



SZD-21-2B „Kobuz 3“

The SZD-21-2B „Kobuz 3“ is originally designed for aerobatic flight. This model is designed as a thermal glider with scale flight characteristics. This is not a beginner plane, advanced piloting skills are recommended when flying this model.

Maiden flight

Parameters

Brief parameters of the model in table. Wingspan, speed, weight, ...

Scale:	20%
Lenght:	1440mm
Wingspan:	2800mm
Wing area:	56dm ²
Airfoil:	
Wing:	HQ/W 3/12
Elevator:	NACA0009
Print weight:	ca. 3200g
Takeoff weight glider:	N/A
Takeoff weight motorized:	ca. 4200g
Center of gravity:	8mm - 9mm

Functions

Plain flaps, tow release, changable nosecone

Requirements

Gcodes are designed for a 200mm x 200mm x 200mm printer.

Stl files for larger printers are available.

Gcodes use 3D Labprint parameters.

[Simplify3D is necessary for recreation of the wings!!!](#)

Additional material needed:

1x – 1250mmx16mmx1mm carbon tube or similar

1x – 1000mmx8mmx1mm carbon tube or similar

5x – 1000mmx4mm carbon rod or similar

2x - 1315mm x 1,5mm steelrod or 525mm x 1,5mm and 790mm x 1,5mm steelrod)

1x – Hacker A30 with glider conversion kit or similar

5x – Corona CS239MG Slim wing or similar

1x – KST DS145MG or similar

1x – YEP 60A ESC or similar

1x – 4s LiPo

2x – M5 Nylon screws 80mm or similar

2x – M5 MP-Jet 1009 nuts or similar

1x – 70x25 Wheel or similar

1x – Messing Canopy Lock L40mm or similar

1x – 32mm Glider spinner or similar

1x – 2blade 13x7 foldable Prop or similar

Additional gear necessary for Control surface attachment, etc. needed.

Print settings

In case you have to recreate files for your printer, make sure to check the suggested parameters for every part.

All parts are printed with 230° nozzle temp and 56° bed temp.

All parts are printed with a 0.4mm nozzle.

All parts are printed with 0.25mm layer height.

Wings and cabin are printed with 10% „fast honeycomb“ infill.

Rudder and Wing6 are printed with 5% „fast honeycomb“ infill.

When printing black parts, it is suggested to use a material with high temperature and UV resistance.

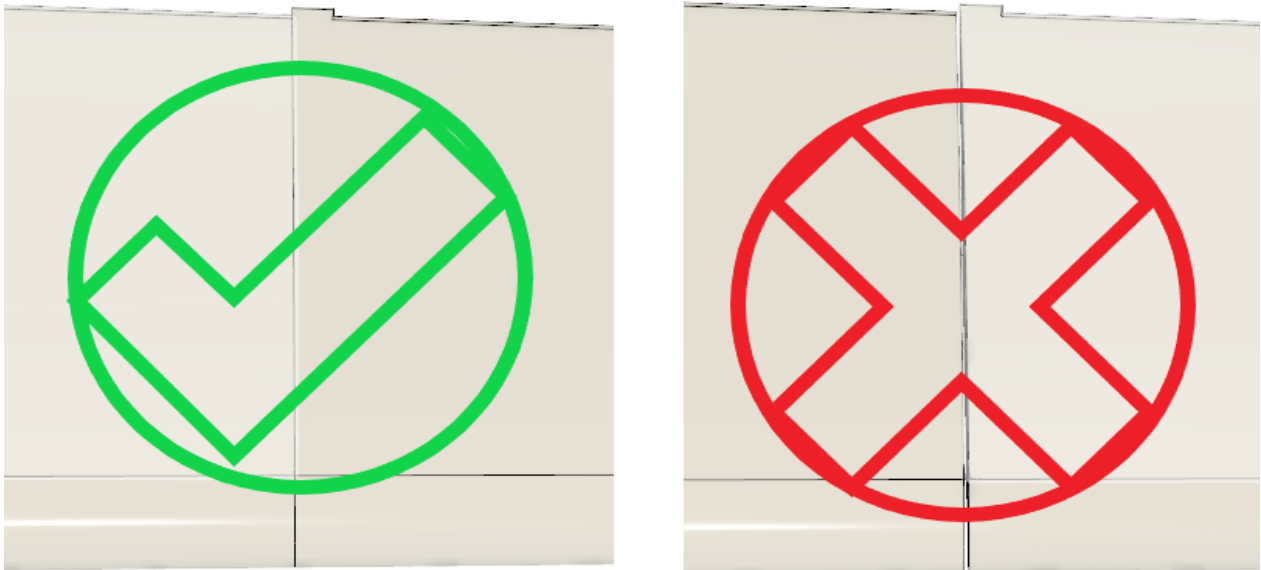
Assembly instructions

Preparations

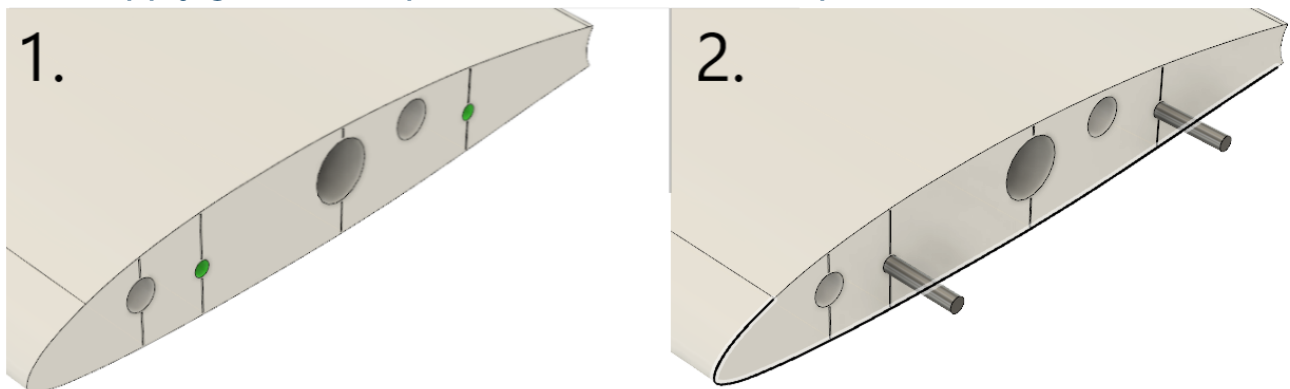
- 1.1 Prepare the 4mm rod pieces. 1x 500mm, 1x 650mm, 1x400mm ca. 70x 40mm (the pieces should be 1-2mm shorter as listed to ensure fit)
- 1.2 Check all printed parts and make sure all holes have the right diameter. If not, use a 4-4.2mm drillhead and manually extend the hole.

Wing assembly

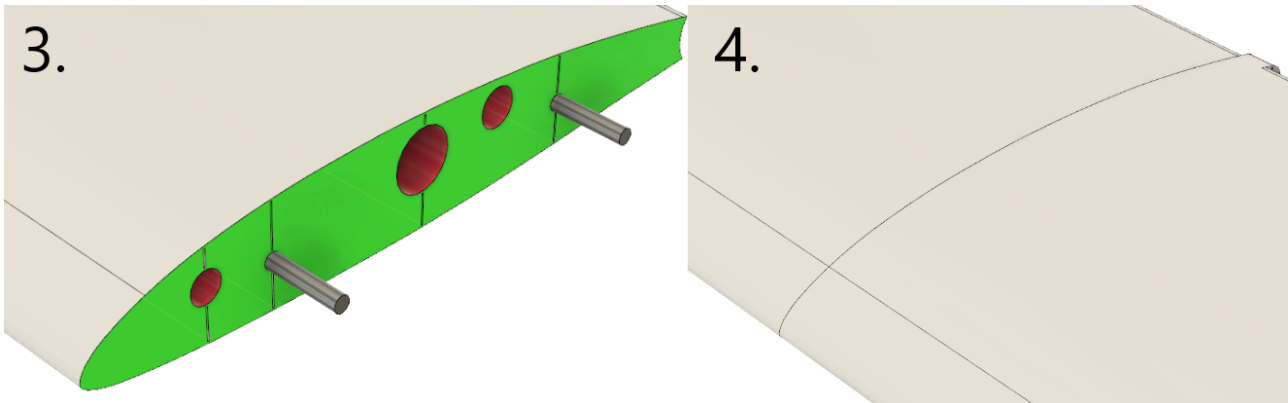
Step 1 : Parts needed: W1-W7, 12x pins per side



- 1.1 Put all parts together without glueing them to make sure everything fits. Shorten pins, if they are to long and gaps are forming.
- 1.2 Apply glue to the pin holes and insert the pins.



1.3 Apply glue to the surface of the wing and attach the next piece. Make sure no glue is getting into the other holes.



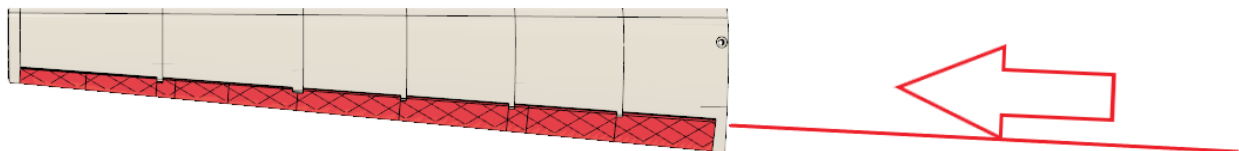
1.4 Repeat for parts W1 to W7. There are no supporting pins for W7, make sure the pieces are properly aligned. Repeat for other wing.

Step 2: Parts needed: ailerons, flaps, 1315mm x 1,5mm steelrod (or 525mm x 1,5mm and 790mm x 1,5mm steelrod) per side.

2.1 Assemble the ailerons and flaps by glueing the parts together. Keep in mind that they are 2 independant control surfaces.

2.2 Make sure the control surfaces can move freely and do not get collide with eachother or the wing.

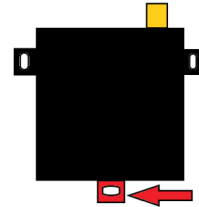
2.3 Attach the control surfaces by putting them into their place and sliding the steelrod through the hole. (in case your using two seperate rods, attach the ailerons first.)



2.4 Secure the rod by applying glue to the end. Repeat for other wing.

Step 3: Parts needed: 2 x Servos, Printed nut, Servo extension cord 1000mm and 300mm (I suggest using wire from the spool and soldering it yourself)

3.1 Remove the pin on the bottom of the servo.



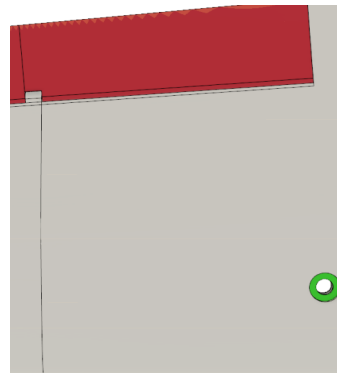
3.2 Attach the servo cord extension. Make sure the plugs are small enough to fit through to servo tray.

3.3 Make sure your servos are at the 0 position.

Attach the the lever to the servo and glue them into the servo slot.

3.4 Connect the Servo lever to the lever of the control surface. Make sure that 0° on rudder = 0° on servo.

3.5 Glue the printed Nut to the slot at the underside of the wing.



Fuselage assembly

Step 1: Parts needed: F1-F8, 24 x pins

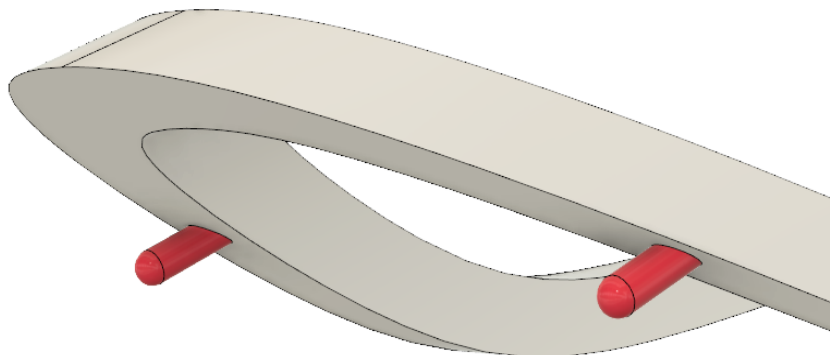
- 1.1 Put all parts together without glueing them to make sure everything fits. Shorten pins, if they are to long and gaps are forming. (As seen in „wing assembly Step 1.1“)
- 1.2 Assemble F1-F5 as shown in „wing assembly step 1.2-1.3“
- 1.3 Glue F6 A and B together.
- 1.4 Glue F6AB into the slot and make sure it is alligned properly.
- 1.5 Apply glue to the inside edges between F6AB and the other parts to make sure it is secured properly.
- 1.6 Continue attaching F7 - F8 as shown in „wing assembly step 1.2-1.3“
- 1.7 Glue F1B to F1A

Step 2: Parts needed: F9, Vstab

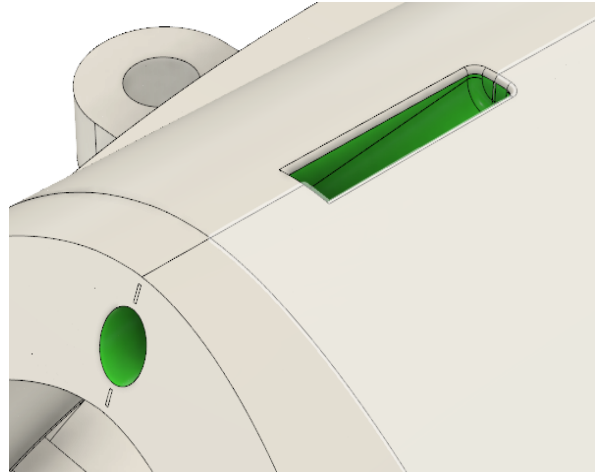
- 2.1 Glue the individual Vstab parts together.
- 2.2 Attach the Vstab to F9 using glue. Make sure to glue it as vertical as possible.
- 2.3 Attach F9 to F8 as shown in „wing assembly step 1.2-1.3“

Step 3: Parts needed: Cabin1-2, Glassing1-2, 4 x pins, cabin lock

- 3.1 Attach Cabin 1 and 2 as shown in „wing assembly step 1.2-1.3“
- 3.2 Glue the other 2 pins in the holes in the front of Cabin 2
- 3.3 Make sure the pins fit into the holes in F1B. Shorten them if necessary.

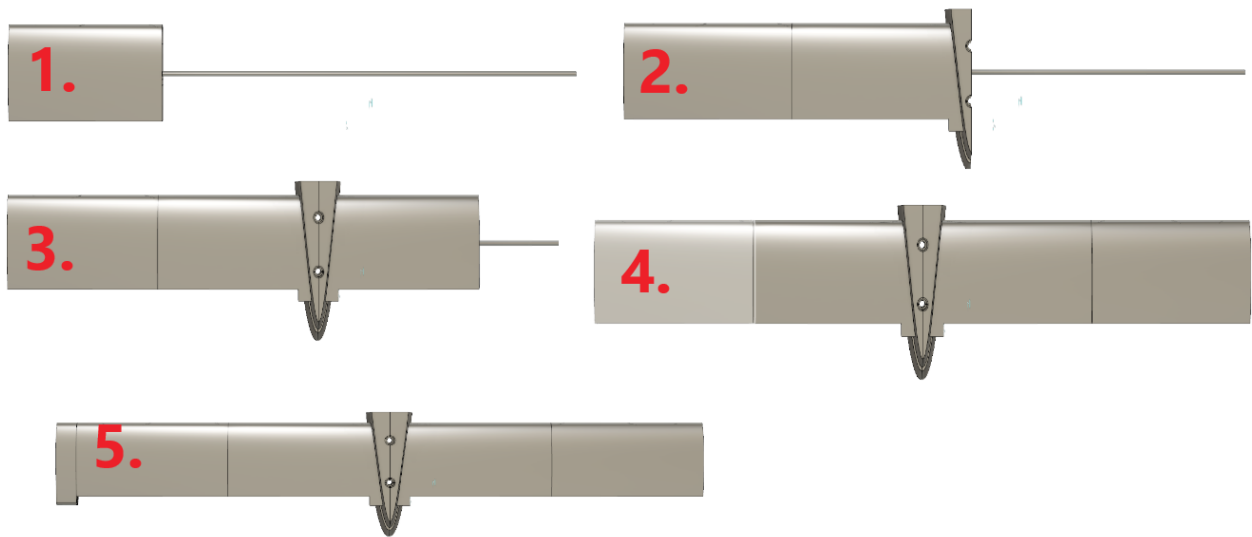


- 3.4 Glue Glassing 1 and 2 to each other.
- 3.5 Glue Glassing12 to Cabin12.
- 3.6 Glue The cabin lock to F3.

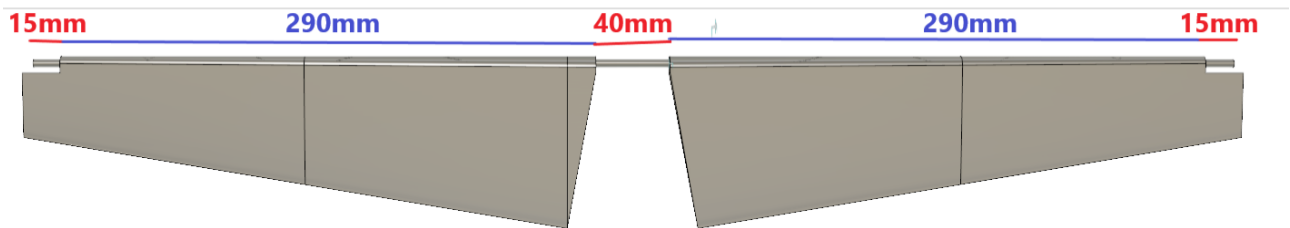


Step 4: Parts needed: Hstab, Elevator, Elevpin, F10, 2 x M5 screws, 2 x M5 nuts, 500mm x 4mm rod, 650mm x 4mm rod.

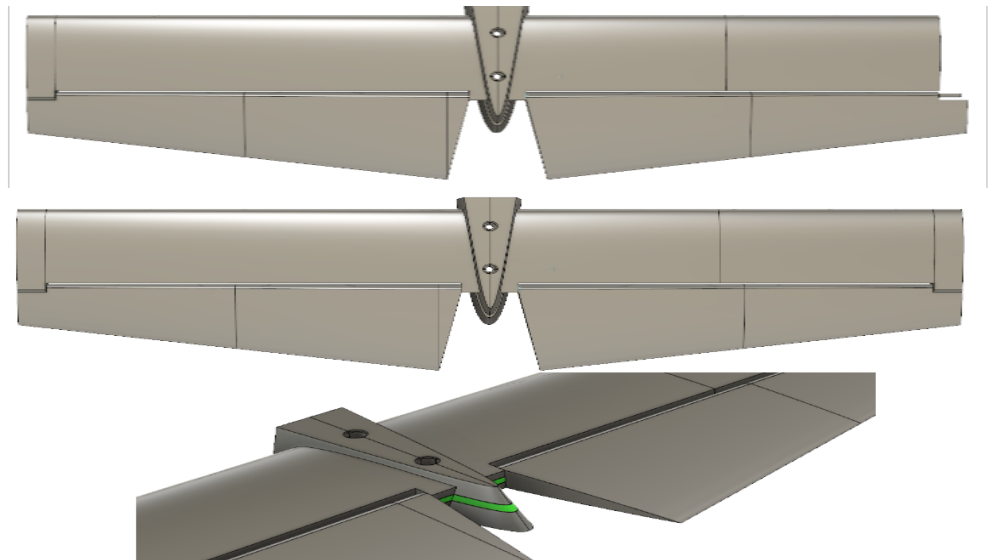
4.1 Glue together the Hstab as shown below



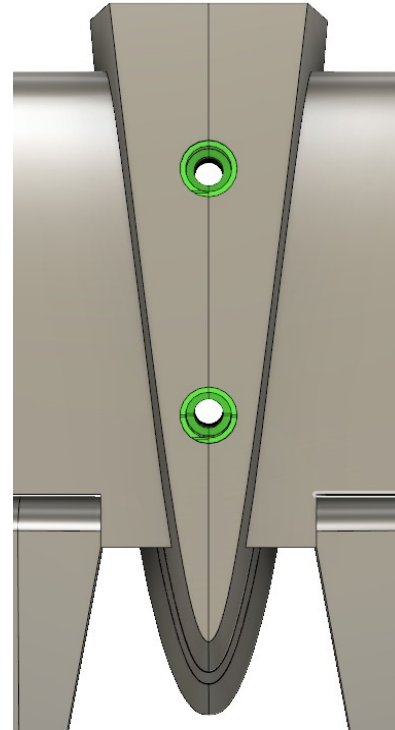
4.2 Glue the Elevators to the rod like shown below



4.3 Attach the Elevators to the Hstab like shown below and secure them with the Elevpin.



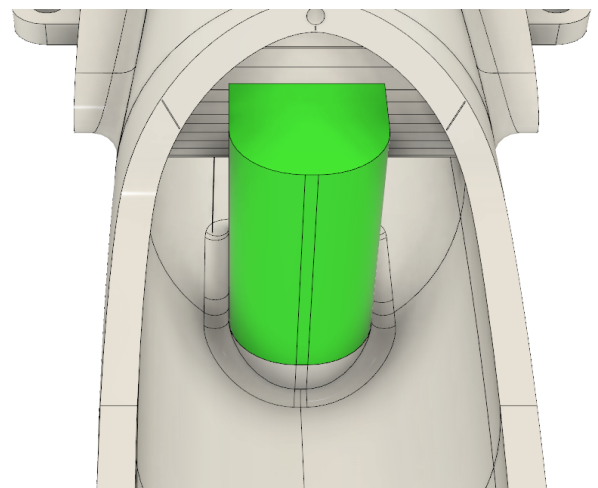
4.4 Glue the M5 nuts to the Hstab



4.5 Glue F10 to F9 and Make sure its perfectly horizontal, attach the Hstab to help with allignement.

Step 5: Parts needed: Wheel disc, tyre, 50mm x 4mm rod, wheel pins, Gearstab

- 5.1 Glue the gearstab to the fuselage.
- 5.2 Slide the wheel on the axis and put it in place.
- 5.3 Secure the axis using the wheelpins.

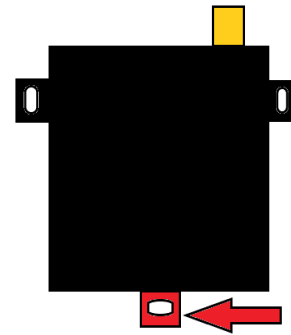


Step 6: Parts needed: Rudder, 280mm x 1,5mm steelrod

- 6.1 Glue the rudder parts together.
- 6.2 Attach the rudder to the Vstab.
- 6.3 secure the rod.

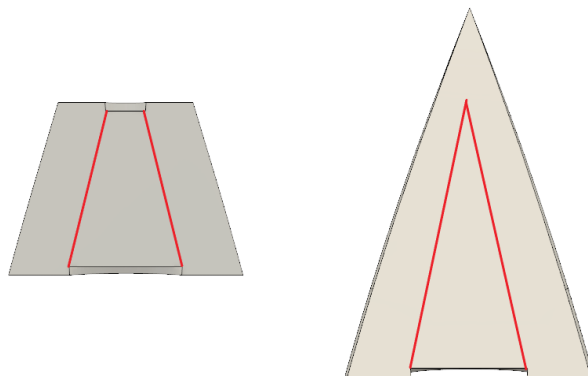
Step 7: Parts needed: Servo, Elev-servo, 2 x 1000mm Servo extension cord.

- 7.1 Remove the bottom pin of the servo.
- 7.2 Attach the servo extension cords
- 7.3 Attach the levers to the servos
- 7.4 Glue the servos into the slots.



Step 8: Parts needed: Upper and lower nosecone, 4 x M3 nuts. (if you are only using the glider cone, you can also just glue the cone to F1AB)

- 8.1 Cut the cones as shown.
- 8.2 Glue the nuts into the inside of the cones.
- 8.3 The nosecone can now be screwed to the fuselage.



Step 9(optional): Parts needed: Servoholder, small servo, 2mm steelrod.

- 9.1 Glue the servoholder into the fuselage.
- 9.2 Glue the servo to the servoholder.
- 9.3 Cut the steelrod to right length.
- 9.4 Make sure the rod sits securely in the counterpart and does not get stuck when activating the tow-release

Step 10: Parts needed: all parts.

- 10.1 Install all electronics and set them up.
- 10.2 Put the whole plane together.
- 10.3 Setup the CoG.
- 10.4 Make sure there are no loose parts.

Control surface guide:

Always measured at the thickest point of the control surface.

	Rudder	Elevator	Aileron	Flaps
Elevator	-	20mm up / 17mm Down	-	-
Rudder	55mm	-	-	-
Ailerons	-	-	15mm Up / 20mm Down	9mm Down
Butterfly	-	4mm Down	8mm Up	28mm Down
Plain flaps	-	-	-	8mm Down