



Do It Yourself Air Purifier ASSEMBLY INSTRUCTIONS

Instructions for the electronic part
will be integrated into this guide soon.

Part I: Structure



Version 2.1 – 23/08/2024

This document is based on the work carried out by three students from CentraleSupélec engineering school during the 2023–24 school year under the supervision of Professor Pascal Morenton: Clément Bonizec, Alex Martinez and Ismaël Rais.

The instructions provided are for guidance only and are an aid to making an air purifier. We invite the reader to adapt them to the means available, the skills that can be mobilized and the security conditions required.

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This document is available there:

letsair.org/diy

Our X account is:

x.com/nousaerons

To talk about this diy air purifier on social media, you can use the following hashtag:

#ladiyap

(Let's Air Do It Yourself Air Purifier)

For more information or any question, please send an email to:

info@letsair.org

TECHNICAL SPECIFICATIONS

- CADR (Clean Air Delivery Rate): 150 m³/h
- Power consumption: 3W
- Volume (measured at 1m): 38dB
- Dimensions: 37cm (length) x 21cm (width) x 30cm (height)

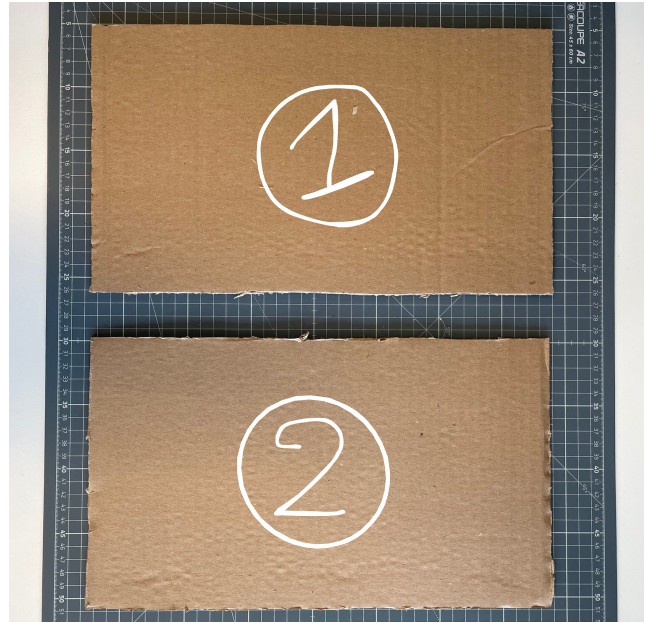
BILL OF MATERIALS & TOOLS

- 2 filters IKEA FÖRNUFTIG
- 2 PC fans Artic P14 PWM PWST
- 2 Protective grilles for 140mm fans

- Cardboard (preferably single-fluted for easier cutting, with maximum dimensions of 21x36 cm)
- Standard wide adhesive tape
- Pencil, Ruler, Square, Compass, Scissors

STEP 1: FANS PANEL

1) Cut out two 29 x 36cm rectangles from cardboard: these are the ① and ② pieces. Set the ② rectangle aside, we won't cut it out.

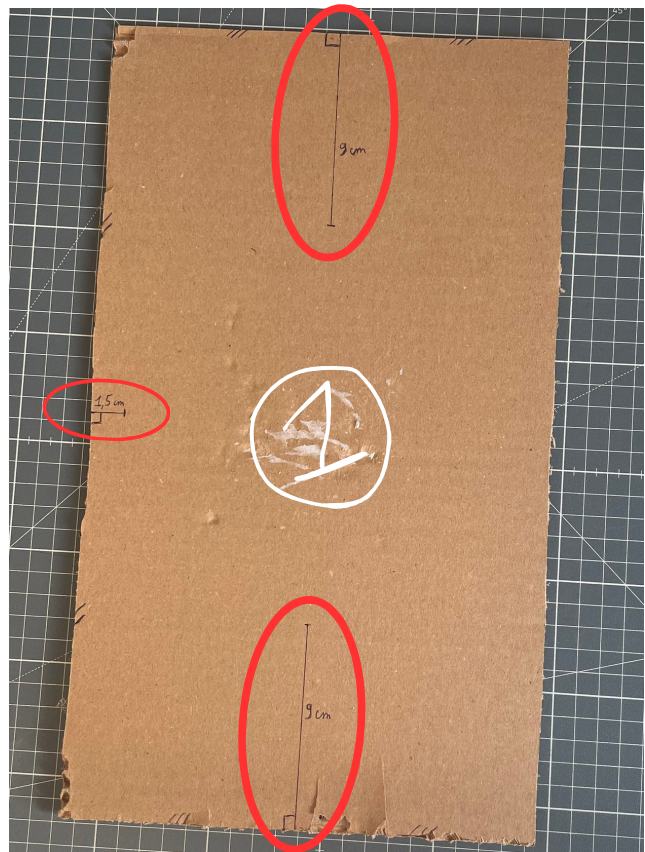


2) On the rectangle ①, draw the following 3 segments:

- Starting from the middle of one of the two widths (the shorter side), draw a **perpendicular segment 9cm** long.

Do the same for the other width.

- Starting from the middle of one of the two lengths (the longer side), draw a **perpendicular segment 1.5cm** long.



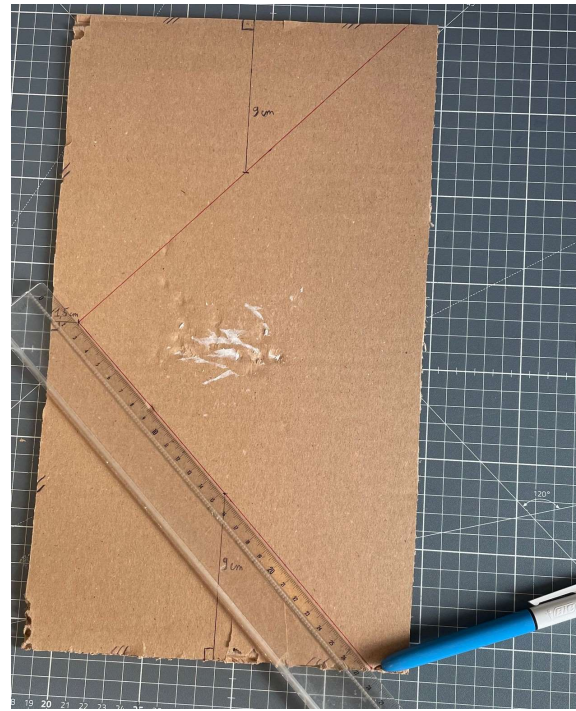
3) Still on the rectangle ① :

- Draw a line in red from the end of the 1.5cm segment to the end of a 9cm segment.

Continue this line to the edge of the cardboard.

(Symmetrically)

- Do the same, starting at the end of the 1.5cm segment and going to the end of the other 9cm segment.
 - Continue this line to the edge of the card.

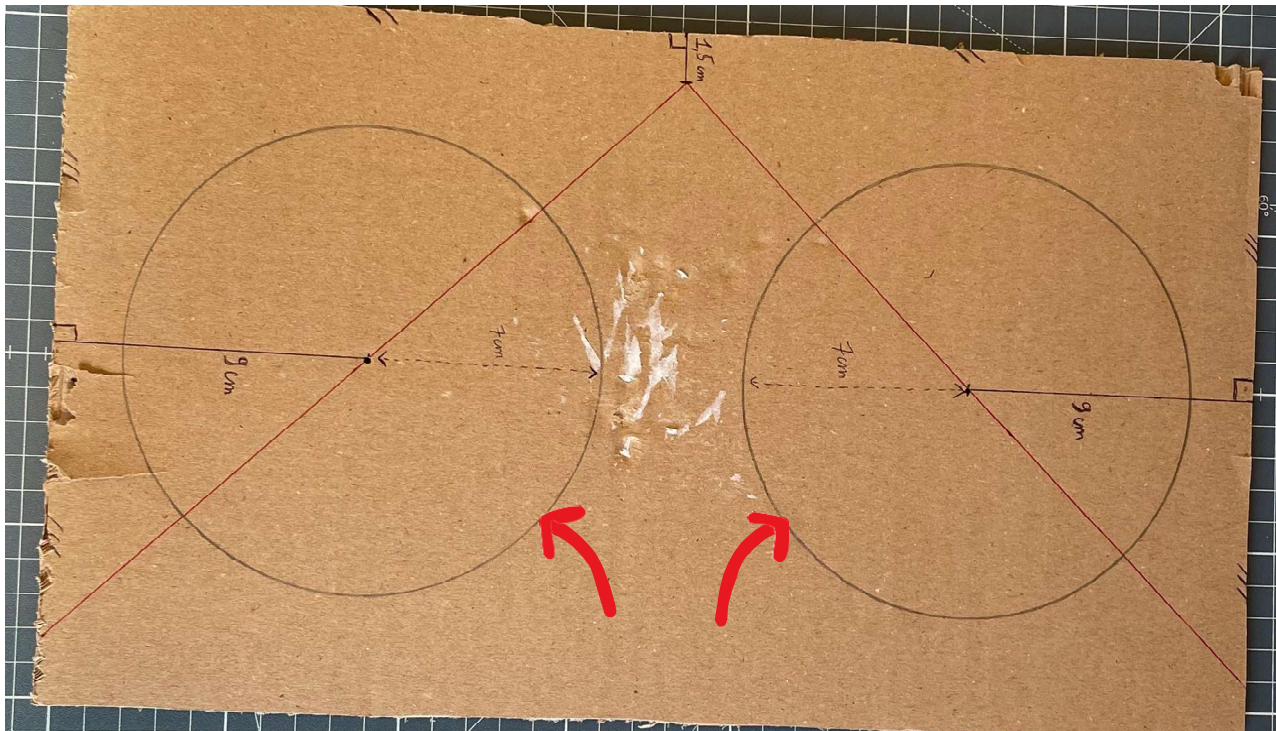


4) Still on the rectangle ① :

- Draw a red circle with a radius of 7cm that has the end of a 9cm segment as its centre.

(Symmetrically)

- Draw a red circle with a radius of 7cm whose centre is the end of the other 9cm segment.



If all goes well, the gap in the middle between the two circles should be around 4cm.

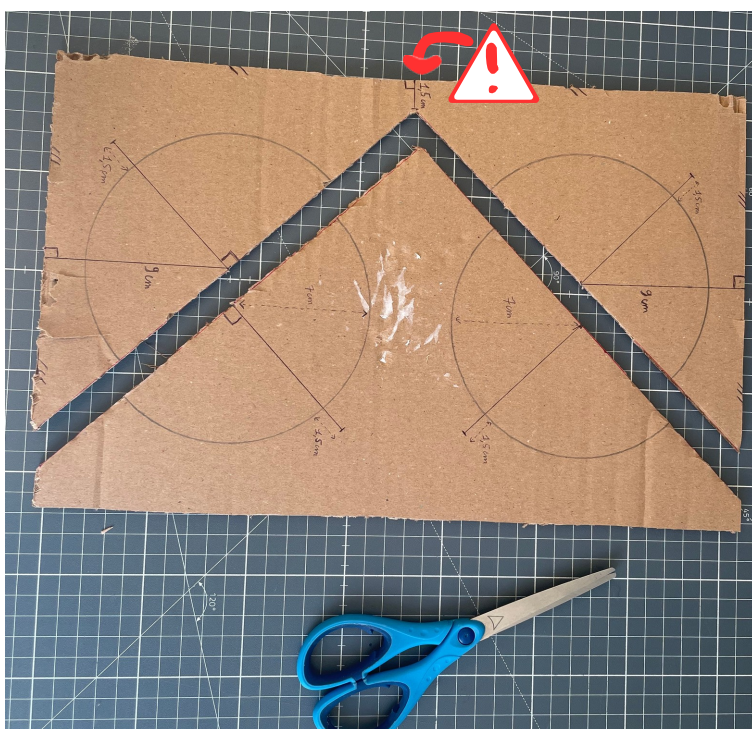
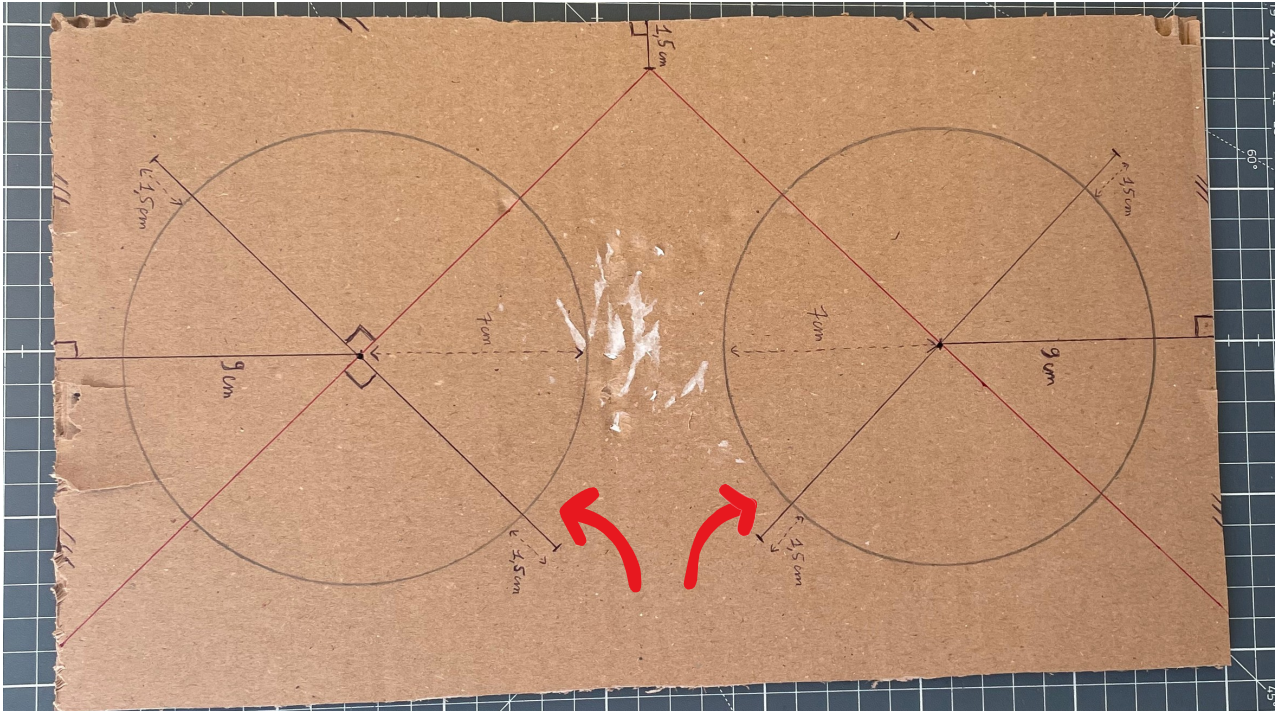
5) Still on the rectangle ① :

- Draw a red segment that passes through the centre of the circle, perpendicular to the red line drawn in step 3).
The segment should "protrude" 1.5cm either side of the circle.

If all goes well, the segment is 17cm long and passes through the centre of the circle.

(Symmetrically)

- Do the same with the other circle.



6) Using the rectangle ①:

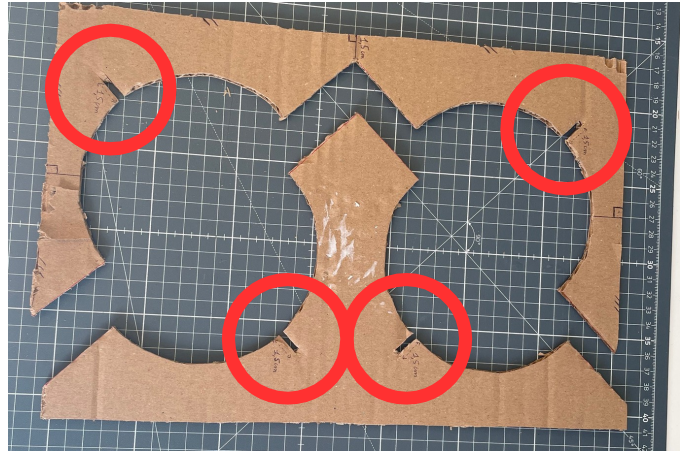
- Cut along the red segments from step 3)

!/\ Do not cut further than the end of the 1.5cm segment!

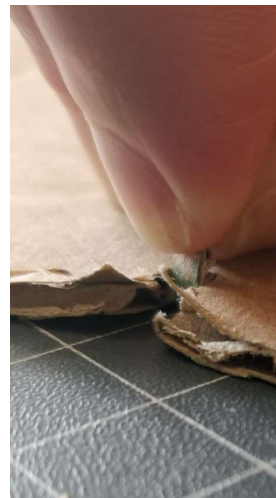
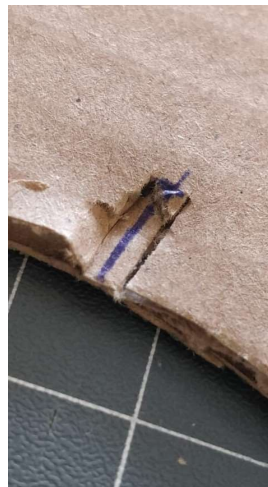
There should only be two pieces of cardboard.

7) Using the pieces cut out in this way:

- ♦ Cut out the **outer edges of the semi-circles**. The half-circle pieces will be discarded, as it is the outer part that will be kept.
- ♦ Using the **1.5cm segments** on the edges of the half circles, cut **2mm thick slots**.



Technique for making the slits: make small cuts 1mm to the left and 1mm to the right of the line, then tear the tab by hand.



8) Insert the fans into the slots in the central triangular piece.

- The side with the white logo should face upwards.

!/\Make sure the wires exit at the centre point!



9) Add the other part of the cardboard, inserting the fans into the slots.

You may need to fold the cardboard little, but be careful not to tear it.



!/\Make sure that the wires exit from the white logo side of the fans.

10) Place a 10cm piece of **tape** on the middle point.
Make sure it sticks to both pieces of card.
If it sticks out a little on the outside, fold over the excess.

!\\The threads should come out on the side with the white logos, towards the centre of the card.

- ◆ Turn the assembly over and repeat the operation at the centre point.



11) Cut pieces of tape about 10cm long. On the corners:

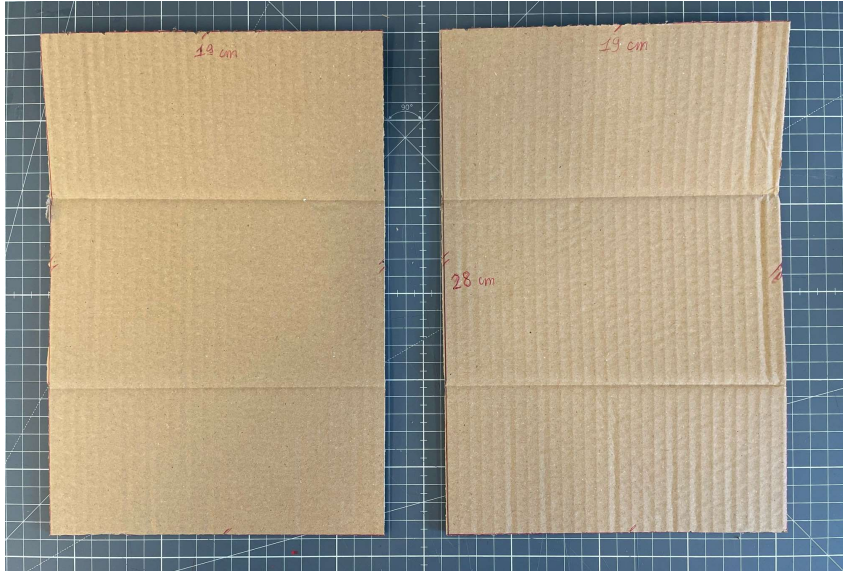
- Place 5cm of the tape on the edge, so that it protrudes across the width of the rectangle.
- Fold the protruding part over to the other side of the assembly: this way the piece of tape goes around the corner.
- Do the same for the other corner.



This assembly should now be able to support both fans, if not repeat this step.

STEP 2: SIDE PANELS

1) Cut out two 19 x 28cm rectangles from cardboard. These are the ③ rectangles.



2) Take one of the pieces ③

- Present its length (28cm side) at the level of the width of a filter and draw lines about 3cm perpendicular to the edge at the level of the three crosspieces .
- Carry out the same operation on the other width of the piece



3) Repeat this step (on both widths) for the second piece ③.

4) Cut successively:

- Slots about 0.3 cm thick and 3 cm long on the lines in step 10)
- The corners of the slots and edges to facilitate insertion into the filters

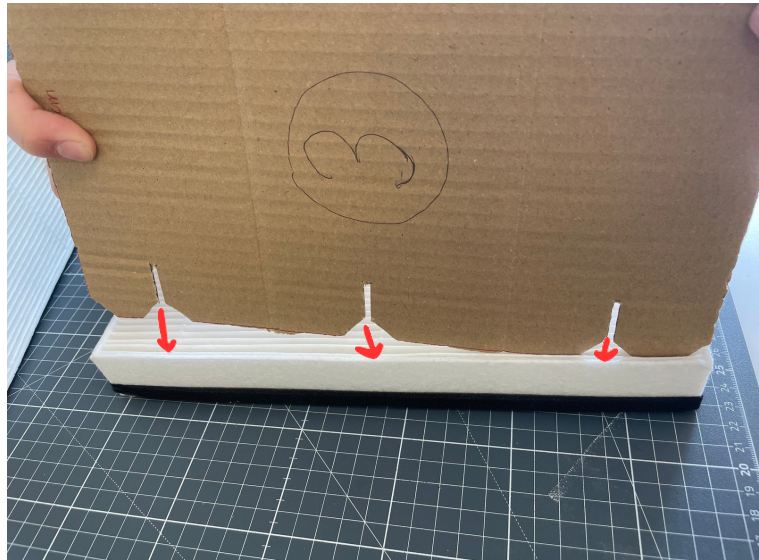


The two identical parts below are obtained

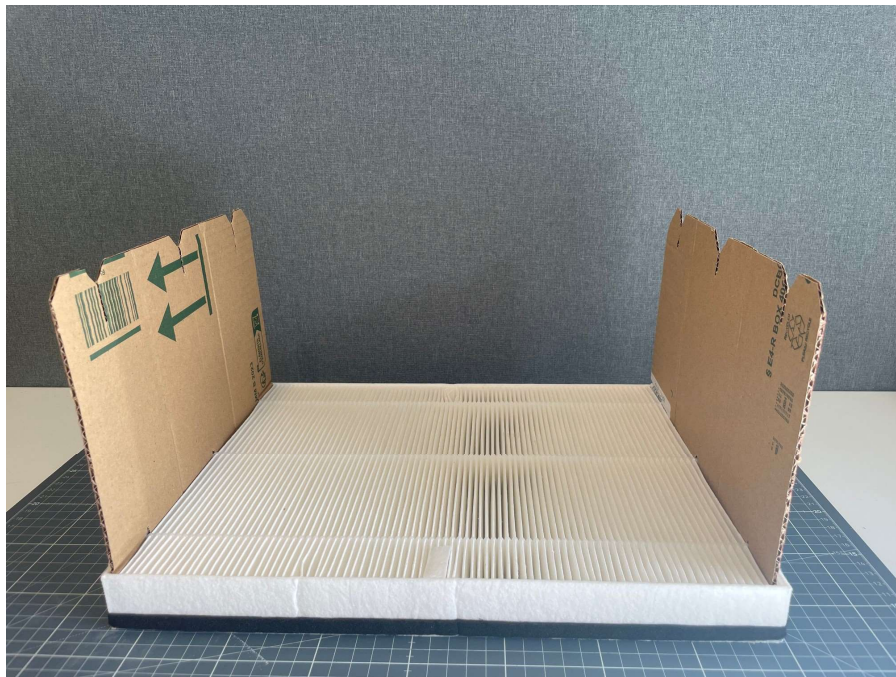


STEP 3: ASSEMBLING THE “BOX”

1) Insert the length of part ③ into the second to last slot of the filter. The previously cut slots fit together with the three crosspieces of the filter.

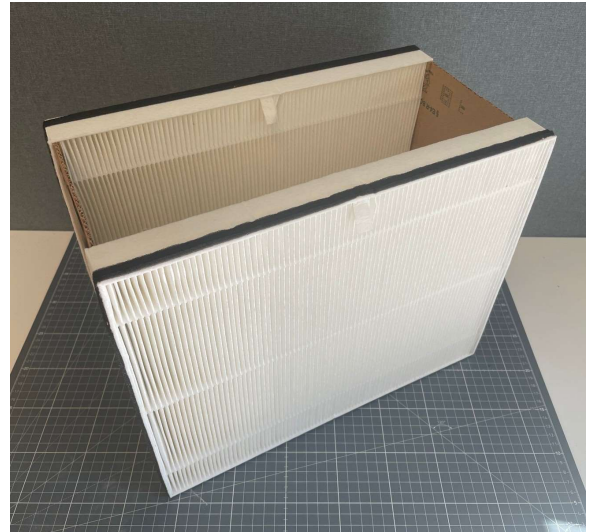
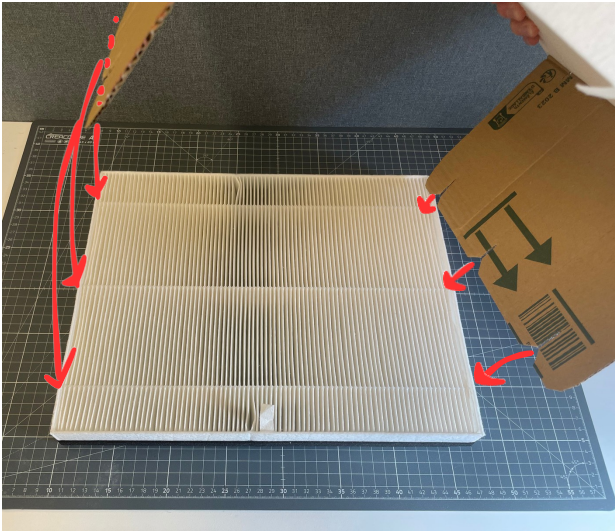


2) Insert the length of the second part ③ into the same filter using the same method as in step 1).



Don't hesitate to trim corners a little more or widen slots if inserting parts ③ is difficult. Be careful not to bend the cardboard.

3) Present the **second filter** and insert the two free cardboard ends into the filter using the method in step 1).



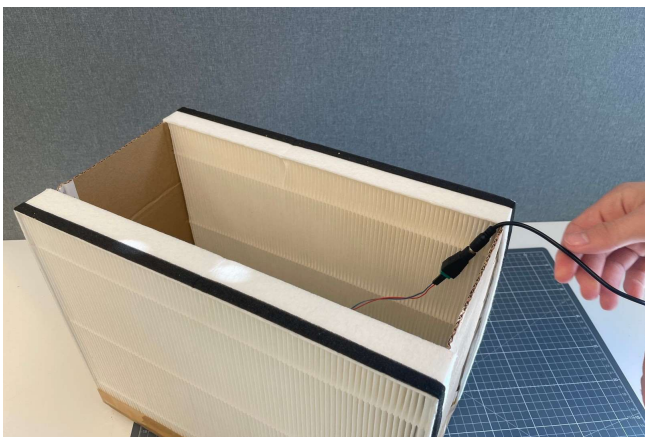
4) Place the **electrical system** in the frame and place the ① piece on top, making sure that the white part of the fans are hidden in the box (the black part should be facing you).



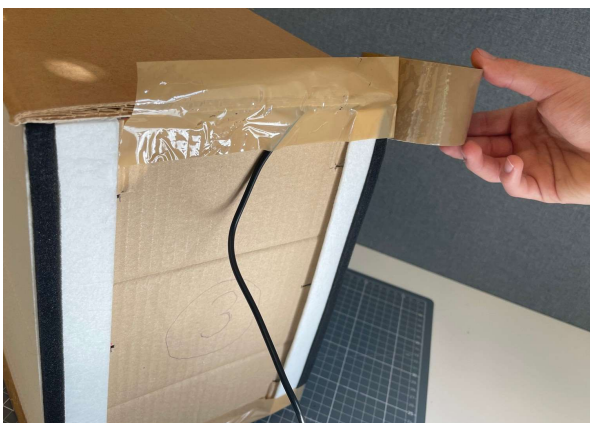
5) **Tape** the top of the purifier all the way round, leaving half the tape sticking out, as shown in the photos.
Fold the sides over, starting with the shorter edges.



6) Turn the assembly over.
• **Bring out the supply wire** on the side as shown in the photo (the last connection must be on the inside).
• Place part ② on top of the assembly.



7) **Tape** the bottom of the purifier, starting with the wire, using the same method as in step 5).



8) Add the protective grilles for the 2 fans.



Congratulations, the box is fully done!

To use it, simply plug it in. Make sure you leave it with the fans pointing upwards, with nothing on top.