Guidelines for laser cutting and engraving

ARCHIVE

- The file must be saved in DXF 2018 format
- You must include in a single file all the cuts or engravings you want.
- You can create as many pink reference frames as you want with the name of the materials and their size below.
- If the pieces touch, the cut will be faster and consequently cheaper. (To cut two squares the common line is only cut once by the machine)
- Do not place tabs except in special cases. We will place them and try to make them as small and few as possible.
- Try to optimize the space as much as possible.

SCALE

- As a general rule, the documents must be in millimeters and the parts must have the final size to scale.
- It is important to put a reference rectangle with the dimensions of the material with an annotation of the dimensions it must have. In this way, if there is a scale problem, we can correct it ourselves by re-scaling the reference rectangle (example: White Feather Cardboard 5 mm 50x70 cm).

COLORS I CAPES

- **NAME: Reference, COLOR: PINK**
  - Material frames
  - Name of the material and size below the frame
  - 8mm inner material offset
  - In the final laser cut there is no trace of this layer.

- **NAME: Engraving COLOR: dark blue**
  - Everything we want to mark but not cut
  - Respect the distance between lines (min. 0.8 mm) so that it does not become very dirty and dark
  - Avoid very dense or complex engravings, they make the cut very expensive as they take a lot of machine time. You can make the textures with transparent adhesive paper for printer.

- **NAME: Inner cut COLOR: Red**
  - All pieces in this color are cut without tabs or, in the case of pieces over 20 mm, with very small tabs to prevent them from moving the material while cutting.
  - Parts that you can lose and not do anything to you.

- **NAME: Outer cut COLOR: Yellow**
  - The parts you want to keep.

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RECOMMENDATIONS BEFORE SENDING:

- Run the commands:
  - EXPLODE, or exploding turns groups, texts, textures into lines
  - OVERKILL removes duplicate elements
  - REGEN lets us see the drawing as it really is

- Check the distances between lines at least 0.8 mm.
- Remove all layers and elements that are not necessary for laser cutting.

TOPOGRAPHIES and how to make them

"Topographic example of 34 level curves with some sections with a steep slope"
PREMISE: My lowest level curve is 1, I consider curve 0 to be the base of my mockup which I will make with another material.

- We recommend making the topographies empty.
  - A topography can be
    - **VERY EMPTY** 2 sheets of material, light and economical, will require that we put some support material on it to make it harder.
    - **MODERATELY EMPTY (Recommended)** 4 or 5 plates
    - **NOT EMPTY** The same number of plates as inefficient, expensive and heavy level curves. Very resistant.

  - CRITERION: slopes of the land.
    - If they are soft, we can use less material, 3 or 4 plates
    - If they are strong, it is better to use a little more material, 5 or 6 plates. "I will make it using 5 plates"

  - Choose using the previous point how many sheets of material we will use.
  - Create as many reference frames as plates we have chosen.
  - Put on each plate the level curves that correspond to cut and engrave.

- How do I know which level curve goes to each plate and with which color?
  - If I have decided to use *5* irons what I will do will be
    - On the plate k put all the layers k + n*5 in yellow and I will put the layers k + n*5 + 1 in blue (simply record the following curve to be able to place it with total ease when we assemble the model)

    - n is a positive integer, starting at 0 and ending when n+5 is equal to or greater than the number of contours

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- k is the number of the board I'm working on and ranges from 1 to the number of boards I've chosen.

- "I have 34 layers and I have chosen to do my topography with 5 cardboard sheets so k = [1,2,3,4,5] and n = [0,1,2,3,4.... 34/k]"

- Plate 1: [k=1]
    - Curves in yellow: $k + n*5$
        - 1+0*5 =1
        - 1+1*5 =6
        - 1+2*5 =11
        - 1+3*5 = 16
        - 1+4*5 = 21
        - 1+5*5 = 26
        - 1+6*5=31
        - ~~1+7*5=36~~ Beats my curve count
    - Curves in blue those that go above we add $k + n*5$+1
        - 2,7,12,17,22,27,32

- Plate 2: [k=2]
    - Curves in yellow:
        - 2+0*5 =2
        - 2+1*5 =7
        - 2+2*5 =12
        - 2+3*5 = 17
        - 2+4*5 = 22
        - 2+5*5 = 27
        - 2+6*5=32
        - ~~2+7*5=36~~ Beats my curve count
    - Curves in blue those that go above add +1
        - 3,8,13,18,23,28,33

- This is how we will do it with layer 3, 4, and 5.

- We only have to think that the vertical parts, such as the limits of the material or a cliff, will need a cover so that the interior of the model is not visible.