

Sublimation printing

EPSON SC-F500



institut
FRANÇAIS
de la
MODE

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FabLab security and good practices regulations

- Wearing of closed shoes recommended.
- Wear appropriate clothing for handling machines and tools (not too loose clothing, too long jewelry, tie your hair back if necessary).
- Never use a machine without first being trained on it.
- Be fully aware of your actions.
 - Do not use machines if you are tired or ill.
 - Do not consume alcohol or drugs before using the machines and tools.
- Do not distract or surprise other users while using the fablab machines and tools.
- Never leave a machine running unattended, use only one machine at a time.
- Warn the fabmanagers of any danger.
- Never open a machine, warn the fabmanager present in the area for any technical problems related to the machines (malfunction, breakage, etc.).
- Keep the work area clean and tidy after use.
- Store materials and tools in their place.
- Prepare files before occupying the machine workstation.
- Do not apply force to the machines: ask for help, that's what fabmanagers are there for!
- Turn off the machines after use.
- Do not eat or drink in the Fablab.

Security related to sublimation printing

The F500 printer is not a dangerous machine for the user. BUT the user can be a danger to the machine.

- **Never leave the covers of the printer open. The print head could dry out and be unusable.**
- **Never use force on the machine (forcefully remove paper, force on moving parts, etc.).**

Dye sublimation requires the use of a thermal press. The main danger of this technique is burn injury.

- **Never leave the hot heating press unattended.**
- **Only one person at a time may use the heating press**

Principle of sublimation printing

The F500 printer is a machine that uses the printing technique known as "sublimation". This technique is used to color the mesh of a fabric.

By the process of ink jet, a sublimation printer deposits inks in solid form on a suitable paper. The inks do not reveal their colors as soon as they come out of the printer. They must be brought into contact with polyester fabric, or fabric containing polyester (the higher the percentage of polyester, the more the inks will reveal themselves), and put on press at high temperature.

Under the effect of the heat of a thermal press, the fibers of the polyester fabric open and the inks change from a solid state to a gaseous state without passing through the liquid state: this is called sublimation. The gaseous inks diffuse into the mesh and color the textile. The printed and then sublimated image is then trapped, with precision, in the polyester when the fabric cools.

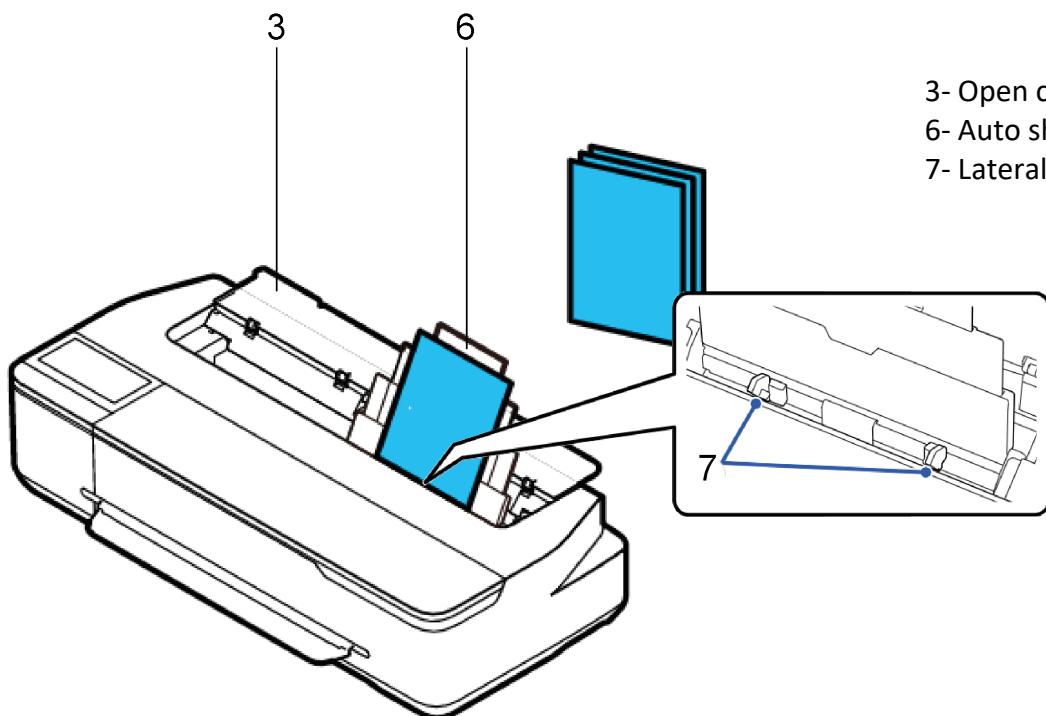
Diagram

Printer description

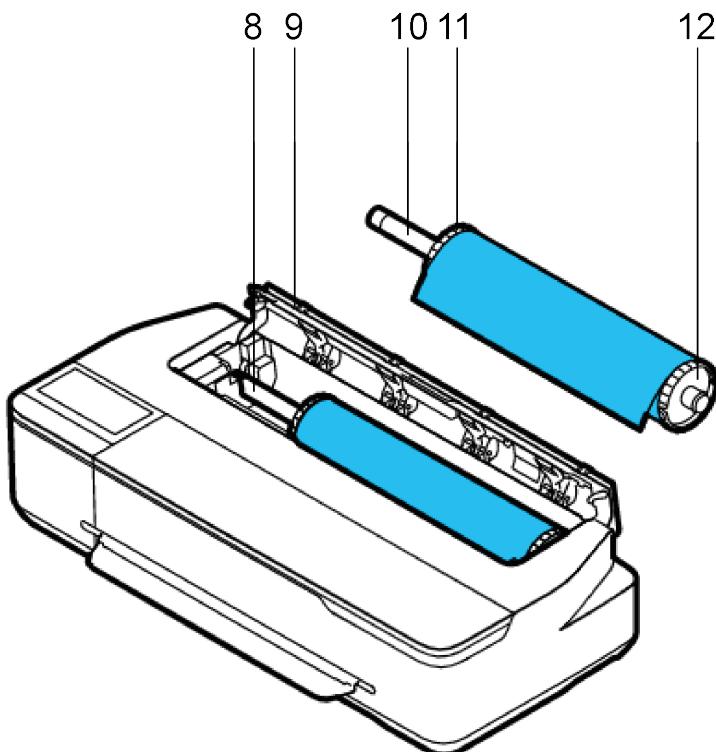
1. EPSON SC-F500 Printer diagram



- 1- Control panel
- 2- Front hood
- 3- Closed cut sheet cover
- 4- Paper stacker
- 5- Ink tank



3- Open cut sheet cover
6- Auto sheet feeder
7- Lateral guide



8- Roller system
9- Paper cover on roll
10- Spindle
11- Movable rod
12- Fixed rod

2. Features

The Epson SC-F500 is a small format dye-sublimation printer.

Technical information :

- CMYK Ink jet printing
- Printing methods: textile or rigid (identical paper)
- Print size: A4 sheets, A3 sheets, rolls up to 61 cm (24") wide
- How it works : Automatic switching between the auto sheet feeder and the paper roll.

Sublimation printing process

1. Diagram of the steps

Dye sublimation printing is a multi-step technique that requires the handling of several machines (printer and thermal press). It is essential to follow all the steps of the process to obtain a result.

PREPARATION OF THE IMAGE TO BE PRINTED

Know and verify the required "image" characteristics before printing.



PREPARATION OF THE PRINTER

Know how to set up the printer for successful printing.



PRINT SETTINGS OR "RIP"

Know how to set the print settings in the RIP software.



PRINT

Start printing correctly.



SUBLIMATION OF THE PRINTED IMAGE

Know how to transfer the printed image onto a textile support thanks to the use of a thermal press.



PAY

Indicate to the fabmanager how much paper and ink you used

2. Preparation of the image to be printed

For any printing, knowing and understanding the characteristics of the image you want to print is essential. The following notions are the key to a good printing result.

- *Type d'image :*

Images can be classified in two categories: vector images or raster (bitmap) images. Raster images are images constructed from a grid of colored dots (pixels). Each of the points has a defined color and it is the set of colored boxes placed side by side that will compose the image. Vector images are defined by a set of lines (straight or curved) in a 2D (x;y) space. These lines are characterized by their positions in space, by their contours (color, thickness, style, etc.) or fills (color, opacity, etc.).

! *Both types of images can be printed by the printer. It is however necessary to be vigilant on the treatment of the raster images which does not support enlargement (loss of image quality).*

- *Image format :*

In order to be read by the printer setup software, the images must be in the following formats: **.PDF, .PS, .EPS, .TIFF, .TIF, .JPG, .JPEG, .PNG**

- *Image size :*

The size of an image is defined by the width and height (W x H) of the image when printed. It can be expressed in cm (or mm) or inches.

! *When you want to print an image, always take into account its size (especially for raster images). It is strongly recommended to work with a real size image (scale 1) to avoid any pixelization effect.*

- *Image resolution :*

The resolution of an image corresponds to the pixel density for a given area. It is defined in dpi = dot or pixel per inch or dpi = dot per inch.

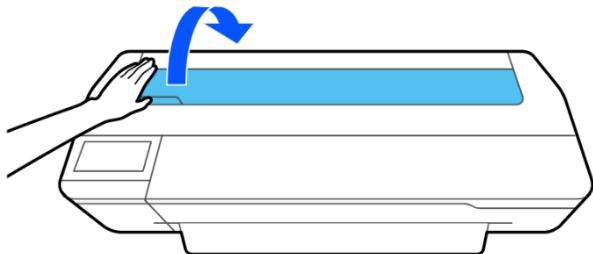
! *When you print an image, make sure the resolution is 300 dpi or 300 dpi.*

3. Preparing the printer

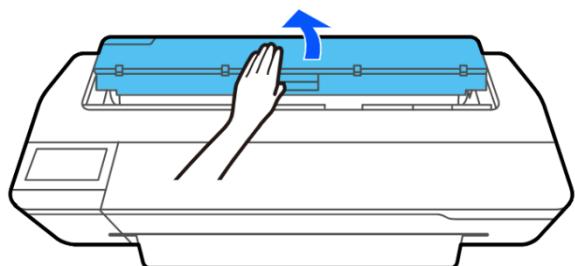
- **PAPER FEEDING**

Roll :

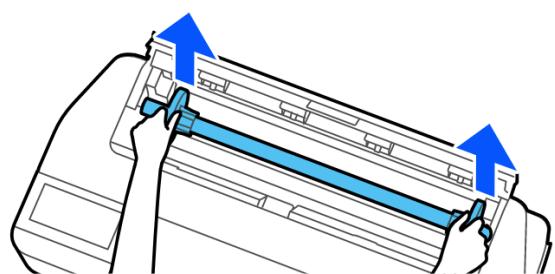
You can load roll paper with a width between 210 mm and 610 mm (maximum width).



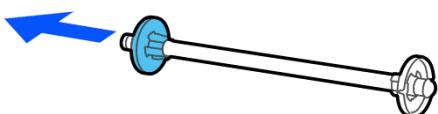
- Make sure that **Load Paper** or **Chargez du papier** is displayed on the Home screen, then open the cover.



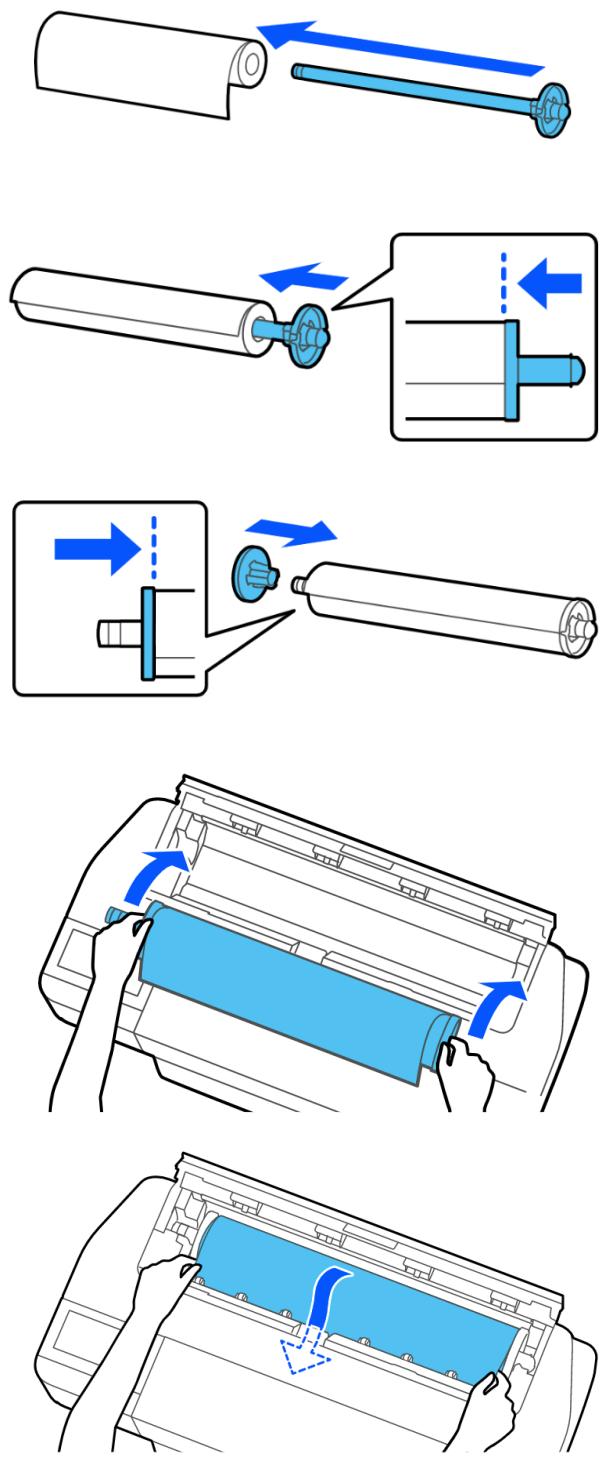
- Release the center lock, then open the roll paper cover.



- Remove the inserted spindle.



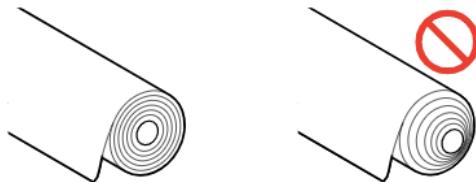
- Remove the transparent rod from the spindle.



- Place the roll paper on a flat surface and insert the pin. With the black pin to the right, orient the roll paper so that the front edge is similar to the illustration.
- Push the rod onto the roll paper until there is no more space between the rod and the roll paper.
! If gaps are present between the two ends of the rods and the paper, the paper could be fed at an angle and cause an error.
- Place the ends of the spindle in the notches on the left and right sides of the spindle holder, making sure that the black flange of the spindle is on the right side.
- Check that the front edge of the roll paper is not folded, then insert it into the paper slot until you hear a beep. Hold the edges of the paper and insert it straight into the paper slot.
! If you insert it at an angle, you may cause a tilt problem and a paper jam.

- Close the roll paper cover and cut sheet cover.
- On the screen that appears, set the paper type corresponding to the loaded paper.
- If the front edge of the roll paper is not horizontal or is not cut correctly, it will be cut automatically when loading is complete.

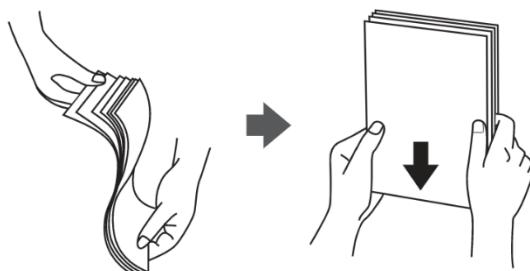
! *Never load an improperly wound roll. This can cause paper feed problems. Paper may also move during printing. > Rewind the paper to even out the edges before using the roll paper, or use roll paper that does not have this problem.*



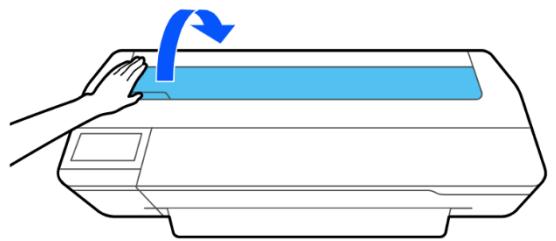
! *Never load a corrugated roll. This can cause paper jams or missed prints.*
> Flatten the paper before use by folding it in the opposite direction or using paper that does not have this problem.

Sheets :

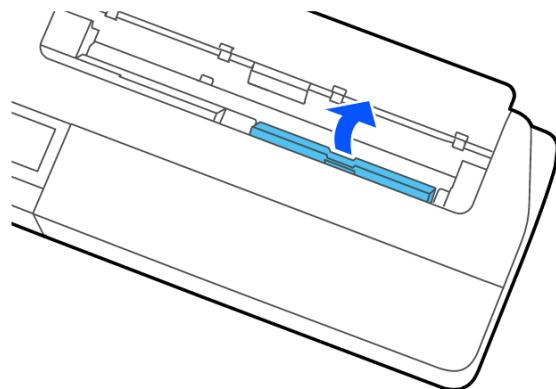
You can load A4 and A3 size sheets.



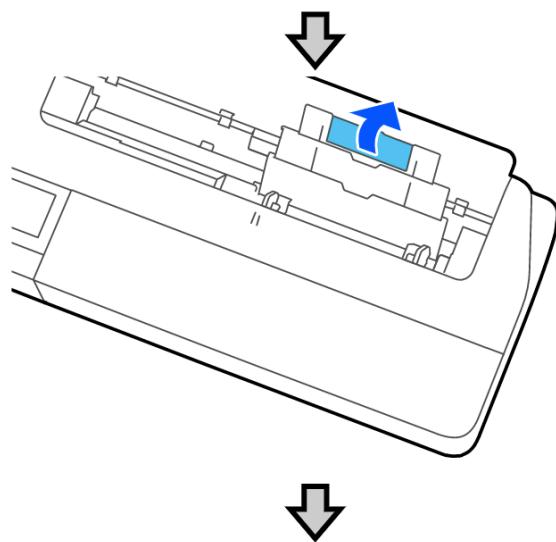
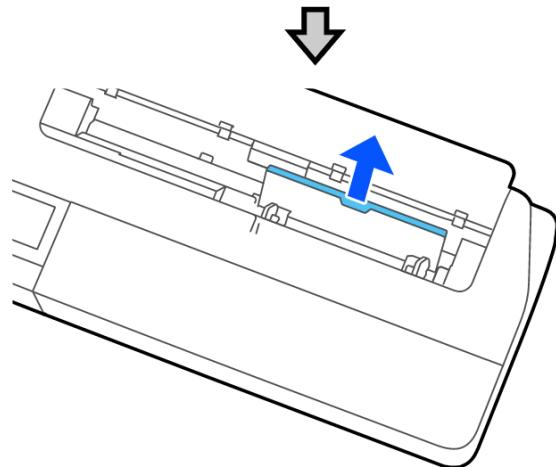
- When loading multiple sheets of paper, be sure to remove dust and align the edges.
! *Do not clean or fold the photo paper. This may scratch the surface to be printed.*

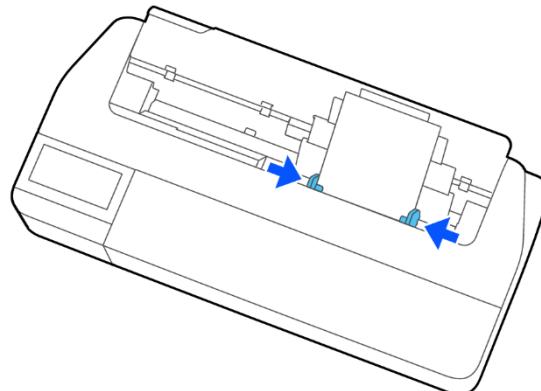
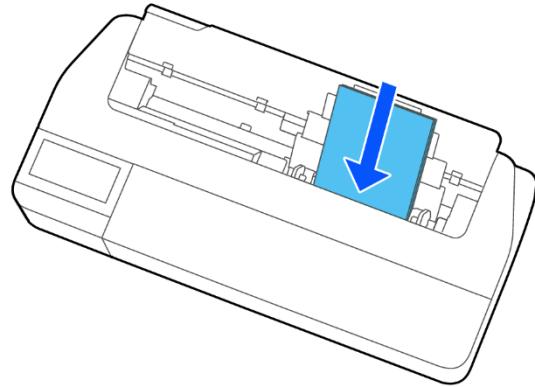
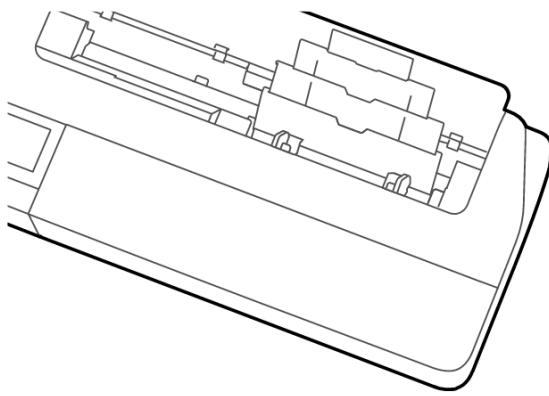


- Make sure that **Load paper.** or **Ready** is displayed on the home screen, then open the cut sheet cover.



- Unfold the Auto Sheet Feeder, then pull it up and out.





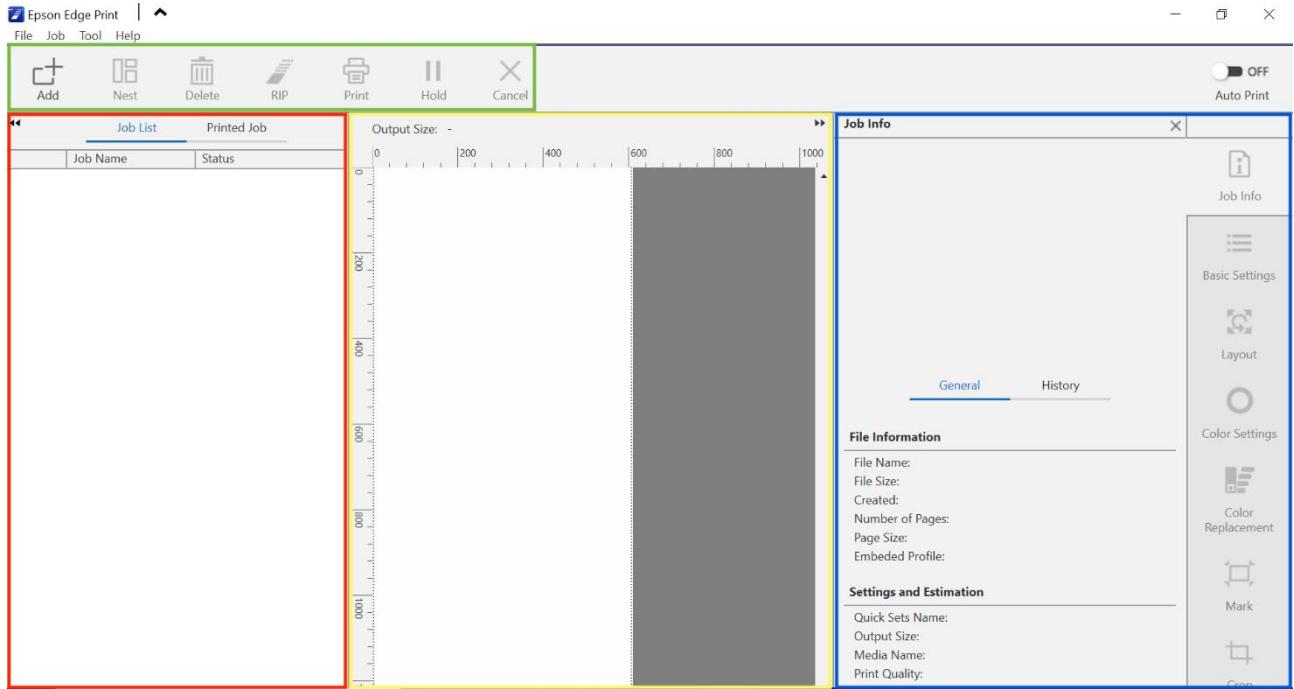
- Load paper in portrait orientation into the Auto Sheet Feeder, facing towards you.
! Align the edges of the paper before printing.

- Align the side guides with the edges of the paper.
! If the side guides are too far away from the paper, the paper may be driven at an angle, causing skew problems and paper jams.

- On the screen that appears, select the type and size of paper corresponding to the loaded paper.

4. Printing settings or "RIP".

Presentation of Epson Edge Print software



Main operations

Job list

Printing visualization

Settings

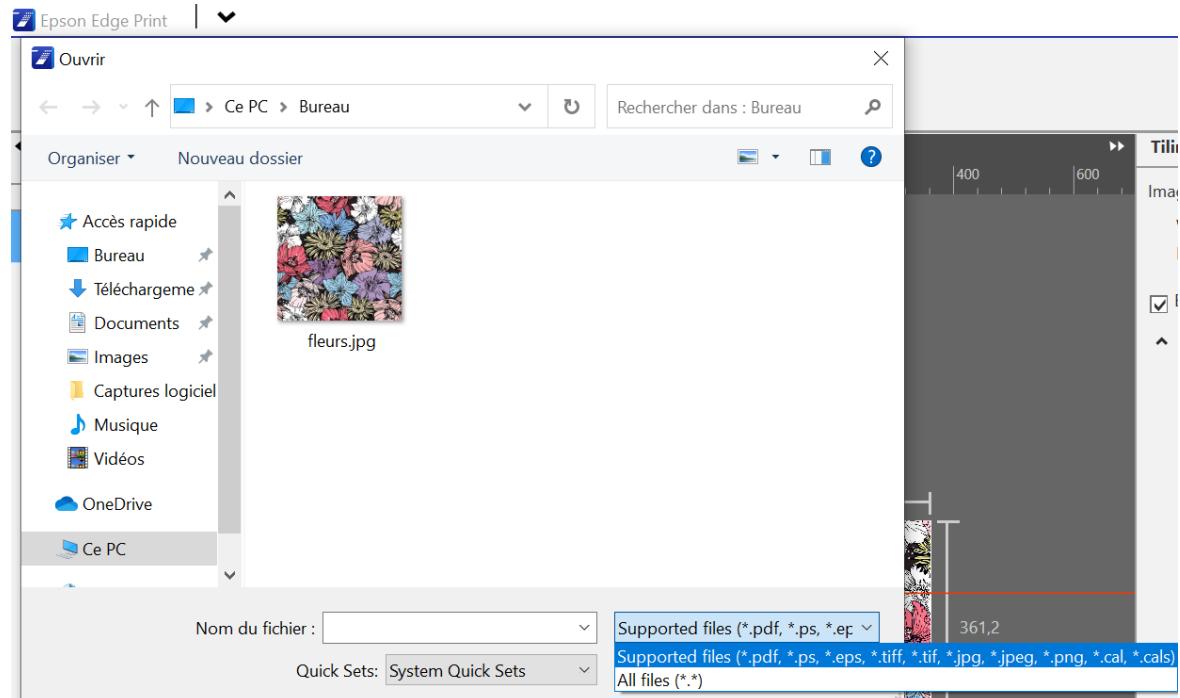
Using Epson Edge Print



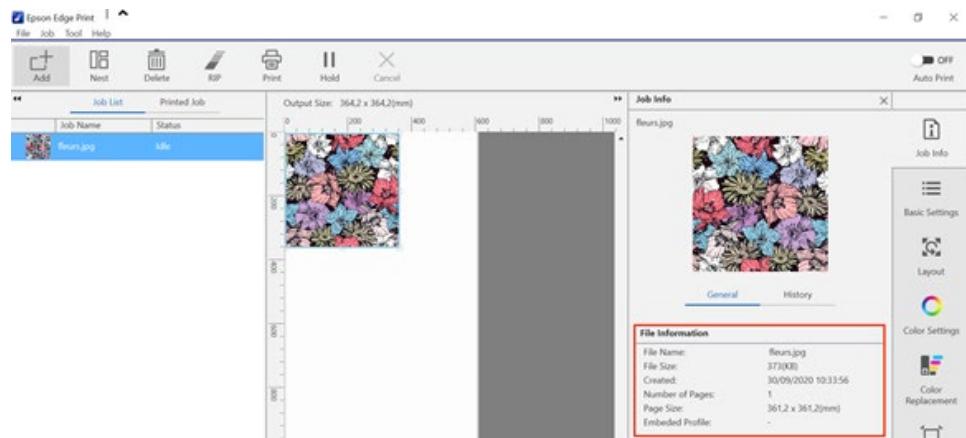
- **IMPORT A FILE** by clicking on

Then select the image to be printed in one of the following formats:

.PDF, .PS, .EPS, .TIFF, .TIF, .JPG, .JPEG, .PNG



You can check the information about the imported image on the **Job info** tab :



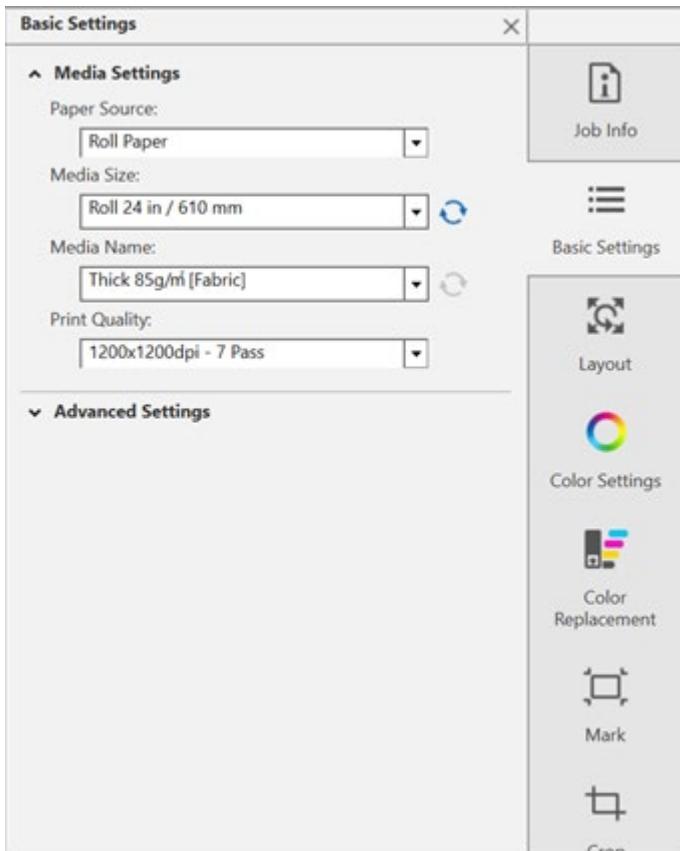
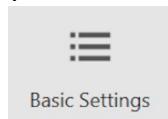
! Check the dimensions of your image! To have a good printing result, the image should not be smaller than the expected print size.

Example: if my image is 100 x 100 mm and I want a 200 x 200 mm print, my result will not be convincing.

- **IF YOU NEED TO PRINT MORE THAN 1 PICTURE**, you can **NEST** them together



- **CHOOSE THE BASIC PARAMETERS** by clicking on



- In **Print Quality** you have to choose the desired print quality.

Choose between : 2 Pass (not recommended), 7 Pass (recommended) and 12 Pass (if necessary).

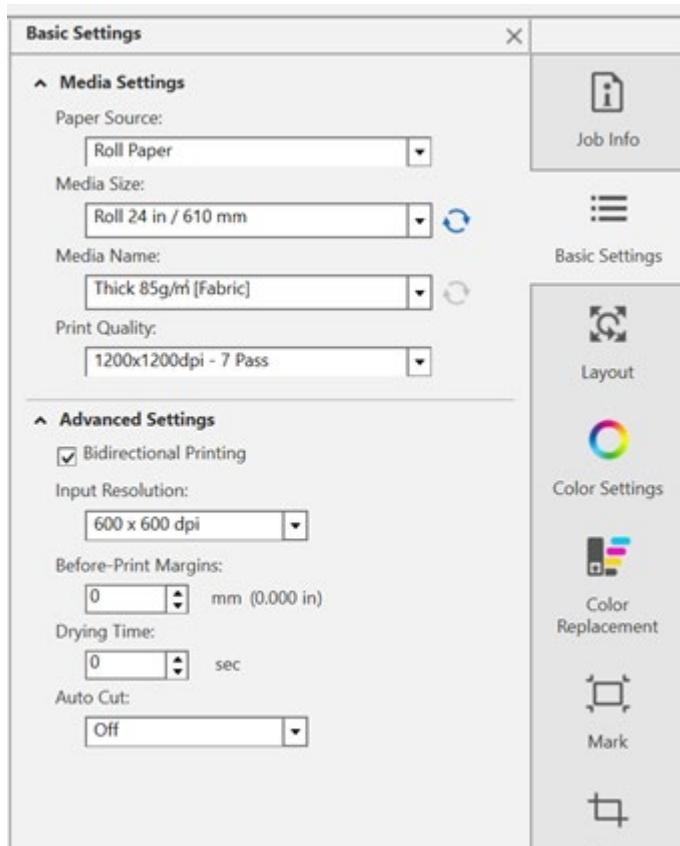
More passes :

Quality +
Colors +
Time +
Cost +

Less passes :

Quality -
Colors -
Time -
Cost -

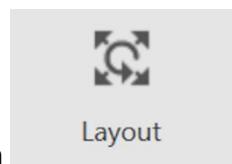
! *However, be careful with the absorption capacity of your support. It is possible that a textile or other support does not accept as much ink. In this case, the printing will have lasted longer than necessary and you will have spent more ink (costing more than necessary).*



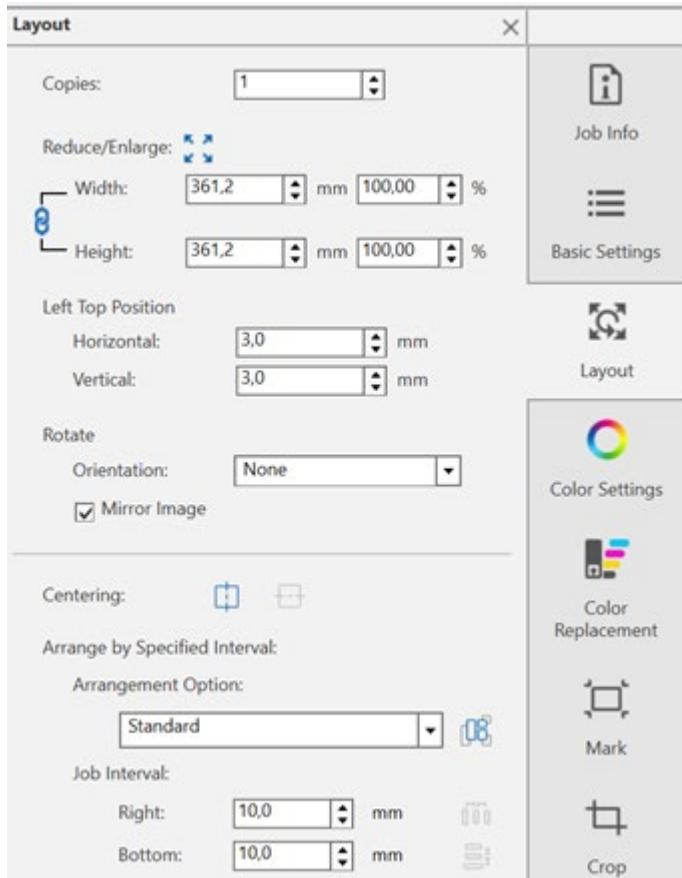
In the same tab, you can also access the **Advanced Settings**

- **Bidirectional Printing** gives you the choice between :
 - print only when the print head is moving, the box is unchecked (longer printing)
 - print when the print head is moving back and forth, the box is checked (faster printing).

- **Input Resolution** asks you for the input resolution of your image. Choose **300x300 dpi** with the drop-down menu.
- **Auto Cut** allows you to set up an automatic paper cut after printing. This command is used when using roll media.



- **DEFINE THE PLACEMENT OF YOUR IMAGE** by clicking on



- **Copies** : choose the number of copies of the image.

- **Reduce/Enlarge** : Change the size of the image.

! If you go beyond the 100% scale of your image, your result may not be what you expect.

- **Left Top Position** : Define the location of the image in relation to the origin of the paper (top left on the software = bottom right when the printed paper comes out of the machine).

- **Rotate** : Define the orientation of the image.

! The Mirror Image box must be checked since this is transfer printing. If this box is not checked, the image will be reversed when applied to the final media.

- **Centering** : Center the image on the support.

- **Arrange by Specified Interval** : Organize images in relation to each other when you have multiple copies of the same image.



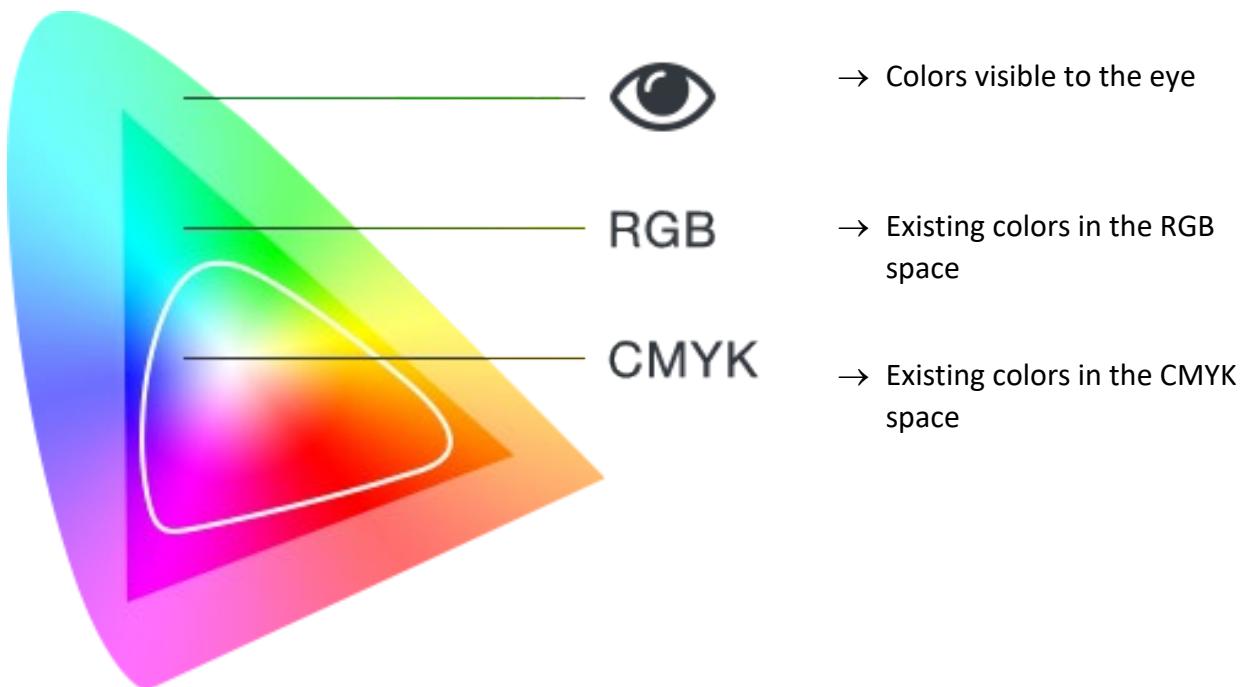
- **DEFINE COLORIMETRIC PARAMETERS** by clicking on

You must be in the **Input** tab since it is necessary to specify from which space and/or colorimetric profile the colors of the image will be interpreted and calculated to give a printed result as faithful as possible to the digital image.

An image is always defined by a colorimetric space :

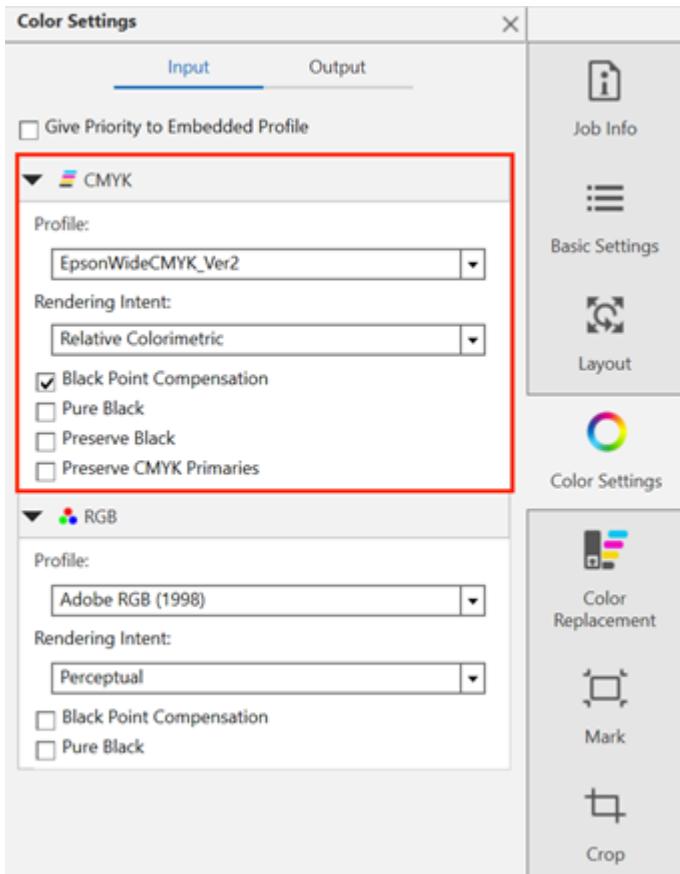
CMYK (CMJN) or RGB (RVB).

By convention, the images intended for the impression are created in space CMYK and the images intended for the screens are created in space RGB.



You can create or use CMYK and RGB images for dye-sublimation printing BUT the settings and results will not be the same.

- **CMYK image :**



- **Profile** : choose the colorimetric profile EpsonWideCMYK_Ver2.

- **Rendering Intent** : Define the color rendering intention.

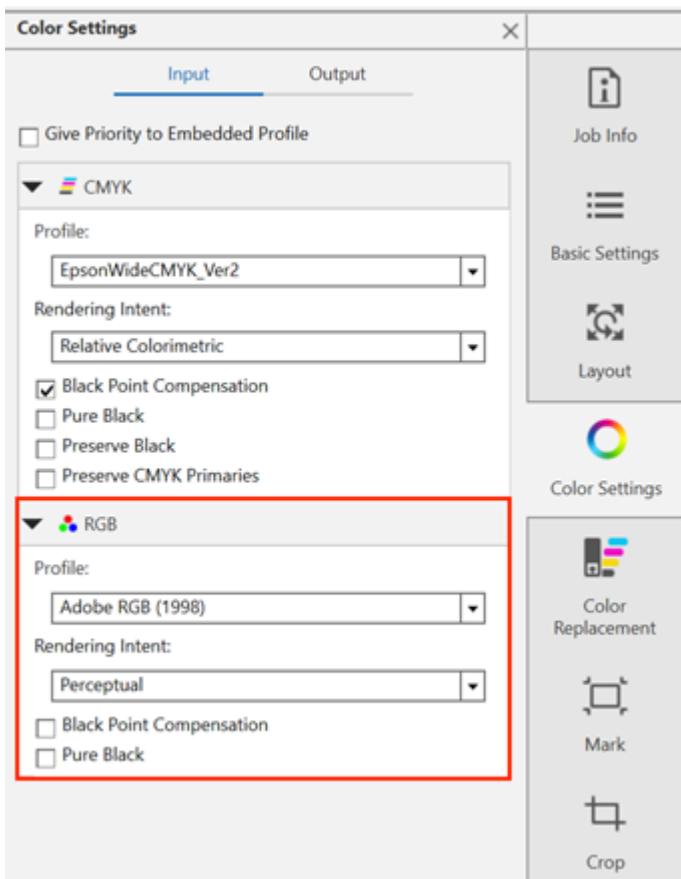
Choose between :

- *Relative Colorimetric* if the image is composed of solids (for vector images without gradient)
- *Perceptual* if the image is a photograph (for raster images or vector images with gradient).

- **Black Point Compensation** : Define whether black points should be compensated.

! Check the box when Relative Colorimetric is selected.

- **RGB image :**



- **Profile :** choose the colorimetric profile which was chosen during the creation of the image :

- **Adobe RGB (1998)**

- **Apple RGB**

- **ColorMatch RGB**

- **EPSON sRGB**

! Explanation of the choices of profile in the part Colorimetric profiles of the RGB images below.

- **Rendering Intent :** Define the color rendering intention.

Choose between :

- *Relative Colorimetric* if the image is composed of solids (for vector images without gradient)

- *Perceptual* if the image is a photograph (for raster images or vector images with gradient).

- **Black Point Compensation :**

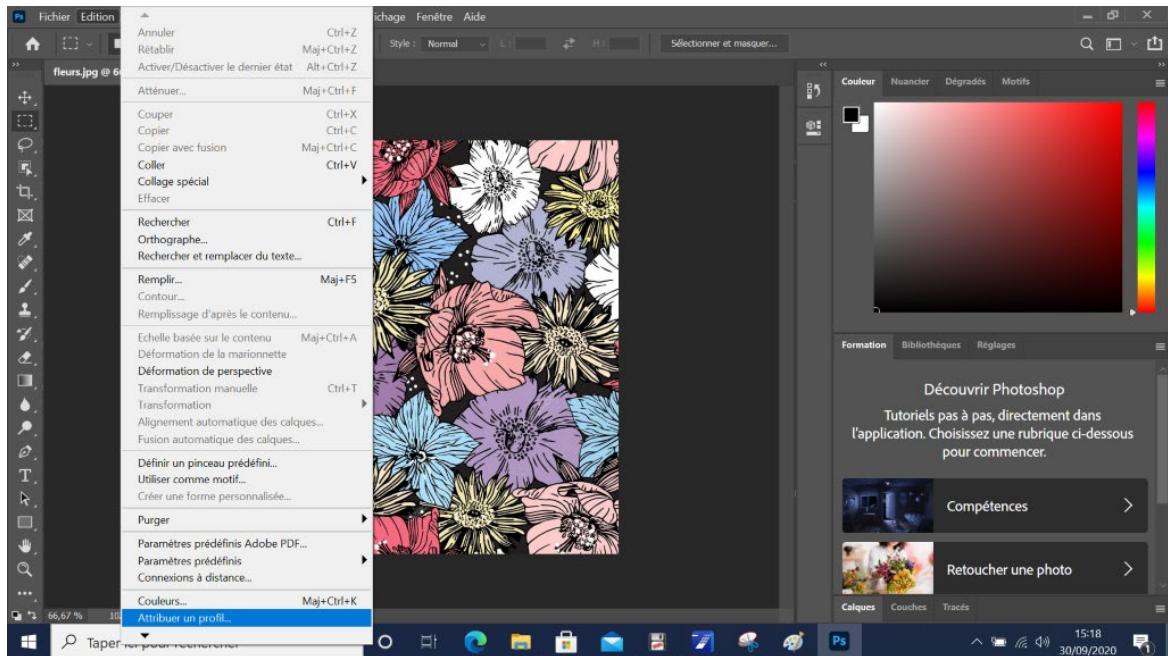
Define whether black points should be compensated.

! Check the box when Relative Colorimetric is selected.

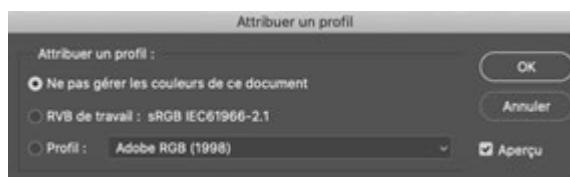
! Colorimetric profiles of RGB pictures : 2 options

- To know if the picture was created with a specific profile, open it with **Adobe Photoshop** :

- Click on **Edition > Assign a profile...**



- The window **Assign a profile** is now opened :



- You now need to compare the colour variation on the screen when you tick the different profiles against the option ***Do not manage the colors of this document (Ne pas gérer les couleurs de ce document)*** :

Comparison 1 :

No profile



sRGB profile

Is there a color difference on the screen?

- > if NO, the **sRGB profile** was chosen at the creation of the image.
- > If YES, it is not the profile that was chosen at the creation of the image, go to comparison 2.

Comparison 2 :

No profile



Adobe RGB (1998) profile

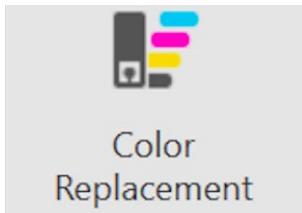
Is there a color difference on the screen?

- > if NO, the **Adobe RGB profile** was chosen at the creation of the image.
- > if YES, it is not the good profile. Test other profiles in the drop-down menu.

- **Save the created image with a profile defined in Adobe Photoshop and Illustrator :**

- Click on **Edit > Assign Profile...**
- Select the desired profile and click **OK**.
- Click **Save As** or **Export** and verify that the profile you selected is listed in the window.
*! When exporting, check the **Incorporate Color Profile** checkbox. By default, your image will be converted to sRGB space when exporting.*

- **OTHER TOOLS** by clicking on :



- **Color Replacement** : modify colors directly from the software (not recommended for photographic images).



- **Mark** : Add cutting indications (such as swallows) when printing.



- **Crop** : Crop the image.



- **Tiling** : Separate the image into several parts.



- **Step and Repeat** : Use the image as a pattern and set up the layout.



- **RIP THE IMAGE** by clicking on

The RIP is essential because it allows the software to transform all the parameters you have selected into data that can be understood by the machine for printing.

The image is ready for printing when the status is *Ripped*.

Job List		Printed Job
	Job Name	Status
	fleurs.jpg	Ripped <input checked="" type="checkbox"/>

5. Printing



When the image is ripped, click on

The printing starts, you just have to wait for the end of the printing and the automatic cut, if it has been checked in the software (see in *Basic Settings*).

The print dries almost immediately on the paper. You can store it away from light and moisture or sublimate it directly onto the polyester fabric.

6. Sublimation of the printed picture

To perform the sublimation operation, you will need :

1. The printing
2. The polyester fabric
3. The heating press dedicated to dye sublimation
4. Some “backing” paper

! CAUTION, DANGER OF BURN INJURY ! You will be handling a very hot machine that could injure you. Be careful !

- TURN ON THE PRESS with the big button on the back of the machine and check that the red compressor is on.



Position 0: press off

Position 1: press on



Button pushed down: compressor off

Button pushed up: compressor on

- SET THE TEMPERATURE AND TIME.



The control panel is touch-sensitive. Simply press the temperature or time "button" to make your settings.

Do not forget to confirm your selection with the purple button.



The temperature should be **between 185°C and 200°C**.

The time should be **between 50 seconds and 75 seconds**.

! *There is no exact temperature and time, it is up to you to test several temperatures and times to get a result that suits you. Only change one parameter at a time to see what has affected your result.*

- OPEN THE PRESS TRAY by pulling it towards you.



- PLACE A LAYER OF BAKING PAPER.

The baking paper is **MANDATORY**. It protects the mat from the press.

- PLACE THE POLYESTER FABRIC.

Make sure that the fabric lies flat without folds.

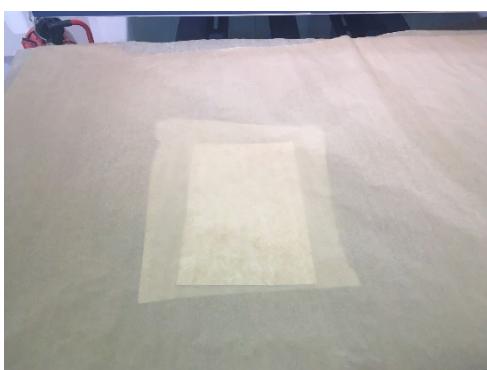
- PLACE THE IMAGE WITH THE PRINTED SURFACE AGAINST THE FABRIC.



Position the image precisely where you want it.

Check that there is nothing lying around on the tray.

- PLACE A SECOND LAYER OF BAKING PAPER.



You must obtain a "sandwich".

The baking paper is **MANDATORY** to protect the sole of the press.

- **CLOSE THE PRESSING PLATE** by pushing it to its maximum.

When you hear a "CLANG" the platen is properly positioned.

Make sure that no one leaves their hands nearby.

- **START THE HOT PRESSURE** by pressing both buttons at the same time.



IT IS MANDATORY TO WAIT IN FRONT OF THE PRESS TO ACTIVATE THE EMERGENCY BUTTON IF NECESSARY.



- **AT THE "BEEP", THE PRESS OPENS.**

! Be careful, the combination of baking paper + printing + fabric is very hot. Wait a few seconds before removing it.

- **ADMIRE THE RESULT!**

Bravo ! You've just made an image even more beautiful. You can now use the printed fabric as you wish.

! If the result obtained does not suit you, note all the parameters chosen in Epson Edge and on the heating press. Try to determine the source of the problem:

- Try with different sublimation times and temperatures.
- Check the colorimetric mode of your image and the associated profile.
- Check the number of passes when printing.

For any other problem, do not hesitate to talk to the fabmanagers.

Cleaning, storage and payment after printing

It is essential that everyone participates in the proper maintenance of the fablab and the machines to ensure quality and comfort of work for everyone. It is necessary to clean and tidy the machine and its work space each time it is used.

1. Cleaning

- **THROW THE WHOLE PAPER CUTTERS** into the fablab garbage cans.

2. Storage

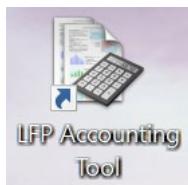
- **If you have used it, REMOVE THE AUTOMATIC SHEET LOADER and STORE IT** in its place.
- **STORE TOOLS** (baking paper, rulers, etc.) in their respective locations.
- **Be sure to LEAVE THE WORK AREA** as you found it when you arrived.

! Inform the fabmanager present in the fablab if the work area was not in order, clean and tidy when you arrived on the machine.

3. How to pay

! Payment only by card !

- **MEASURE** with the ruler the length of the paper you used (in meters with margins).
- **CHECK THE AMOUNT OF INK** in the software “LFP Accounting Tool”:



1. After you updated the data (“Actualiser les données”).
2. *Check in the right time period*
3. *The amount of ink of your job (in ml)*
4. *The right date and time slot can be written in the Nesting Job’s name*

Screenshot of the LFP Accounting Tool software interface:

Header: Certains des travaux n'incluent pas de paramètres de coûts. EPSON SC-F9300 Series Comm Driver. Numéro de série :4431E10009. Aquisition des données 11/09/2024 11:49:19. **1**

Toolbar: Imprimante, EPSON SC-F9300 Series Comm Driver Numéro de s..., Aj. Imprimante, Paramètres de prix, Préférences, **Actualiser les données** (highlighted with a red box).

Filter: Période: Mois, Mois de début: 1, Jour de début: 1, Travaux à afficher: 200, Rechercher, Param. filtrage.

Table: Période 01/05/2024 - 31/05/2024. **2** The table lists various print jobs with their details. A specific job is highlighted with a red box: **4** Nesting Job [31/05/2024 18:22:20]. **3** The 'Utilisation de l'encre' column shows the ink consumption for this job as 0.78 ml.

Bottom: Résumé de la période sélectionnée. **162** No. tot. trav. **2 111,04 ml** Total encre **375,85 m²** Total media **6 0,00** Autres coûts **???** Coût total. **???** **Précédent** 1 / 1 **Suivant**

Buttons: Péri. sélectionn., Exp. au form CSV, Info dét. rel. trav., Toutes les pén.