F Series Flexible Resin Instruction

1. The Product Description

F39/F39T/F69 refer to white,transparent and black flexible resin respectively. The hardness of the prints is about 70A.The tensile strength and tear strength of the prints are very well,which close to the traditional acrylic rubber.The flexible resin is widely used for printing no matter large or small models, hollow structure or solid structure models.

F80 is an elastic resin with black and gum color,mostly like silicone rubber.F80 gum color resin is used to print elastic false gums. It is better to used in conjunction with 3D-printed dental models to ensure correct adjustment of dentures.

The products have passed the inspection and obtained ROHS and REACH certificates.

2. Material Properties Data

|	METHOD	F39/F69 DATA	F80 DATA
Shore Hardness	ASTM:D2240-05	60~75A	50-60A
Tear strength	ASMT:D624-98	47.2KN/m	9.75KN/m
Tensile Strength	ASTM: D412-06	7.9MPa	3.8MPa
Elongation at Break	ASTM: D412-06	255.10%	159%
Viscosity（25℃）	ASTM:D4212-10	980mpa.s	2300mpa.s
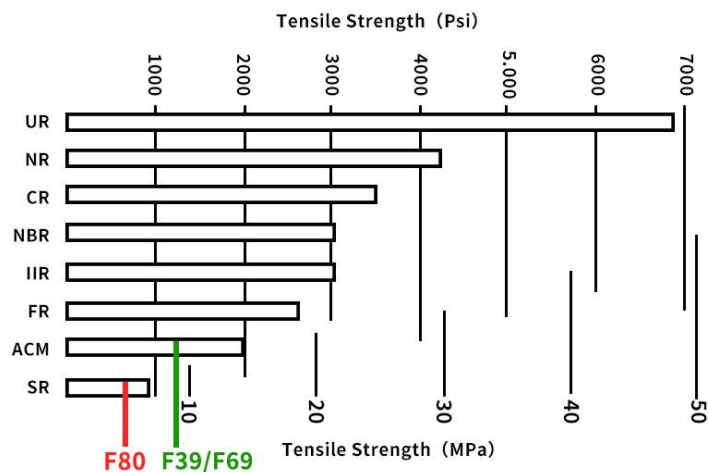
Comparison of tensile strength of various rubber materials at 25°C

3. Printing

Because the soft resin prints are easy to be stretched and deformed when they are separated from the FEP film during printing. Please following below steps in order to improve the success rate of printing.

I. **Model Location:** Please don't place the model in the middle of the build plate.Because F39/F39T/F69/F80 series resin is soft resin with high viscosity.(Fig2).The model should be placed at a certain Angle to avoid a vacuum sucker. (Fig1)
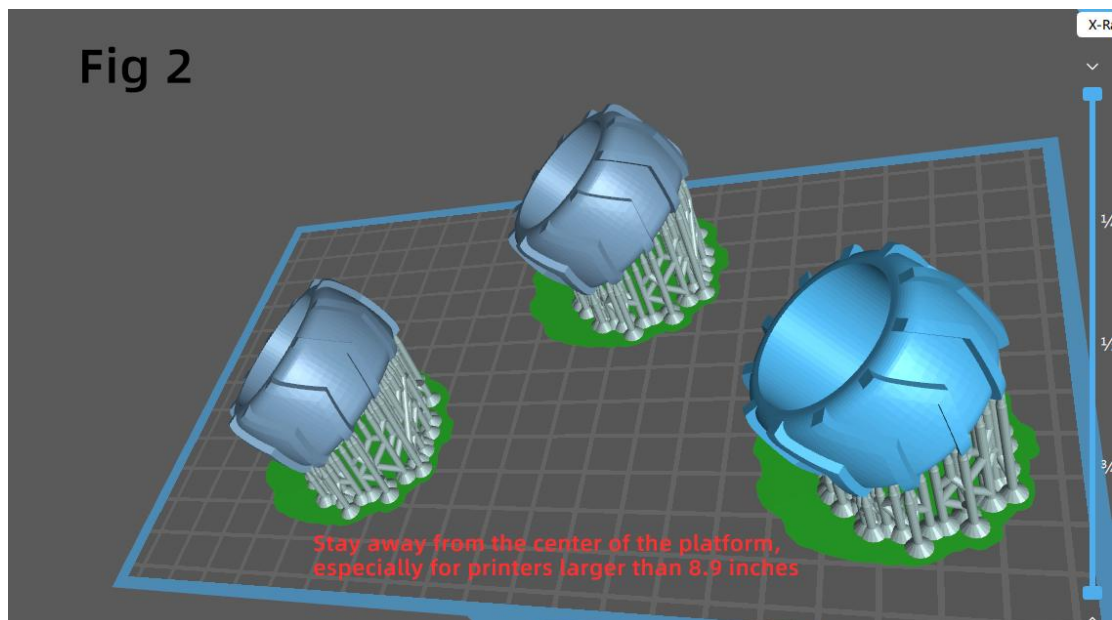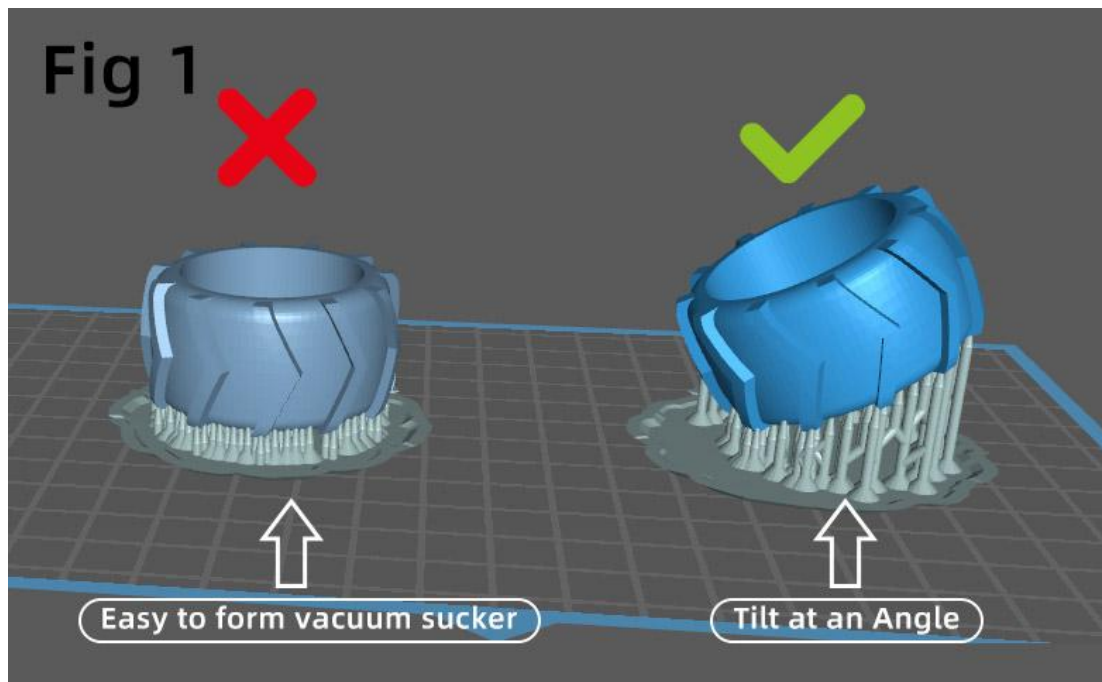
II. **Supports Settings:** Please use heavy and massive support (Density: 80%-95%), vertical supports (Angle: 0 °).The supports in the middle of the model also need to be thick.(Figure 3).A thin raft or none raft are much better considering easy remove the prints from the build

plate,because F series resin are very tightly stick to the build plate.
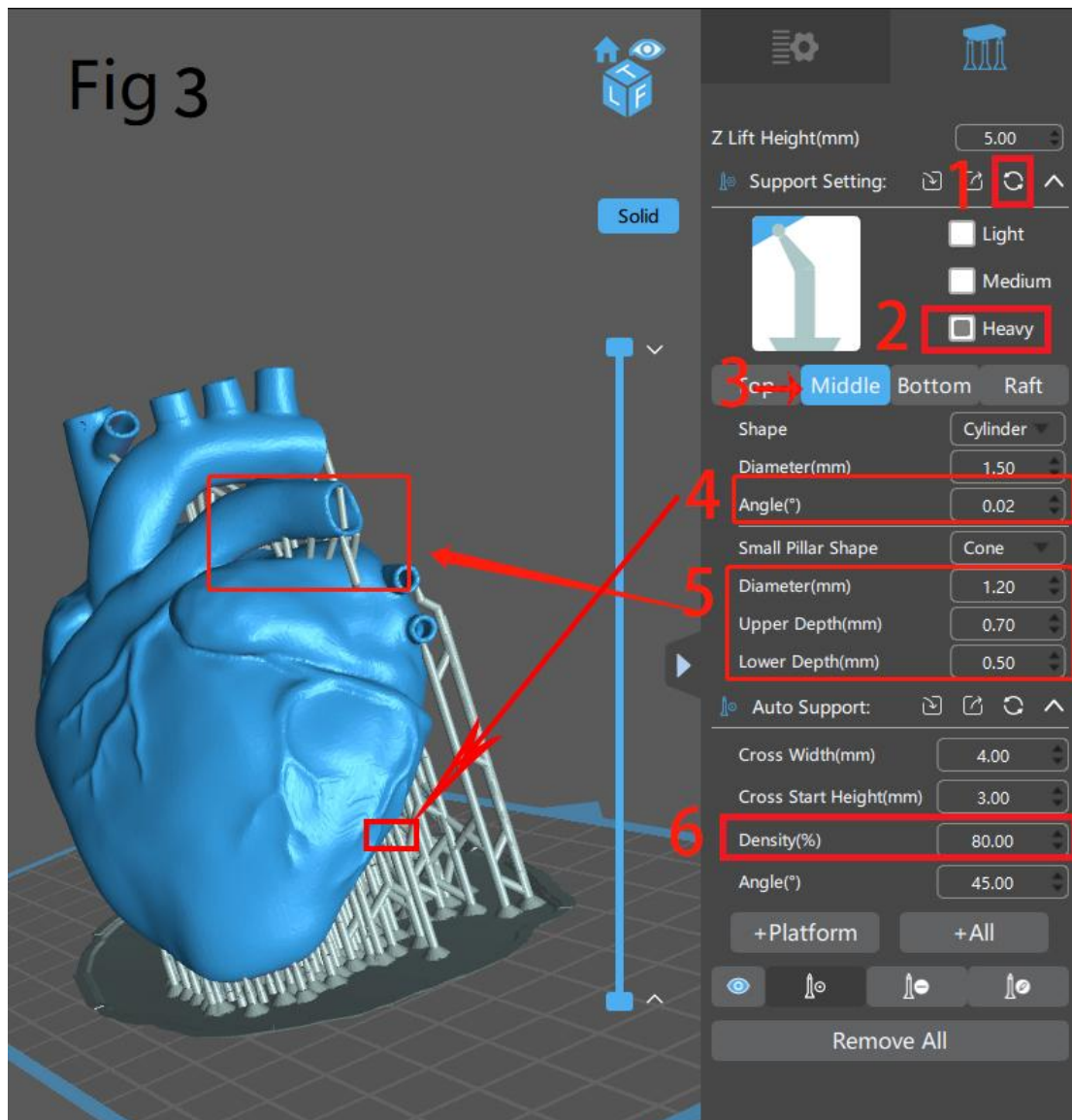
III. **Printing Settings:**The slow Lifting Speed is required to ensure that the model will not stretched and deformed; High Lifting Distance ensures that the printing piece is completely separated from the FEP film; Long Light-off Delay time ensures the resin fully backflow.

Use the standard resin settings of the printer brand you successfully printed as the "Standard Settings" (**25-30 ℃**), otherwise, use the default standard resin settings of the printer (or slicer) as the "Standard Settings". Then follow the following method to set the settings of RESIONE resin according to the "Standard Settings".

	Standard Settings	F39/F39T Settings	F39/F39T Settings	F69 Settings	F80 gum color /F80 black Settings
Layer Height(mm)	50	50	100	50	50
Bottom Exposure Time(s)	A	1*A	1.2*A	1.25*A	1.25*A
Exposure Time(s)	B	0.8*B	1.4*B	1.2*B	1.2*B

Light-off Delay (s)	D	D+1.5	D+1.5	D+1.5	D+2
Bottom Lift Distance(mm)	E	E+2	E+2	E+2	E+4
Lifting Distance(mm)	F	F+2	F+2	F+2	F+3
Bottom Lift Speed (mm/min)	G	60-120	60-120	60-120	60
Lifting Speed (mm/min)	H	60-120	60-120	60-120	60-120
Retract Speed (mm/min)	I	120-180	120-180	120-180	60-120

Note:

a. When the room temperature during printing is 18℃-24℃, change the settings as follows:

Bottom exposure time: (RESIONE resin settings) +15%

Normal exposure time: (RESIONE resin settings) +15%

Light-off Delay time: (RESIONE resin settings) +1s

It is recommended to heat the resin if the printing is still not successful.(The heating temperature is 60-80℃, heating time is 10mins). F series resin is not recommended for printing at room temperature lower than 18℃

b. The lifting of some printers can be divided into two stages. All the above settings for lifting only for to the first stage. The lifting speed of the first stage is generally very slow, no need to change

*The calculation of the above printing parameters is based on the experimental results of the RESIONE laboratory and is for reference only

4.Cleaning and Post-curing

Cleaning: You can use ultrasonic or 3D printing special cleaning machine with the ethanol(concentration≥95%), or IPA. It is not recommended to brush the prints with a toothbrush. Please use compressed air to dry the prints after cleaning it. It is a normal phenomenon if there are a little sticky hand feeling.

Post-curing: If you use a post-curing box with a power of 40W, our recommended post-curing time is about 10-20mins (Adjust the post-curing time according to the power of the post-curing box, the greater the power, the shorter the time). So you can get a dry surface print.

RESIONE Resin	F39/F39T	F80	F69
Cleaning time	≤3min	≤3min	≤3min
Cleaning solvent	95% Ethanol or IPA	95% Ethanol or IPA	95% Ethanol or IPA
Post-curing light source	385-405nm UV (40W)	385-405nm UV (40W)	385-405nm UV (40W)
Post-curing time	10-20min	10-20min	10-20min

Attentions:

a. Too long post-curing time will make the resin prints easy to warping, hard and brittle.

b. The resin prints will be fragile after post-curing. It is not recommended to apply force to the prints immediately. Just need to wait for a while until the internal stress of the prints is completely released.

5.Use and Save

a. Add the needed resin liquid when printing. To avoid moisture absorption of resin,please filter the remaining resin as soon as possible and pour it into a new light-proof container for sealing and preservation after printing.

b. The prints can maintain normal performance at 25-35°C, and they will become hard and brittle at low ambient temperature like traditional plastics.F series of soft resin prints show more obvious, F39/F69/F39T printings will become harden and lose flexibility if the temperatures below 20°C. The lower the temperature, the harder the prints become.

The F80 prints retains good elasticity at low temperatures, but feels harder than it does at normal temperature.

c. In order to make the flexible resin prints maintain good flexibility for a long time.It is recommends that save the prints in sealed bags or apply a layer of soft waterproof coating.

For more questions, please contact support@godsaid3d.com