Vinyl cutter guide

Figure 1: Our vinyl cutter

Theory

Figure 2: Uppsala Makerspace

Contents

Foreword

This is a book about using the laser cutter at the Uppsala Makerspace.

About this book

This book has a CC-BY-NC-SA licence.

Figure 1: Licence for this book

Figure 2: QR Code of this guide

1. Install Inkcut

Inkcut is a program to send things to cut to the vinyl cutter. It works under Linux, Mac and Windows. This guide shows how to do this for Linux.

1.1 Start a terminal

On a Linux computer, start a terminal:

- Press the Meta/Windows key (between Ctrl and Alt at the bottom left of the keyboard)
- Type `terminal`

Now you have started a terminal

1.2 Install the Debian packages

Copy-paste the following command to the terminal:

```
sudo apt-get install python3-pip python3-pyqt5 python3-setuptools
```

Probably you will need to type a password and press enter.

You will probably be asked if you want to install these programs. Type 'Y' and press enter.

You will see a lot of programs being installed.

Well done!

Now repeat with this command:

```
sudo apt-get install libcups2-dev python3-pyqt5.qtsvg
```

1.3 Create a virtual environment for Inkcut

Create a (mandatory!) virtual environment for Inkcut:

```
python3 -m venv ~/inkcut_venv
```

If you get the error 'The virtual environment was not created successfully', try:

```
sudo apt install python3.12-venv
```

1.4 Install Python packages in the virtual environment

Install the Inkcut and PyQt5 Python packages in the virtual environment"

```
~/inkcut_venv/bin/pip install inkcut PyQt5
```

1.5 Start Inkcut

Now you can start `inkcut` with:

```
~/inkcut_venv/bin/inkcut
```

Inkcut is now started. Well done!

2. Setup Inkcut

2.1 Start a terminal

On a Linux computer, start a terminal.

2.2 Add yourself to the `dialout` group

Add yourself to the `dialout` group:

```
sudo usermod -a -G dialout "$USER"
```

2.3 Reboot the computer

Reboot the computer.

3. Get T-shirts

Get one or more T-shirts.

Company	Address	Price	Description
Lager 157	Kungsgatan 95	30	Has S, M, L and XL
New Yorker	Marknadsgatan 1	79	?All sizes

- Price is in kroner per (cheapest) T-shirt

4. Get vinyl

Get suitable vinyl

Suitable foil looks like this:

Figure 3: Transfer foil ready for transfer

- The foil feels smoother than a sticker (‘klistermärke’)
- The foil is shinier than a sticker

Places to buy vinyl:

Place	Features
https://folier.se/	Recommended by a member
https://www.scandraft.se/	Sells our favorite Siser P.S. Film Easyweed in 25 meter rolls for 2500 kr

5. Connect the vinyl cutter

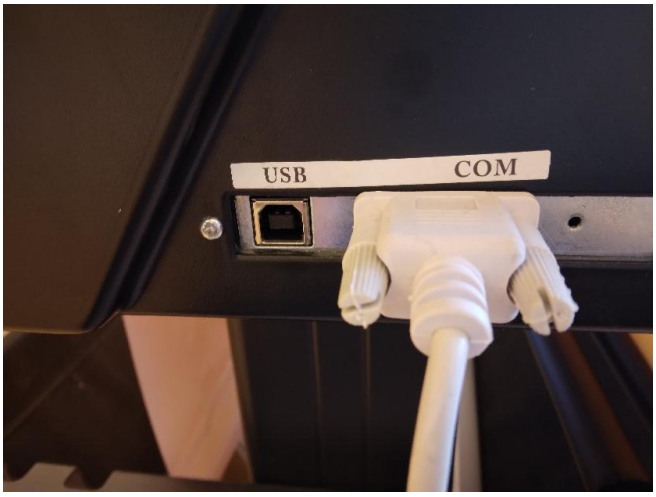
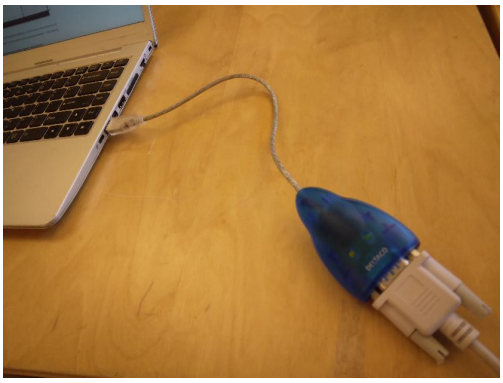
There are two ways to connect the vinyl cutter to a computer.

8.1 Use the USB port

Plug in the USB cable from the vinyl cutter's USB port to your computer. This is a regular/simple USB cable.

8.2 Use the COM port

Plug in the correct USB cable from the vinyl cutter's COM port to your computer:

Vinyl cutter side	Center	Computer side
		

6. Setup the vinyl cutter

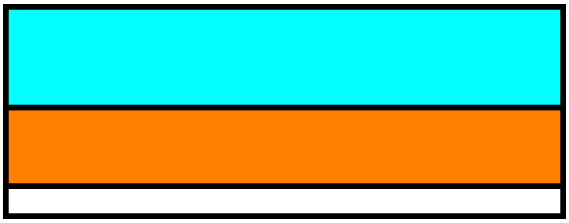
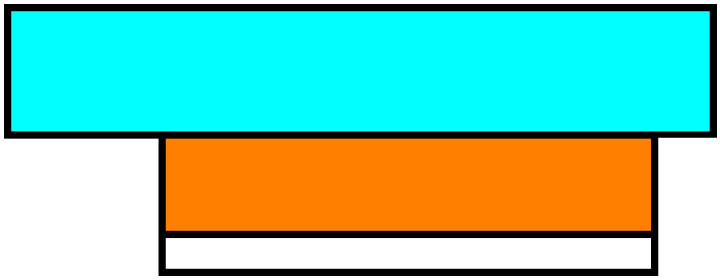
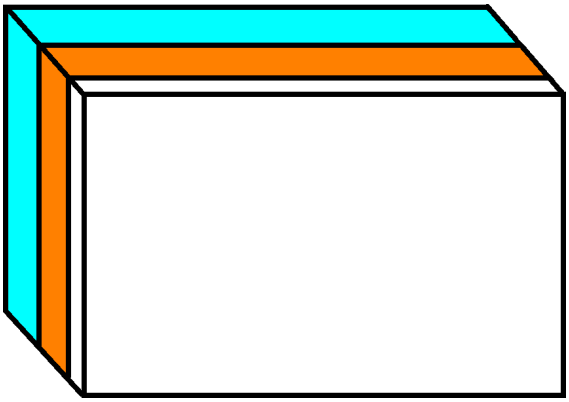
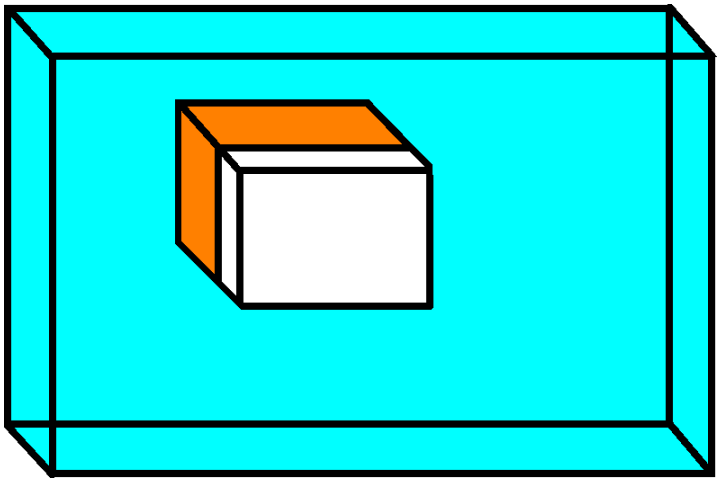
The vinyl cutter has three parameters:

- Origin: the bottom-left of the cut, move the red dot to the bottom-left of the vinyl
- Speed: the speed of the blade
  - If the speed is too high, no idea what happens. Please contribute if you know!
  - If the speed is too low, the process takes needlessly longer
- Force: how much force the blade applies to the vinyl
  - If the force is too high, the cutter will go through the vinyl
  - If the force is too low, the vinyl cannot be removed easily

Vinyl	Speed (mm/s)	Force(g)	Recommendation source
Siser P.S. Film	20	120	Trying out, works!
Siser P.S. Film	300	60	manual

7. Place foil on the vinyl cutter

Place the foil on the vinyl cutter, with the white side up, i.e. with the thick and transparent plastic at the bottom.

View	Before cutting	After cutting
Slice		
Isometric		

Structure of the foil and what will be cut away. Light-blue: thick, transparent layer, do not cut, can be separated from orange layer by hand. Orange: the color of the print. White: the glue connecting the print to the T-shirt

The knife cuts the white and colored layer only. The thick and transparent layer needs to remain intact.

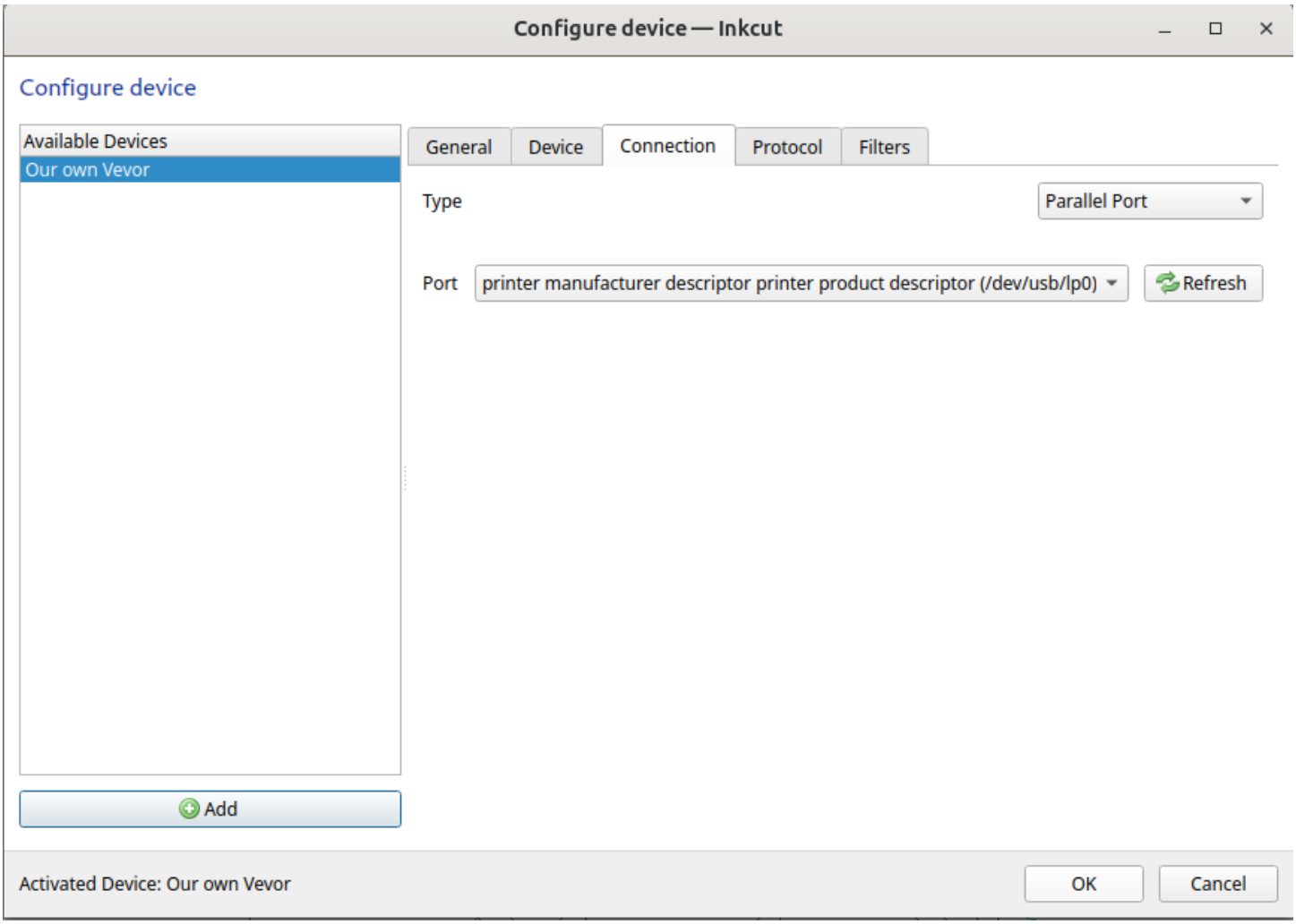
8. Set up Inkcut connection

Depending on how you've connected the vinyl cutter, here is how to connect Inkcut to the vinyl cutter.

8.1 Use the USB port

In Inkcut, go to the 'Configure device | Connection':

- Type: Parallel port
- Port: `printer manufacturer descriptor printer product descriptor (/dev/usb/lp0)`



8.2 Use the COM port

In Inkcut, go to the 'Configure device | Connection':

- Type: Serial port
- Port: `ttyUSB0`. If you cannot select `ttyUSB0`, you've used the wrong USB cable coming out of the vinyl cutter :-)
- Baudrate: 38400

  Use the serial port with a baudrate of 38400. If you cannot select `ttyUSB0`, you've used the wrong USB cable coming out of the vinyl cutter

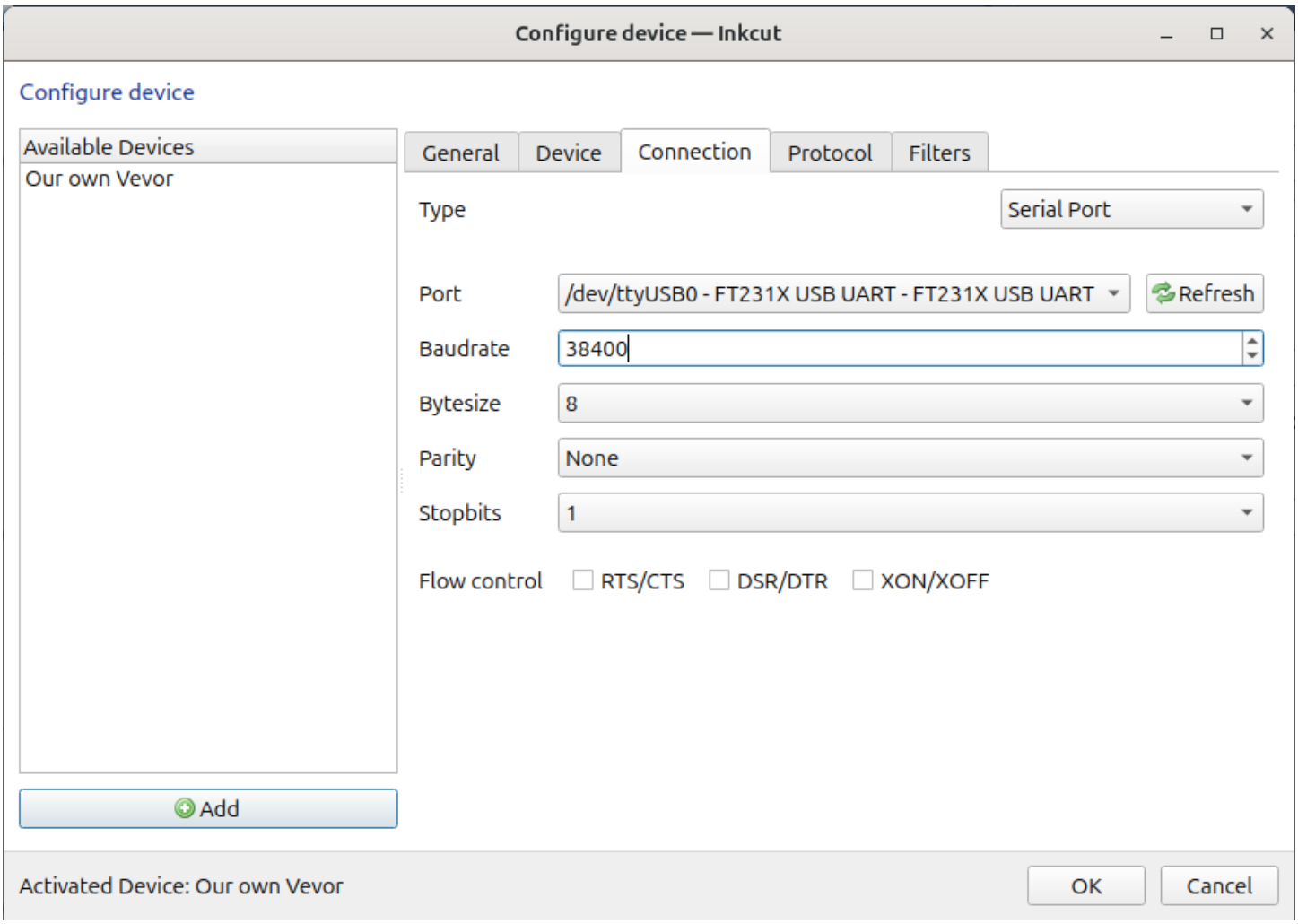


Figure 4: Use the serial port with a baudrate of 38400

9. Use Inkcut

9.1 Load an SVG

In Inkcut, load an SVG.

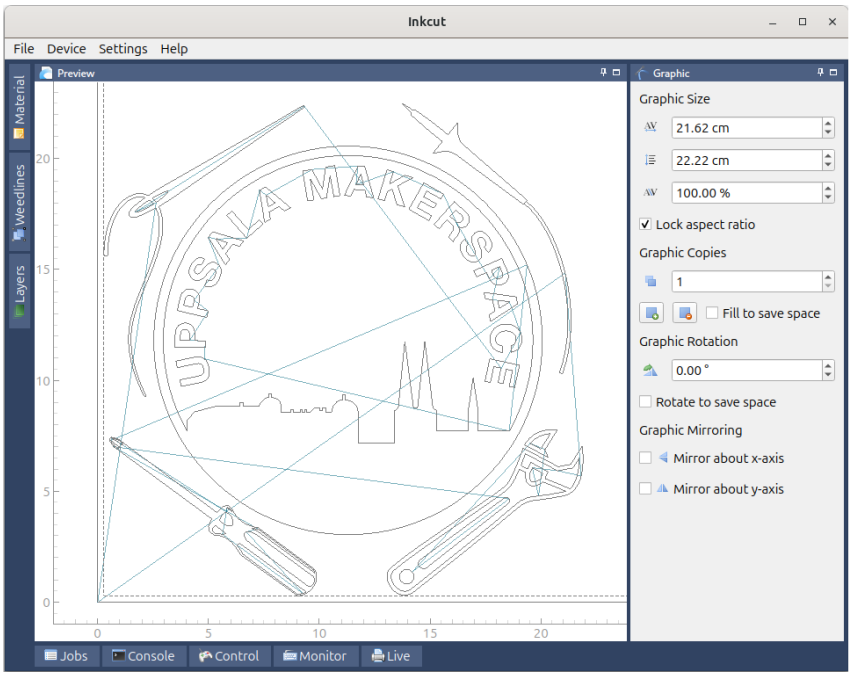


Figure 5: Inkcut in action

9.2 Mirror the image

Click on 'Mirror y-axis' (at the bottom-right of the screen) to mirror the image horizontally. This is especially important for letters.

9.3 (optional) Set up multiple images correctly

For many copies, do as shown here:

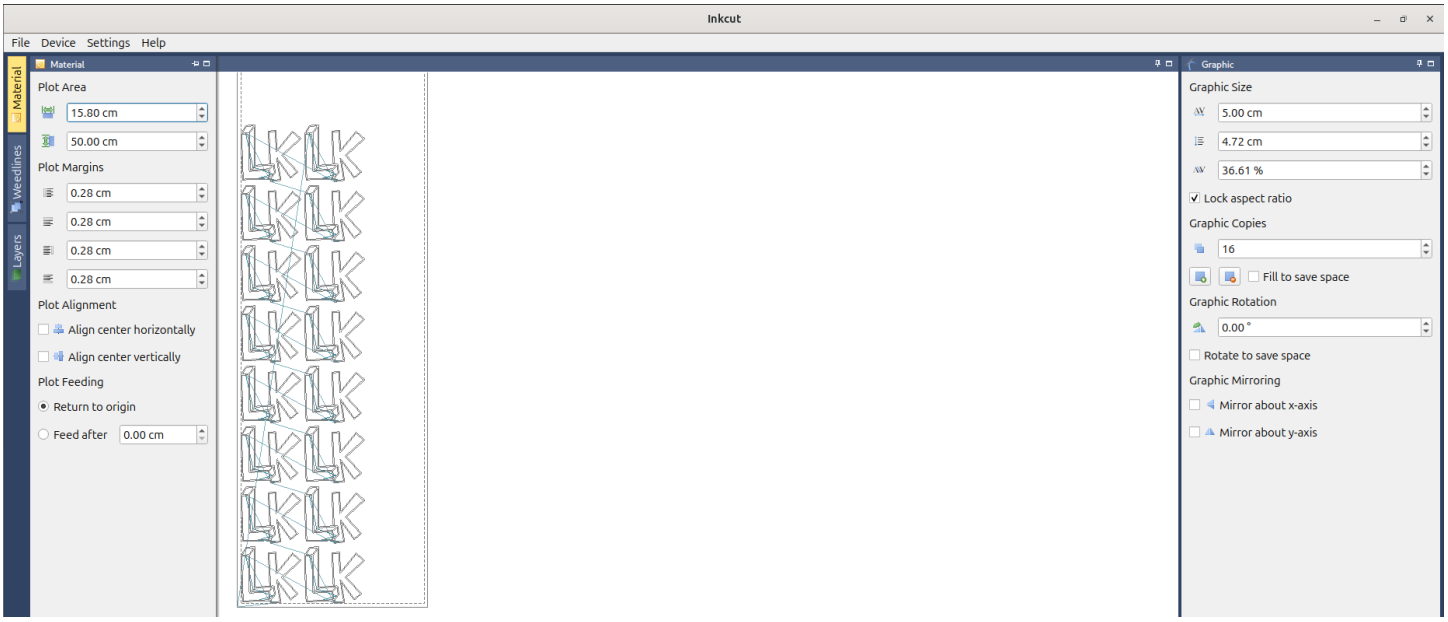


Figure 6: Do many copies like this

9.4 Start the cut

Click on ‘Device | Send to device’ to start the vinyl cutter.

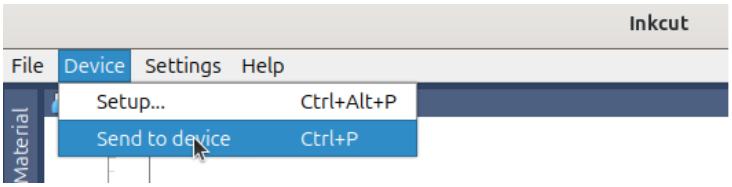


Figure 7: Click on ‘Device | Send to device’ to start the vinyl cutter

Click on ‘Device | Send to device’ to start the vinyl cutter

10. Set up heat press

Set up the heat press to have the correct temperature and time.

Vinyl	Temperature (C)	Time (s)	Recommendation source
Siser P.S. Film	180	10	Trying out, works!
Siser P.S. Film	150	15	manual

11. Peel vinyl

You now have vinyl with your pattern cut out.

Figure 8: Vinyl with a pattern cut out

Remove all the vinyl that should **not** be on the T-shirt. Use your favorite tools for this.

In the end, this how your vinyl looks like after peeling:

Figure 9: Vinyl after peeling

12. Transfer vinyl to T-shirt

Put the remainder of the foil on the T-shirt, with the colorful side up:

Figure 10: Vinyl to be transferred to T-shirt

Confirm the heat press is warmed up: it's temperature should match the desired temperature.

Place the T-shirt under the press, with the foil still at the desired location on the t-shirt.

When the heat press is warmed up, lower the press. After the time you've set up in an earlier step, the press will start to beep. Raise the press again.

Wait for the print to cool off.

Peel off the transparent layer from the shirt:

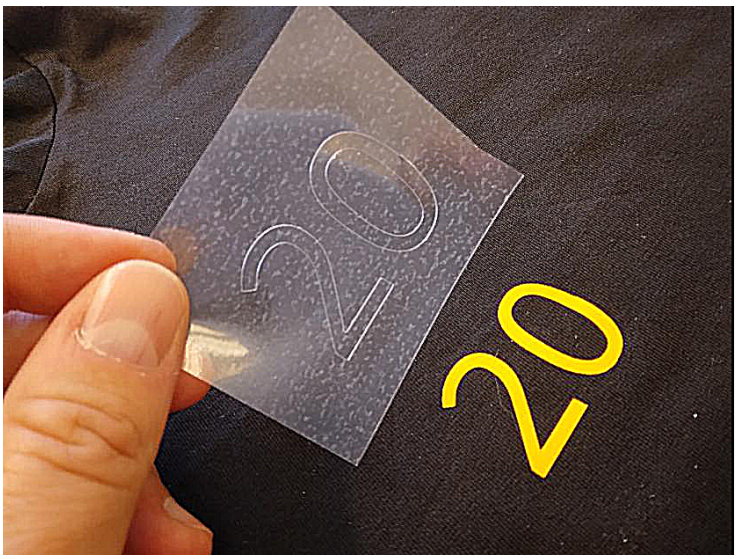


Figure 11: Vinyl transferred to T-shirt

Done!