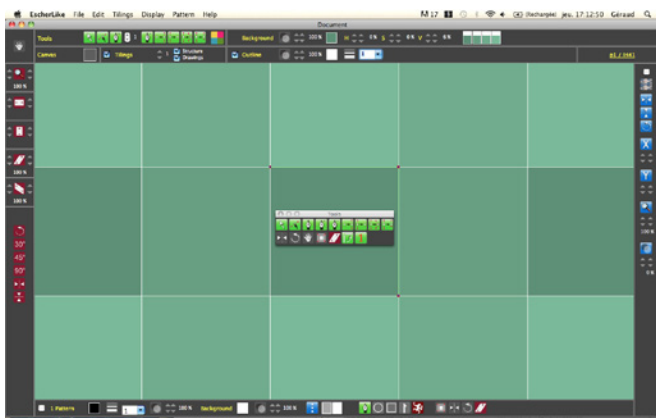
- 1 • The toolbox will appear on the drawing space by clicking on the word *Tools* or by this menu item : *Display > Tools*



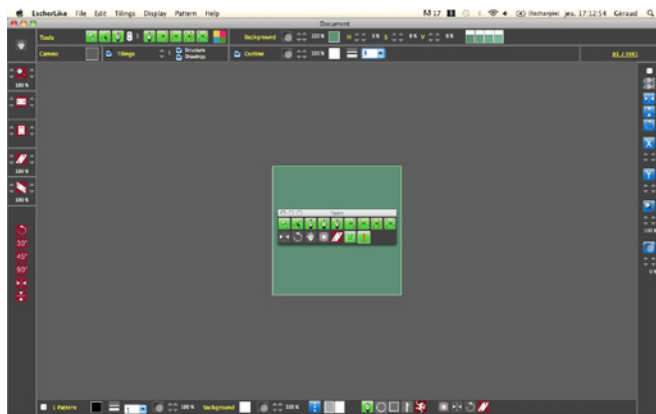
ToolBox to work quickly.

C02-02 WORKING ON A TILE

- 1 • Choose a tiling (C01-02) for example p1 /IH41.

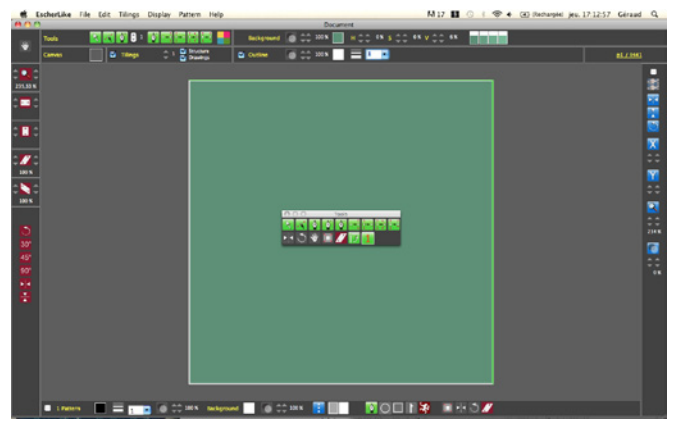


- 2 • Click on the **1** button of the toolbox to show only one tile.

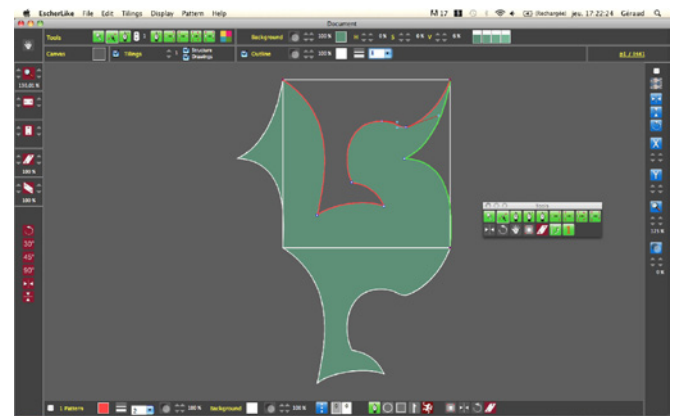


The **1** button of the toolbox has the same effect as the checkbox *1 tile* on the bottom left of the window.

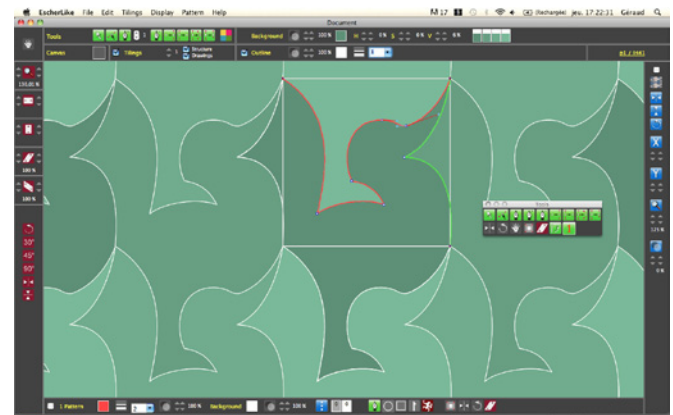
- 3 • Click on the button  to enlarge the tile



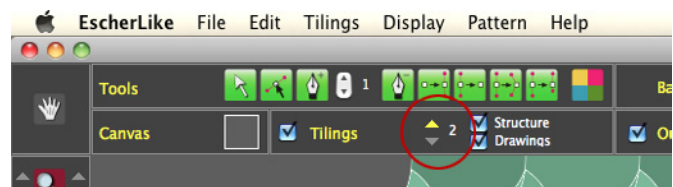
- 4 • After adding anchor and control points the curves can be modified.



- 5 • Click on the **1** button to show several tiles.



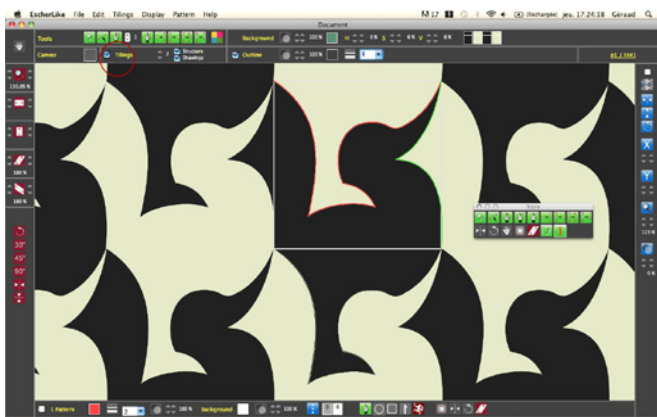
- 6 • Modify the number of tiles by using the up/down arrows near the *Tilings* checkbox.



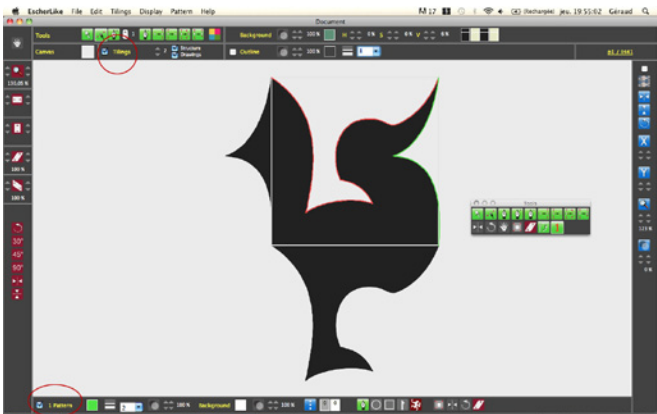
- 7 • Modify the fill colors and the stroke colors (see C03)

C02-03 DIFFERENTS DISPLAYS

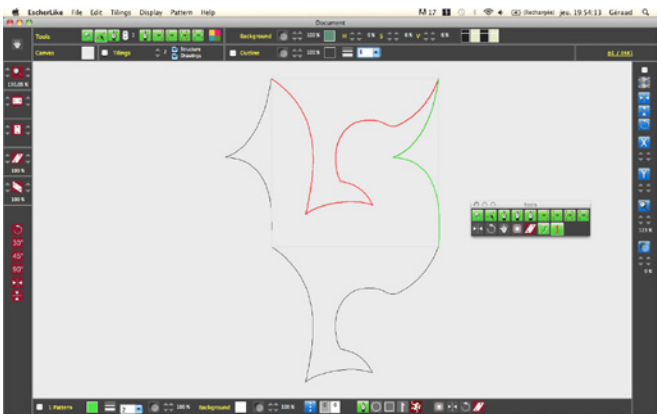
- 1 • When the *tilings* checkbox is checked, the default display show several full tiles.



- 2 • When the *Tilings* and *1 tiling* checkboxes are selected, the display shows only 1 full tile.



- 3 • When the *Tilings* checkbox is unchecked, the display shows only 1 empty tile.

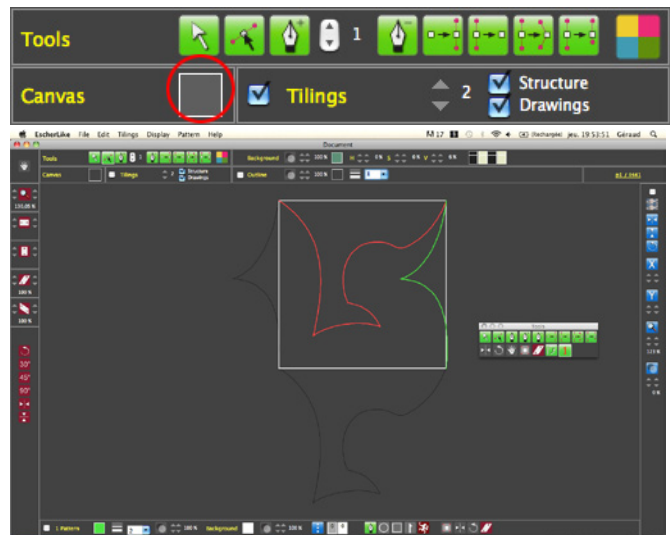


This is a more flowing drawing mode.

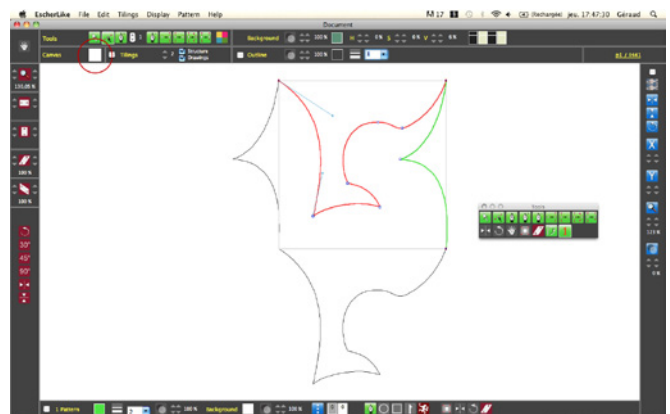
Chap 03 COLORS OF TILING

C03-01 DRAWING SPACE COLOR

- 1 • The drawing space color can be modified by clicking on the coloured square on the right of the text *Canvas*.



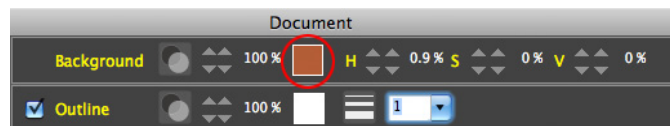
Before the modification of the canvas color.



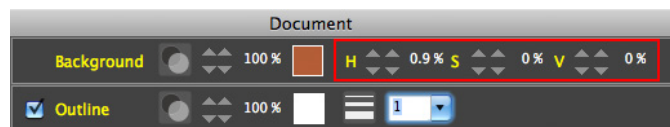
After the modification of the canvas color.

C03-02 FILL COLORS

- 1 • Click on the colored rectangle to choose the basic fill color.

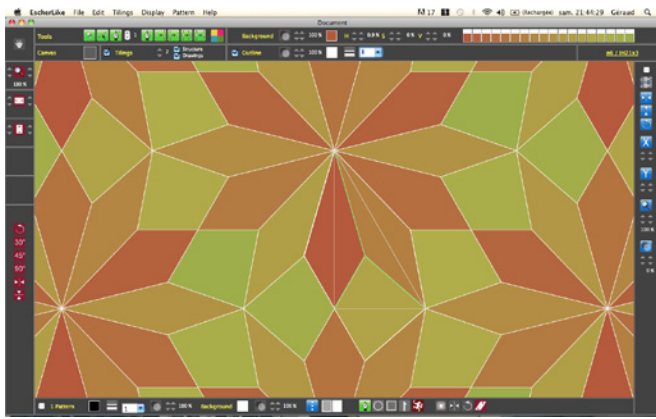


- 2 • Adjust the increments for the hue, the saturation and the value with the up/down arrows.



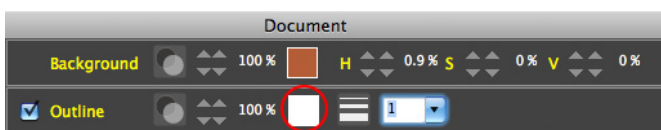
- 3 • Modify manually the automatically calculated fill colors by clicking on the different colored rectangles. Each rectangle corresponds to one different tile.





C03-03 STROKE COLORS

- 1 • Click on the colored rectangle to choose the basic stroke color.

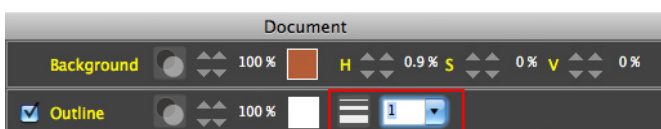


- 2 • Modify manually the automatically calculated fill colors by clicking on the different colored rectangles. Each rectangle corresponds to one different tile. It is recommended to keep all these colors identical.



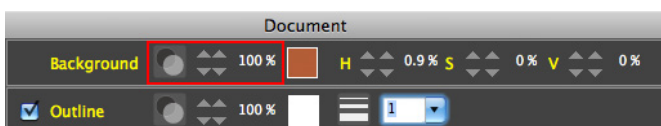
C03-04 STROKE WIDTH


- 1 • Choose the stroke width (in points) with the drop down menu. You can hide the outlines by unchecking the checkbox *Outline*.

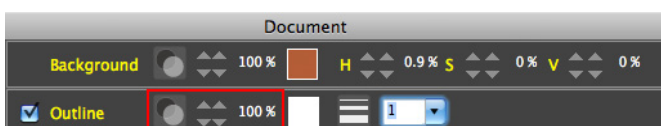


C03-05 TRANSPARENCIES

- 1 • Adjust the backgrounds transparencies with the up/down arrows to the right of the button .



- 2 • Adjust the outlines transparencies with the up/down arrows to the right of the button .



Chap 04 SAVE, OPEN AND EXPORT

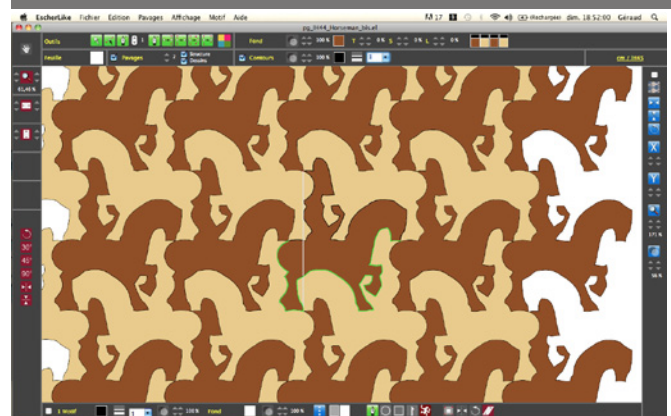
C04-01 SAVE YOUR WORK

- 1 • To save a file created with EscherLike (extension *.el*) go to the menu item *File > Save*
The corresponding shortcut is *cmd+S*

C04-02 OPEN A FILE

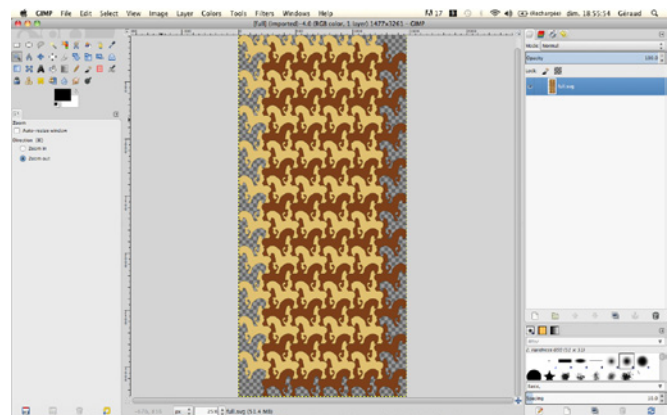
- 1 • To open a file created with EscherLike (extension *.el*) go to the menu item *File > Open*
The corresponding shortcut is *cmd+O*.

C04-03 EXPORT TO VECTOR FORMAT



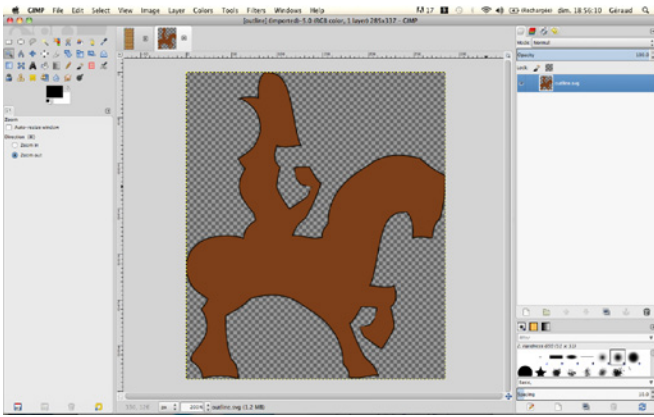
file in EscherLike

- 1 • To export a full drawing created with EscherLike to the vector format *.svg*, go to the menu item :
File > Export > SVG
When the exported file is open with GIMP, Inkscape or Illustrator, all the visible tiles in EscherLike will be visible.



File > Export > SVG and opening with GIMP

- 2 • To export a single tile *.svg*, go to the menu item :
Pattern > Export single tile as SVG
When the exported file is open with GIMP, Inkscape or Illustrator, only one tile will be visible.

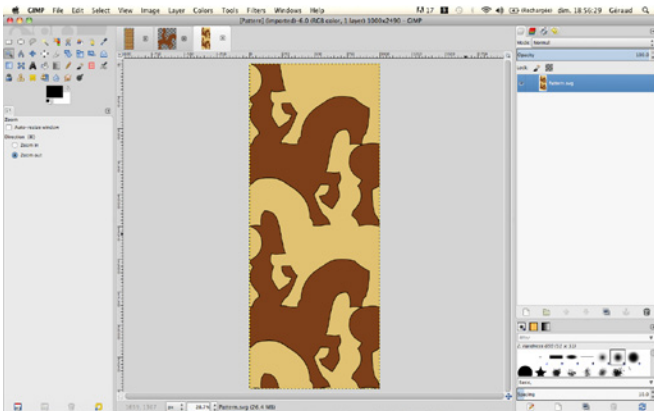


Pattern> Export a single tile as SVG and opening with GIMP

- 3 • To export a seamless pattern to the vector format .svg, go to the menu item :

Pattern > Export seamless pattern as SVG

When the exported file is open with GIMP, Inkscape or Illustrator, a seamless picture is created and can be used as a pattern.



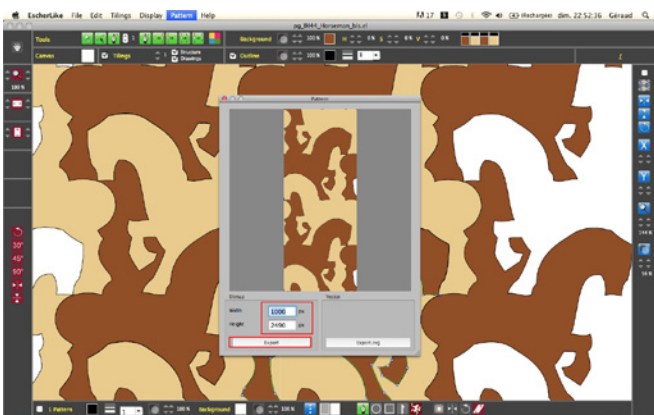
Pattern > Export as a seamless pattern SVG and opening with GIMP

C04-04 EXPORT TO BITMAP FORMAT

- 1 • To export the seamless pattern to TIFF bitmap format, go to the menu item :

Pattern > Preview

- 2 • Choose the width of the pattern in pixels





Pattern > Preview > Export seamless pattern as TIFF and opening with GIMP

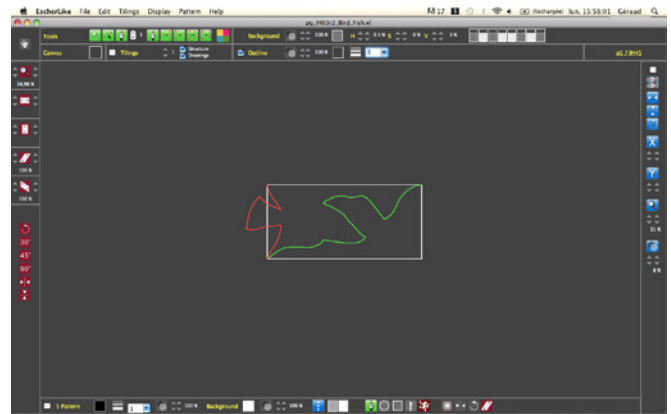
- 3 • Click on the button TIFF

Chap 05 DEFORMATIONS OF THE TILE

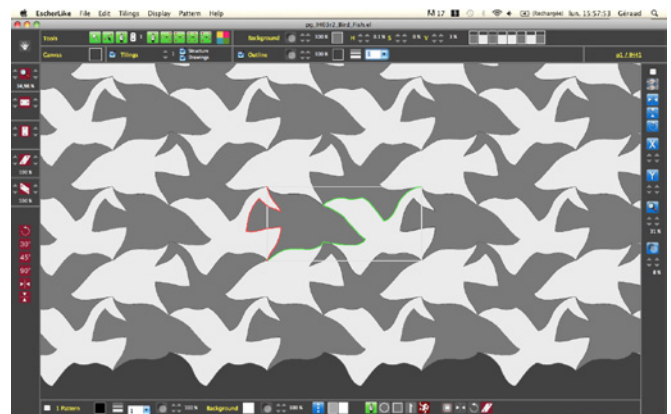
C05-01 EXPANSION/CONTRACTION

- 1 • The tile can be expanded or contracted in width and / or



height by clicking on the up/down arrows near the buttons  et .

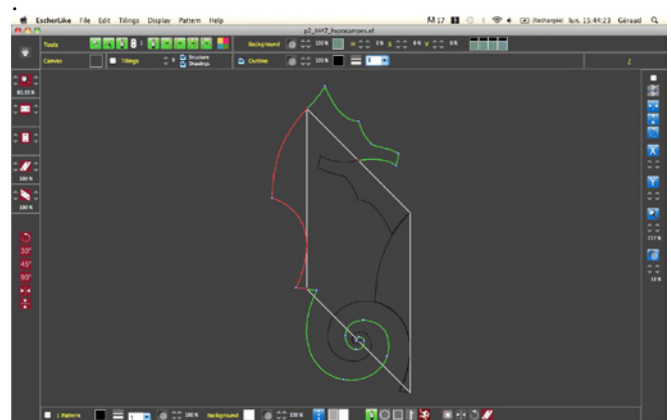


Horizontal expansion/contraction of the tile.

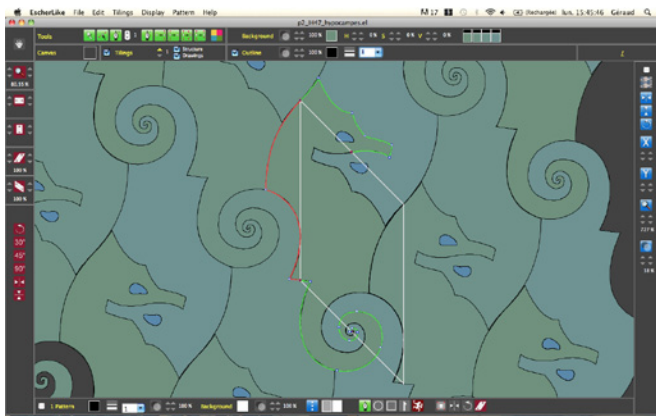


C05-02 SHEAR

- 1 • The tile can be deformed by shear vertically and horizontally by clicking on the up/down arrows near the buttons  et . It is not recommended to use the shear and axial symmetry if you want to export a seamless pattern. In this case it is recommended to export the whole drawing



Vertical shear of the tile.



C05-03 ROTATION

- 1 • The tile can be rotated 1°, 30°, 45° or 90° by clicking respectively on the up/down arrows near the buttons , , . .

C05-04 AXIAL SYMMETRY

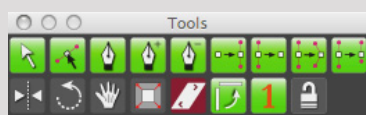
- 1 • You can apply an horizontal and/or vertical axial symmetry to the tile by clicking on the buttons et .

Chap 06 ADDING GRAPHIC ELEMENTS

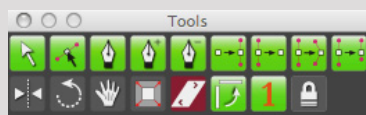
You have two layers in EscherLike :

- one layer with the curves of the tile
- one layer with all the curves of the graphic elements

To make the manipulation of the curves easier you can't work on the two layers at the same time. To choose the layer you want to work on, click on the button on the toolbox window. When the padlock is unlocked you work on the tile and when the padlock is locked , you work on the graphic elements. When you add a graphic element, you automatically switch to the graphic elements mode , so don't forget to click on the padlock to go back on the tile.



The padlock is unlocked : you are working on the curves of the tile.



The padlock is locked : you are working on the curves of the graphic elements

C06-01 ADDING AN ARROW

- 1 • It is possible to add any vector shape to the drawing. Some simple shapes are available by default; they can be added and modified. I am working to add more in the near future. To add an arrow you have to click on the button ; pedagogically, this is very useful to understand how the tile is moved to fill the plan.

C06-02 ADDING A CIRCLE

- 1 • To add a circle , click on the button . This shape can be modified.

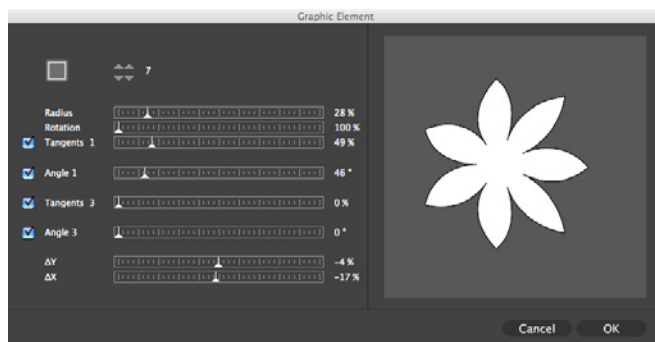
C06-03 ADDING A STRAIGHT LINE SEGMENT

Click on the icon to launch the video.

- 1 • To add a straight line segment, click on the button . This shape can be modified.

C06-04 ADDING A SPECIAL SQUARE

- 1 • To add a special square , click on the button .



Special square window

- 2 • Play with the different sliders to create polygons, flowers... This shape can be modified.

C06-05 ADDING A WHOLE PATTERN

- 1 • To add a whole pattern, click on the button (use in preference with tilings with no internal symmetry, eg p1, p2, p3, p4, p6, pg, some pgg ...)

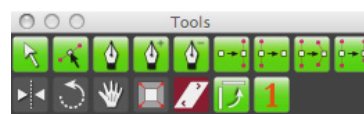
C06-06 ADDING ANY SHAPE

Click on the icon to launch the video.

- 1 • Click on the pen tool to create a new shape, then click on the canvas to create the first point of the new shape.

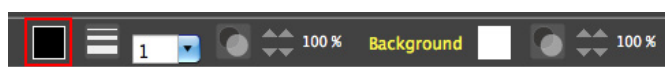


- 2 • Click on the canvas to add new points.
- 3 • Click on the first point to close the shape.
- 4 • Use the toolbox tools to modify the points of the shape.

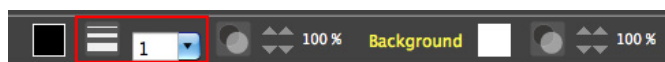


C06-07 MODIFICATION OF GRAPHIC ELEMENTS

- 1 • Select the graphic element with the selection tool .
- 2 • Click on the colored square on the bottom of the window to change the stroke color .

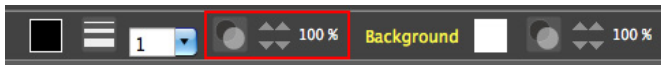


- 3 • Go to the drop down menu to choose the stroke width.



- 4 • Click on the up/down arrows to modify the stroke opacity. If you click directly on the button , the opacity changes

from 0% to 100 % , or from 100% to 0%.



- 5 • Click on the other colored square on the bottom of the window to change the fill color .




- 6 • Click on the up/down arrows to modify the fill opacity.




- 7 • Fill the grey and white fields (here with 10 et 20) and then click on the blue icon to create a dotted line. The grey field represent the lenght of the visible segment and the white one the lenght of the invisible segment.




- 8 • To expand or contract a graphic element, click on the button  then click on one of the red handles of the frame and then drag the handle without releasing the mouse button.




- 9 • To apply an axial symmetry to a graphic element, click on the button  then click on one of the red handles of the frame.



- 10 • To rotate a graphic element, click on the button  then click on one of the red corner of the frame and then drag the handle without releasing the mouse button.



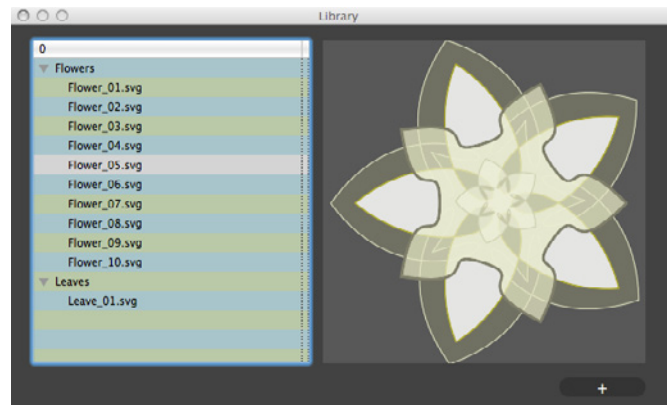
- 11 • To apply a horizontal shear to a graphic element, click on the button  then click on the upper right red corner of the frame and then drag the handle without releasing the mouse button.



C06-08 LIBRARY OF GRAPHIC ELEMENTS

- 1 • To open the library of graphic elements, go to the menu item :

Display > Library



Library of graphic elements

- 2 • Display a graphic element by clicking in the hierarchical list
- 3 • Add the choosen graphic element by clicking on the plus button on the bottom right.
- 4 • To add a graphic element to the library, select it on the canvas and go to the menu item :
File > Add to loibrary (cmd+E)
- 5 • You can create complex graphic elements by grouping several elements :

- click on one graphic element to select it
- click on another graphic element by keeping pressed the shift key

- group the elements

Edit > Group (cmd+G)

The graphic elements can be ungrouped if necessary :

Edit > Ungroup (shift+cmd+G)

- 6 • You can change the order of the objects by clicking on the graphic element and by using the following commands :

Edit > Bring to front (shift+cmd+“”))

Edit > Bring forward (shift+cmd+ “+”)

Edit > Send backward (shift+cmd+“-”)

Edit > Send to back (shift+cmd+“(”)

Chap 07 TRACING A PICTURE

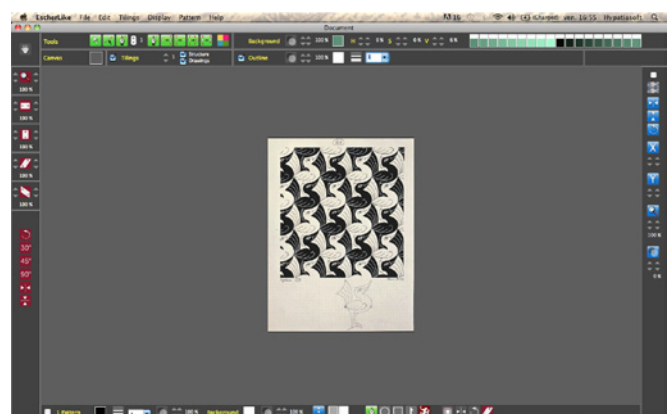
C07-01 IMPORT A PICTURE




- 1 • Click on the icon to launch the video.

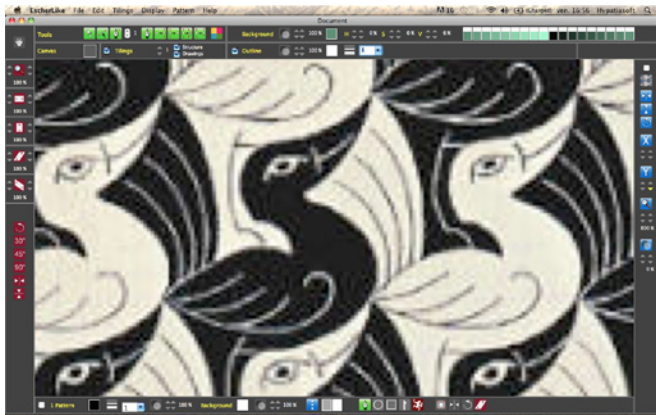
- 1 • To import a picture , go to the menu item :

File > Import > Picture


The picture is drawn in the background.

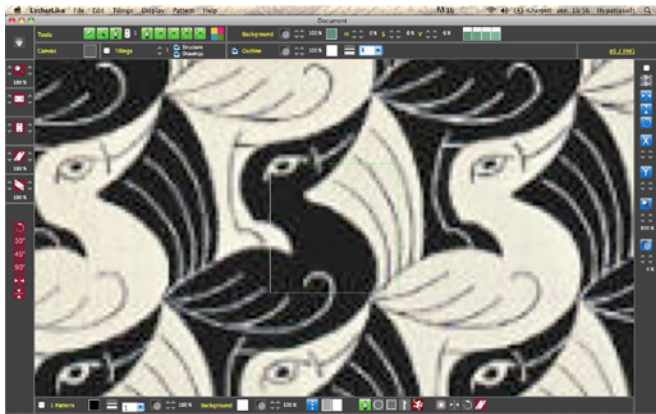




- 2 • Adjust the size of the picture with the up/down arrows under the button  which is at the right of the window.
- 3 • Adjust the vertical position of the picture with the up/down arrows under the button .
- 4 • Adjust the horizontal position of the picture with the up/down arrows under the button .

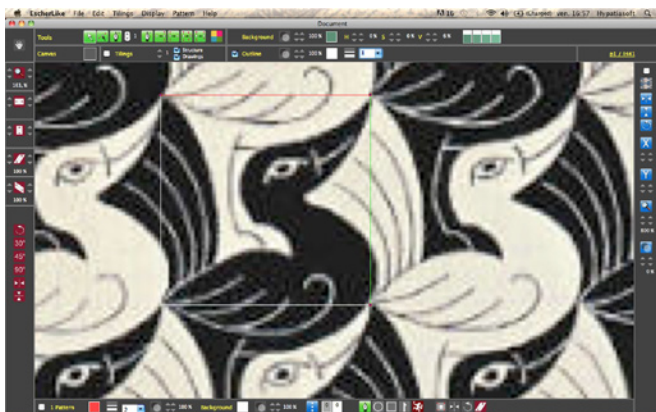


C07-02 POSITIONING THE TILE


- 1 • The most difficult thing is to identify the kind of tiling and to position the tile. Here the tiling is p1 because there are only translations to fill the plan with tiles (no rotation nor axial symmetry). Select the tiling IH 41 which is the p1 type (click on the button , then on the tab p1, then on the picture IH 41)
- 2 • Uncheck the checkbox *Tilings* to work on the tile while seeing the image below.

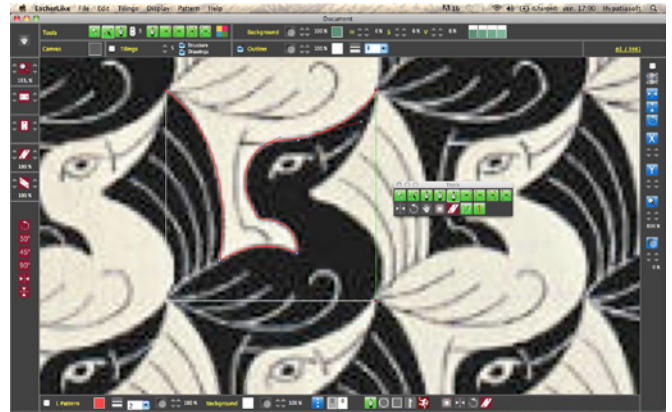


- 3 • Adjust the size () and the position () of the tile in order to superimpose it to the image tile (not so easy, but a great satisfaction when you get it !).

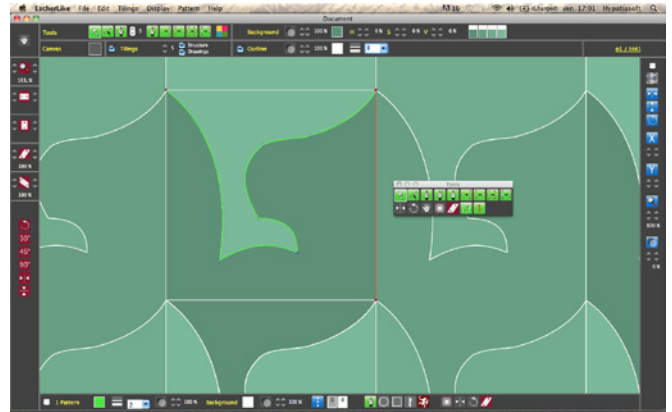


C07-03 AJDUST THE CURVES

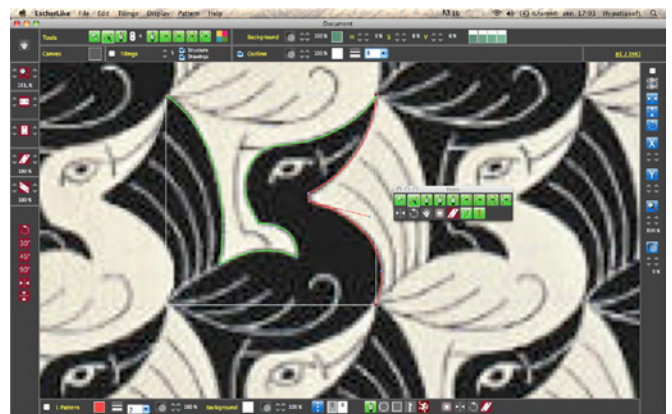
- 1 • Add the necessary number of points () to each curve so that the curves follow the image curves. It's easier to work with points which have independant tangents (alt+click : the new points will have independant tangents).



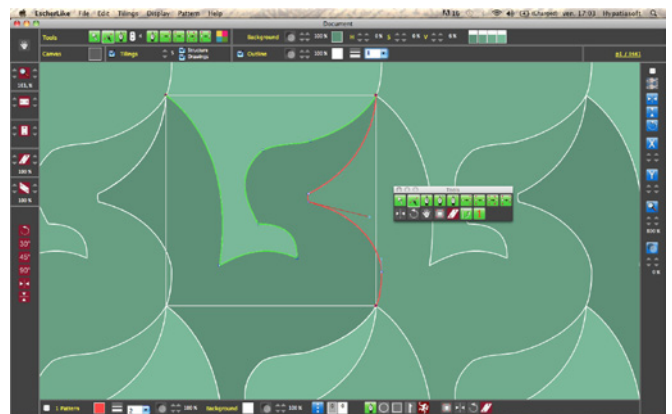
Adjustment of the first curve.



With the checkbox *Tilings* checked.



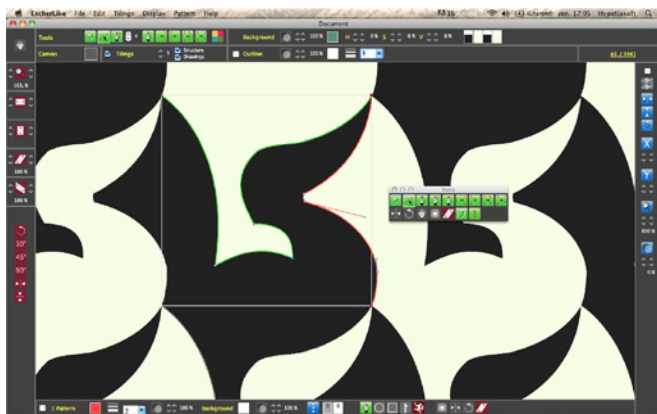
Adjustment of the second curve.



With the checkbox *Tilings* checked.

C07-04 SELECTING COLORS

- 1 • Add graphic elements (lines ...) and modify the colors.



Modification of colors.



Variants with graphic elements.

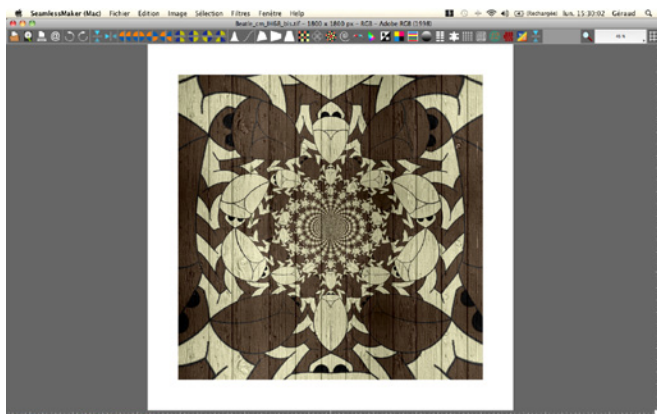
Chap 08 ESCHERLIKE AND OTHER APPLICATIONS

C08-01 ESCHERLIKE & SEAMLESSMAKER

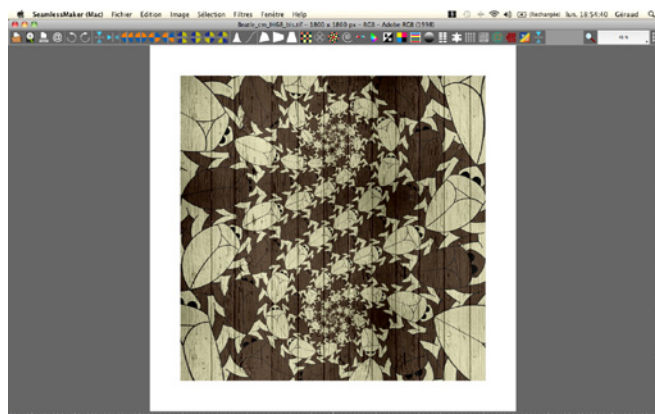


Click on the icon to launch the video.

- 1 • Export the drawing to format .tif (see C04-05).
- 2 • Open the TIFF file with SeamlessMaker. The pattern is seamless, so you can apply several transformations as the conformal map :



Filter conformal map + filter texture in SeamlessMaker



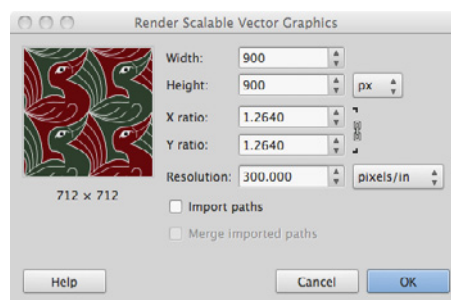
Filter conformal map + filter texture in SeamlessMaker

C08-02 ESCHERLIKE & GIMP



Click on the icon to launch the video.

- 1 • In EscherLike, export the drawing as SVG.
File > Export > SVG
- 2 • Launch GIMP and open the SVG file . GIMP open the following dialog box :



Dialog box when a SVG file is open with GIMP

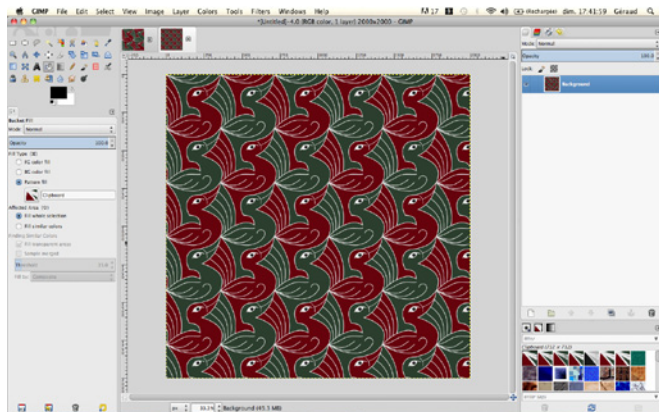
- 3 • Fill the field for the width in pixels (or height) and click on the OK button.



Creation of a bitmap file from a SVG file with GIMP.

- 4 • To use the picture as a pattern, copy it and paste as a new pattern. To select all, go to the menu item :
Select > All (cmd+A)
- 5 • Copy the selection :
Edit > Copy (cmd+C)
- 6 • Paste the pattern :
Edit > Paste as > New pattern ...
- 7 • Create a new document
File > New ...
- 8 • Select the paint bucket tool, check the radio button *Pattern*

fill in the section Fill type, choose the pattern and click on the canvas to fill it with your seamless pattern.

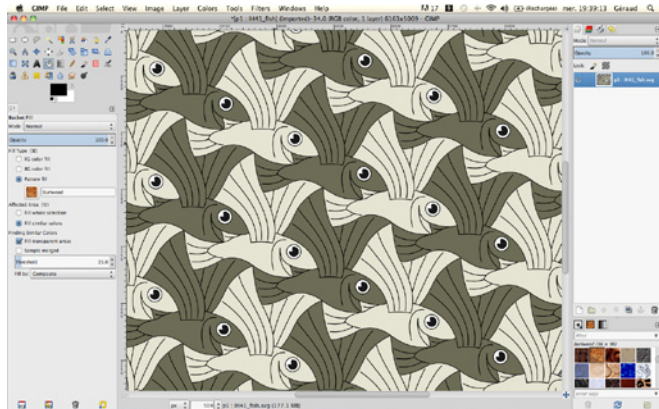


Fill the canvas with your seamless pattern in GIMP

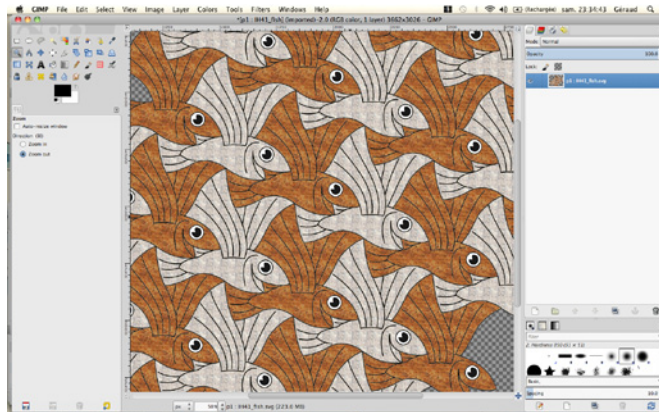
9 • It is possible to fill each color with a different texture in order to have a realistic rendering (cf vidéo).



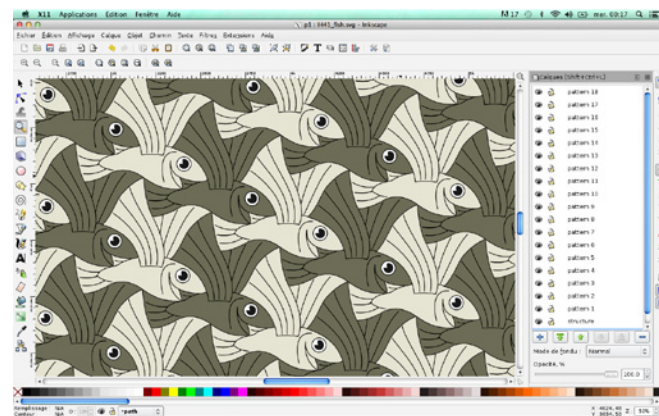
Click on the icon to launch the video.



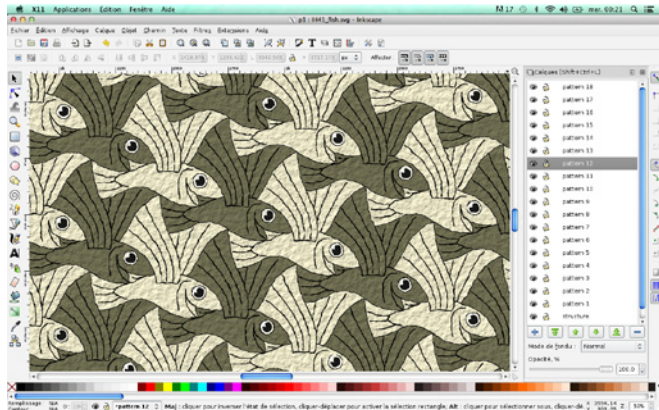
Original colors.



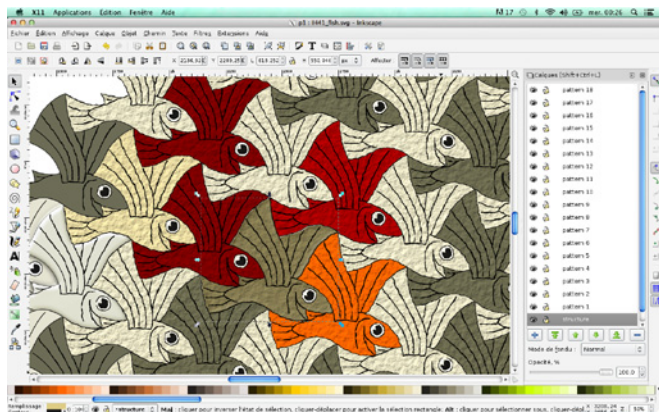
Replacing colors by textures in GIMP.



SVG file open in Inkscape.



Adding paper texture to the vector drawing in Inkscape.



Modification of colors

C08-04

ESCHERLIKE & ILLUSTRATOR

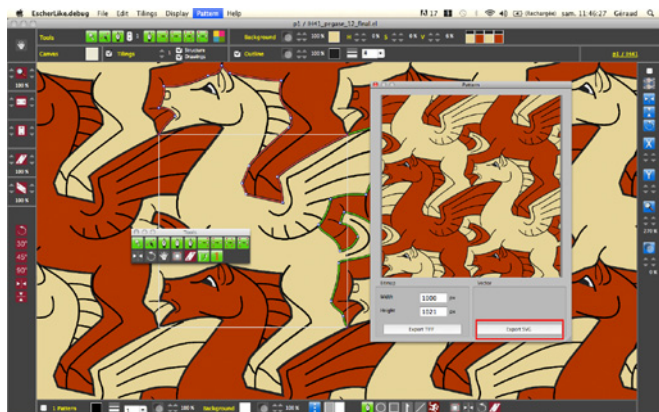


Click on the icon to launch the video.

1 • In EscherLike, export the seamless pattern to SVG .

Pattern > Export to SVG

or *Pattern>Preview>Export to SVG*



Export pattern to vector format SVG.

C08-03

ESCHERLIKE & INKSCAPE



Click on the icon to launch the video.

1 • In EscherLike, export the drawing as SVG :

File > Export > SVG

2 • Launch Inkscape and open the file SVG.

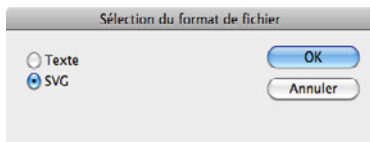
File > Open

3 • You can individually manipulate the tiles in order to change the fill color, the stroke color ... You can also apply vector filters.

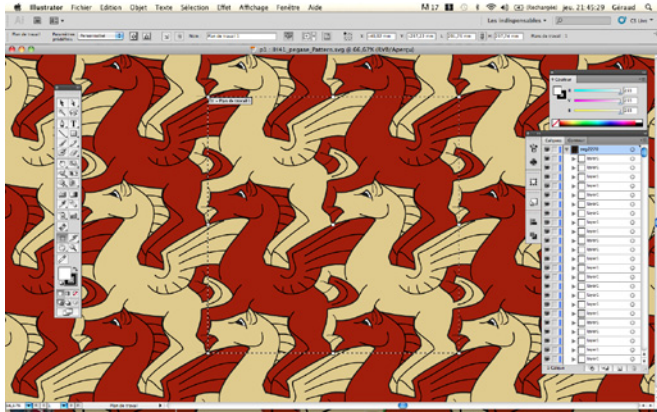
Filters > ...

2 • Launch Adobe Illustrator and open the SVG file.

File > Open



Check SVG in the dialog box of Adobe Illustrator.



SVG File created by EscherLike open in Adobe Illustrator.

3 • All the copies of a same graphic element (line...) are grouped in a single layer in order to facilitate handling.

4 • Use the tools of Illustrator to modify the drawing (apply a charcoal effect to the outlines ...).

5 • Save the drawing to .ai in order to open it with Adobe Photoshop.

C08-05

ESCHERLIKE & PHOTOSHOP

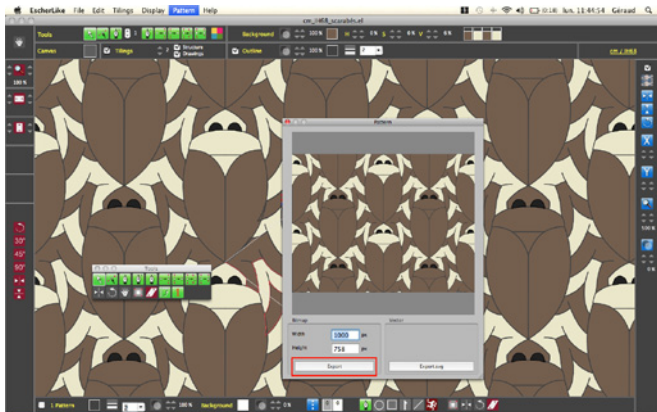


Click on the icon to launch the video.

1 • In EscherLike, export the seamless pattern to TIFF .

Pattern> Export to TIFF

ou *Pattern>Preview>Export to TIFF*



Export to TIFF.

2 • Launch Adobe Photoshop and open the TIFF file.

File > Open

3 • Modify (if you want) the colors with the eyedropper tool and the paint bucket tool.

4 • Save the drawing as a seamless pattern :

Edit > Define pattern

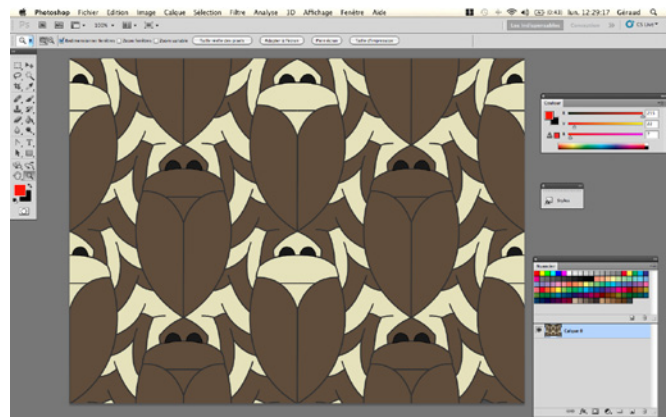
5 • Create a new document.

6 • Fill the empty layer of the new document with your pattern by using the paint bucket tool :

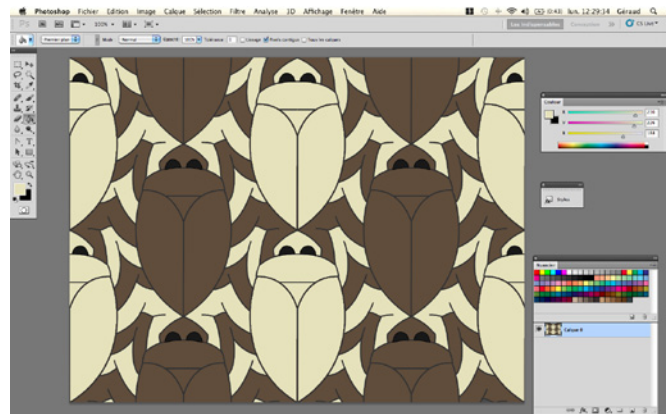
Edit > Fill choose *pattern* and click

7 • You can apply textures (cf vidéo).

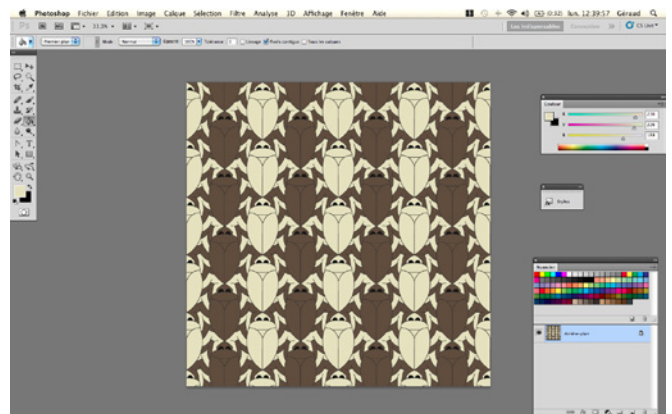
8 • You can also open the .ai file created by Illustrator.



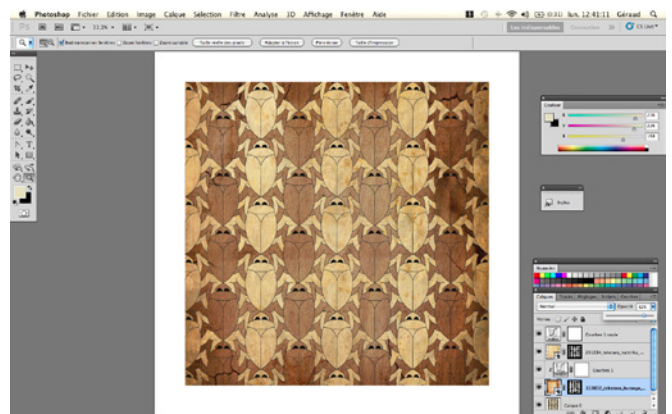
Opening of the TIFF file created by EscherLike in Photoshop.



Modifications of colors.



Filling a new document with the seamless pattern created by EscherLike.



Applying textures in Adobe Photoshop.



Applying textures in Adobe Photoshop.