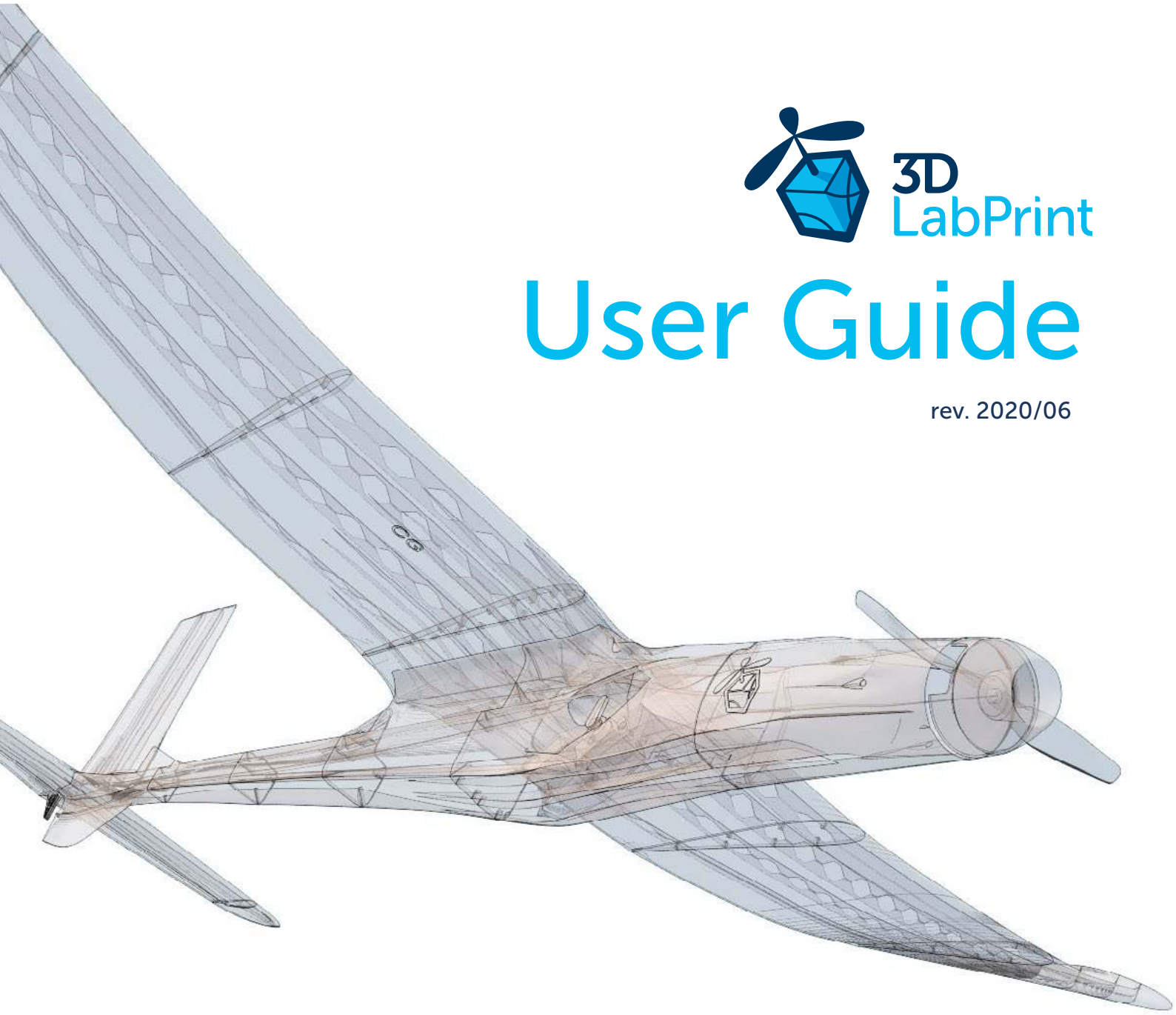


3D LabPrint

User Guide

rev. 2020/06

Fully 3d printable

Bungee Prop

wingspan 1180 mm / 46.5 inch - 320g / 11.3oz

LW planes

Bungee Prop
fully printable extra stable R/C glider.

With its flight weight of 320g, this is a very capable glider. This plane has been designed for foaming LW-PLA filament to be printed in a continous vase/spiral mode (without retractions).

The first fully printable airplanes with files prepared for your 3Dprinter, with flight characteristics, comparable or even supperior to classic build model airplane. This is not a dream, now you can print this HI-TECH at home. Simply download and print the whole plane or spare parts anytime you need just for a cost of filament only about $12

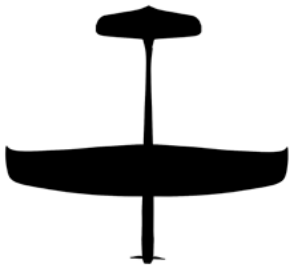
Extensive hi-tech 3d structural reinforcement making the model very rigid while maintaining a lightweight airframe and exact airfoil even it's just a plastic. This perfect and exact 3d structure is possible only thanks to additive 3dprinting technology. So welcome to the 21st century of model flying and be the first at your airfield.

Easy to assembly, you don't need any extra tools or hardware, just glue printed parts together and make pushrods for control surfaces. The rest of the assembly is very easy. Simply add brushless motor, ESC, servos and radio system. Don't worry, detailed step by step PDF/VIDEO is included.

You'll get an extra stable and lightweight airplane, able to fly and land on its own wihout any stick input such as free gliders do, so eventually you can use it as a free glider or to learn RC flying basics. Great as a first RC plane suitable for calm weather conditions.

General specifications:

Wingspan:	1180 mm / 46.5 inch
Lenght:	1070 mm / 42.1 inch
Height:	260 mm / 10.2 inch
Wing area:	21,2 dm2 / 2.3 square feet
Wing loading:	15,1 g/dm2 / 4.9 oz/square feet
Center of gravity:	84 mm / 3.35 in from leading edge CG tag on wing...
Airfoil:	3DLabPrint glide flight 03
Print weight (LW PLA):	216 g / 7.6 oz
Takeoff weight (2s 350 lipo):	320 g / 11.3 oz
Never exceed speed, VNE:	40 km/h / 25 mph
Design maneuvering speed, VA:	32 km/h / 20 mph
Stall speed, VS:	7 km/h / 4 mph

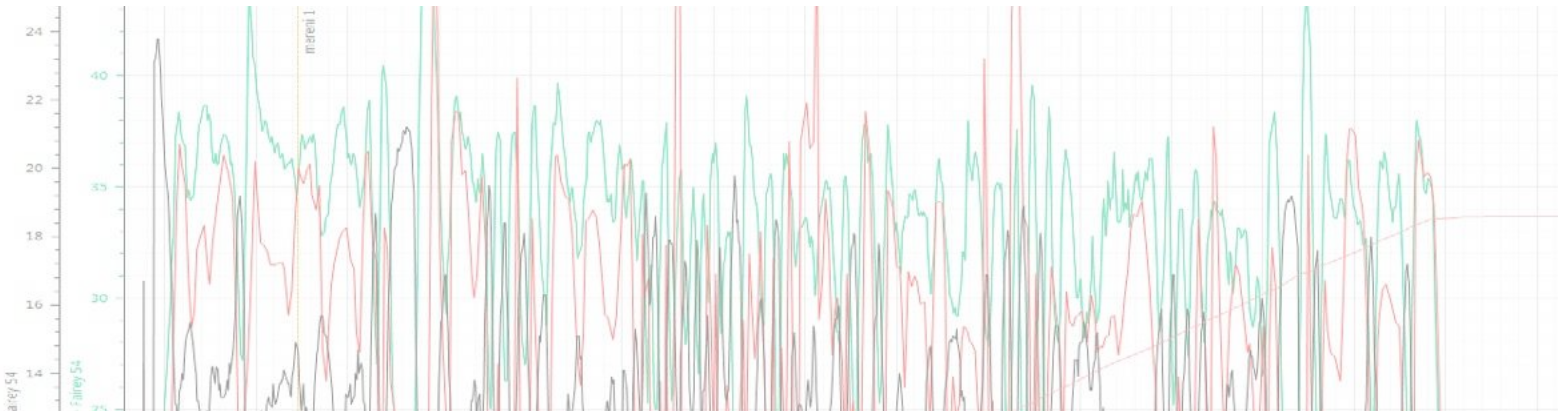


Recommended setup

Motor:	2805 - 2800KV - 26g
ESC:	Turnigy 12A or similar
Propeller:	two blade GWS 5 x 3 (ugly orange)
Battery:	LiPol 350mAh / 2s

Performance measurement

Max speed VH (level flight):	35 km/h – 18.9kn – 22mph
Rate of climb:	15 m/s, 2950 ft/min
Flight time (350mAh/2s):	+30min (glider flying)

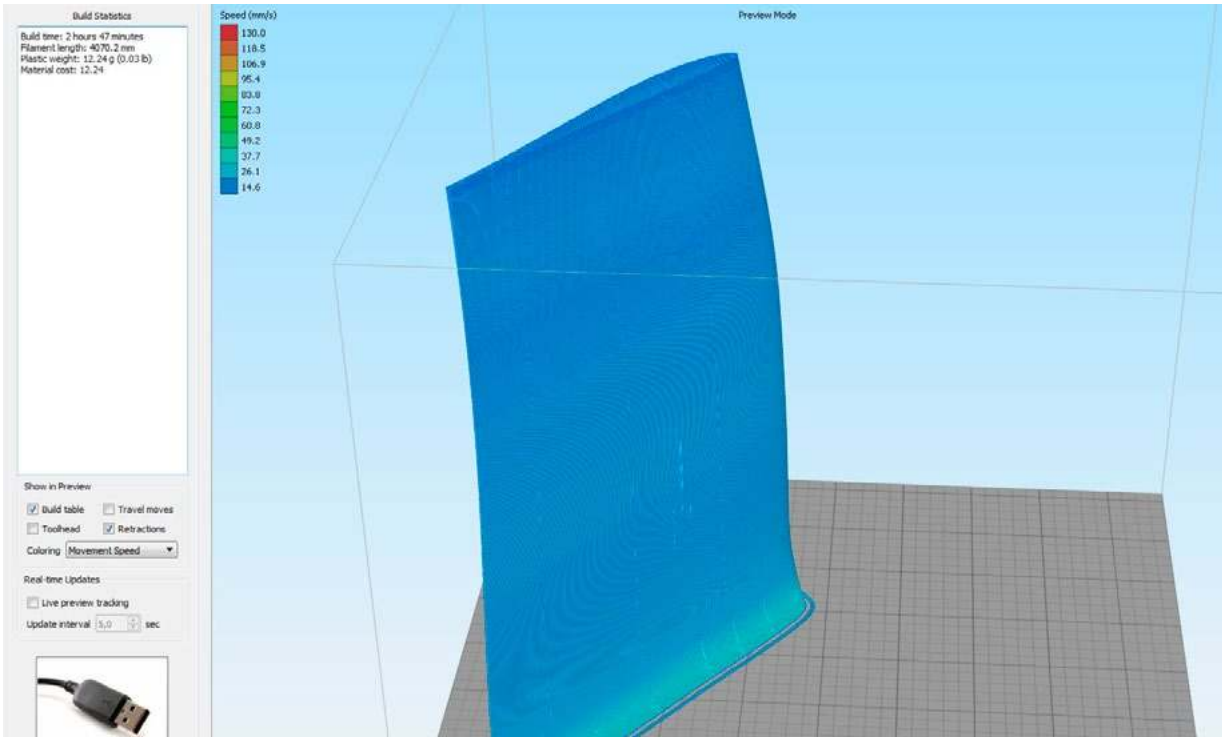


Included:

1. STL 3d files

Universal STL files designed to be used with desktop FDM 3d printers and slicer software as Simplify3D (recommended), CURA or MatterControl (these STLs are not compatible with Slic3r).

2. Factory files for Simplify3D slicer - preffered



Contains all the necessary settings to slice the models along with suggested bed layout. We're using PRUSA i3 ORIGINAL printers so you may need to adjust the basic printing parameters to match your printer or use these files as a start point for you. Please check the Simplify3D

3. Step By Step PDF/VIDEO userguides

Apart from this userguide, please see the Printing Guide to find some Tips and Advice for airplane printing (Thin Wall Printing).

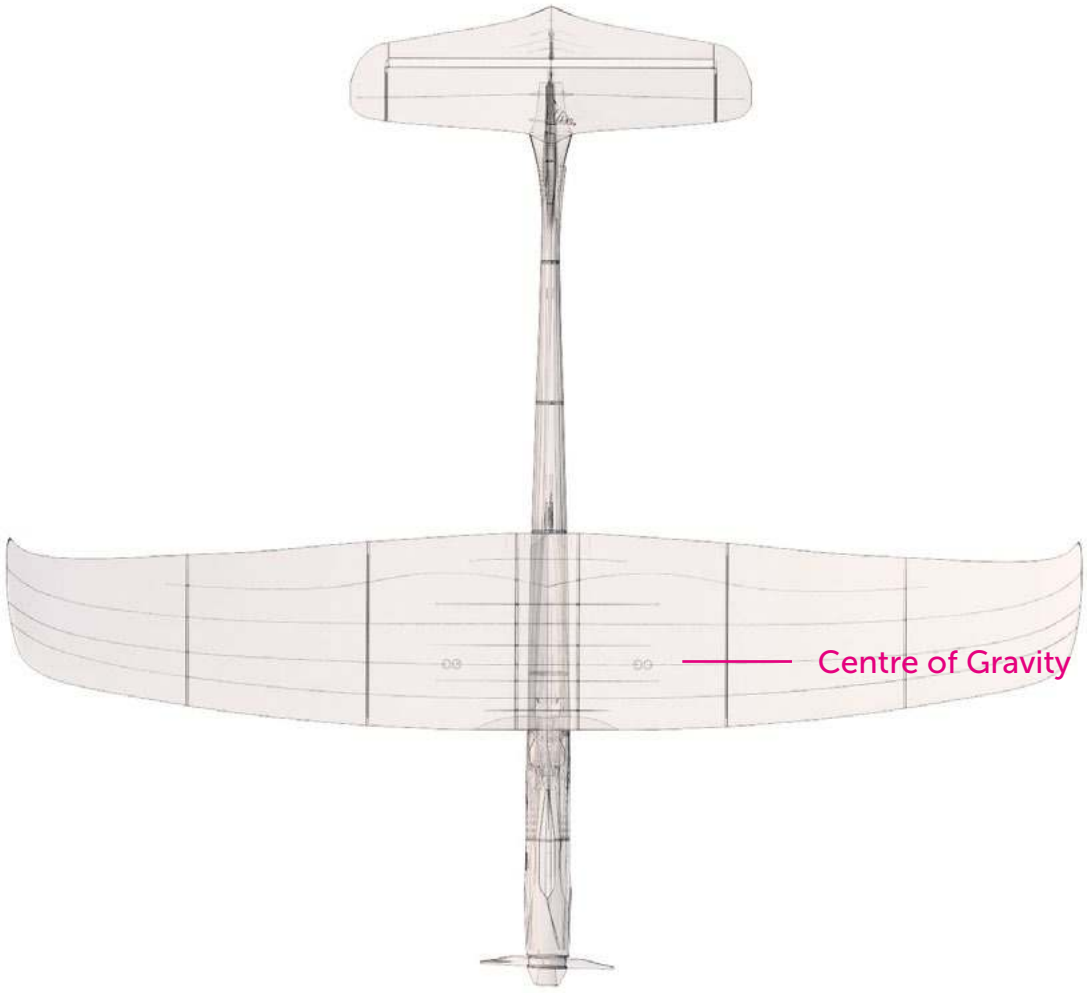
4. Gcodes

Basic Gcodes prepared for direct use, as universal as possible. Should work on i3 style printers, Give it a try, but we can't guarantee it will work on your printer.

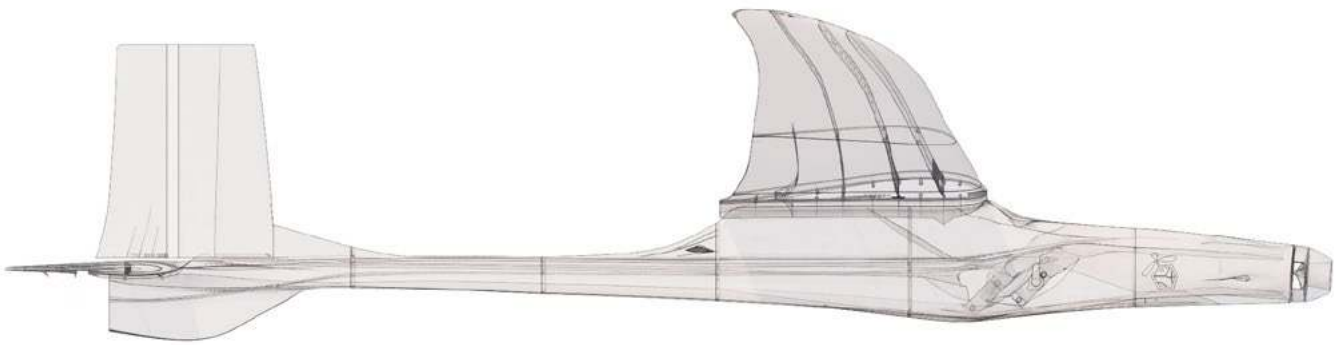
5. Slice on your own with CURA or MatterControl slicers

If you for any reason don't like Simplify3D, there is always option to use another free slicer Please follow our Cura guide in the Help section of the website where you can find the basic single-wall profile. Remember: We use 0 retraction with LW-PLA and a continous vase mode.

Bungee Prop



Wing area: 21,2 dm2 / 2.3 square feet



Lenght: 1070 mm / 42.1 inch

Wing span: 1180 mm / 46.5 inch

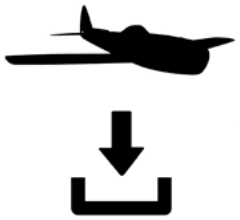
Step By Step PDF/VIDEO userguide

1. Choose airplane at www.3Dlabprint.com, visit our Facebook for latest info.

Basic requirments for Bungee Prop are 195/195/200 mm volume, nozzle 0.4mm recommended (0.35 or 0.5mm alternativelly). Heated bed recommended. Designed to be printed with LW PLA filament.
Contact: support@3dlabprint.com

2. Create account, download

You will receive download link to all the zipped files to your email (please check your spam folder if not) or you can log in to your account and download directly from our websites.



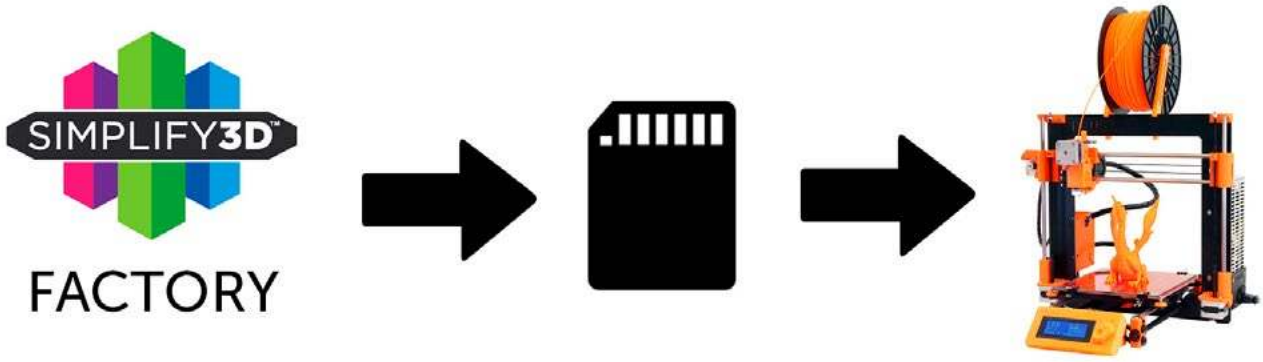
3. Gcodes preparing

option A Gcodes:
if your printer is i3 comptatible you can use prepared gcodes directly. Just save them to the SD card and let the 3d printer do it's job. HE temperature is set to 250°C so the layers fuse together well (with great foaming effect), you can adjust speed and temperature only through your printer's LCD. If these Gcodes does not work for you, please proceed to the next options.

option B Factory files Simplify3D (recommended):

Note: check proper extrusion multiplier for each part - see weight chart on page 11.

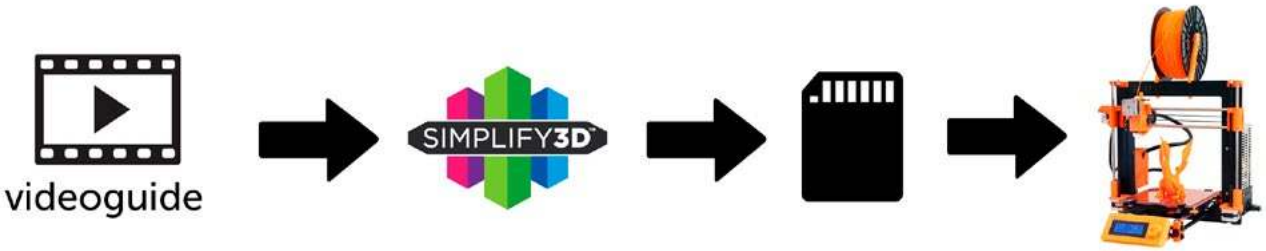
We prepared all you need in these files (FFF process settings, parts layout on bed, etc...) You can use these settings as a start point. Adjust according to your need (adapt for your printer), print single parts and so on... Most 3d printers should work just with these settings, but please go through the settings and amend if necessary, we are not liable for any damage resulting from using our settings. If this still does not work for you, please proceed to the next option.



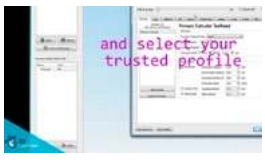
option C Simplify3D manual setting (watch and learn):

Note: check proper extrusion multiplier for each part - see weight chart on page 11.

Use our video guide 2 and check our Simplify3D reference guide for proper setting... this is very good option and you will learn a lot about Simplify3D and become an 3d printing expert. Remember: We use 0 retraction with LW-PLA and a continous vase mode.



AND... please watch our VideoGuides:



video 2 Simplify3D setting

video about Thin Wall Printing (normal PLA)

option D CURA or MatterControl

Note: check proper extrusion multiplier for each part - see weight chart on page 11.

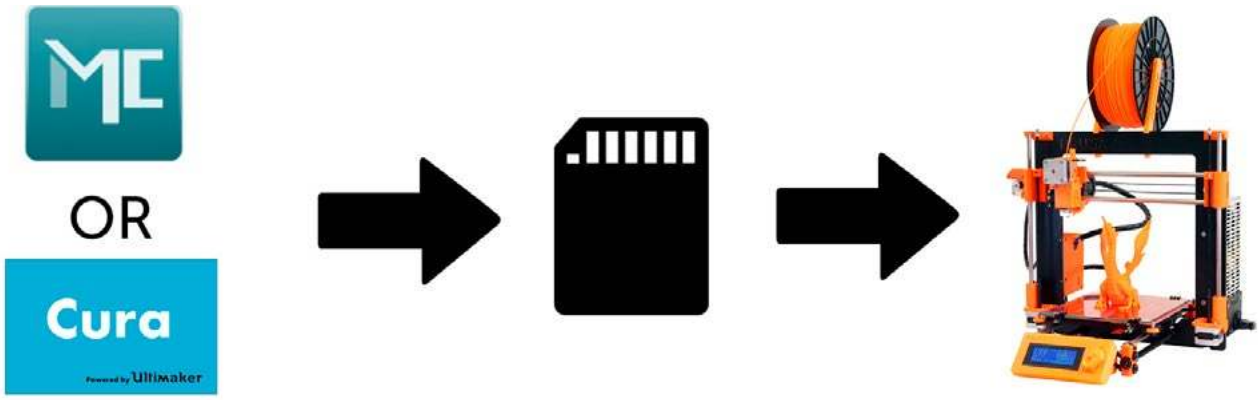
MatterControl and CURA are free and provide satisfactory results. The airframe is still strong enough, but don't expect the best quality. Both slicers lacks some very useful features, and finer settings, like multiple processes according to Z height, retraction options, layer start, etc.

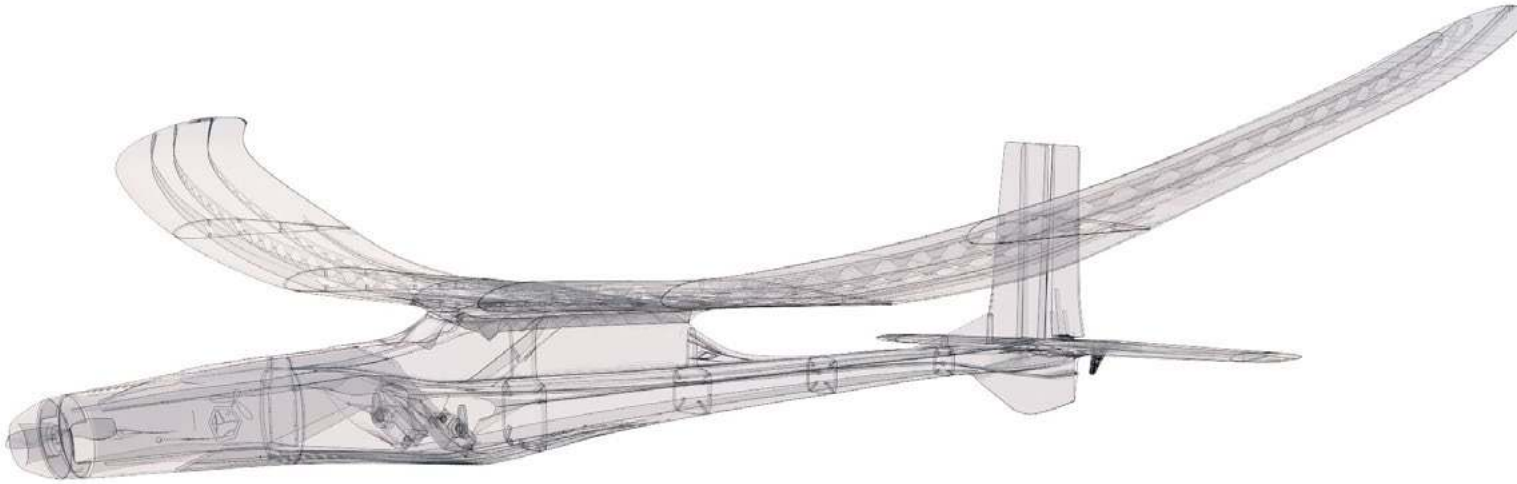
Please try to find the best extrusion multiplier and temperature for good weight and best possible layer bonding. Look at parts weight list for proper multiplier settings.

As a starting point you can use our predefined CURA or MC slicer setting file - see below (always adapt it for your printer, change build volume, filament diameter, etc... according to your printer!!!)

Please check our CURA guide on the website for the latest basic profile. Please visualise our presliced gcodes to see how the result should look like and try to achieve the same in your slicer. Remember: We use 0 retraction with LW-PLA.

Please watch our VideoGuides...





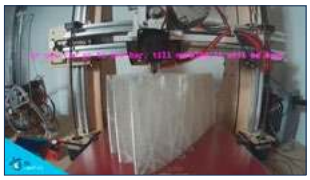
4. Print it

Save the prepared Gcodes to the SD card and insert into your printer. Prepare your printer and start printing, we prefer to use SD card rather than direct USB connection. Scaling the model will lead to unusable result!

you will need: LW PLA filament
3DLac, Strong hair spray, PEI or your favorite adhesive bed surface
Razor blade

AND... please watch our VideoGuides:

printing guide video



LW planes

Basic Tips and Advice

This plane has been designed to be printed from foaming LW-PLA that means about 60% weight reduction on printed parts (with this multiplyer setting).
Note: check proper extrusion multiplier for each part - see weight chart on page 11.

Please Experiment with temperature and extrusion multiplier. Hotend temperature is very important (230° up to 250° celsius). The temperature determines, how much the LW-PLA foams while printing. Cranking up temperature means, you can go lower on multiplier as the material will gain on volume. Turn OFF cooling fan for better layer adhesion (HE fan should be ON). We dont need it for thin wall printing. Heated bed is very recommended, 55° Celsius (to prevent warping ends).

Price of the LW-PLA may look a bit steep at first glance, but since we're using 50-65% less material thanks to the foaming feature, the cost difference is not so high as it may look.

LW-PLA by ColorFabb comes in two colours. White and Black. We found no difference in printing of both colours, but the black colour will probably attract the sunrays more, causing warping of the thin wall surface. There are many 3d printers on the market, most of them are capable of printing our airplanes (specific thin wall printing...) suficient volume, heated bed, 0.4mm nozzle.

Please see the Printing Guide (FAQ):

Enjoy the fun together!

Bungee Prop is another of a new LW Planes series designed for easy and cheap flying. The build is simple even for a beginner. It's very low weight, easy assembly and fantastic flight characteristics makes this model an ideal plane for beginner RC pilots.

Very suitable for dads and kids. Children will learn some modern building skills and technology and most of all have fun. This is the reason, why every dad should have a 3D printer at home.

This model has been completely designed with a new LW PLA material by ColorFabb in mind.

Parts printed from this LW PLA are light, easily sanded and glued together. This model requires only about 220 g of this material, that means it's a very cheap build. In case of accident, parts can be easily reprinted with just a filament cost.

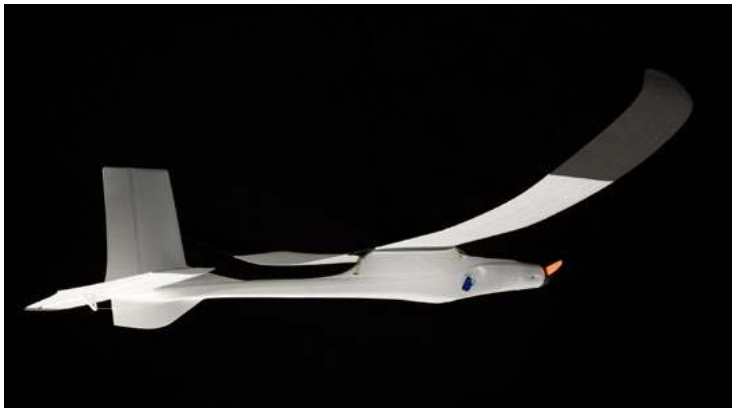
We've been testing this material for half a year before the first LW plane was released... The material is using an active foaming technology to achieve lightweight, low density PLA parts. At around 230°C this material will start foaming, increasing its volume by nearly 3 times.

All parts of this plane should be printed from LW-PLA.

Note: check proper extrusion multiplier for each part.

Bungee Prop weights of printed parts extrusion setting

fuselage	LW PLA
F1 (extrusion m. 0.50)	11 g
F2 (extrusion m. 0.50)	22 g
F3 (extrusion m. 0.40)	12 g
F4 (extrusion m. 0.40)	7 g
F5 (extrusion m. 0.40)	6 g
F6 (extrusion m. 0.40)	8 g
wing	
wing L1 (extr. m. 0.40)	17 g
wing L2 (extr. m. 0.40)	19 g
wing L3 (extr. m. 0.40)	14 g
wing R1 (extr. m. 0.40)	17 g
wing R2 (extr. m. 0.40)	19 g
wing R3 (extr. m. 0.40)	14 g
wing C (extr. m. 0.50)	12 g
tail	
H stab. L1 (extr. m. 0.35)	9 g
H stab. L2 (extr. m. 0.35)	1 g
H stab. R1 (extr. m. 0.35)	9 g
H stab. R2 (extr. m. 0.35)	1 g
V stab. (extr. m. 0.35)	10 g
accessories	
m. mount (extr. m. 0.5)	4 g
spinner (extr. m. 0.5)	4 g
all printed parts	216 g



LW planes

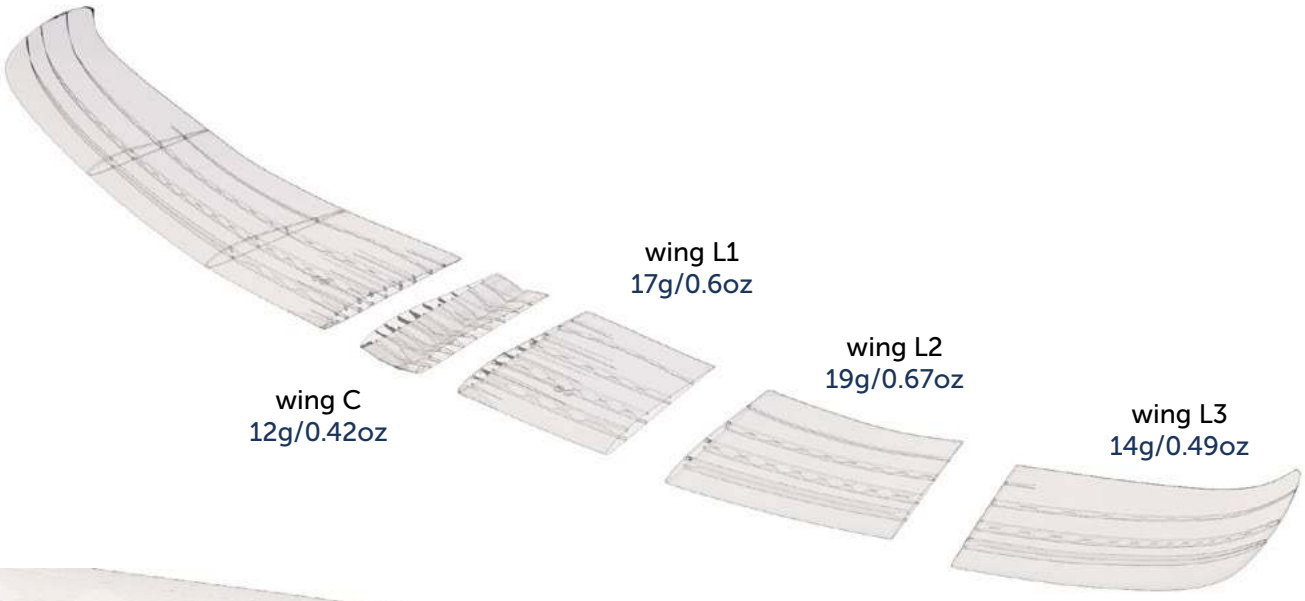
5. Assembly of printed parts

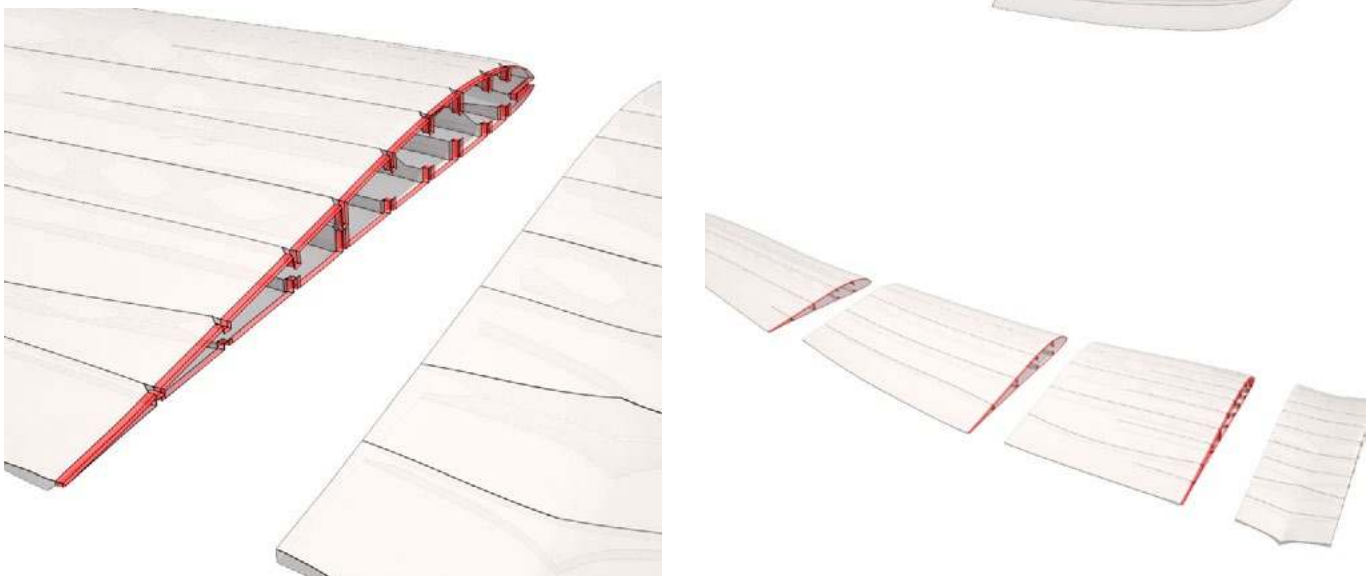
5.1 Wing assembly

Glue wing parts together. The new 3DLabPrint lock system will help you. Repeat for the right side. Glue both halves of the wing together. Use the CA glue and activator to speed up the glue curing.

See video guide #4

you will need: CA Glue medium viscosity + activator
Snap knife, some cloth for wiping CA glue...





5.2 Fuselage assembly

You can use snap knife for cleaning the surface of printed parts (joining spots), but mostly it is not necessary.
Glue fuselage parts F1-F6 with CA glue together. The new 3DLabPrint lock system will help you.
Use any hot tool to cut out the hole for rubber band in F4 part (main wing join).

See video guide #5

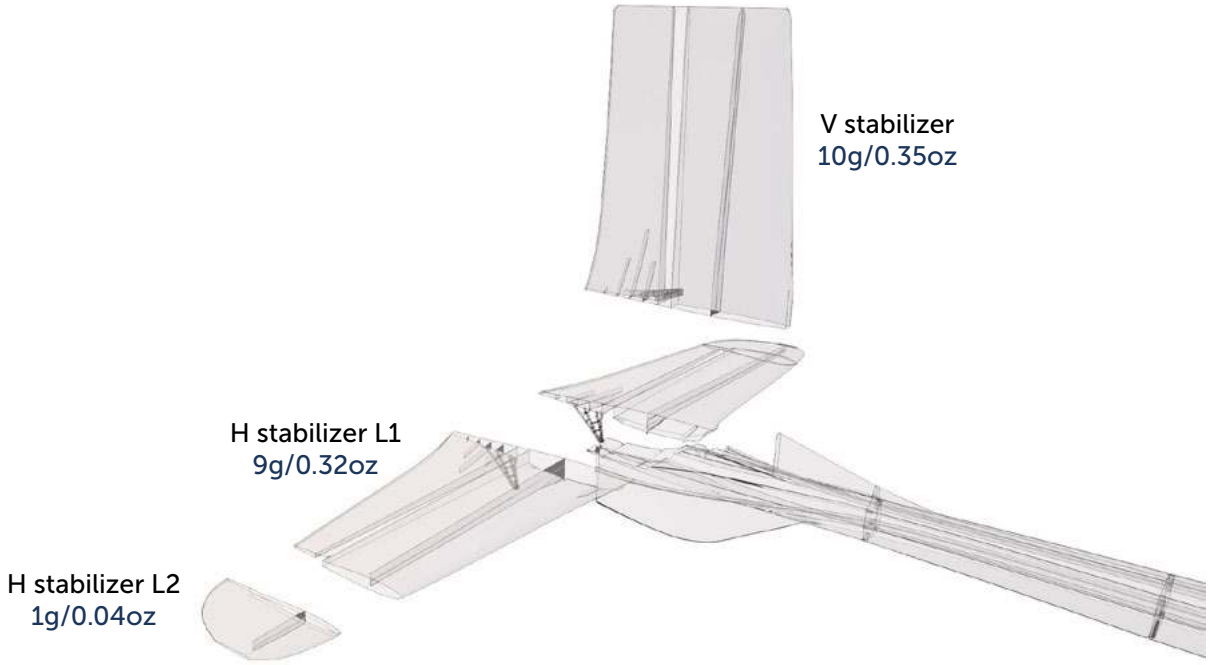
you will need: CA Glue medium viscosity + activator
Snap knife, Soldering Iron or any hot tool (dremel torch)

5.3 Fuselage tail

Use hot snap knife or any hot tool and cut out print bridge so the elevator can freely move (you can than cut some longitudal holes so the elevator hinges will be softer). Glue L1 and L2 parts of the stabilizer, proceede with R side and glue both sides together, then glue whole stabilizer/elevator to the fuselage.
V stabilizer/rudder - cut out the bridge the same way and glue it to the fuselage.

you will need: CA Glue medium viscosity+ activator
Snap knife, Soldering Iron or any hot tool (dremel torch)

See video guide #6

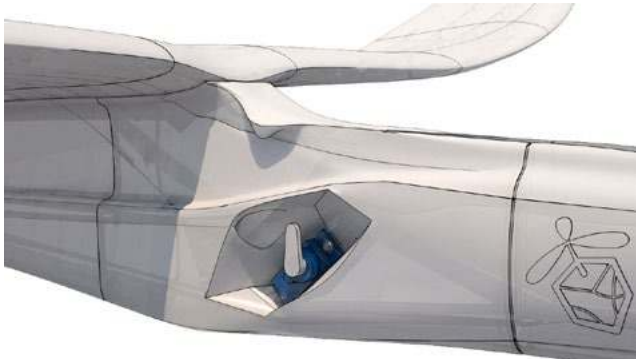


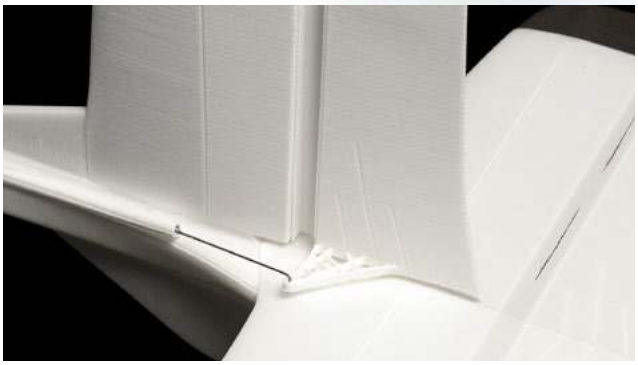
6. Servo and pushrod installation

Install servos to fuselage servo bays. Use a 0,6-0,8mm steel wire with L bends as a linkage between the servos and elevator/rudder control horns.

See video guide #7

you will need: 2x HXT900, or opt1, opt2, opt3 or any similar
23x12x26 mm / 0.74x0.42x0.78 inches
0,6-0,8 mm steel wire for elevator and rudder pushr
Snap knife, pliers





7. Motor & ESC

Mount the motor using small self-tapping screws to the printed universal motor holder. For long motors you can flip the holder to the front. Connect ESC and check rotation. Insert universal motor mount with motor into the fuselage in right position and secure with two screws.

See video guide #8

you will need:
6x 1.5/10self-tapping screws
soldering Iron, shrink tube...

Motor Setup

Motor: any 10-30grams, 28-05, 2800KV, opt1, opt2, opt3... or similar
+ suitable propeller holder (if not included)
ESC: any 12A/2s, opt1, with caution opt2 or similar
Propeller: two blade GWS 5 x 3 (ugly orange) or opt1, opt2 (use CCW)
Battery: 350mAh/2s, opt1, opt2, opt3, opt4,
Batt. connector: JST + shring tube

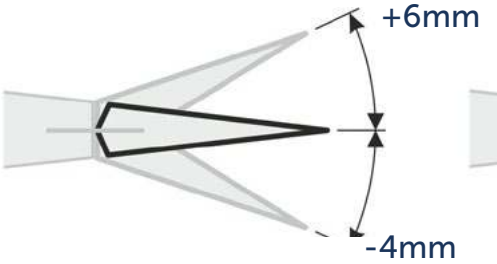
8. Final assembly/setting

See video guide #9

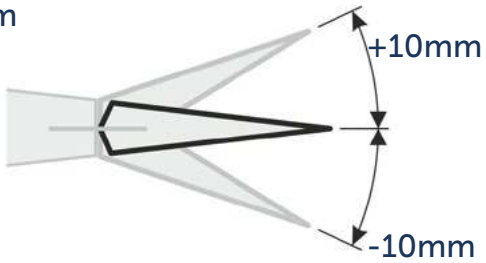
you will need: Your own Rx/Tx system
Rubber Band (thiny)

Refer to your R/C system userguide for setup information.
Install your reciever, connect battery, setup servos and etc. with your trasmitter, check servo position, then install propeller, and spinner.
Never set ESC with propeller installed, this could be very dangerous!

elevator



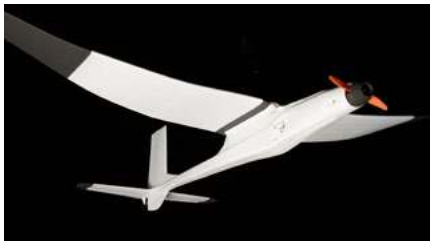
rudder



9. Go flying

Pre-flight check center of gravity is very important, battery properly charged, rudder and elevator deflection check, calm weather (wind under 5km/h, 3mph) ...

Bungee Prop -Flyght video



10. Pilots Please Attention! Wait for a calm weather.

With its 320g/11.3oz this is a very lightweight R/C Glider so We recomend to fly it only in very calm conditions (wind under 5 km/h, 3mph). You can then experiment with angle of attack by wedging the wing and shifting the Center of Gravity to achieve expected flight characteristics. By shifting the CoG backwards you can achieve better glide ratio (in this case you can go further because this plane is itself very stable). Feel free to experiment.

The plane is very stable and able to fly and land without any pilot inputs (given the plane is well tuned) so it can be used as a free glider as well (you need to use balast weight instead of a motor to achieve the CoG).

Never fly aft positioned Center of gravity (not too much in this case :-).

Please, use these files only for your own purpose, do not redistribute or publish. Thank you very much.
Enjoy your flight.

Shopping list

Printing material:	0,22 kg of LW-PLA by ColorFabb
RC:	R/C system, Tx (EU) (GLOBAL) + compatible Rx 4ch, or opt1 we use JETI
Motor:	any 10-30grams, 28-05, 2800KV, opt1, opt2, opt3... or similar + suitable propeller holder (if not included)
ESC:	any 12A/2s, opt1, with caution opt2 or similar
Batt. connector:	JST + shring tube
Battery:	350mAh/2s, opt1, opt2, opt3, opt4,
Servos:	2x HXT900, or opt1, opt2, opt3 or any similar sized servos 23x12x26 mm / 0.82x0.47x0.86 inches
Glue:	CA Glue - medium Activator for CA Glue
Other:	2x 1m of 0.8mm / 16 AWG pushrod wire 6x 1.5/10self-tapping screws Rubber Band (thiny)