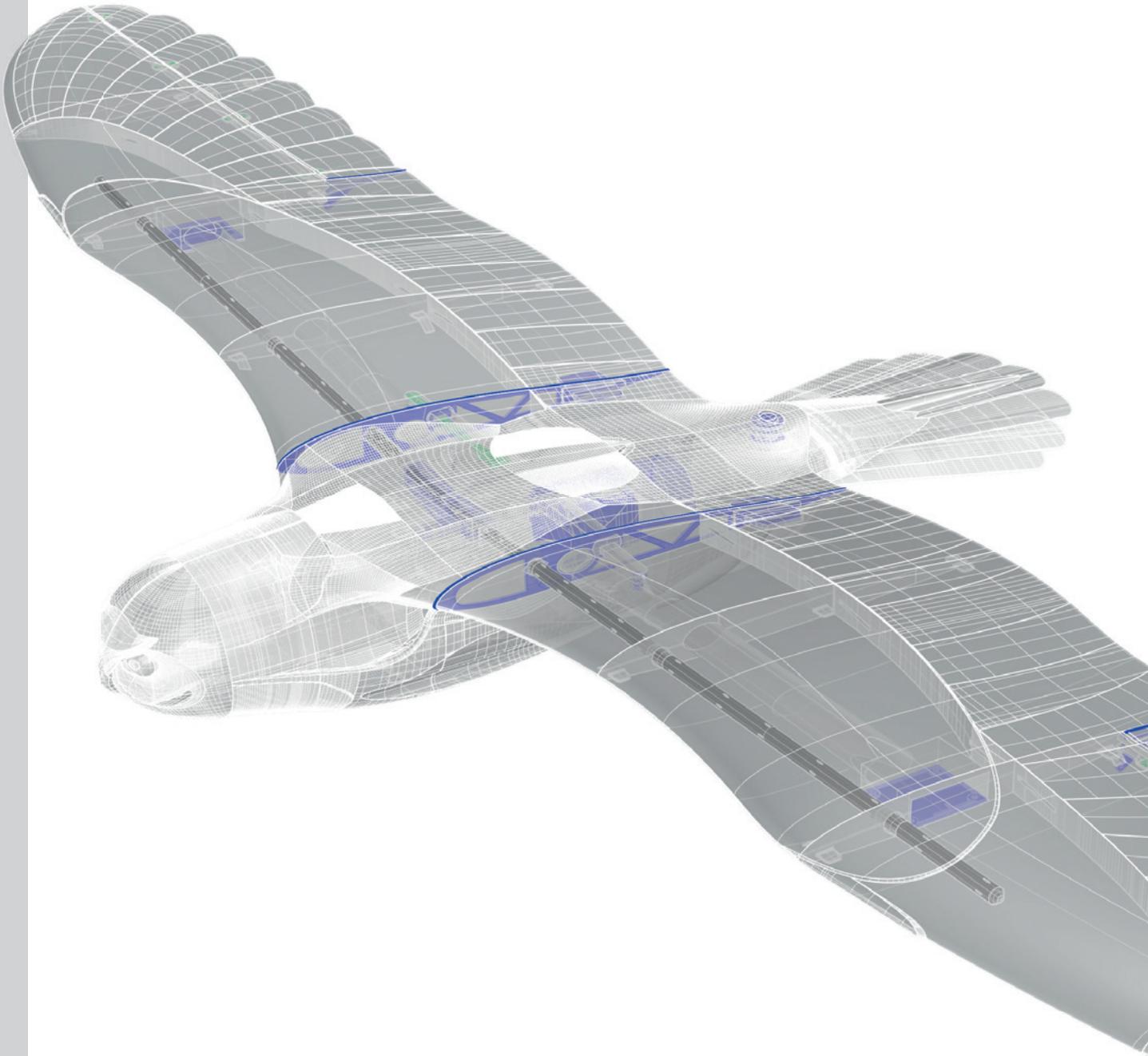# PLANE PRINT

PLANE PRINT Snowy EDF version
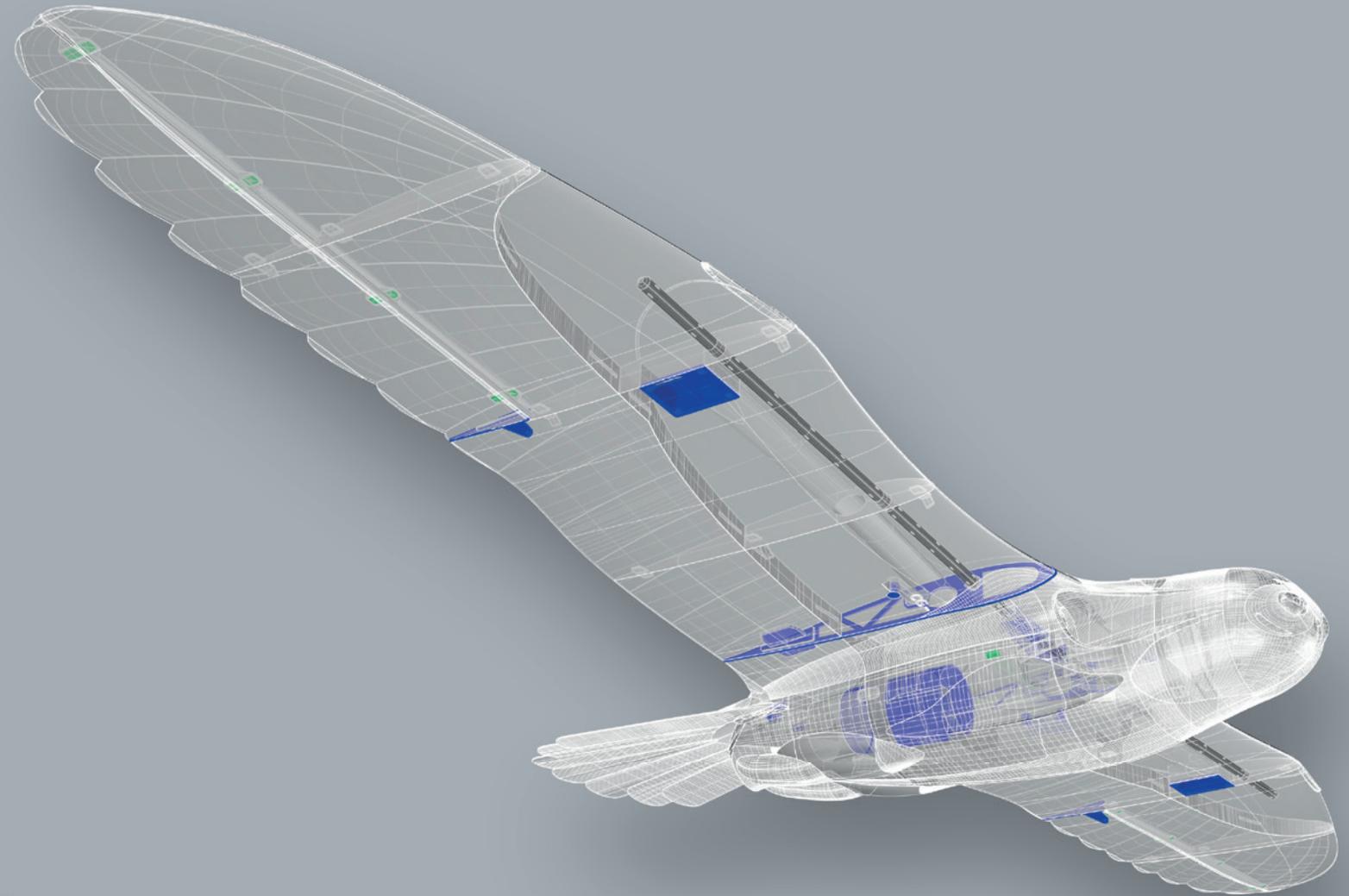
NOTE: Slicing **only** works with CURA!

You can find the STL data at **www.planeprint.com**

PLANE PRINT Snowy

EDF version

LW-PLA   PLA   TPU

Required accessoires – basic equipment

- **LW-PLA (cannot be replaced by PLA!)**, ~800 grams
- **PLA** oder bether **Tough PLA**, ~80 grams
- **TPU A95**, ~20 grams

- some tapping screws Ø2 mm
- Metal screw 3*20mm, 1 piece
- CA super glue (liquid and liquid medium)
- CA activator
- Carbon tube Ø8*500mm, 2 pieces
- Steel wire Ø1mm or Ø1.5mm, about 500 mm
- Rod connection, 3 pieces
- Servo extension cable 350mm, 2 pieces (or a soldered servo cable extension)
- Self-adhesive Velcro tape
- Foil **0,5mm/0.020inches** Din A4 (PVC, PET-G, Polycarbonate or Lexan), 1 piece

(simply search for: M2 flat head tapping screw assortment)

Tools

Cutter knife, small Philips screwdriver, Sandpaper, Metal saw, Needle nose pliers

RC Components

ENGINE   **4S EDF 50 MM** – (We use the FMS), but it also works well with 3S.

**BEC-CONTROLLER**   suitable for your EDF

RECEIVER   4 Channel

BATTERY   4S LiPo-Akku, 2300 - 2500 mAh
(ideal weight 250g – A lighter battery does not make sense, because otherwise you need lead)

SERVOS WINGS   **2 pieces** like **Corona 929MG, 939MG, Hitec HS-5070MH** or equivalent

SERVO RUDDER   **1 piece** like **Corona 929MG, 939MG** or equivalent
The servo should definitely have metal gear!

Maximum dimensions::

max. 35 mm

max. 30 mm   max. 14 mm
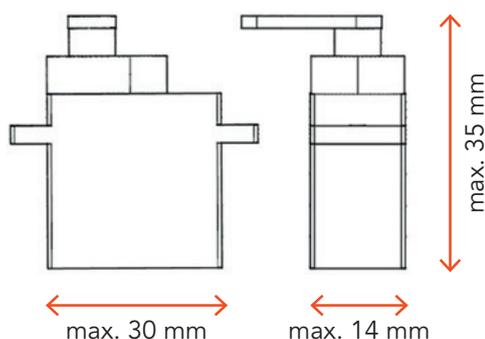
Printing the parts – Printing profiles

This manual is constantly being improved and supplemented, we recommend downloading the **latest version** from our website **before building.**

For slicing all Planeprint models, these profiles have to be created in Cura:

PROFILE P1_fullbody
PROFILE P2_hollowbody
PROFILE P3_surface
PROFILE P4_flex
PROFILE P5_gyroid

You can find the description at www.planeprint.com/print

Important for the 1-wall-print (P3, P5)!

In order to print airfoils of the lowest possible weight with high stability, it is necessary to print with only one wall line (Nozzle 0.4 mm). Decisive here is the adhesion between the layers! To achieve this, you must print at a much higher temperature than normal. As a **guideline**, 230° C is a good starting point. The parts-cooling fan should be set to 0% or a maximum of 20%. Since not every printer works the same, it may be necessary to make small adjustments to these settings.

For the new PROFILE P5_gyroid it is essential to use **Cura Version 5 or later**, It will work with older versions, but the weight of the parts will be higher and the printing time longer.

PROFILE P5_gyroid

It is **essential for the necessary stability** of the **LW parts printed with PROFILE_5 are as stable as possible**. Please use a test part to check the strength by fracture tests. It must not break along the layer lines under any circumstances! Also note that the printing temperature for LW-PLA is as low as possible to obtain a wall thickness of 0.4 to 0.6 mm at a flow of 65%.
At too high temperatures, LW-PLA becomes brittle and breaks more easily.

The development of a complex, airworthy RC flight model to express on any standard 3D printer is a very complex and extensive process. Therefore, we appeal to your fairness not to forward the STL data you have acquired to third parties.

Thank you for your understanding and have fun with your PLANEPRINT MODEL!

PROFILE P1_FULLBODY PLA or Tough PLA

The following parts must be sliced with the PROFILE P1_FULLBODY.
Please note the additional settings for the individual parts!

Carbon tool 8mm_p1.stl

MATERIAL   PLA, Weight: ~ 6 g

ADDITIONAL SETTINGS

None required

EDF-Tube FMS50_p1_so.stl

MATERIAL   PLA, Weight: ~ 9 g

ADDITIONAL SETTINGS
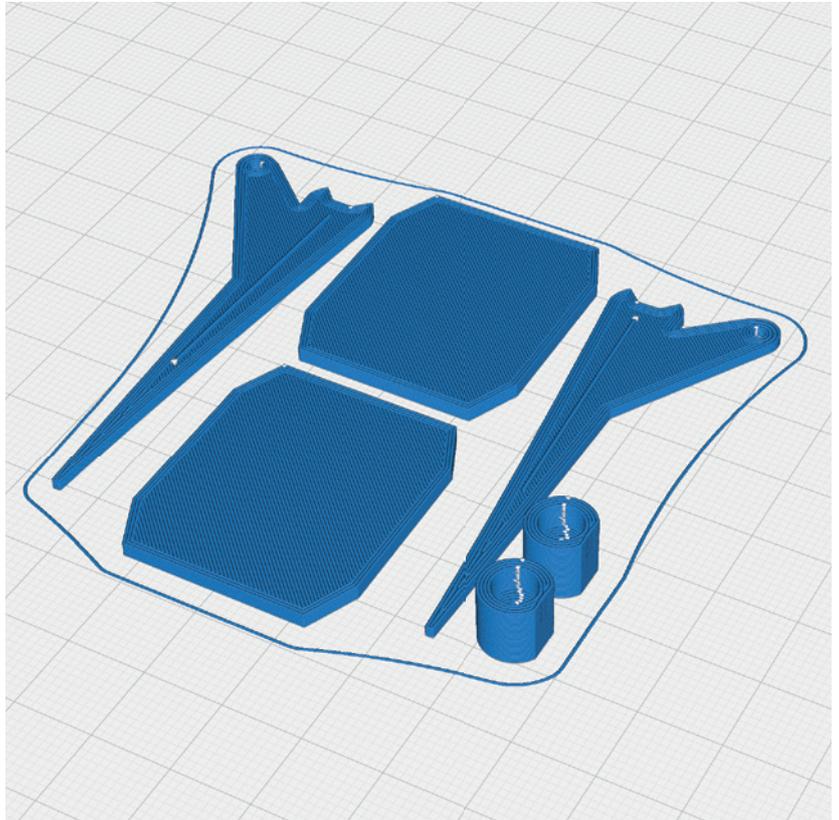
None required

PROFILE P1_FULLBODY PLA or Tough PLA

The following parts must be sliced with the PROFILE P1_FULLBODY.
Please note the additional settings for the individual parts!

Parts 1_p1_so.stl

MATERIAL   PLA, Weight: ~ 8 g
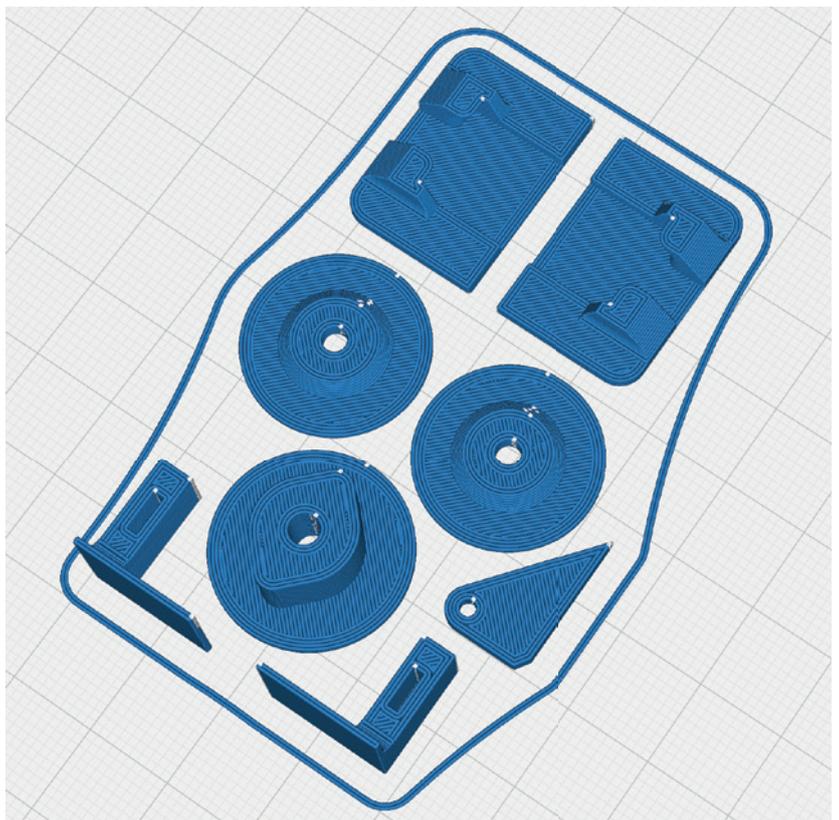
ADDITIONAL SETTINGS

None required

Parts 2_p1_so.stl

MATERIAL   PLA, Weight: ~ 6 g

ADDITIONAL SETTINGS
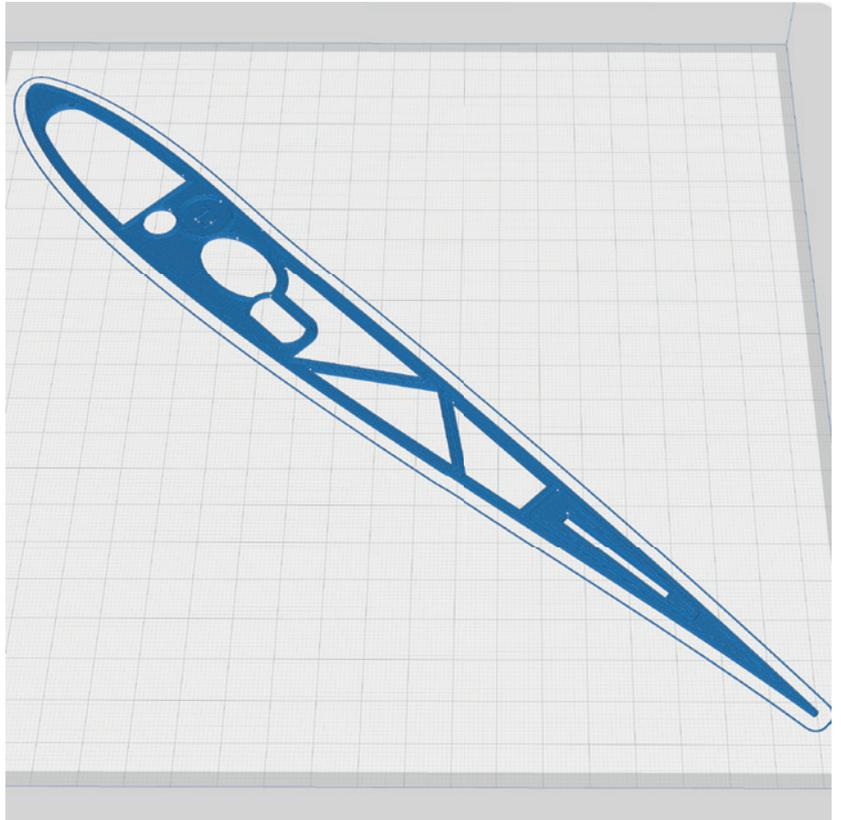
None required

PROFILE P1_FULLBODY PLA or Tough PLA

The following parts must be sliced with the PROFILE P1_FULLBODY.
Please note the additional settings for the individual parts!

Protector FL_p1_so.stl
Protector FR_p1_so.stl
Protector WL_p1_so.stl
Protector WL_p1_so.stl

MATERIAL   PLA, Weight: ~ 4 g
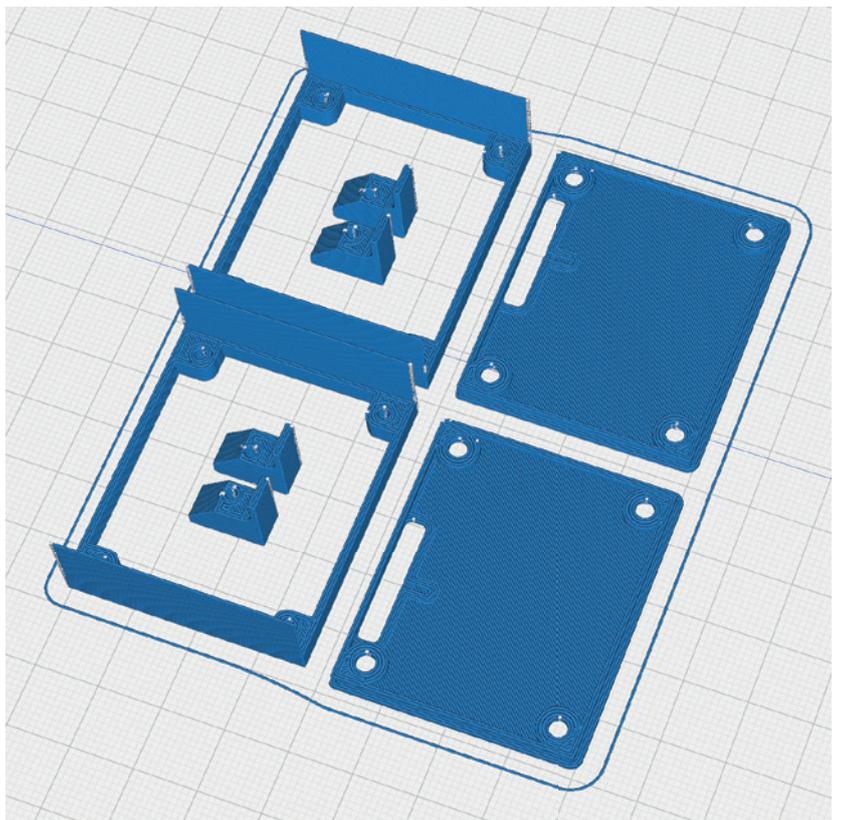
ADDITIONAL SETTINGS

None required

Servocovers_p1_so.stl

MATERIAL   PLA, Weight: ~ 11 g

ADDITIONAL SETTINGS

None required

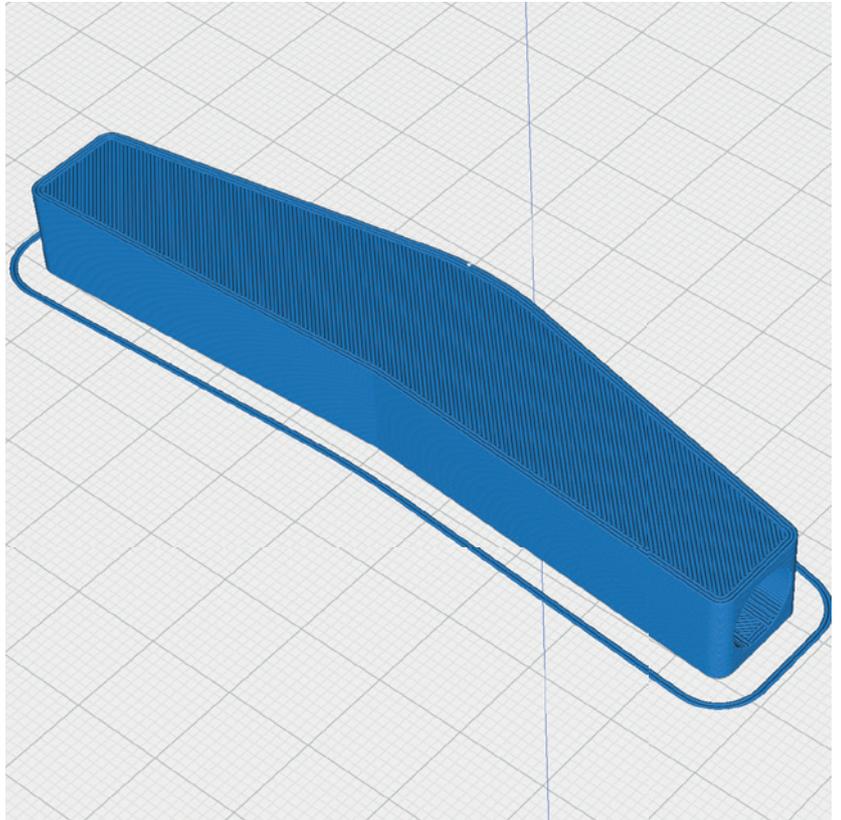# PROFILE P2_HOLLOWBODY PLA or Tough PLA

The following parts must be sliced with the PROFILE P2_HOLLOWBODY.
Please note the additional settings for the individual parts!

Center Part_p2_so.stl

MATERIAL   PLA, Weight: ~ 7 g
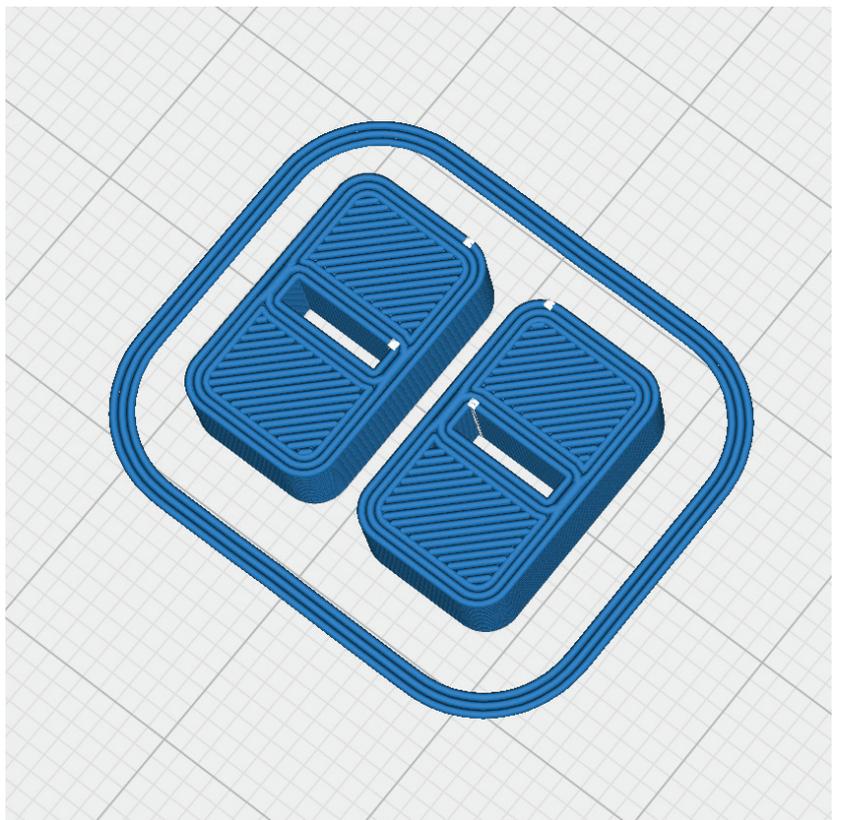
ADDITIONAL SETTINGS

None required

EDF Bracket FMS50_p2_so.stl

MATERIAL   PLA, Weight: ~ 1 g

ADDITIONAL SETTINGS

None required
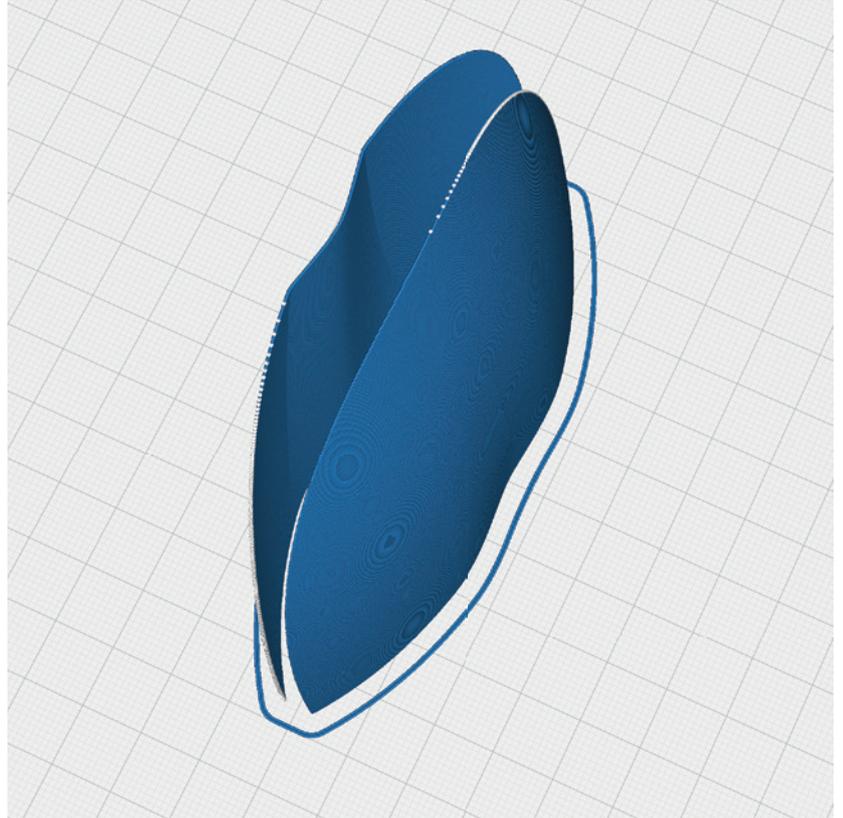
PROFILE P3_SURFACE PLA or Tough PLA

The following parts must be sliced with the PROFILE P3_SURFACE.
Please note the additional settings for the individual parts!

Breastplate_p3_so.stl

MATERIAL   PLA, Weight: ~ 7 g

ADDITIONAL SETTINGS

None required

PROFILE P4_FLEX TPU A95
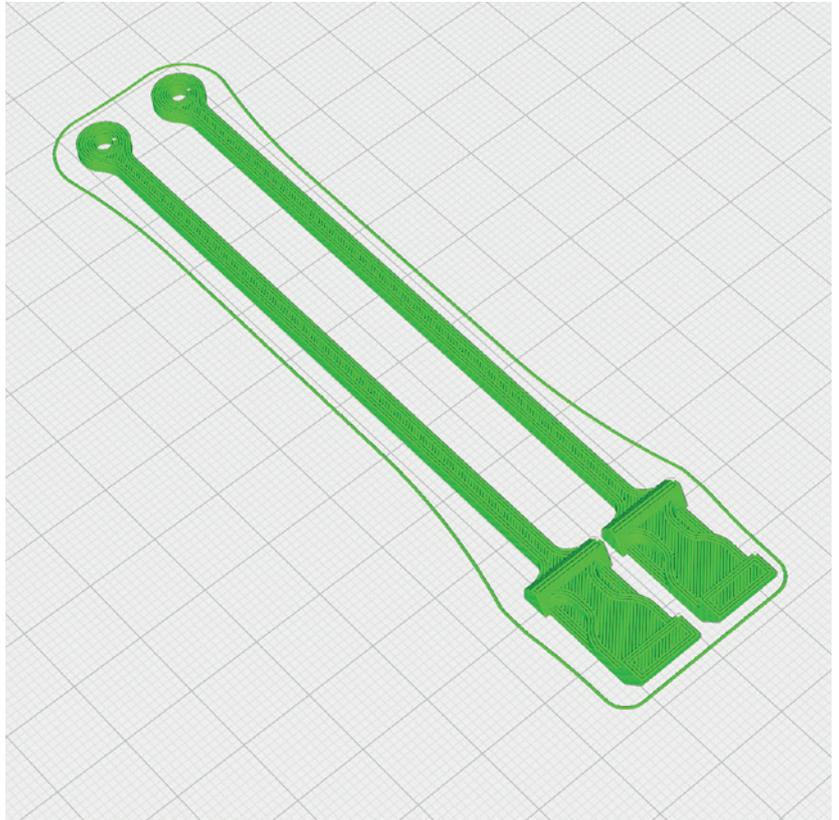
The following parts must be sliced with the PROFILE P4_FLEX.
Please note the additional settings for the individual parts!

Tension belt TPUA95_p4_J.stl
Tension belt VarioShore_p4_J.stl

MATERIAL   TPU ~ A95, Weight: ~ 2 g

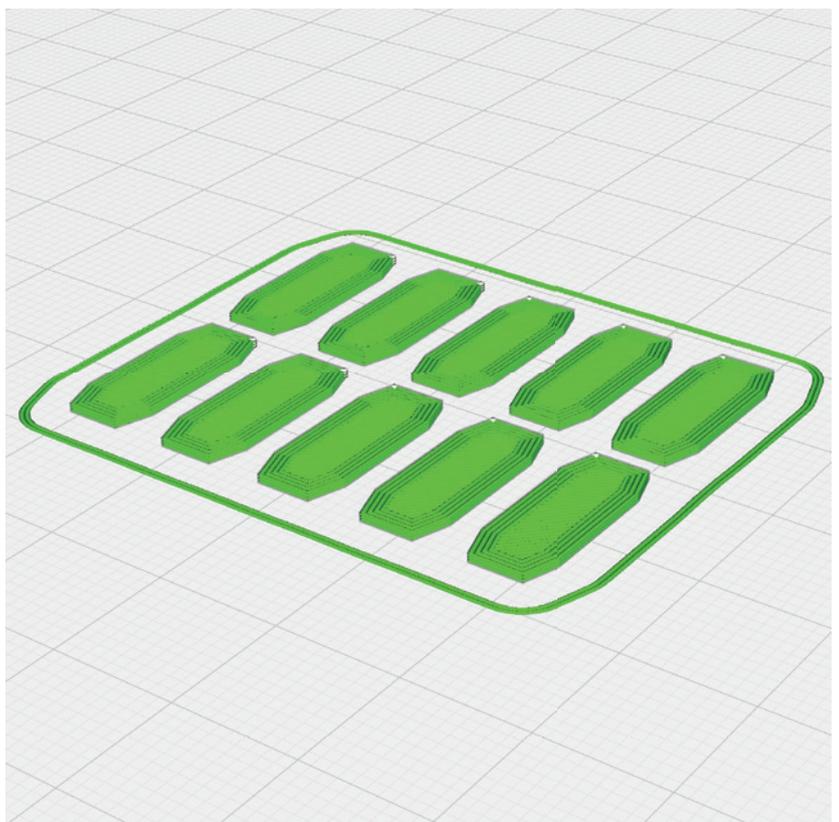**ADDITIONAL SETTINGS**

• Infill Density 100 %

Hinges_p4_so.stl

MATERIAL   TPU A95, Weight: ~ 1 g

ADDITIONAL SETTINGS

• Infill Density 100 %

PROFILE P5_GYROID Light-Weight LW-PLA!

The following parts must be sliced with the PROFILE P5_GYROID. **Please note the additional settings for the individual parts!** It is essential to print these parts with LW-PLA!

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment!
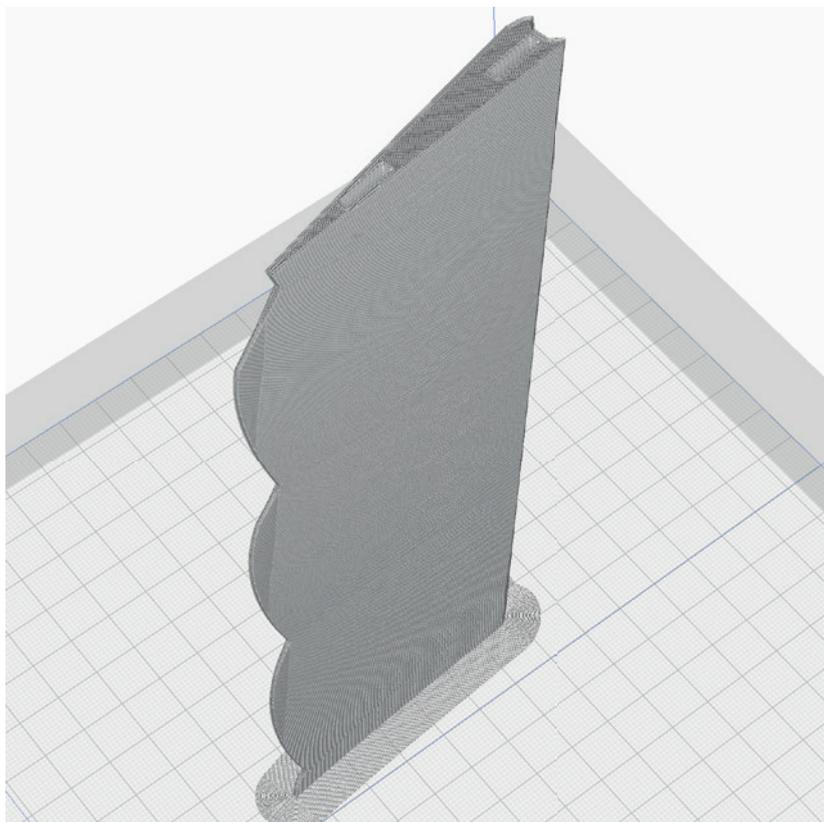
Aileron 1 left_p5_so.stl and Aileron 1 right_p5_so.stl

MATERIAL   **LW-PLA**, ~ 15 g*
*Weighed (approximate guideline)

ADDITIONAL SETTINGS

• set Brim

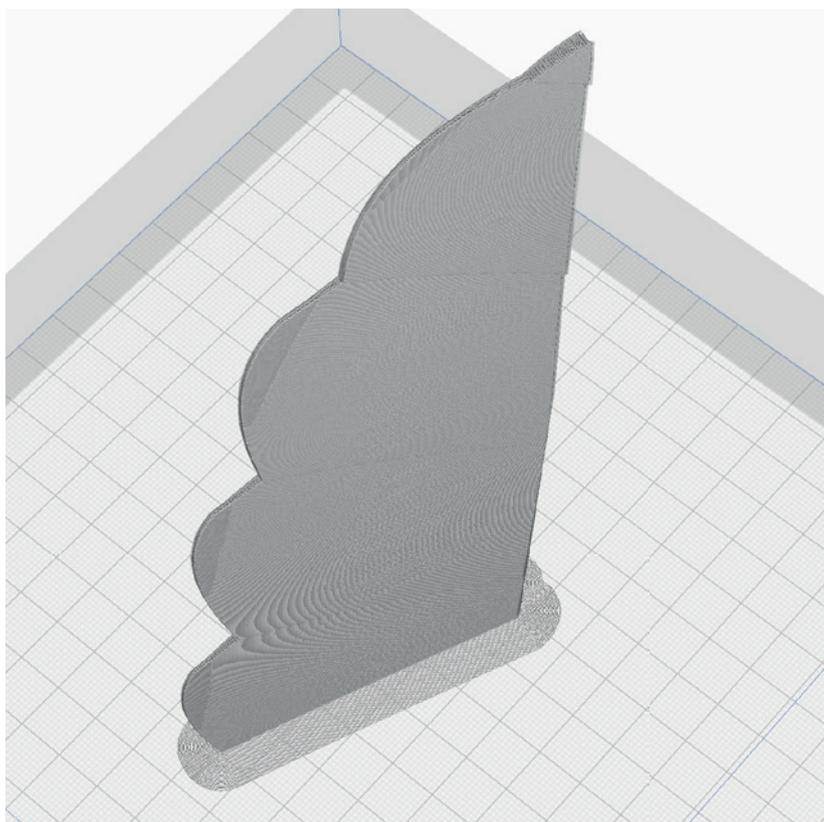
Aileron 2 left_p5_so.stl and Aileron 2 right_p5_so.stl

MATERIAL   **LW-PLA**, ~ 12 g*
*Weighed (approximate guideline)

ADDITIONAL SETTINGS

• set Brim

PROFILE P5_GYROID Light-Weight LW-PLA!

The following parts must be sliced with the PROFILE P5_GYROID. **Please note the additional settings for the individual parts!** It is essential to print these parts with LW-PLA!

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment!
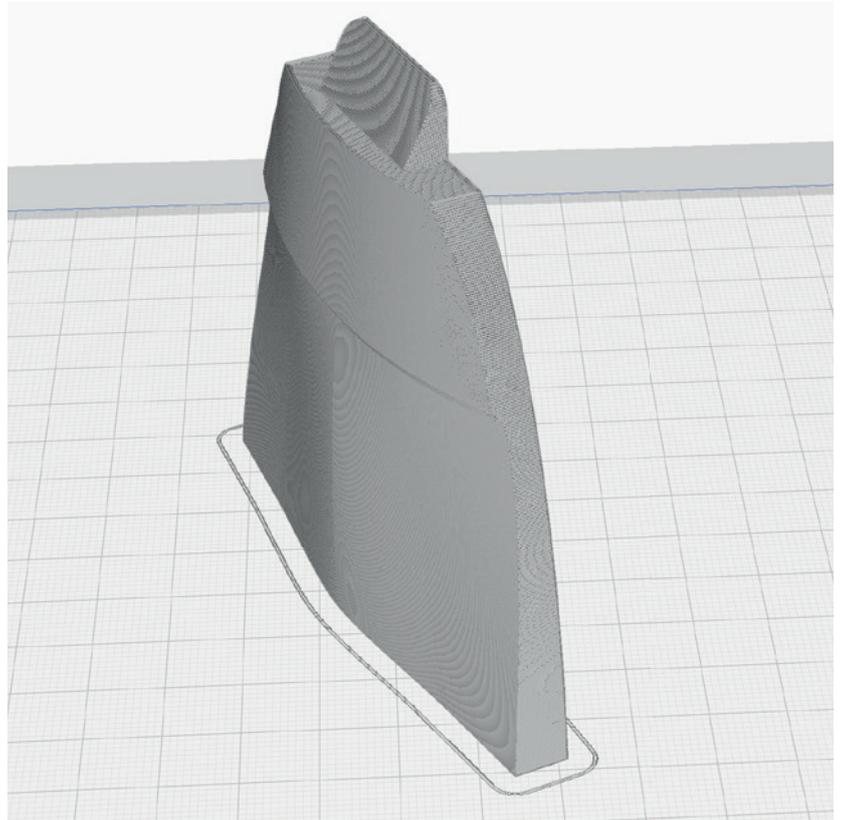
Canopy 1_p5_so.stl

MATERIAL   LW-PLA, ~ 8 g*

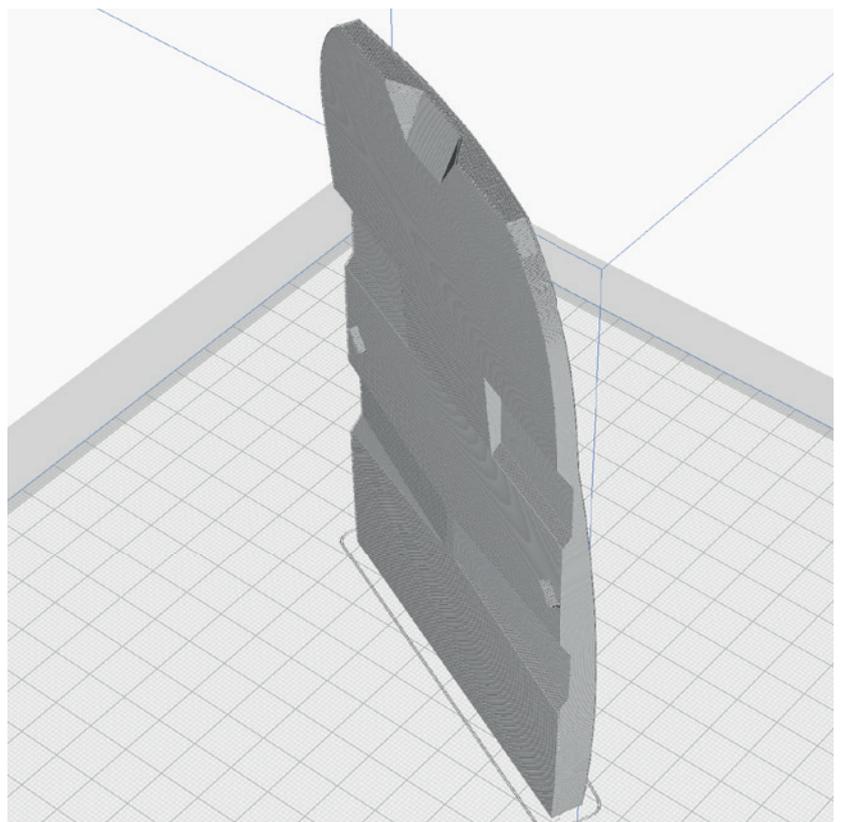*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

Canopy 2_p5_so.stl

MATERIAL   LW-PLA, ~ 16 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

PROFILE P5_GYROID Light-Weight LW-PLA!

The following parts must be sliced with the PROFILE P5_GYROID. **Please note the additional settings for the individual parts! It is essential to print these parts with LW-PLA!**

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment!

Fuselage 1_p5_so.stl

MATERIAL   LW-PLA, ~ 48 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

Fuselage 2 left_p5_so.stl and Fuselage 2 right_p5_so.stl

MATERIAL   LW-PLA, ~ 45 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

PROFILE P5_GYROID Light-Weight LW-PLA!

The following parts must be sliced with the PROFILE P5_GYROID. **Please note the additional settings for the individual parts!** It is essential to print these parts with LW-PLA!

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment!
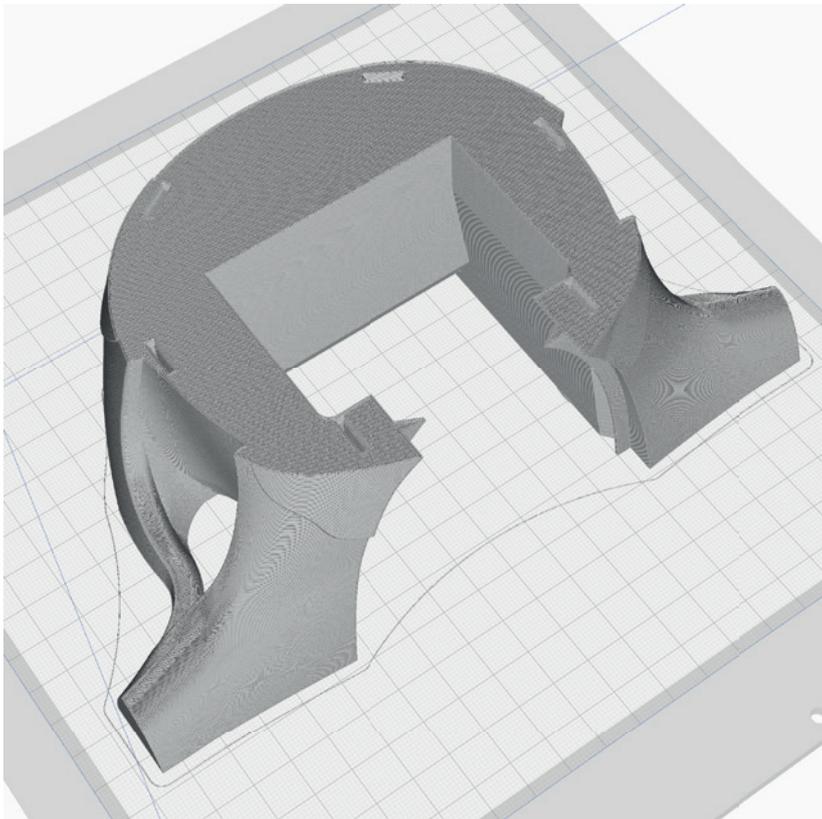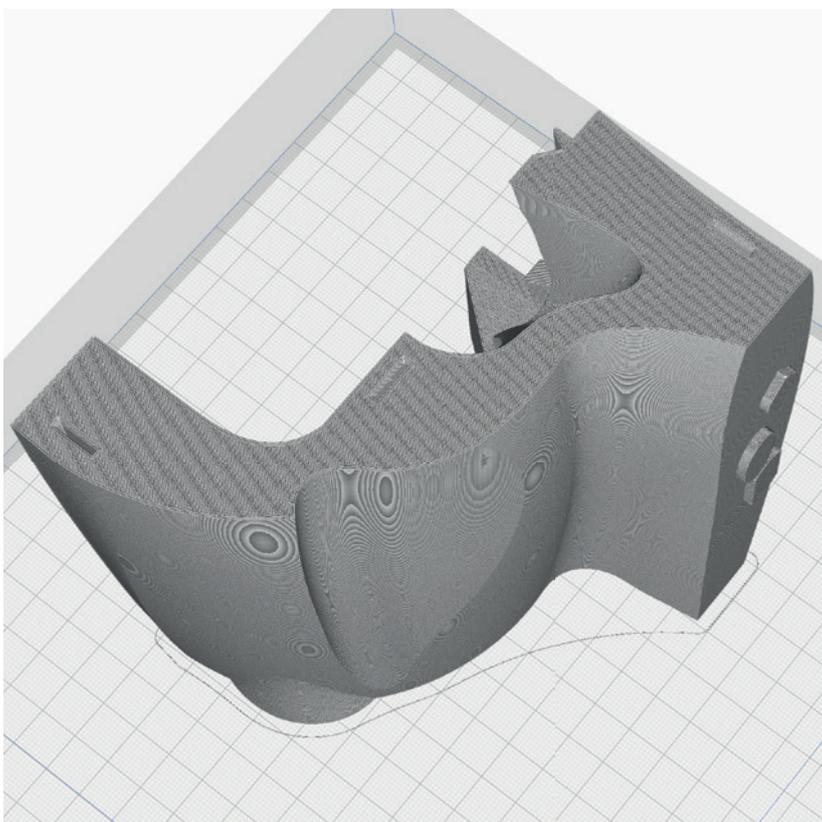
Fuselage 3A_p5_so.stl

MATERIAL   LW-PLA, ~ 50 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

Fuselage 3B_p5_so.stl

MATERIAL   LW-PLA, ~ 18 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

PROFILE P5_GYROID Light-Weight LW-PLA!

The following parts must be sliced with the PROFILE P5_GYROID. **Please note the additional settings for the individual parts!** It is essential to print these parts with LW-PLA!

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment!
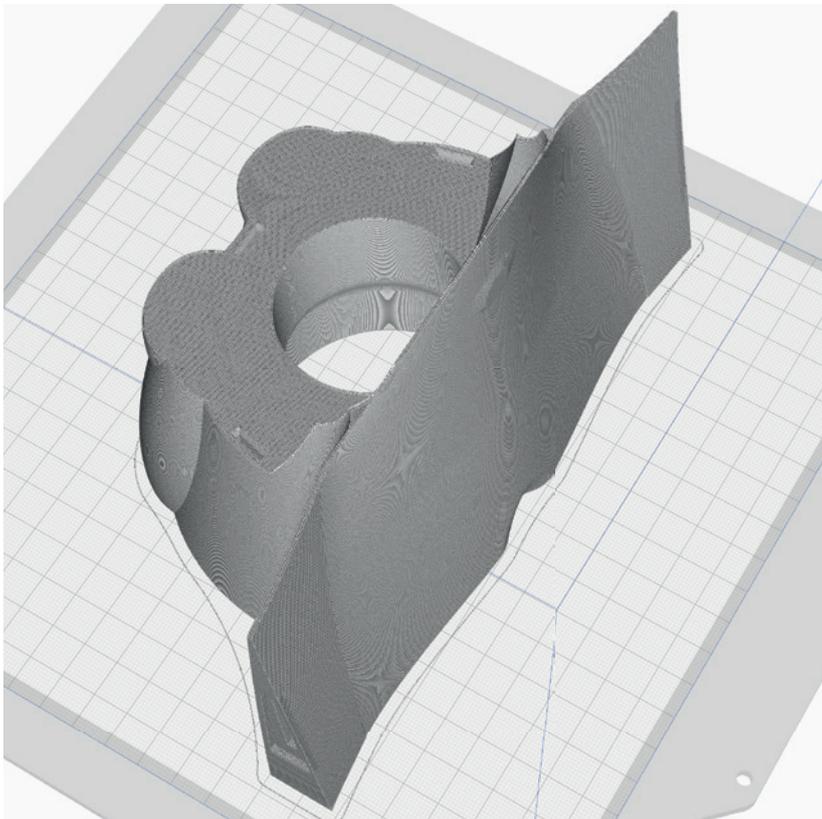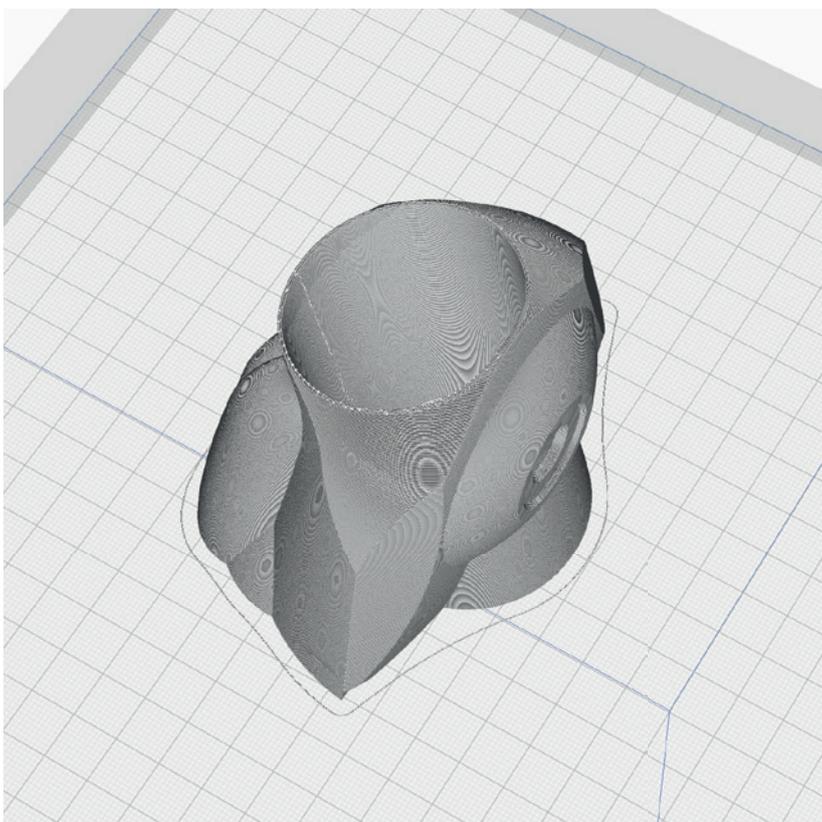
Head_p5_so.stl

MATERIAL **LW-PLA**, ~ 46 g*
*Weighed (approximate guideline)

ADDITIONAL SETTINGS

• Infill Density **10 %**

Tail 1_p5_so.stl

MATERIAL **LW-PLA**, ~ 8 g*
*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

PROFILE P5_GYROID Light-Weight LW-PLA!

The following parts must be sliced with the PROFILE P5_GYROID. **Please note the additional settings for the individual parts! It is essential to print these parts with LW-PLA!**

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment!
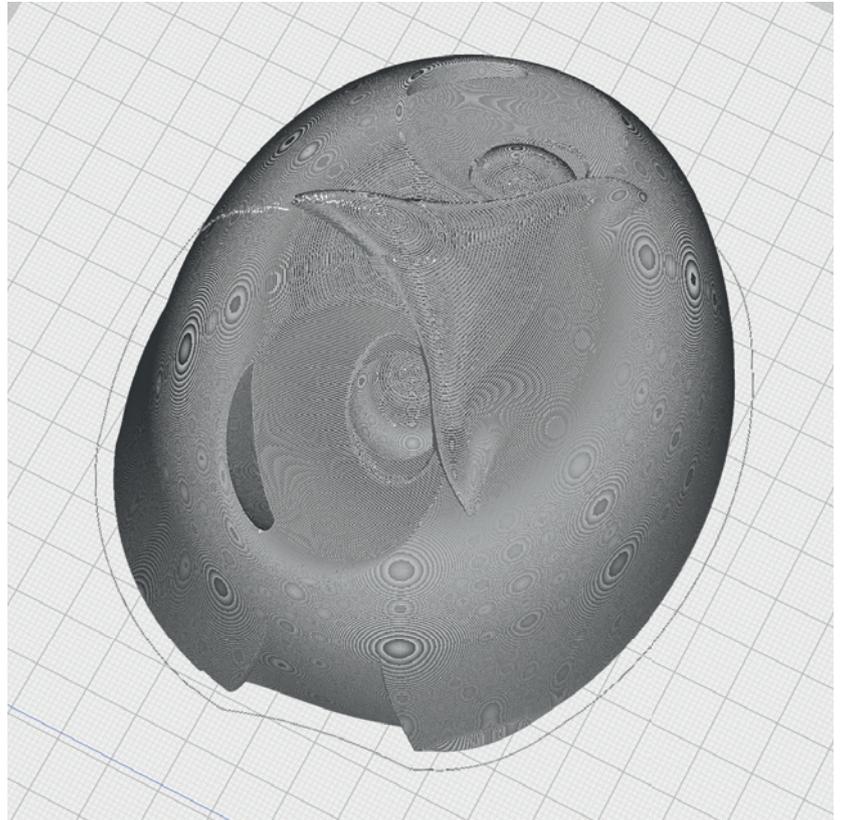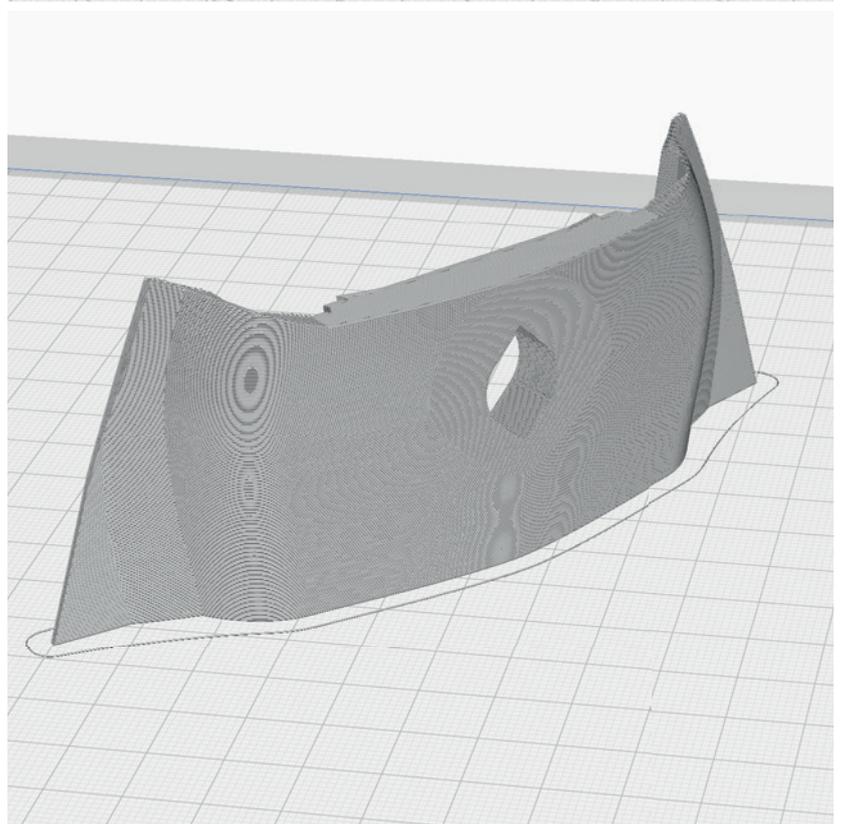
Tail 2_p5_so.stl

MATERIAL   LW-PLA, ~ 25 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

If you don't have a suitable transparent material for the rudder, you can print Tail 2 Rudder_p5_so.stl and replace it later with a new tail.

Wing 1 left_p5_so.stl and Wing 1 right_p5_so.stl

MATERIAL   LW-PLA, ~ 38 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

PROFILE P5_GYROID Light-Weight LW-PLA!

The following parts must be sliced with the PROFILE P5_GYROID. **Please note the additional settings for the individual parts!** It is essential to print these parts with LW-PLA!

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment!
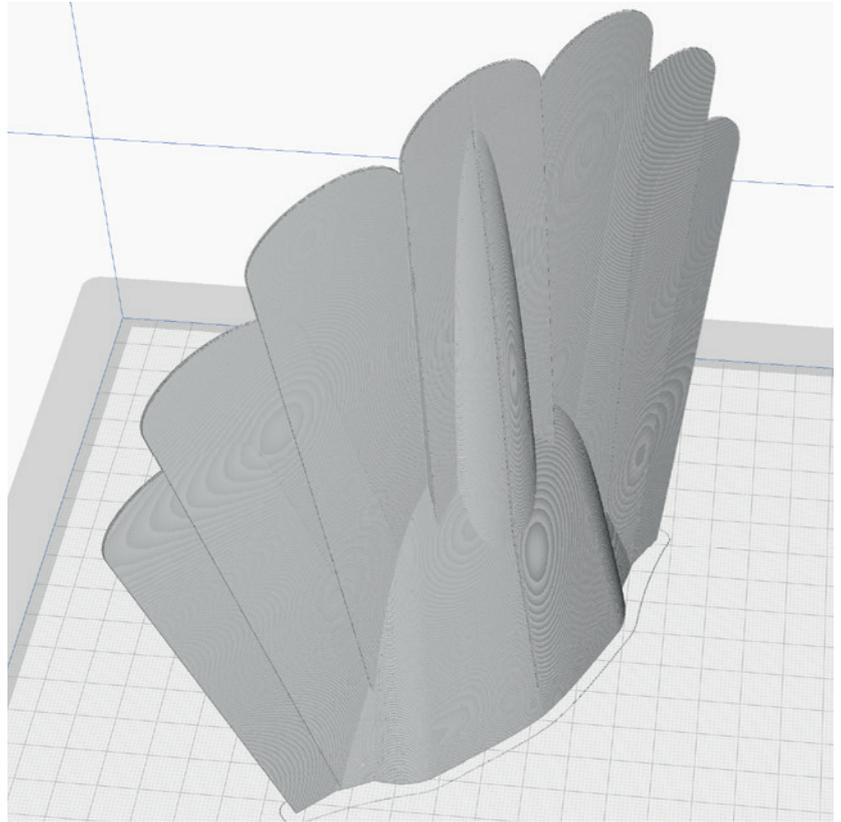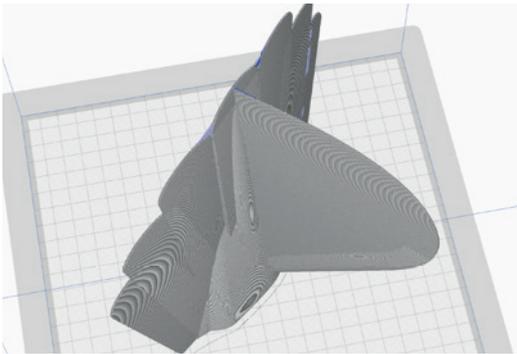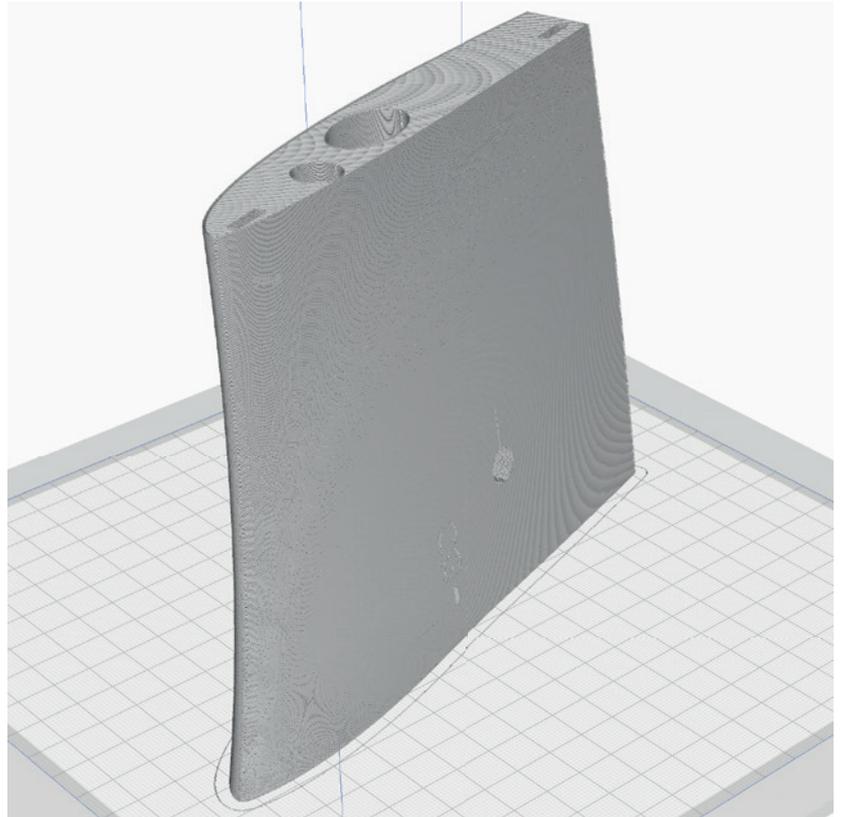
Wing 2 left_p5_so.stl and Wing 2 right_p5_so.stl

MATERIAL   **LW-PLA**, ~ 15 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

Wing 3 left_p5_so.stl and Wing 3 right_p5_so.stl

MATERIAL   **LW-PLA**, ~ 45 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

PROFILE P5_GYROID Light-Weight LW-PLA!

The following parts must be sliced with the PROFILE P5_GYROID. **Please note the additional settings for the individual parts!** It is essential to print these parts with LW-PLA!

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment!
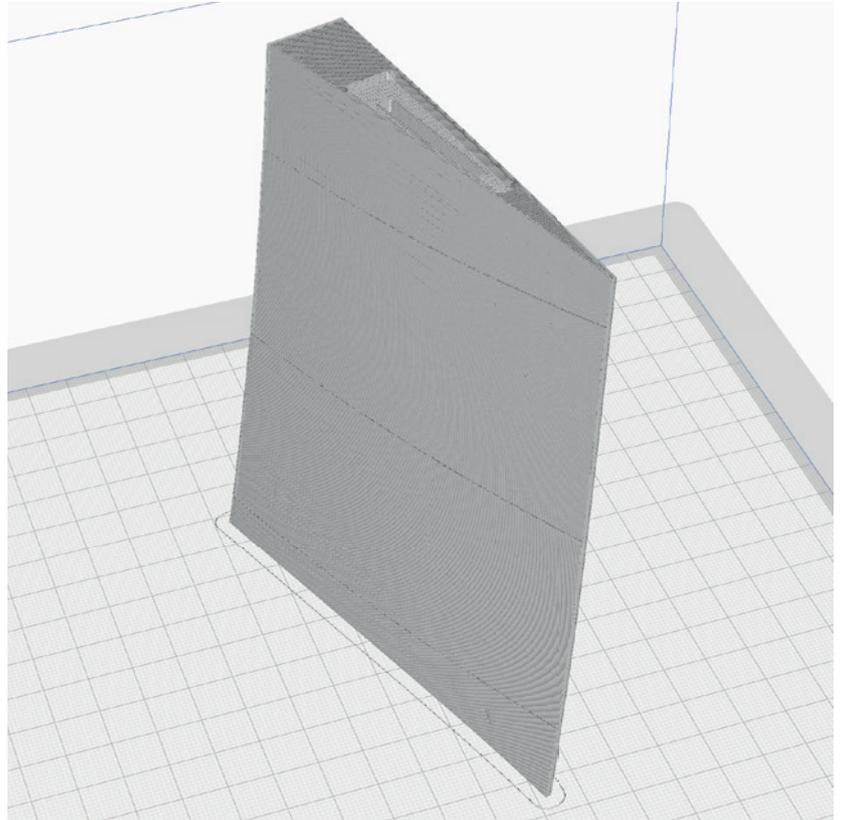
Wing 4 left_p5_so.stl and Wing 4 right_p5_so.stl

MATERIAL   LW-PLA, ~ 27 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

Wing 5 left_p5_so.stl and Wing 5 right_p5_so.stl

MATERIAL   LW-PLA, ~ 27 g*

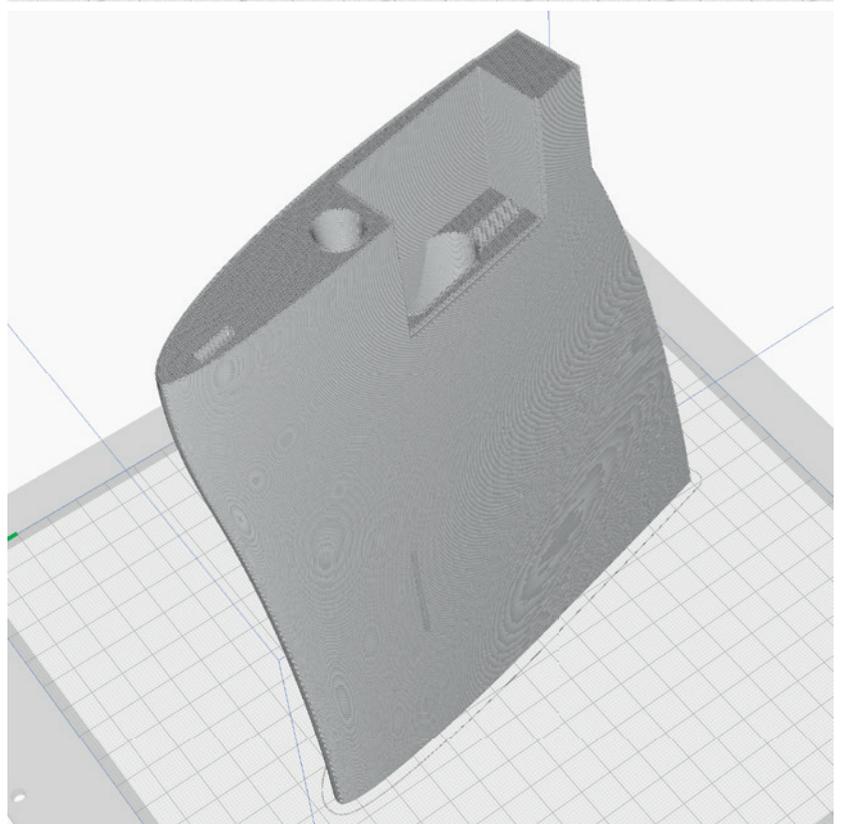*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

PROFILE P5_GYROID Light-Weight LW-PLA!

The following parts must be sliced with the PROFILE P5_GYROID. **Please note the additional settings for the individual parts!** It is essential to print these parts with LW-PLA!

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment!
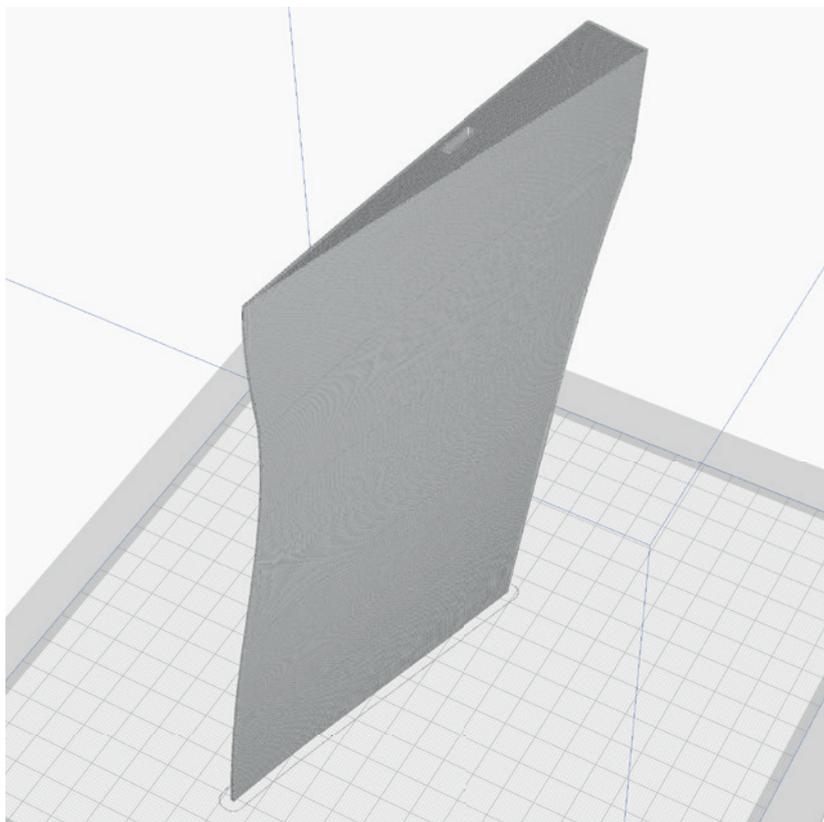
Wing 6 left_p5_so.stl and Wing 6 right_p5_so.stl

MATERIAL   **LW-PLA**, ~ 24 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

Wing 7 left_p5_so.stl and Wing 7 right_p5_so.stl

MATERIAL   **LW-PLA**, ~ 24 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required
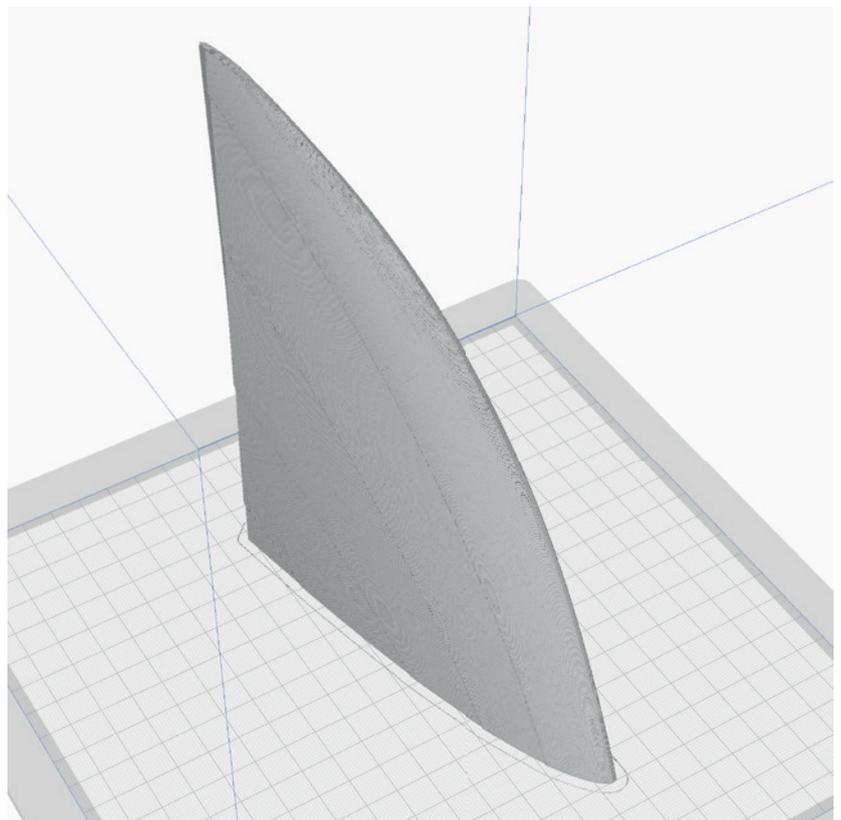
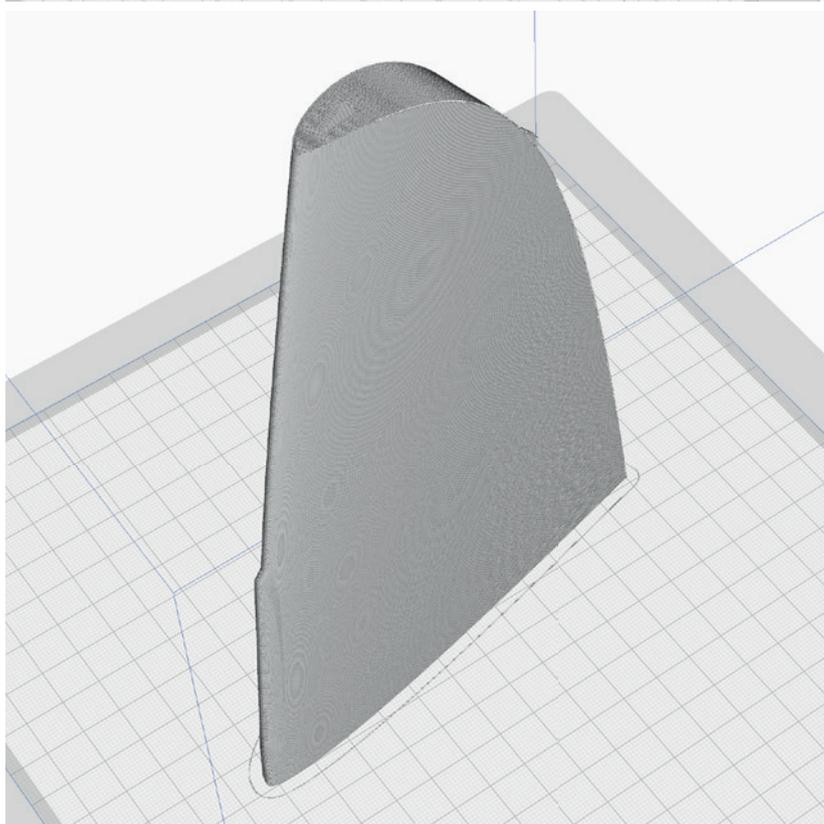# PROFILE P5_GYROID Light-Weight LW-PLA!

The following parts must be sliced with the PROFILE P5_GYROID. **Please note the additional settings for the individual parts!** It is essential to print these parts with LW-PLA!

Basic settings for LW-PLA: Please follow the instructions in our **WINGTEST AND CALIBRATION TOOL** on our website for correct adjustment!
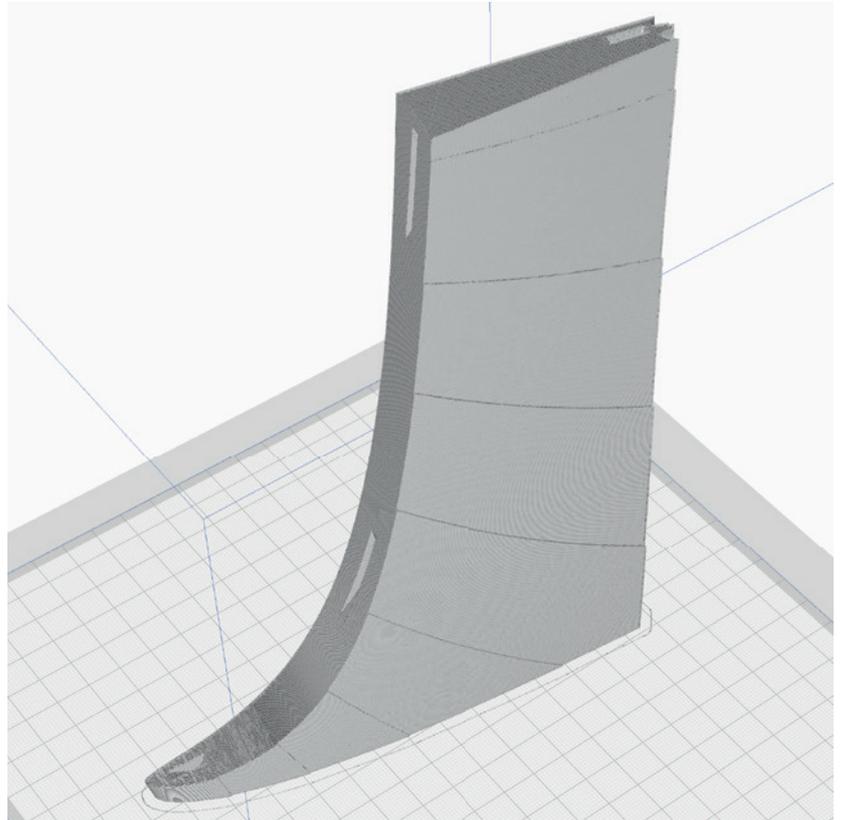
Interconnects_p5_so.stl

MATERIAL **LW-PLA**, ~ 3 g*

*Weighed (approximate guideline)

ADDITIONAL SETTINGS

None required

Basic Information:

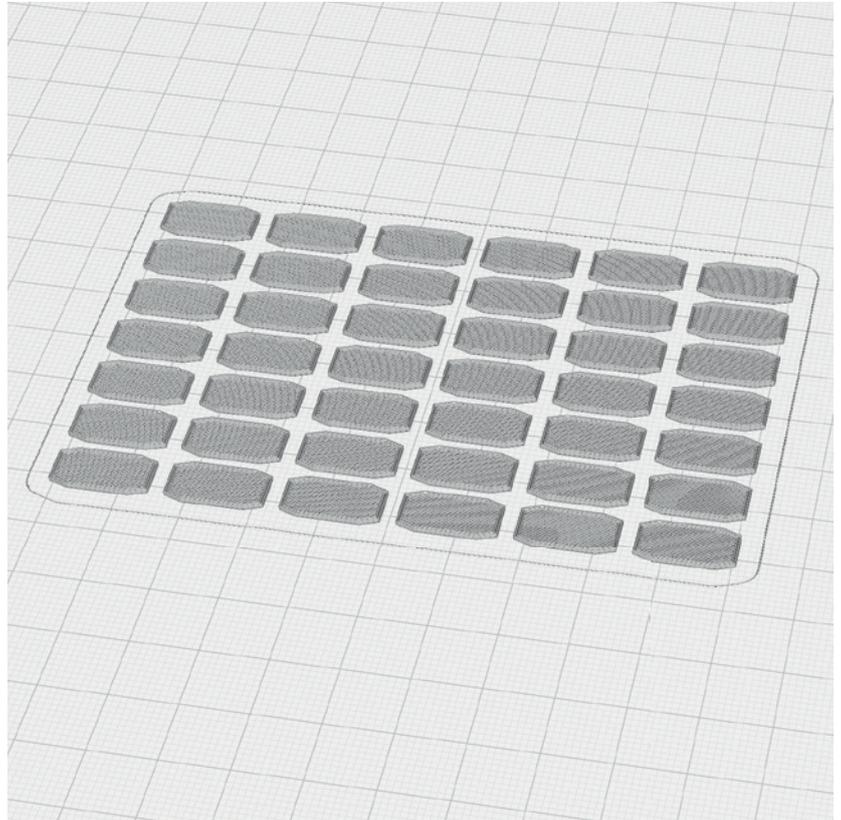## Gluing the parts printed with PROFILE P5

STEP 1   As a first step, it is important to **roughen and smooth the adhesive surfaces** with sandpaper.

STEP 2   Insert the **interconnects into the slots** provided on one side.

STEP 3   Apply **a lot of glue** to the side with the interconnects. It is important that there is glue everywhere, especially on the outside and inside of the wall surfaces, in order to achieve a perfect connection. The interconnects only serve to align the parts to each other. It is better **not** to apply glue here, otherwise it can happen that the glue suddenly hardens while the parts are being put together and stops the process.

Use medium viscosity CA glue, thinner glue would run down the parts too easily.

After assembly, **align the two parts exactly** and wipe off the excess CA glue from the surface with a cloth. Now spray with activator spray along the gluing surface and carefully press the parts together.

STEP 4   Clean the glued areas slightly with a **sharp-bladed** cutter.

Installing the hinges – rudder/elevator/ailerons/flaps
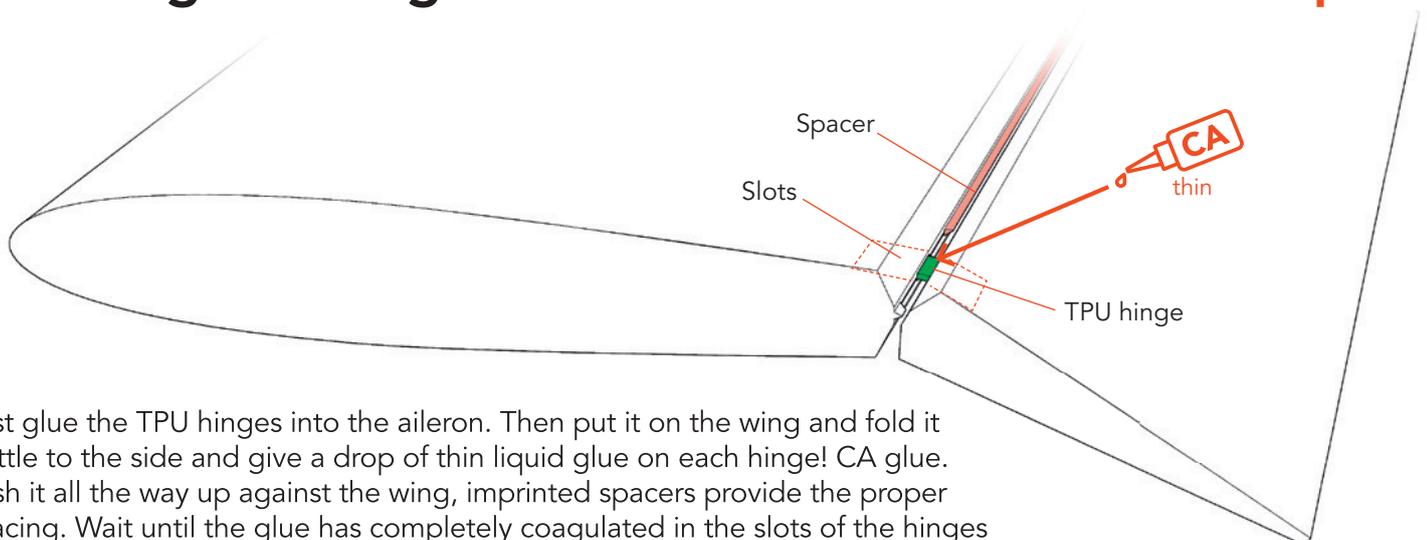
First glue the TPU hinges into the aileron. Then put it on the wing and fold it a little to the side and give a drop of thin liquid glue on each hinge! CA glue. Push it all the way up against the wing, imprinted spacers provide the proper spacing. Wait until the glue has completely coagulated in the slots of the hinges (by capillary action). Now spray some activator spray on each hinge to cure the CA glue. Repeat the process on the other side of the hinges. **Do not use too much glue and test if each hinge holds well.**

Wings assembly

CA
medium l.

Wing 1 left_p5_so.stl

CA

Wing 2 left_p5_so.stl

Wing 3 left_p5_so.stl

CA

Wing 4 left_p5_so.stl

Wing 5 left_p5_so.stl

CA

Wing 6 left_p5_so.stl

Parts 1_p1_so.stl

Aileron 1 left_p5_so.stl

CA

Interconnects_p1_so.stl

Aileron 2 left_p5_so.stl

CA

Interconnects_p1_so.stl

CA

Wing 7 left_p5_so.stl

CA
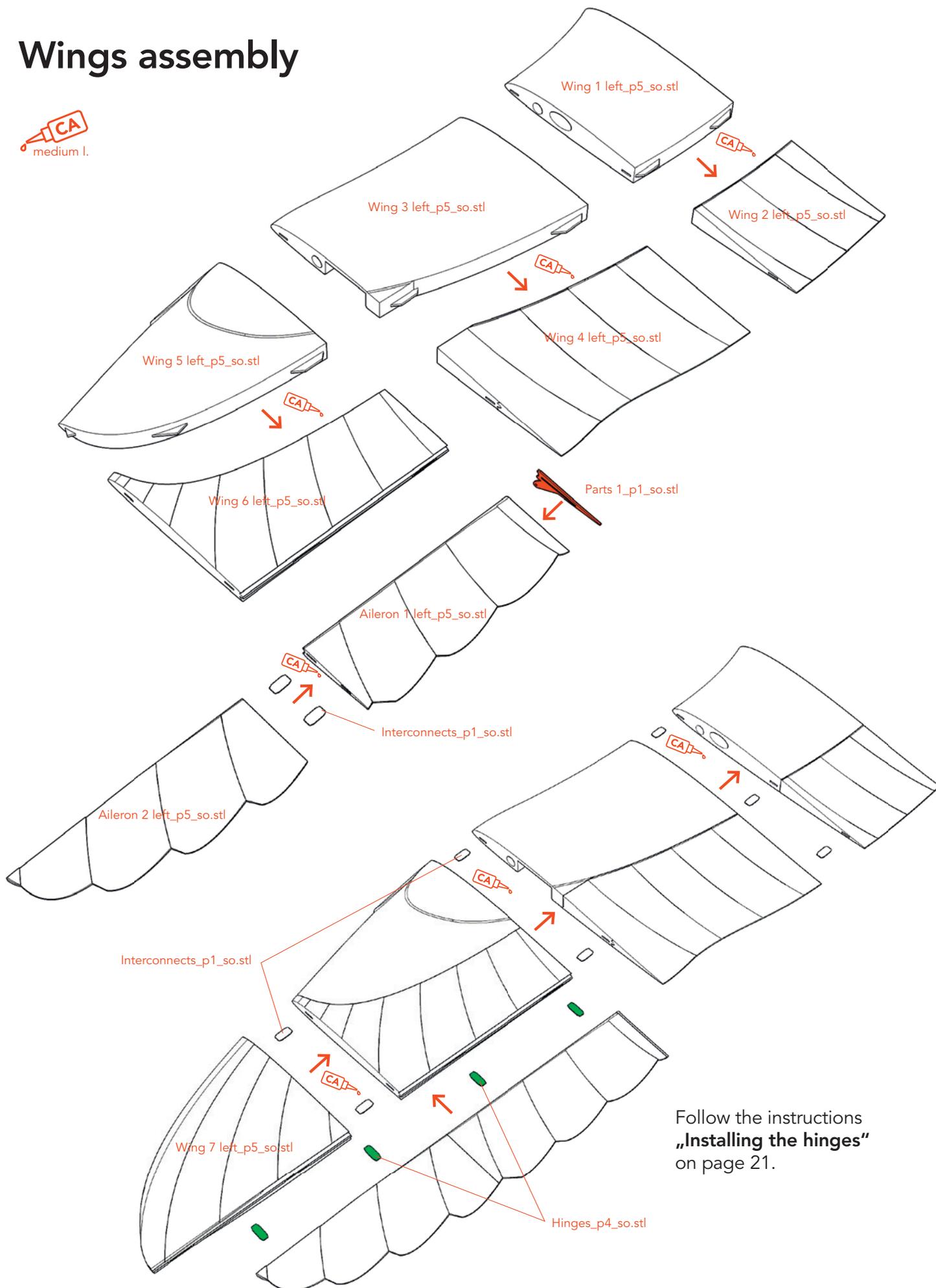
Follow the instructions **„Installing the hinges"** on page 21.

Hinges_p4_so.stl

Wings assembly

Servocovers_p1_so.stl

CA

Carbon tube Ø8*500mm
(Do not glue!)

CA

CA

Protector WL_p1_so.stl

CA

CA

Tension belt TPUA95_p4_so.stl

Bottom side
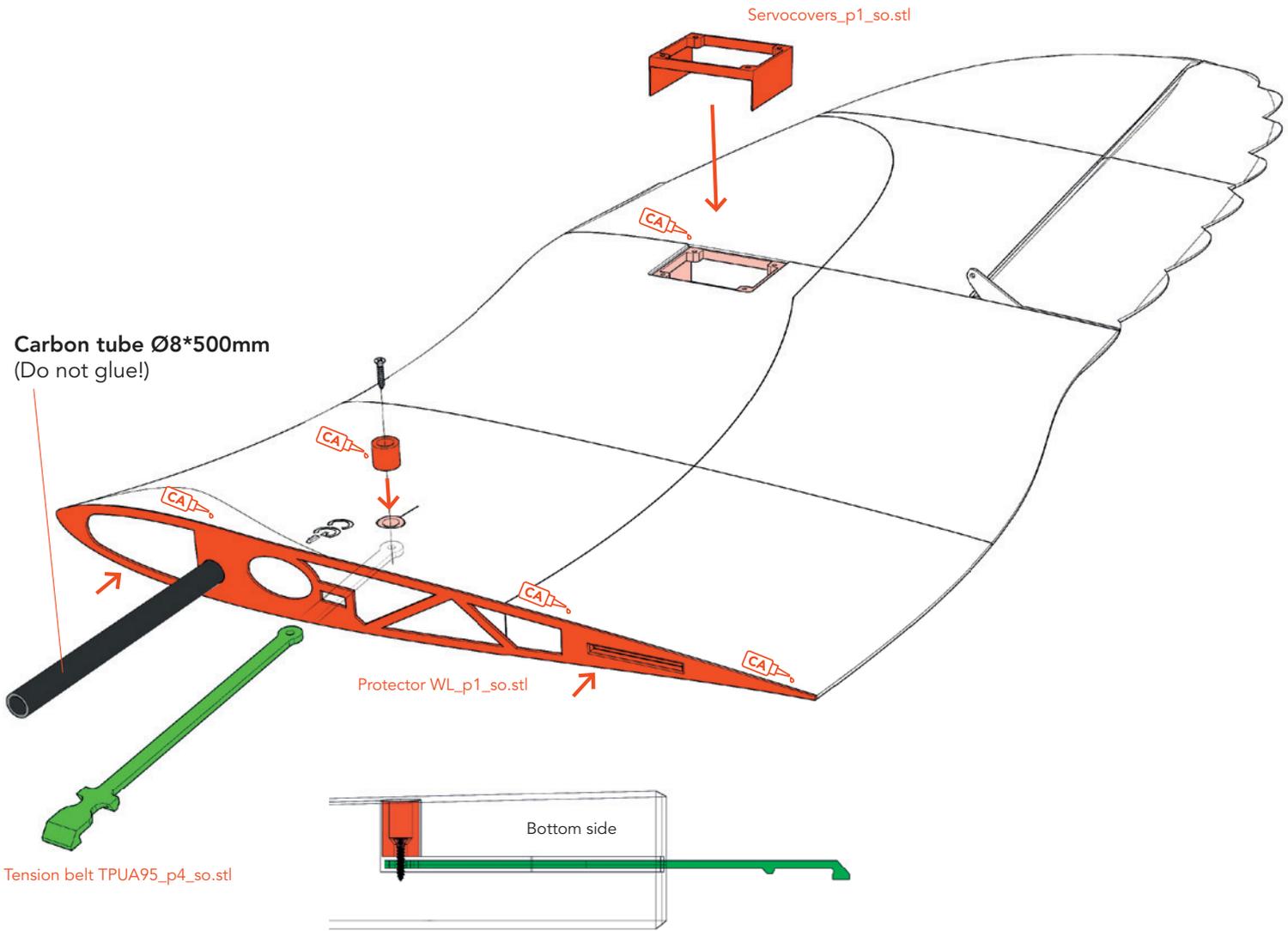
The sleeve for the tension belt must be aligned as shown here so that the belt can be secured with a screw.

NOTE

FL = Fuselage left
FR = Fuselage right
WL = Wing left
WR = Wing right

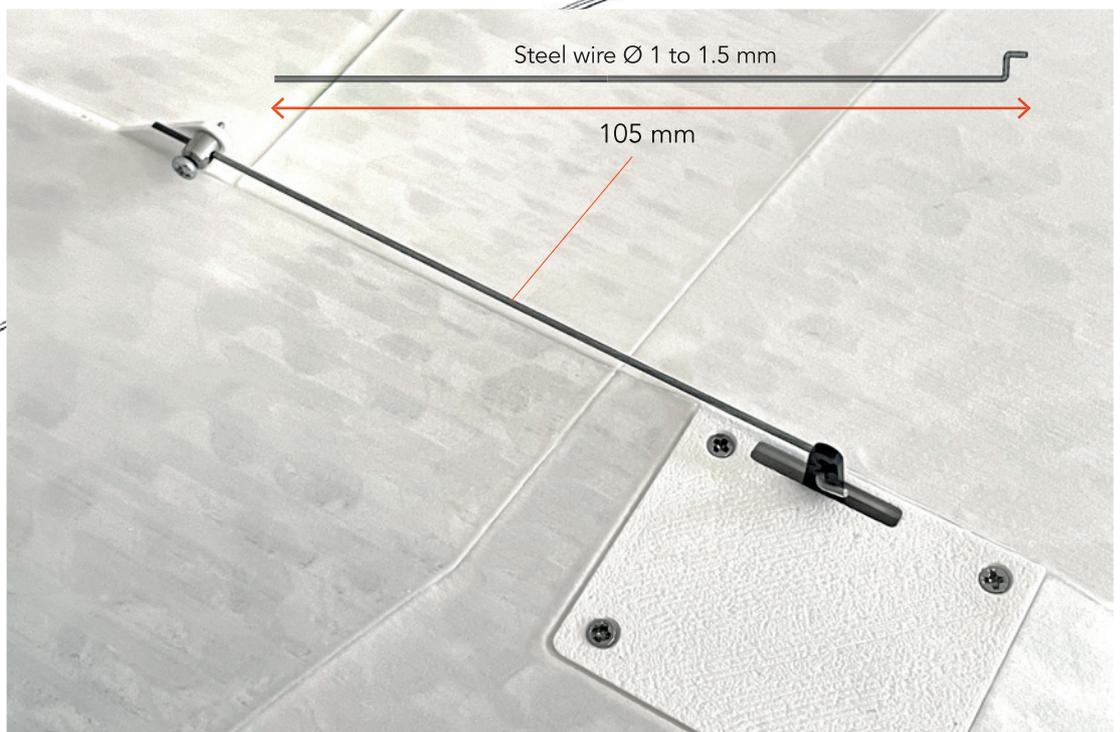**The inscription is the side of the adhesive surface!**
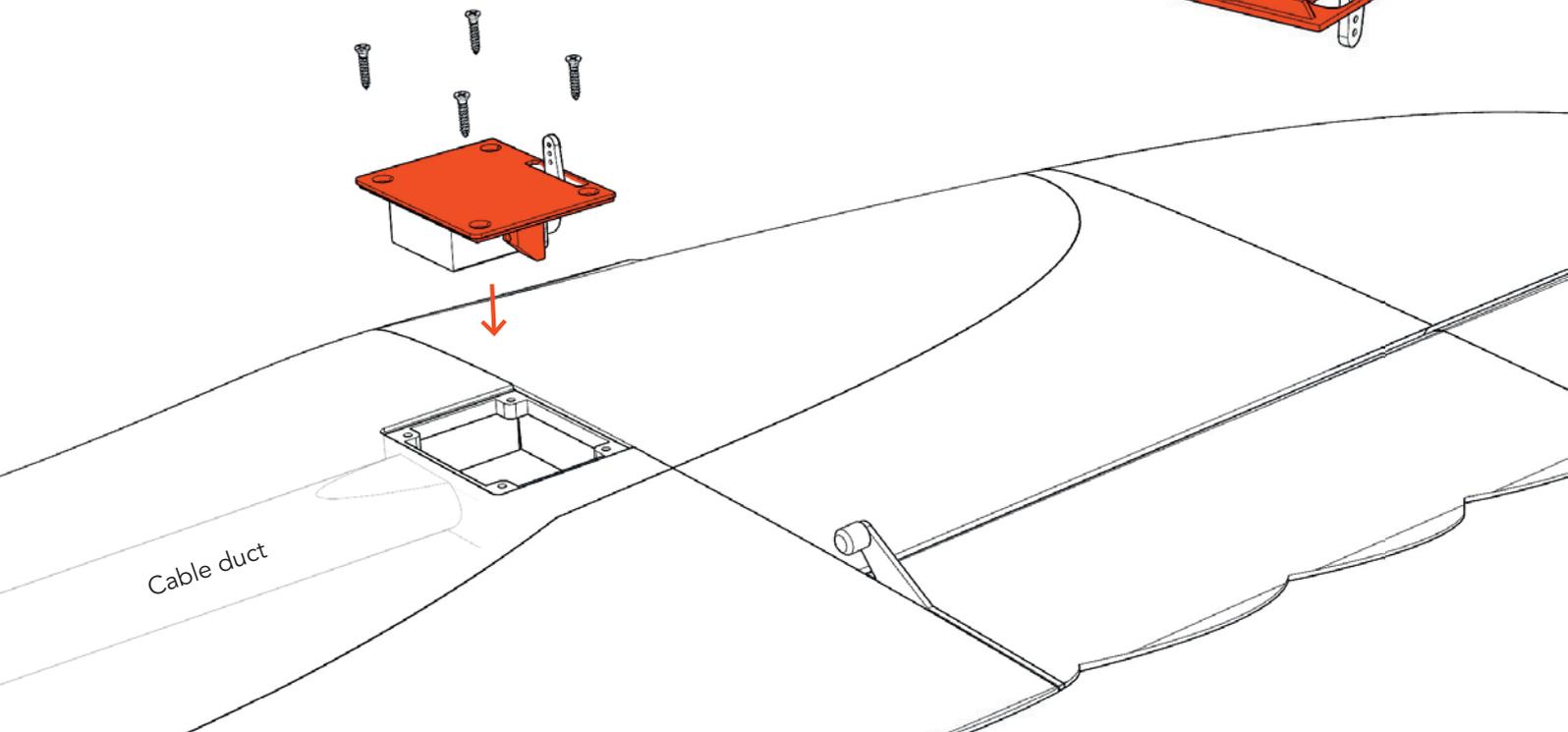
WL
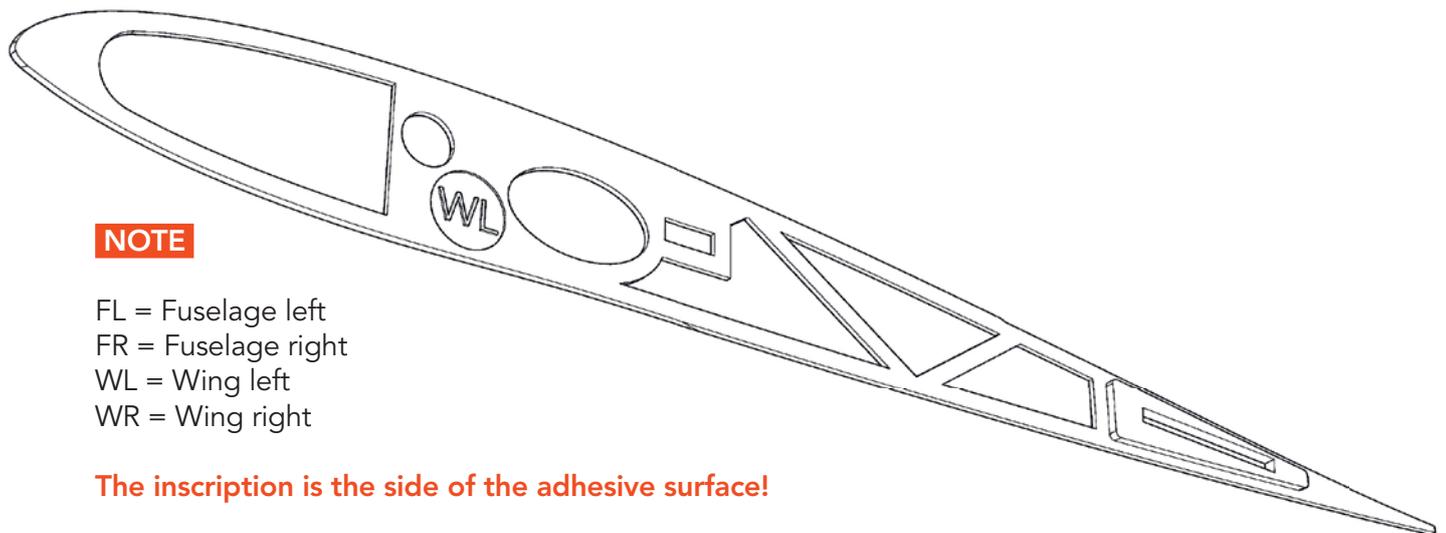
Aileron Servo

Assemble the parts as shown here.

Align the servo so that the lever protrudes exactly in the center of the slot.

Tighten the servo cover with four tapping screws.

Servocovers_p1_so.stl

Cable duct

Steel wire Ø 1 to 1.5 mm

105 mm

Fuselage assembly

CA
medium l.
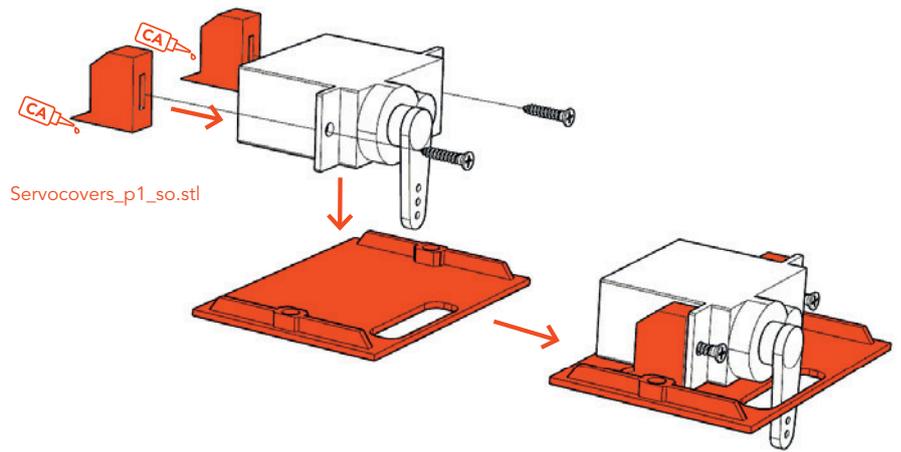
First remove support.
Please be careful with the knife!
You can also use a saw blade.

Fuselage 3B_p5_so.stl

CA

Fuselage 3A_p5_so.stl

CA

Fuselage 2 right_p5_so.stl

STEP 1

CA

Fuselage 2 left_p5_so.stl

CA

CA

Interconnects_p1_so.stl

Fuselage 1_p5_so.stl

CA

Head_p5_so.stl

Fuselage assembly

CA
medium l.

Carbon tube Ø8*500mm
(Do not glue!)

Parts 2_p1_so.stl

Protector FL_p1_so.stl

CA

CA

CA

Protector FR_p1_so.stl

CA
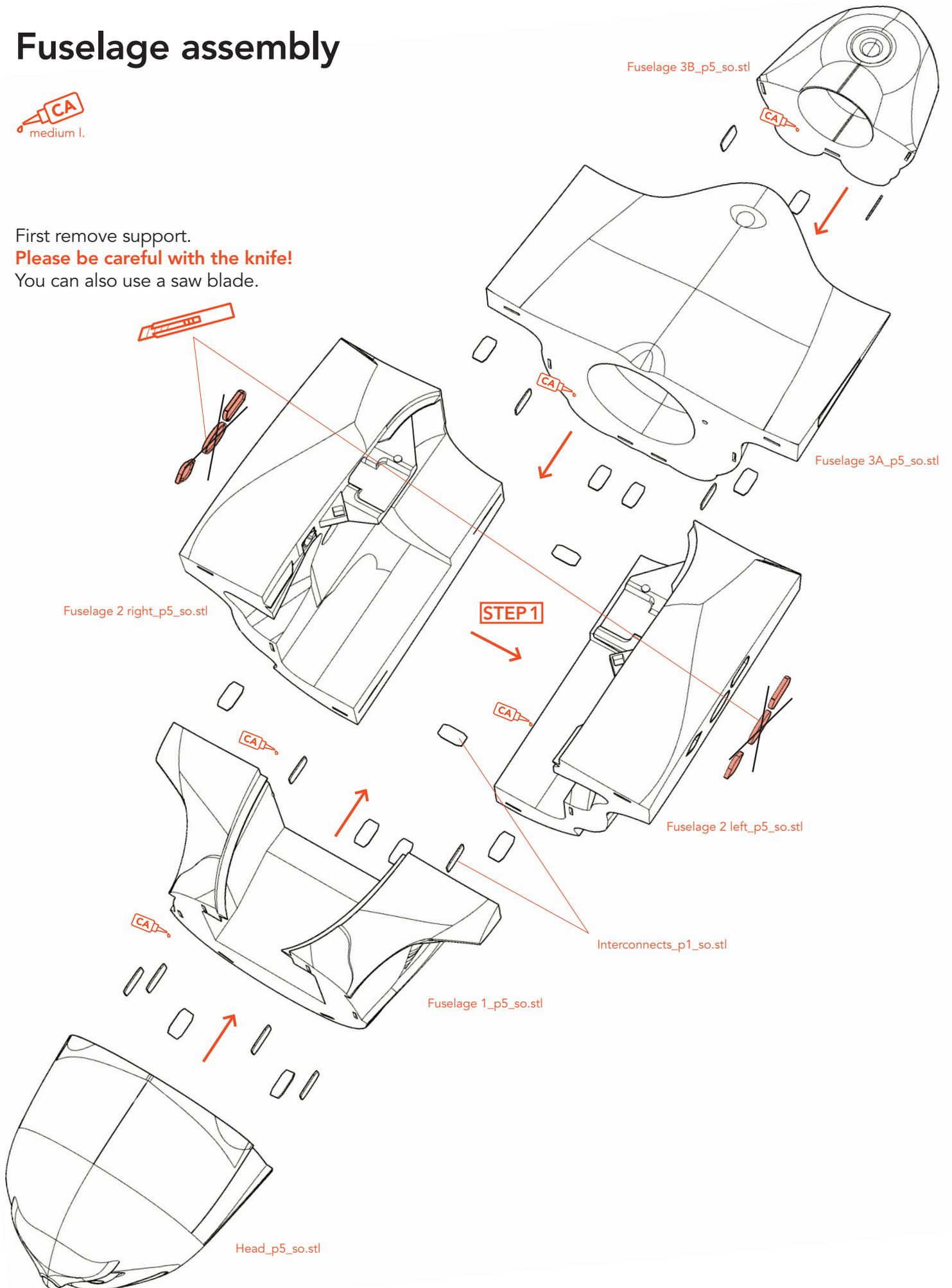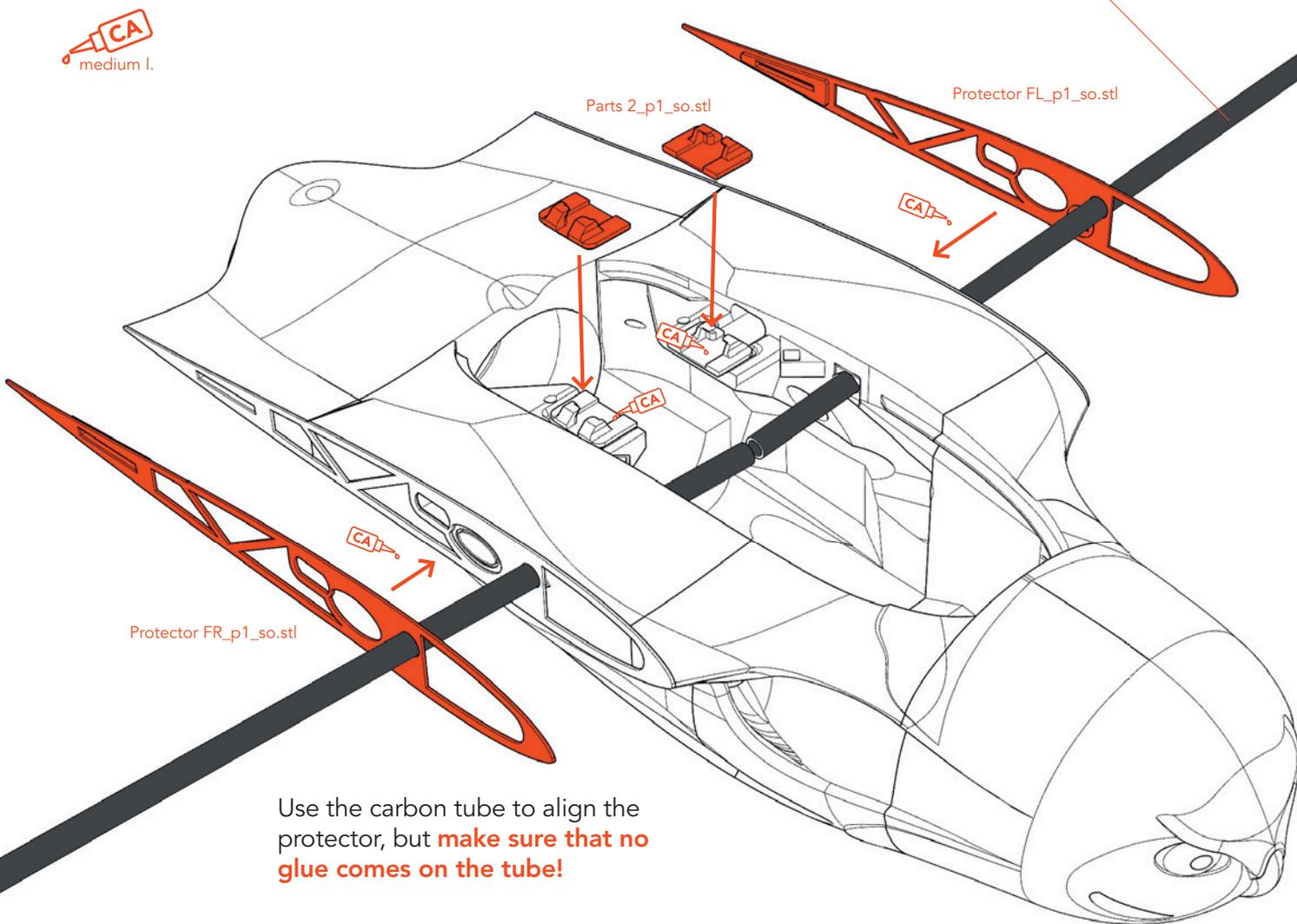
Use the carbon tube to align the
protector, but **make sure that no
glue comes on the tube!**

Cover mount

CA

Canopy 2_p5_so.stl

Canopy 1_p5_so.stl

Neodym Super
Magnets 5x5x5 mm

Glue the four magnets into
the gaps. **Pay attention
to the alignment of the
magnets to each other!**

Tailplane assembly

Mount the tail as shown in the picture.

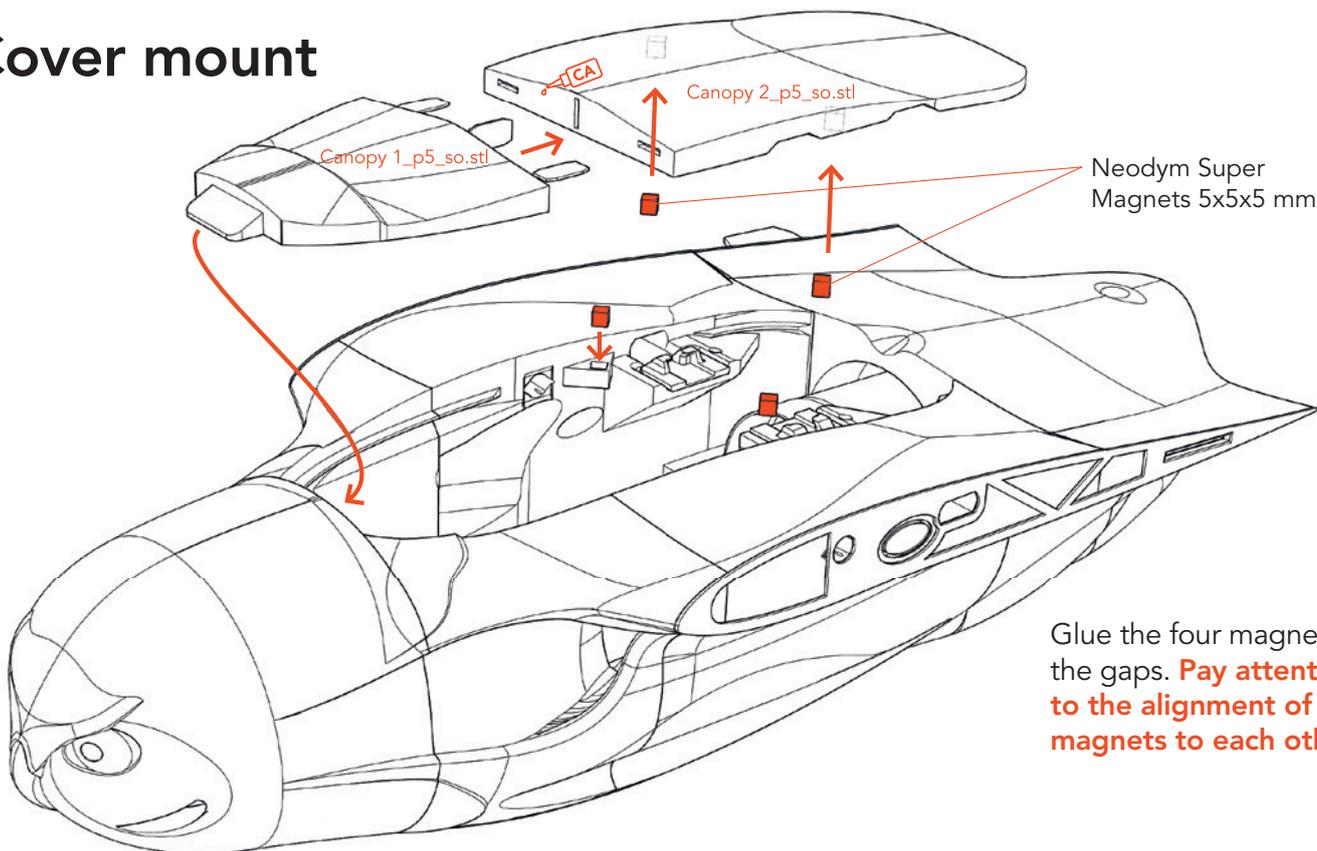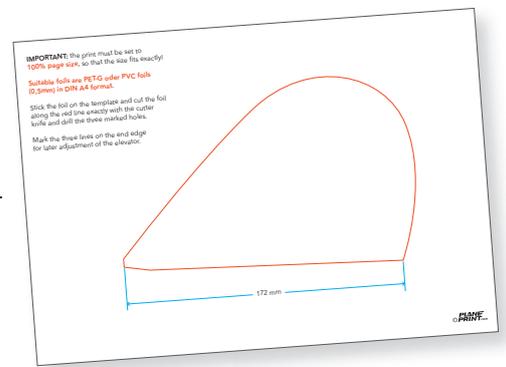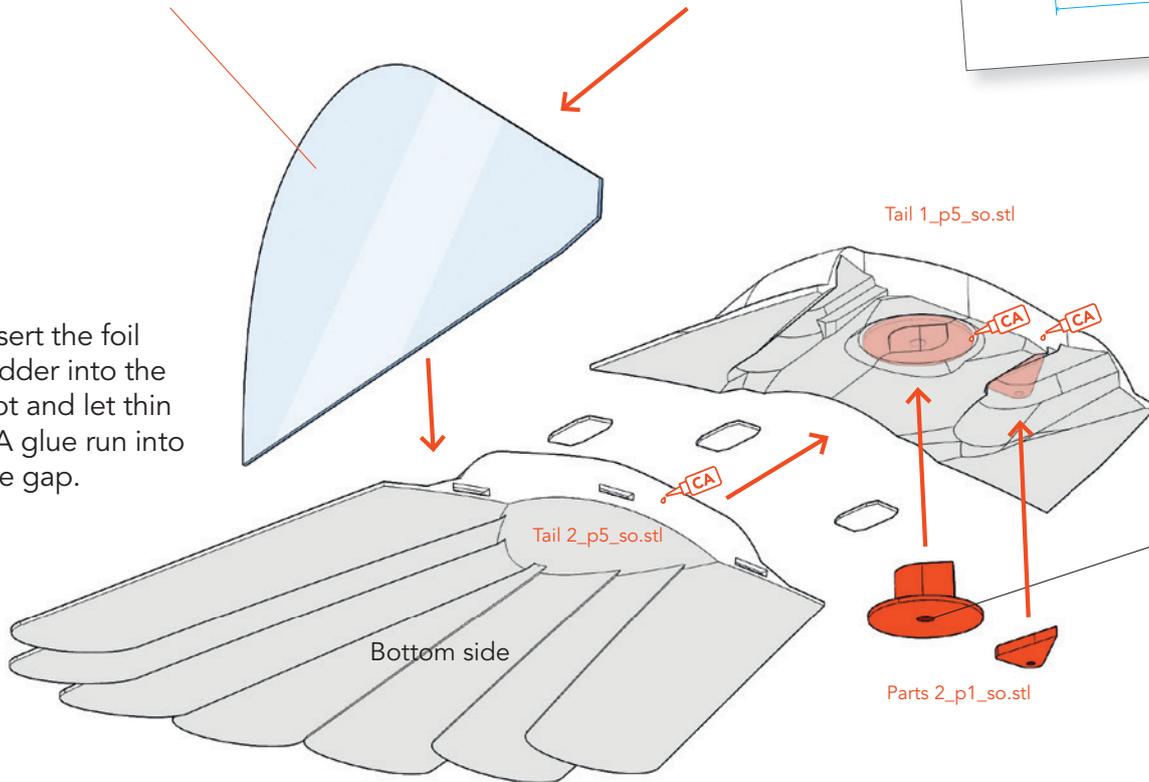**PET-G oder PVC foil (0,5mm)**

First, please print the Din A4 sheet **Rudder template.pdf** from the download folder.

Insert the foil rudder into the slot and let thin CA glue run into the gap.

Tail 1_p5_so.stl

Tail 2_p5_so.stl

Bottom side

A 3 mm screw (M3) must fit through this hole and turn easily but precisely.

Parts 2_p1_so.stl

If you don't have a suitable transparent material for the rudder, you can print Tail 2 Rudder_p5_so.stl and replace it later with a new tail.
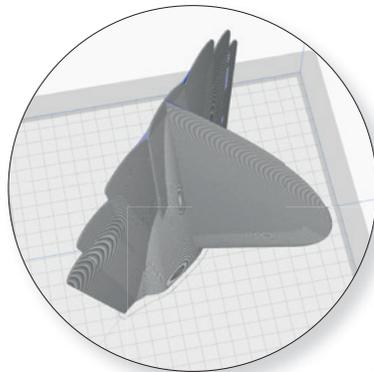
IMPORTANT The rudder is enormously important for a safe flight and must not be smaller!

Screw Ø3*20mm

Glue these shims into the fuselage and drill a 2.5 mm hole from the top. Screw a 3 mm screw (M3) through the holes. The screw will cut the thread in the PLA and **must be heavy duty!**

Parts 2_p1_so.stl
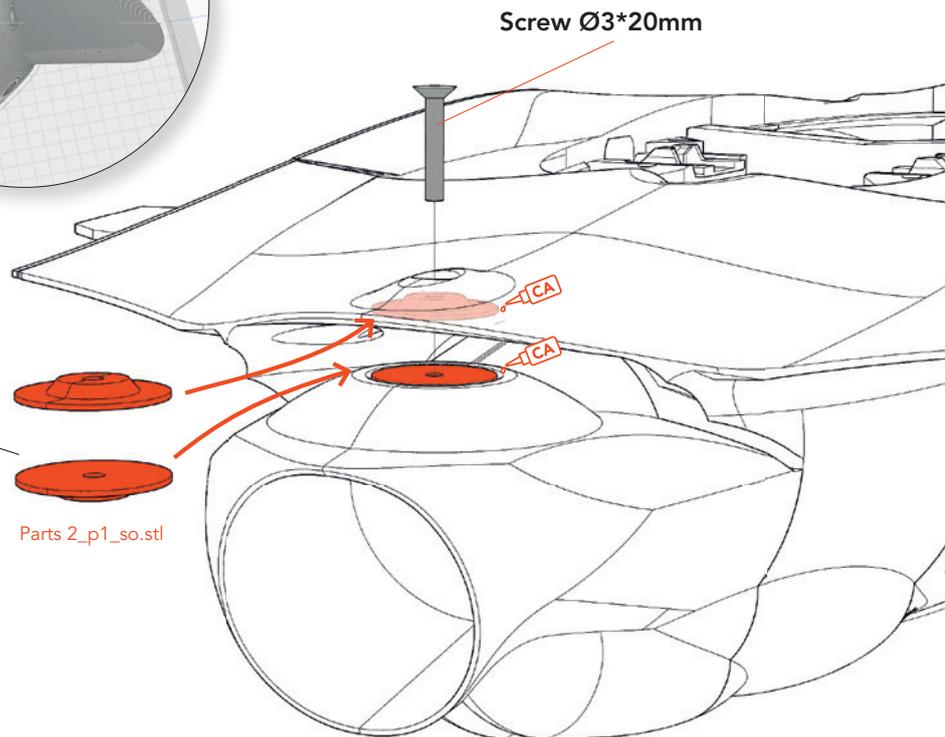
Tailplane assembly

Hook the steel wire into the control horn and insert the tail into the fuselage. Then carefully turn the screw into the discs.

Attention, if the screw does not hit the hole of the tail exactly, the upper part of the fuselage will be damaged.

Screw Ø3*20mm

Steel wire Ø 1 to 1.5 mm

220 mm
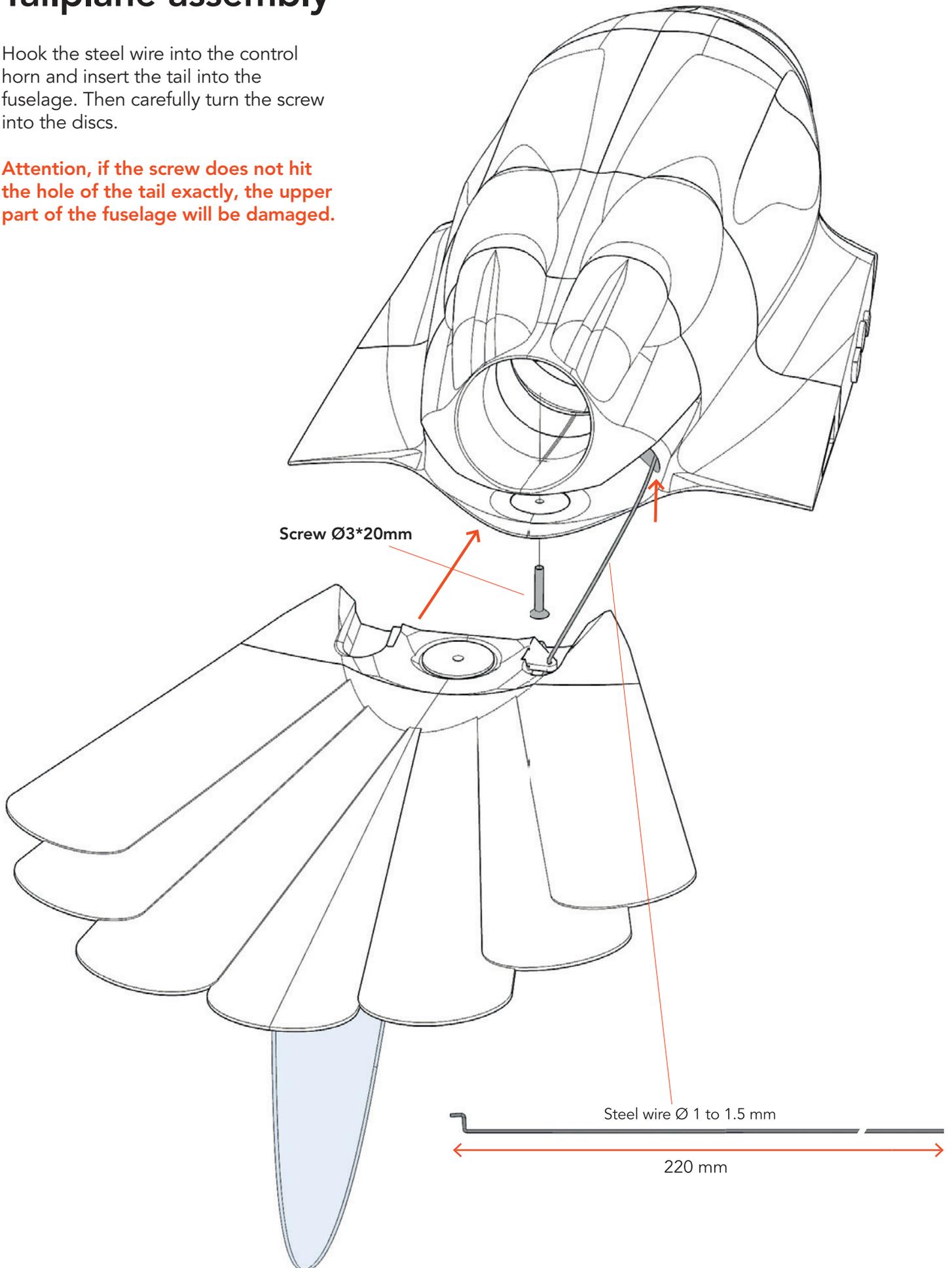
Fuselage assembly – rudder servo

Screw the servo brackets to the servo, mount the steel wire and glue the servo as shown in the picture so that it is in line with the steel wire.

Parts 2_p1_so.stl
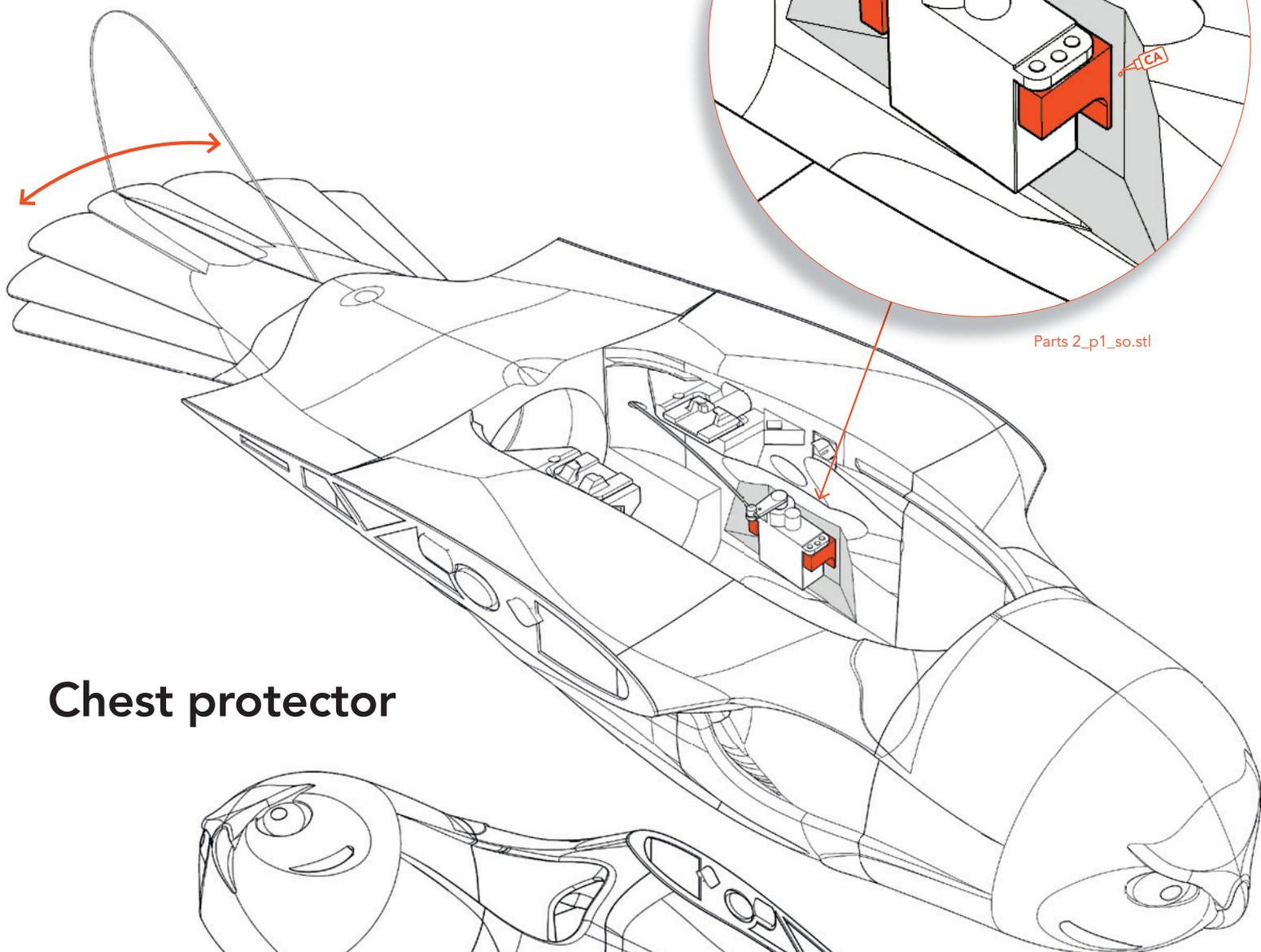
Chest protector

Optionally, you can glue this plate made of PLA on the fuselage for protection during landings.

You can also fix it with double-sided tape, then you can change it carefully.

Breastplate_p3_so.stl

EDF mounting

Insert the EDF into the EDF tube and feed the cables through the hole on the bottom. Then tape it with adhesive tape and **make sure to mount the intake ring** that comes with the EDF!

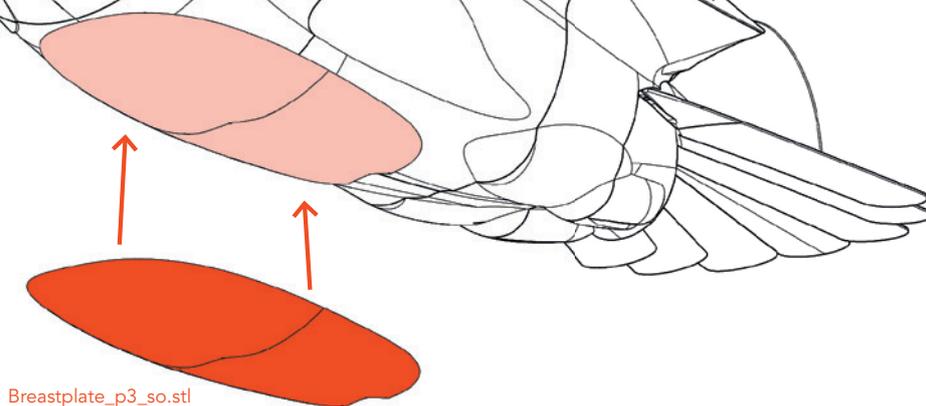**Without this intake ring the EDF has about 40% less power!**

Also seal the cables at the outlet with adhesive tape.

Screw the EDF brackets to the tube.

Adhesive tape

EDF-Tube FMS50_p1_so.stl

EDF Bracket FMS50_p2_so.stl

Intake Ring

Adhesive tape
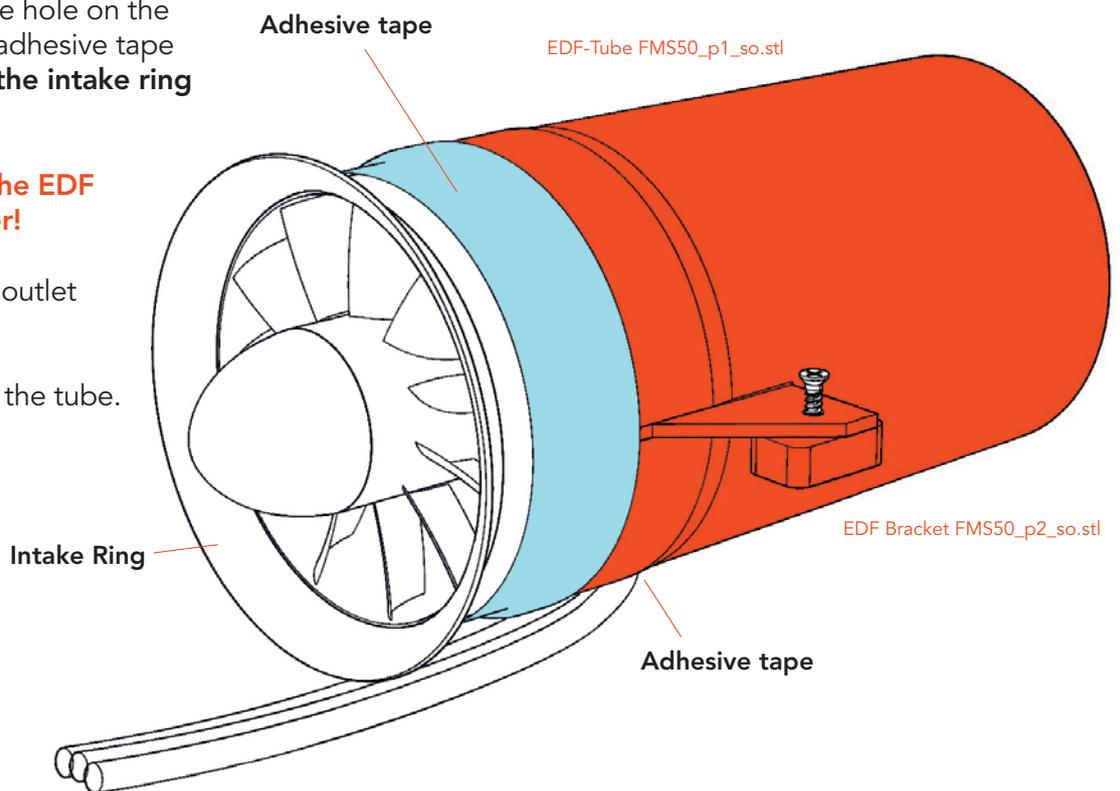
Then push the assembly all the way back into the push tube and glue the brackets to the base in fuselage 2 with a drop of CA glue on each side.

Remove the screws once again and glue the brackets firmly in place. Then mount the EDF again.

CA

Wing mounting system

Parts 1_p1_so.stl

Center Part_p2_so.stl
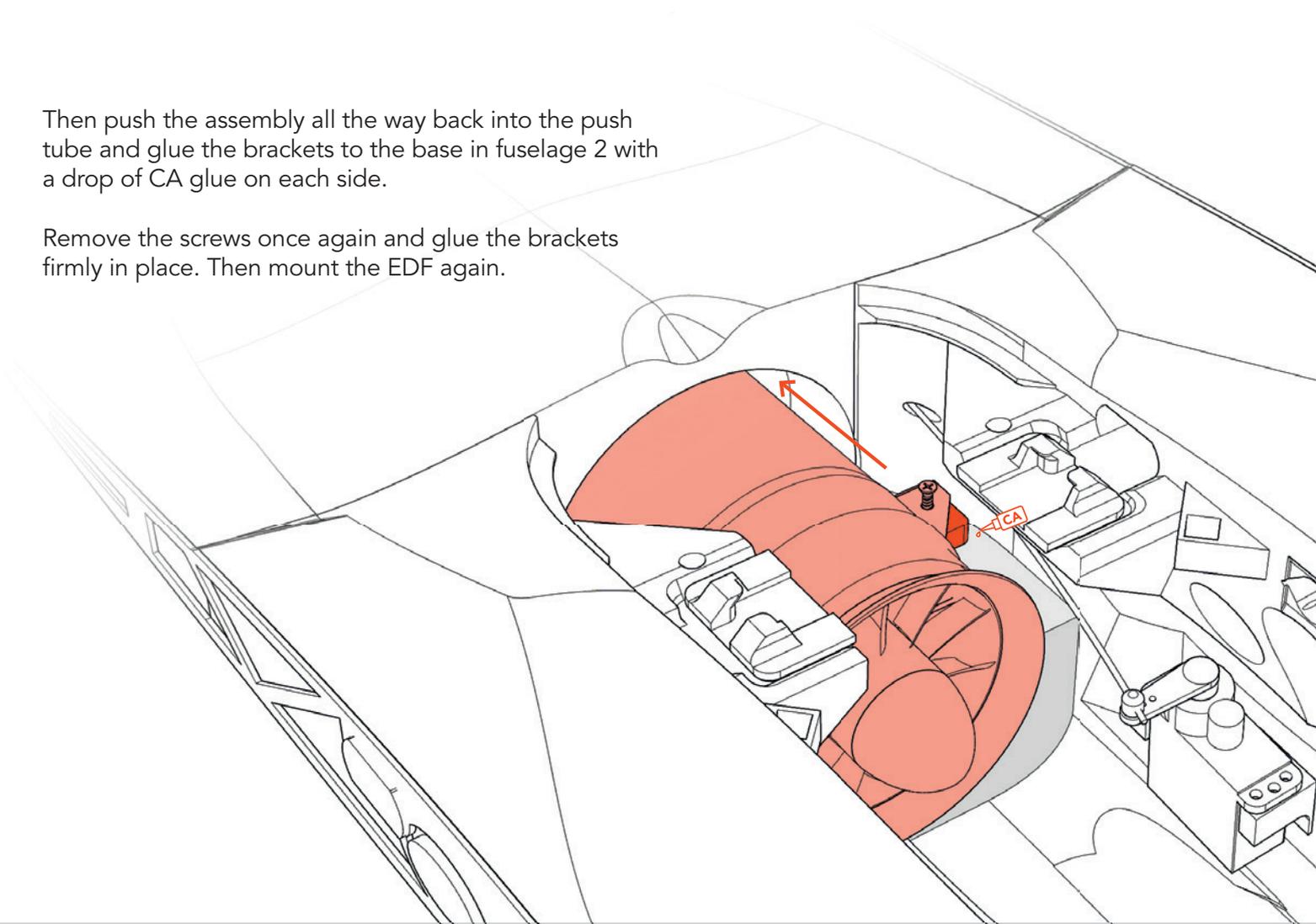
Insert the center part into the fuselage and then the two carbon tubes all the way in. **Nothing needs to be glued!** Now put the wings on the tubes. Feed the tension belts and servo cables through the openings in the fuselage and insert the two PLA plates into the slots in the fuselage and wing.

To secure the wings, pull the handles of the tension belts inward and hook them into the PLA holders. **The tension belts should normally be relaxed so that they do not overstretch.**

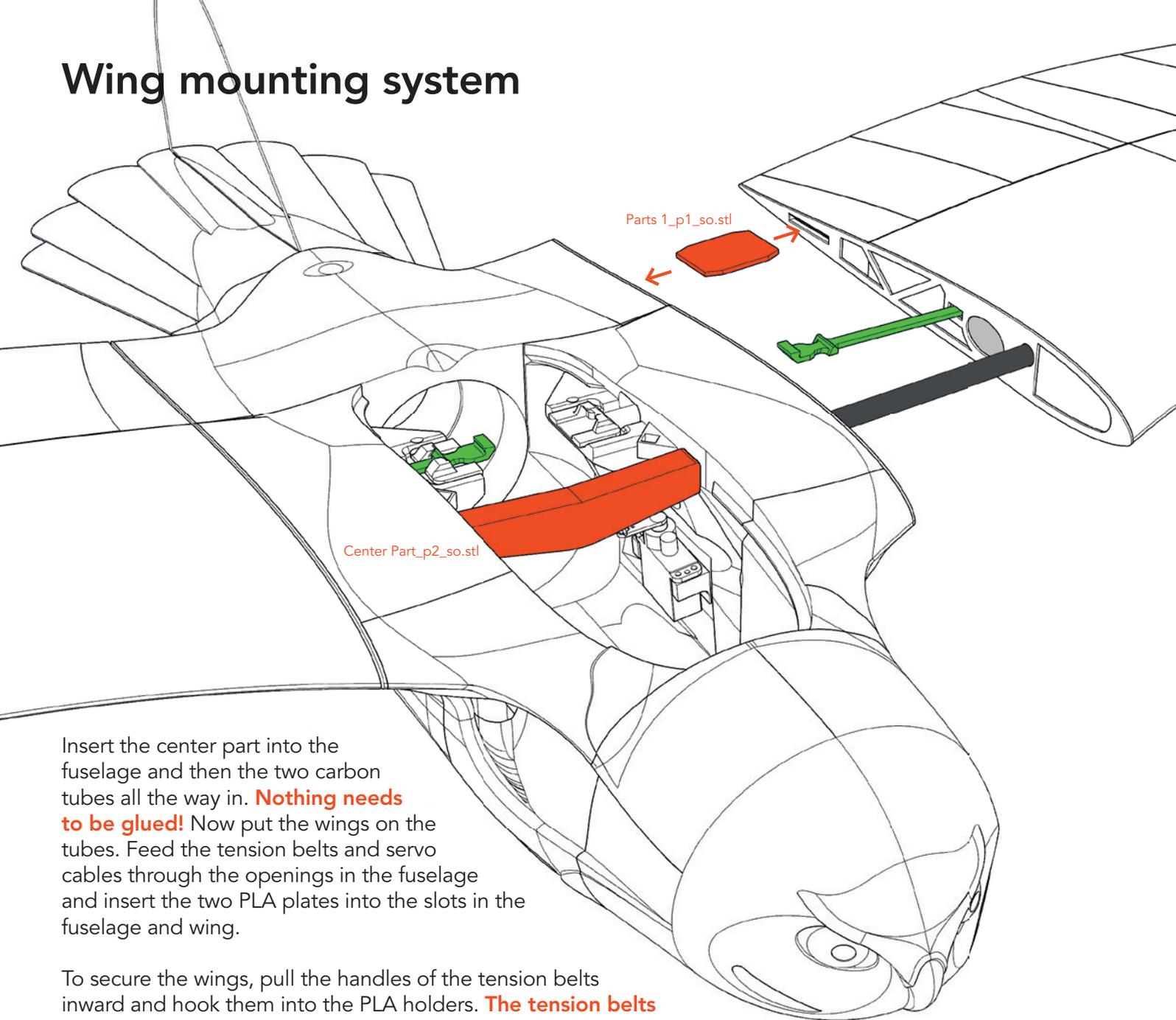Do not worry, if the tension belts are not hooked in, the canopy cannot be closed. So you don't forget to secure the wings before the flight.

Painting tip

With a flat brush and brown acrylic paint is very easy to make a very lifelike painting. Do not take too dark colors then the bird is less sensitive to high temperatures in the sun.

RC components

Use self-adhesive Velcro tape to attach the RC components.

Set the exact CG by positioning the battery.

Receiver

Battery
←→

Controller

EDF
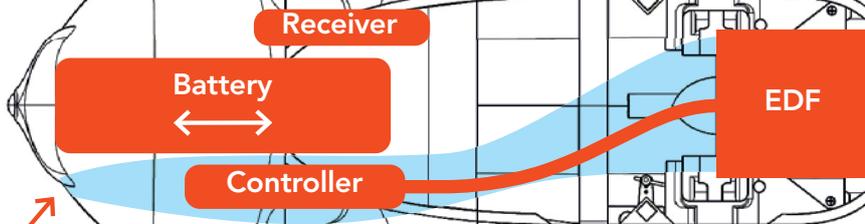
The air inlets in the front of the head must remain open in order to cool the controller!

Fasten all cables with tape or velcro so that they cannot be pulled into the EDF!

Center of Gravity (CG)

The aircraft must balance **absolutely precisely** on these points.

Do not forget to check if the wings are exactly in ballance in the roll axis. If one wing is heavier, correct this with a small weight on the wingtip.

Technical specifications

WINGSPAN   1650 mm/65 inches
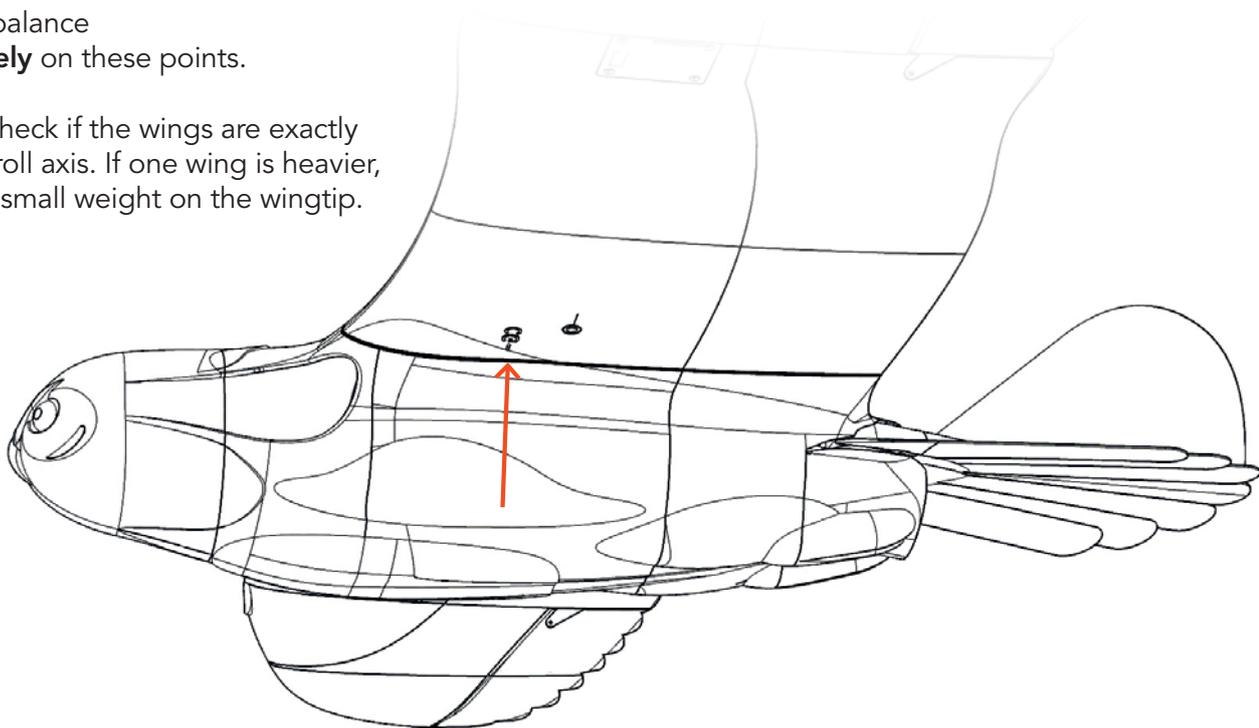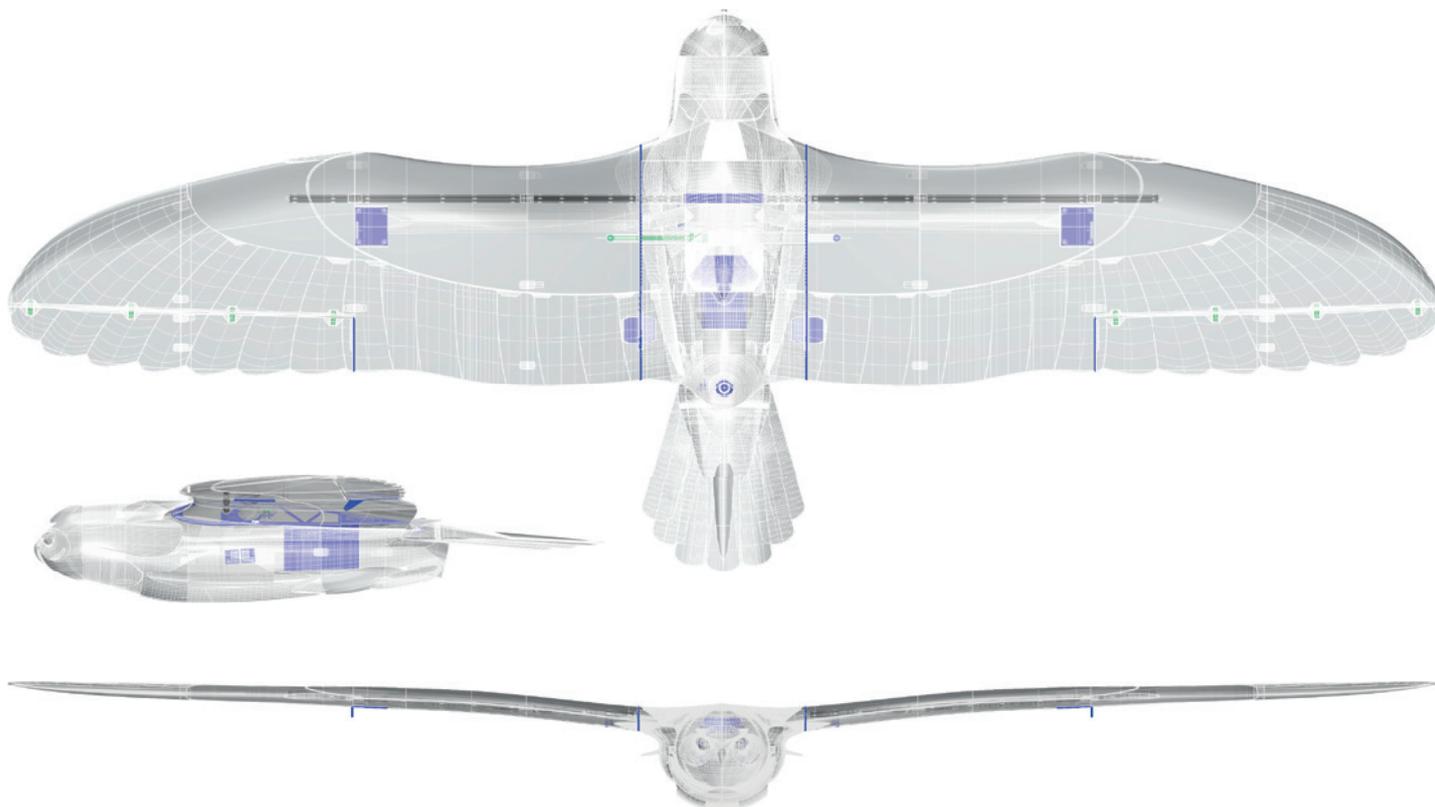
LENGTH   652 mm/2.6 inches
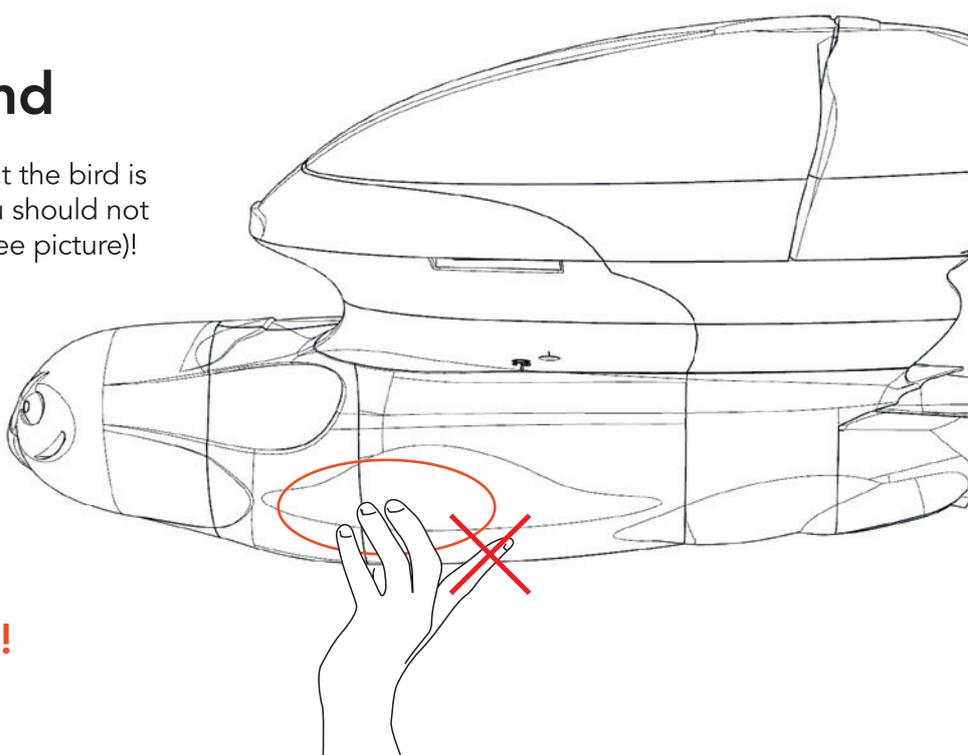
WEIGHT   1340 grams (Battery 4S, 2300 mAh)

Takeoff from the hand

NOTE   When throwing, it is important that the bird is **pulled** forward, not pushed. Therefore you should not support it behind with your index finger (see picture)!

Please be aware of wildlife and fly the snowy owl only in areas where it is allowed!

SETTINGS FOR FLYING

The SNOWY must be **programmed like a flying wing (delta)**. This means that the ailerons also take over the elevator function. Since the SNOWY requires the simultaneous use of aileron and rudder to initiate the turn for optimum flight characteristics, we recommend that you **also mix rudder to aileron function**. This means that with the aileron, the rudder also moves a little. We recommend **50 to 70 %**. When the rudder is actuated, only the rudder should be moved.

Setting the servo travel

With the recommended CG, the basic setting of the ailerons/elevators should be as shown here.
At full throttle, the EDF pulls up minimally. If this bothers you, you can mix in the ailerons/elevators:

The mixer must be **linear**.

Aileron/Elevator default setting in gliding:

EDF off

＋ 2 mm up
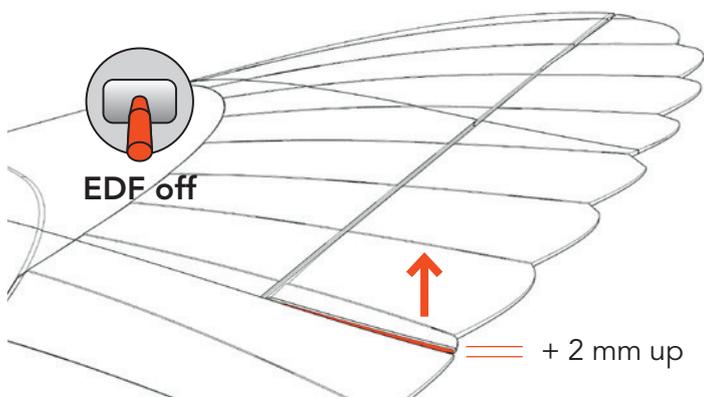
Aileron/Elevator default setting AT FULL THROTTLE:

Full Throttle

1 mm up
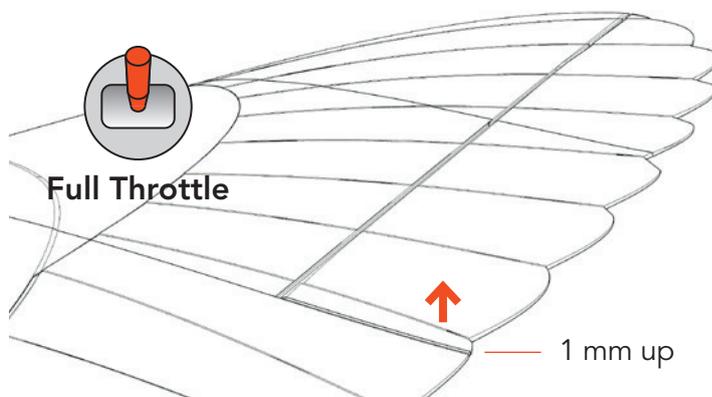
These specifications are basic settings! If your SNOWY still pulls up at full throttle, check the CG or mix the Ailerons a little more down or vice versa.

Deviating from this setting, this maximum travel must be set:

ELEVATOR up: 17 mm, down: 17 mm

AILERON up: 17 mm, down: 17 mm

RUDDER left/right: 50 mm

Expo setting

ELEVATOR 30 %

AILERON 30 %

RUDDER 0 %
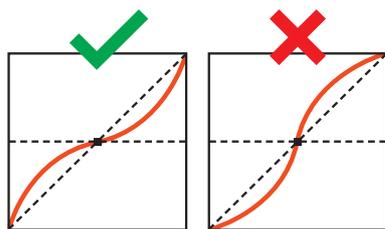
(for some remote controls a minus has to be in front of the number)

Control Direction Test

When checking the control directions, **look at the aircraft from behind.**

Zero setting

↑ + 2 mm up   + 2 mm up ↑

Elevator up

↑ + 19 mm up   + 19 mm up ↑

Elevator down

↓ + 15 mm down   + 15 mm down ↓

Aileron left

↑ + 19 mm up

from 25 mm left (mix 50 to 70 %) ←

+ 15 mm down ↓

Aileron right

+ 19 mm up ↑

↓ + 15 mm down

from 25 mm right (mix 50 to 70 %) →

Rudder left

50 mm left ←

Rudder right

50 mm right →

EDF off

↑ + 2 mm up   + 2 mm up ↑

Full throttle

↑ + 1 mm up   + 1 mm up ↑
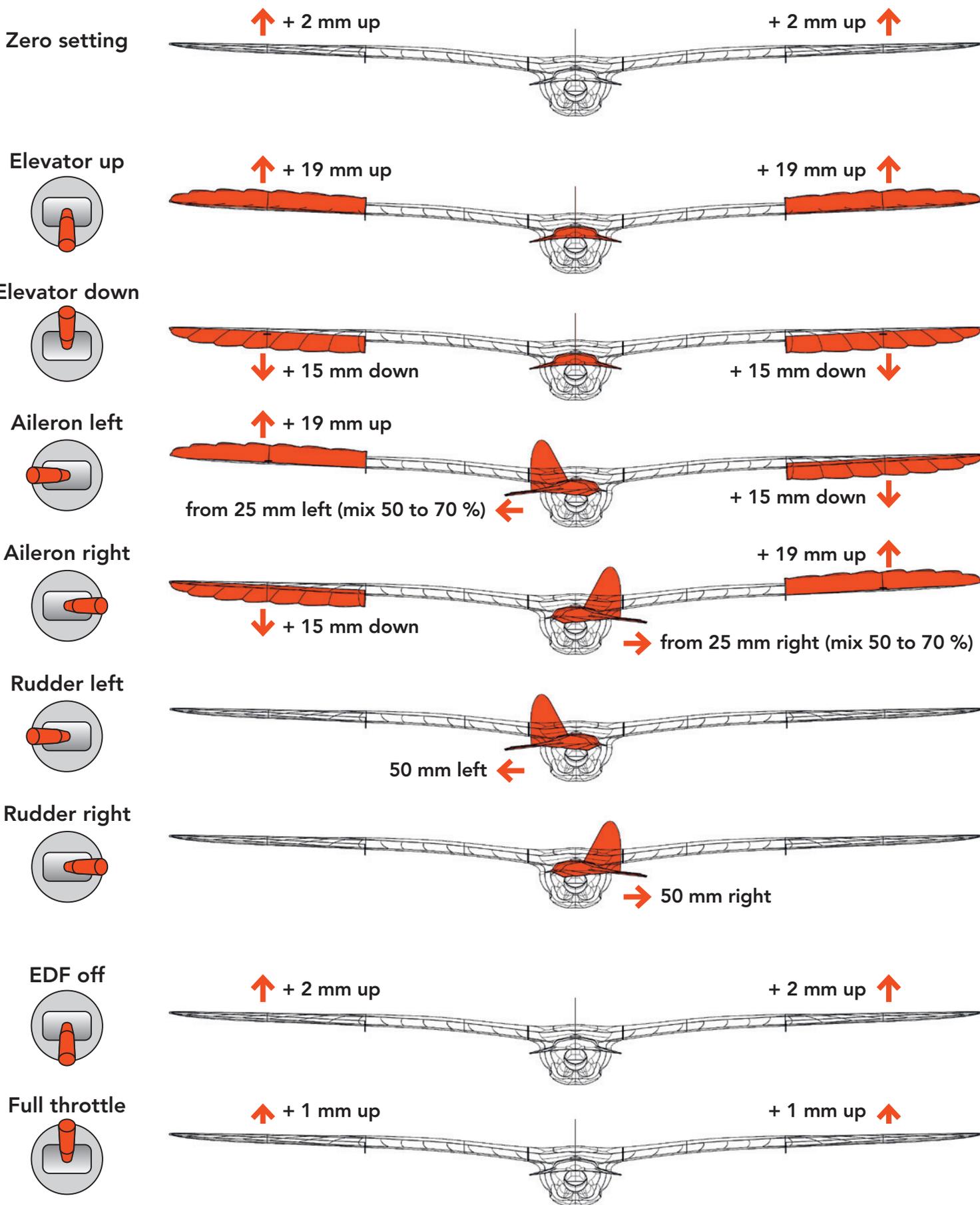
AGE RECOMMENDATION 14+

NOT FOR CHILDREN UNDER 14 YEARS.
THIS IS NOT A TOY!

By using the download data, an RC model airplane, called „model" for short, can be manufactured using a 3D printer. As a user of this model, only you are responsible for safe operation that does not endanger you or others, or that does not damage the model or property of others.

PLANEPRINT.com assumes no responsibility for damage to persons and property caused by pressure, transport or use of the product. Filaments, printing supplies, hardware or consumables that can not be used after faulty 3D printing will not be replaced by PLANEPRINT.com in any way.

When operating, always keep a safe distance from your model in all directions to avoid collisions and injuries.

This model is controlled by a radio signal. Radio signals can be disturbed from outside without being able to influence it. Interference can lead to a temporary loss of control.

Always operate your model on open terrains, far from cars, traffic and people.

Always follow the instructions and warnings for this product and any optional accessories (servos, receivers, motors, propellers, chargers, rechargeable batteries, etc.) carefully.

Keep all chemicals, small parts and electrical components out of the reach of children.

Avoid water contact with all components that are not specially designed and protected. Moisture damages the electronics.

Never take an item of the model or accessory in your mouth as this can lead to severe injuries or even death.

Never operate your model with low batteries in the transmitter or model.

Always keep the model in view and under control. Use only fully charged batteries.

Always keep the transmitter switched on when the model is switched on.

Always remove the battery before disassembling the model.

Keep moving parts clean and dry at all times.

Always allow the parts to cool before touching them.

Always remove the battery after use.

Make sure that the Failsafe is properly set before the flight.

Never operate the model with damaged wiring.

Never touch moving parts.

We develop our models to the best of our knowledge and belief. We accept no liability for consequential damage and injuries caused by improper use or incorrectly printed parts. **Please be careful when handling motors, batteries and propellers** and only move your model with insurance and in approved places!

PLANE PRINT