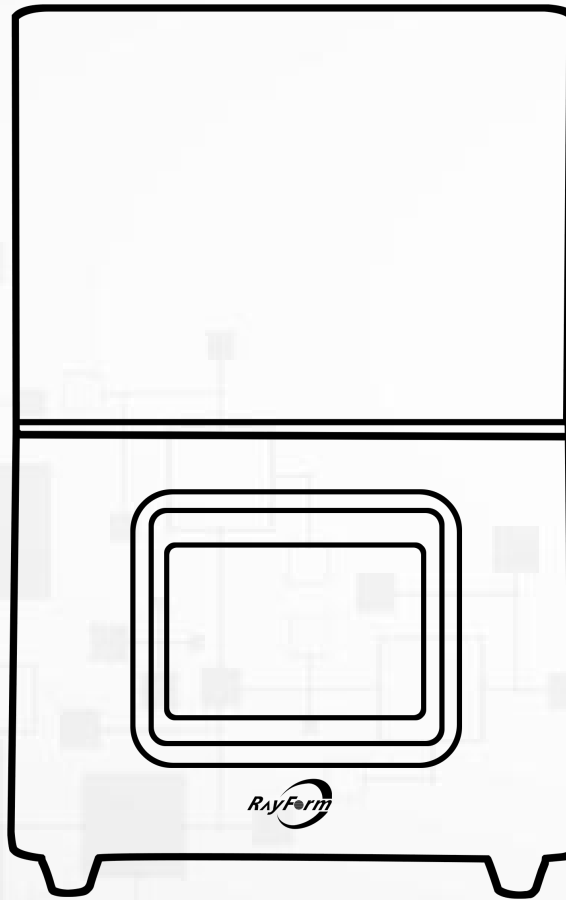




Dental 3D Printer

User Manual

Dear customer,

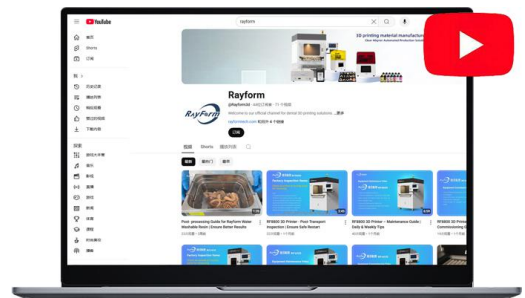
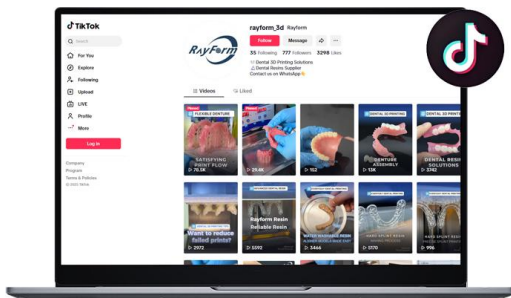
Thank you for choosing RayForm products!

Maybe you are familiar with 3D printing technology or have purchased RayForm printers before. However, we still highly recommend you read this manual carefully, as the installation techniques and precautions can help you avoid any unnecessary damage or frustration.

1. Please visit <https://www.rayformtech.com> to contact us if you have any questions. You can also learn more information from the website, such as software, videos, models.

2. Social media platforms:

The official social media platform will regularly release updated information on the 3D printing industry, cutting-edge technical news, and common product technical guidelines.



RayForm Official

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Team RayForm

Safety Instructions

Always follow the safety instructions during assembly and usage, to avoid unnecessary damage to the 3D printer or individual injury.

1. Please contact our Customer Service if you have any issues after receiving the products.
2. In case of emergency, please immediately cut off the power of the 3D printer and contact our technical support.
3. UV light is harmful to the eyes; please avoid direct contact. when operating, wear protective equipment such as anti-UV goggles and gloves.
4. RayForm 3D printer includes components that can cause injury.
5. When the Temperature control resin vat heats up for a long time its surface temperature becomes high. Avoid touching the resin vat without protection after heating.
6. Be cautious when using the scraper, and make sure to orient the sharp parts of machine and tool away from people.
7. Keep the RayForm 3D printer and its accessories out of the reach of children.
8. Vapors or fumes may be irritating at operating temperatures Always use the RayForm 3D printer in an open and well ventilated area.
9. Do not expose RayForm 3D printer to any water or rain environment.
10. Use RayForm 3D printer in an environment with a temperature of 5°C-40°C and a humidity of 20%-80%. For optimal performance, do not exceed this range. Also, avoid direct sunlight exposure.
11. Do not disassemble RayForm 3D printer, please contact technical support if you have any questions.

After-sales service

Process Support: support@rayformtech.com

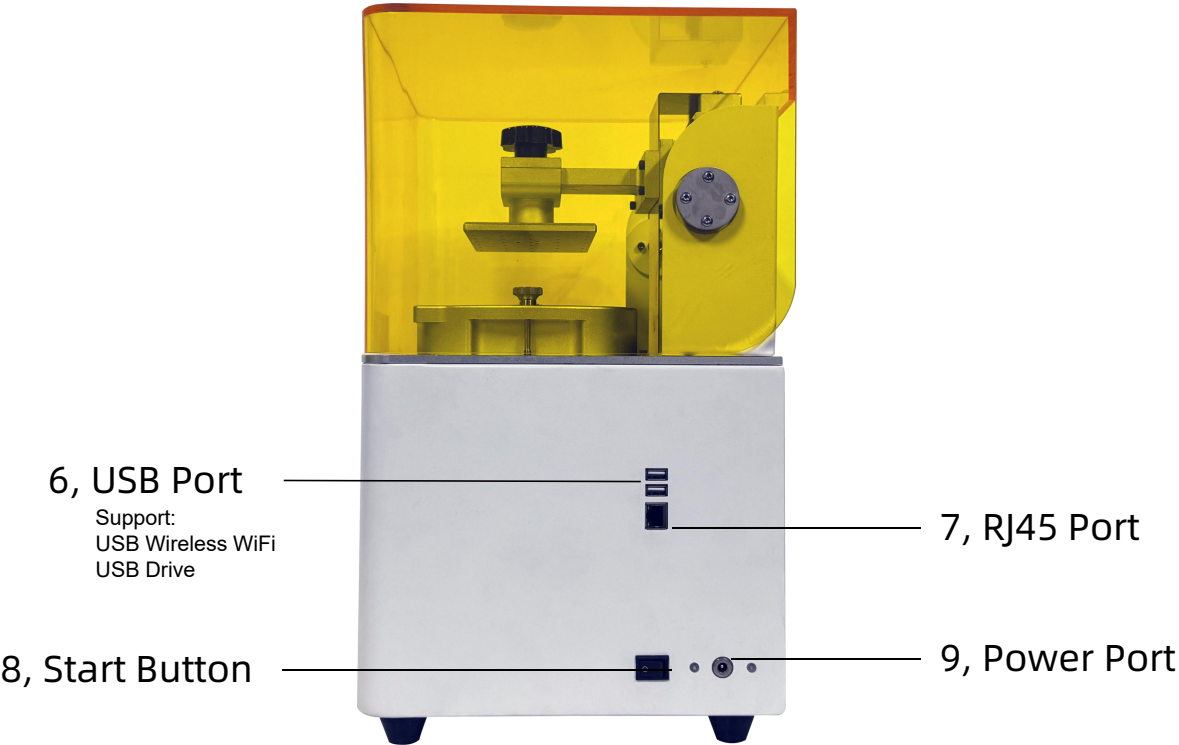
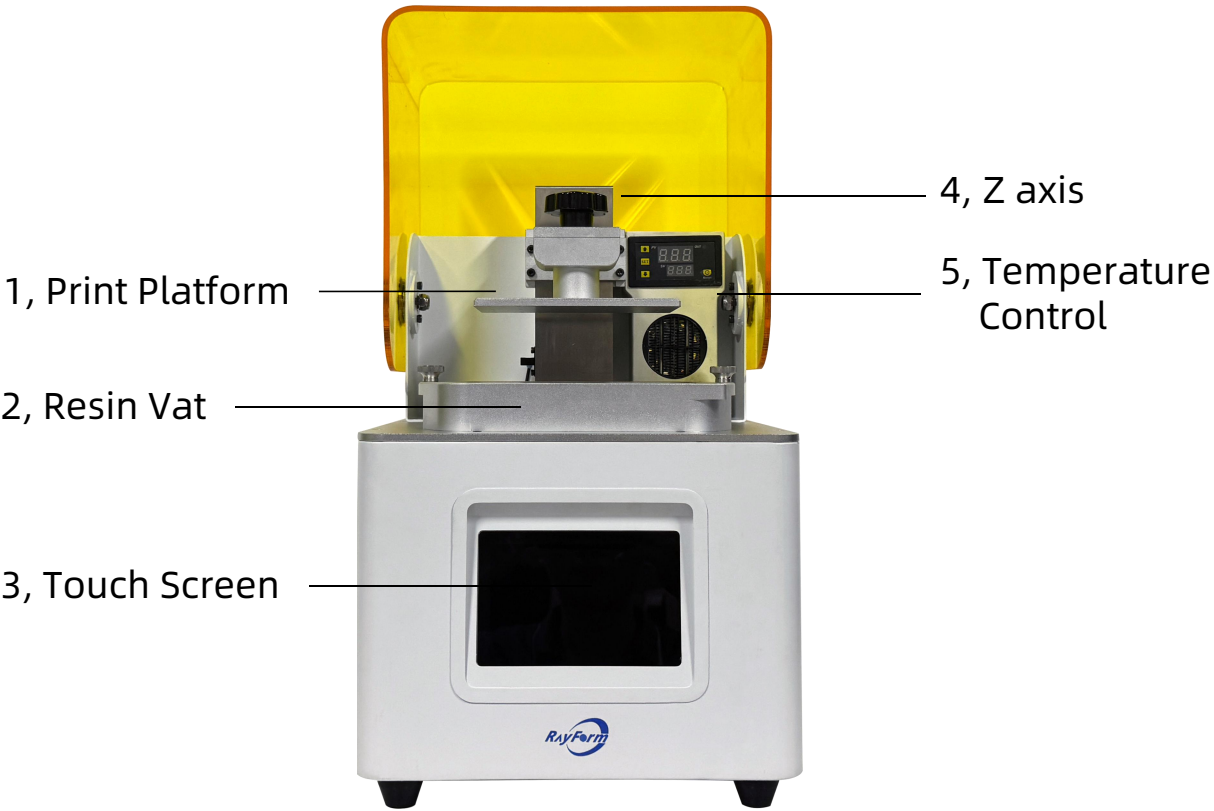
Customer Service: contact@rayformtech.com



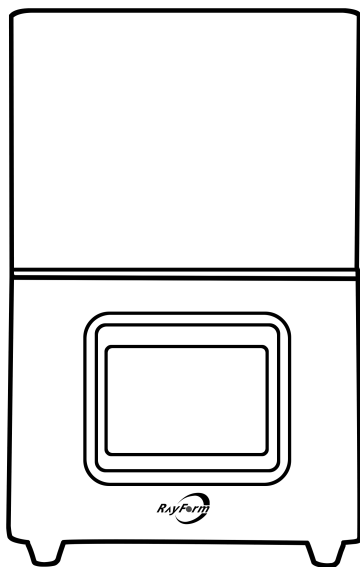
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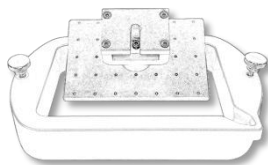
Product Overview



In the Box



RF-3024D



Print platform



Power Supply



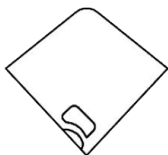
Manual



USB drive



Metal shovel



Funnel



Protective mask



Protective equipment



Plastic shovel

Technical Specification

Operating System

System	RayForm 3D Printer System
Operation Screen	5-inch capacitive touch screen
Software	ChiTuBox (Support .ctb file)
Connectivity	USB Drive, WLAN

Specifications

LCD Screen	6.6 inch 4K
Light Source	COB light
XY Resolution	4098*2560
Z axis Accuracy	0.01 mm
Suggested Layer Thickness	0.01~0.15 mm
Power Supply	24V - 3A

Physical Dimensions

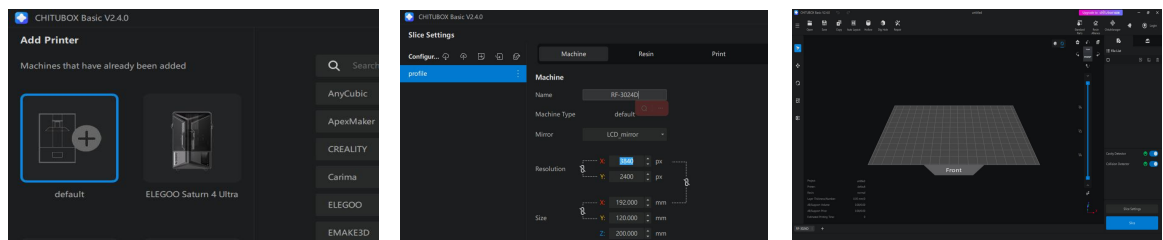
Dimension	300(L)*280(W)*430(H) mm
Build Volume	A: 143(L)*90(W)*80(H) mm B: 85(L)*85(W)*80(H) mm
Weight	13kg

WLAN

Interface	RJ45 100M
WIFI	2.4Ghz

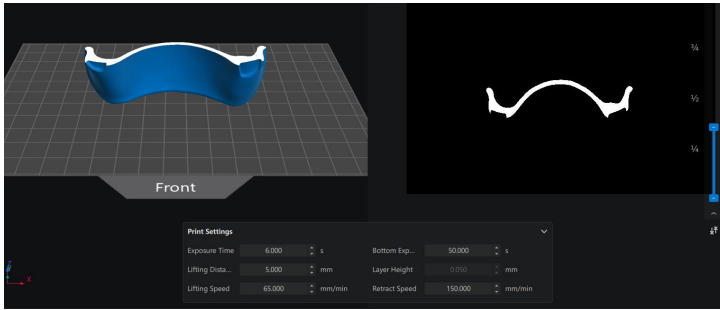
Slice File

- 1. You can choose to install the slicing software provided in the USB drive or download it from the official website (www.chitubox.com) and install it on your computer.
- 2. Since the RF-3024D is an innovative three-platform integrated 3D printer, when using CHITUBOX Basic, additional device information and print platform parameter settings are required. (Two different platform parameter settings)



Platform	Name	Resolution		Size		
		X	Y	X	Y	Z
	Normal	4098	2560	143	90	80
	Small			85	85	80
	Dual			143	90	80

- 3. Import the 3D model into CHITUBOX Basic, and perform operations such as repair, shell removal, hole drilling and adding supports. The software installation package and operation guide can be found at: <https://docs.chitubox.com/en-US/chitubox-basic/latest/ui-and-features/configure-print-parameters>
- 4. Setting the printing parameters in the software, you can modify the required parameter groups in the resin options. USB drive also have three types of resin models slice files: orthodontic tooth molds, elastic bases, and temporary crowns. Select the appropriate file for printing based on your actual needs.



- 5. After completing the settings, perform the slicing operation and save the sliced file in the .ctb format. Then, import it into the USB drive.

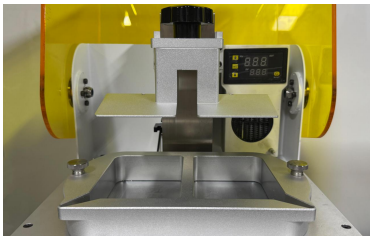
Recommended Print Parameters

Parameters Group	Dental Model Resin	Invisible Denture Base Resin	TEMP C&B Resin
Layer Thickness	0.05 mm	0.05 mm	0.05
Exposure Time	3.5 s	6.5 s	3.7 s
Rest Time After Retract	1.5 s	0 s	0 s
Bottom Exposure Time	20 s	30 s	35 s
Bottom Layers	3	4	4
Lifting Distance	7 mm	8 mm	7 mm
Retract Distance	7 mm	8 mm	7 mm
Lifting Speed	120 mm/min	60 mm/min	90 mm/min
Anti-alias	2		
Notice	1. RF-3024D is suitable for many dental cases. The above data are for reference only, and the specific effect is subject to the actual environment. 2, All RayForm production resins can adapt to the use of equipment, more printing parameters and Settings can visit the official website or consult us. 3. The ambient temperature of resin printing is recommended to be 20°C-30°C(68°F-86°F). If the ambient temperature is too low, the temperature controller can be opened to adjust the temperature of the printing room. Set the PV temperature higher than the SV temperature, greater than 2°C, and the heater will automatically start working. 4. For the first use, please test according to our parameters, do not modify at will. If you need to improve the printing speed, please contact us first. 5. The use of ACF release film can print 45000 layers normally. If you need to replace it, please use the same type.		

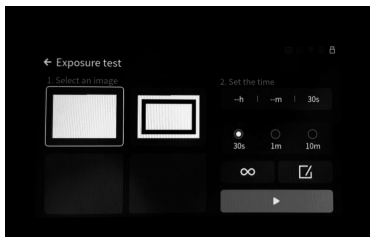
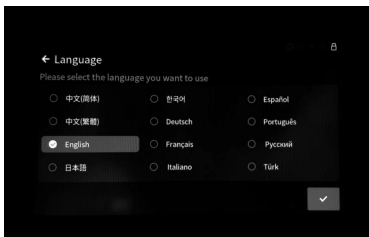
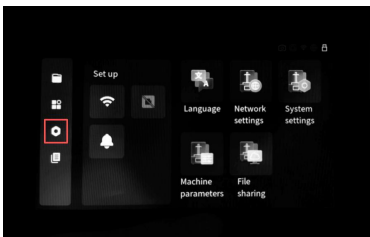
--The data above root in RayForm lab, only for reference.

Start Printing

1. Place the equipment on a stable work table, in a well-ventilated environment, avoid strong ultraviolet light, such as fluorescent UV disinfection lamp, so as not to affect the printing effect of abnormal curing.
2. According to the items to be printed, choose the appropriate printing platform and the corresponding material box to install, turn on the power supply, hit the boot key, and pour the required resin.
(Note: for long standing colored resin, shake for 2-3 minutes)



3. Select the appropriate language in the system interface Settings, and then select the pattern for exposure detection.



4. Import the prepared slice file into the U disk, and then insert the U disk into the USB interface on the right of the printer



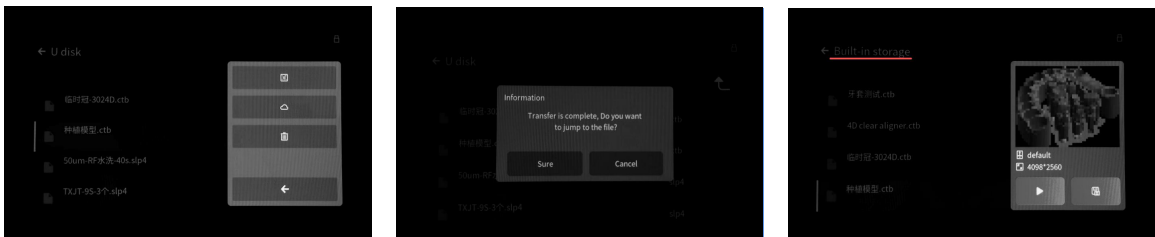
Suggestions for using U disk:
① It is recommended to use the USB flash drive that comes with the machine. If you use other USB sticks, make sure the USB stick has a capacity of less than 4G and that the format supports FAT/FAT32.
② Please put the print file in the root directory of the U disk to avoid abnormal file reading.

Start Printing

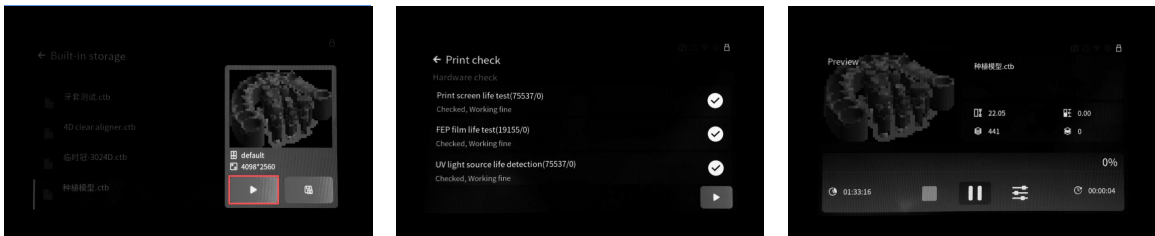
5. Select the model file to be printed on the printer touch screen and enter the detail page.



• The U disk file can be copied to internal storage, and the next printing can be initiated directly on the device.



• Select the files that need to be printed, and then click "Confirm Print".



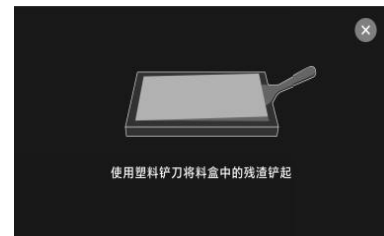
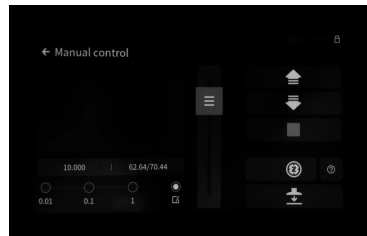
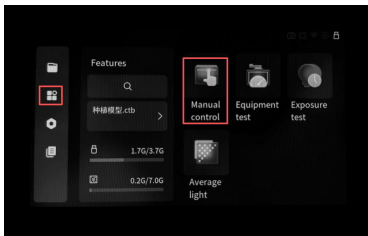
- **Print completed and lifted to the top:** After the printing is finished, the printing platform automatically rises to the top of the Z-axis.

6. Before printing, printer will conduct an intelligent monitoring to ensure that the printing process can proceed normally. If any error situation are detected during the monitoring process, the machine will automatically report an error, please handle it according to the tips.

Recycled Resin

1. After the printing is completed, wait until the remaining resin on the platform no longer drips. Then remove the platform. Next, use a metal spatula to remove the model and rinse the residual liquid resin on the model surface with 95% alcohol (or other cleaning agents). After cleaning and drying, perform other post-processing steps such as post-curing on the model.

2. When there is some solidified resin in the material box, plastic shovels can be used to clean the material box. Failure to clean in time will affect the subsequent printing process and may even cause damage to the release film and the exposure screen.



3. Remove the material box, pour out the remaining resin from the inclined opening of the box, and filter the resin using a filter screen and funnel. The funnel model file is provided in the complimentary USB drive. If needed, you can print and use it.



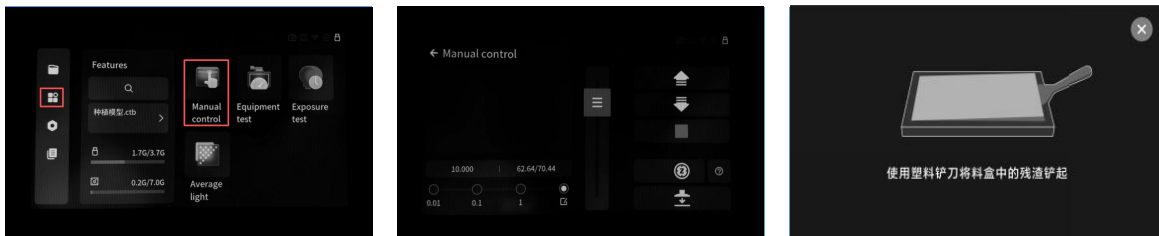
4. If the machine is not used for a long time, thoroughly clean the material box and store the resin in a light-proof and sealed container to prevent any deterioration that could affect its next use.

5. If the stored resin has not been used for a long time, it is necessary to shake it for 2-3 minutes before the next use to prevent the precipitation of pigments and other organic substances, which may affect the printing results.

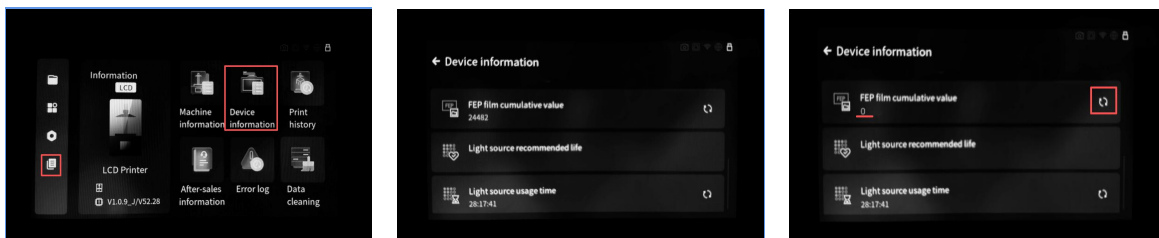
Machine Maintenance

Material box maintenance

- Remove the resin remaining on the release film: Use the tray cleaning function. For the final step, use a plastic spatula to scrape off the solidified resin layer by layer; do not use sharp objects to scrape the release film as it may cause damage.



- Replace the release film: Users can view the cumulative number of printing layers on the device's self-check interface and replace the release film in a timely manner according to the actual situation to avoid affecting the printing quality or causing resin leakage.



Reset the number of print layers after replacement

- If not used within 48 hours, please filter the resin and store it in a light-proof and sealed container.
- If resin gets on the tray, please wipe it clean immediately.

Z-axis maintenance

If there is a frictional noise during the Z-axis operation, please apply an appropriate amount of lubricating grease to the Z-axis screw rod.



Machine Maintenance

Firmware upgrade

- **Local upgrade:** Download the latest firmware from the official website and copy it to the USB drive. Be sure to delete any previous versions of the firmware on the USB drive. Then insert the USB drive into the printer and complete the upgrade.

Machine cleaning

- **Clean the printing platform:** Wipe it clean directly with a tissue or clean it with alcohol.
- **Protect the hardened surface:** If there is any resin adhering to the scratch-resistant film, please replace the scratch-resistant film immediately.
- **Clean the body:** Wipe it clean with alcohol.

FAQ

Complete the initial problem investigation by referring to the following solutions, or contact the after-sales support for additional assistance.

Printing

Model does not stick to the platform

- The exposure time at the bottom is insufficient. Please increase the exposure time.
- The contact area between the model's bottom and the platform is small. A bottom valve needs to be added.

2. Model fracture of the layer

- The machine shakes during the printing process.
- The release film becomes loose after long-term use and needs to be replaced.
- The printing platform or the material box is not tightened.
- The lifting speed is too fast.
- The shell model has not been drilled.

3. The model has layering patterns and deformations

- Check if there is insufficient support.
- Reduce the lifting speed.

4. There are tufts of something resembling kelp attached to the tray or the model.

- Excessive exposure has occurred. Therefore, the exposure time at the bottom and the normal exposure time need to be reduced.

Network connection

1. WLAN connection failed

- The WLAN name or password is incorrect. Reset the network and try reconnecting.
- The WLAN signal is poor or there is no network. Ensure that the current network environment is normal, then reset the network and reconnect.

2. Cannot add printer

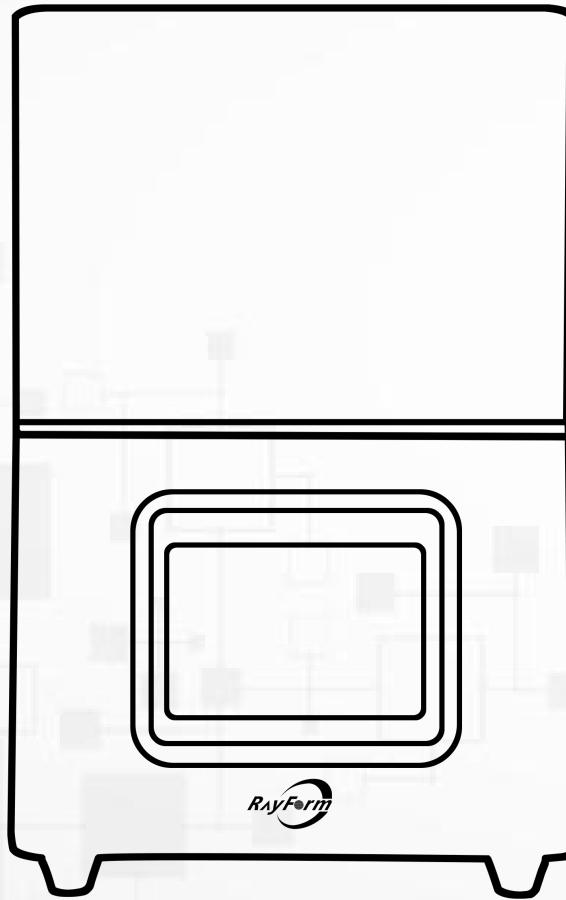
- Check "Server Location". For the Chinese mainland region, please select "China"; for other countries and regions, select "Global".



Processing of electronic components

This sign indicates that this equipment must not be disposed of together with household garbage. When the equipment reaches the end of its lifespan, please handle it in accordance with local environmental protection regulations. It can be recycled at the electrical and electronic waste recycling points. By properly disposing of the equipment, the improper handling of electronic waste can be avoided, which would cause harm to the environment and health. Recycling also helps to protect natural resources. Do not discard this product together with unclassified household garbage.

Once again, we would like to thank you for choosing RayForm products! We offer a maximum one-year warranty for the products (and accessories). If you encounter any problems, please log in to the RayForm official website (<https://www.rayformtech.com/>) to inquire about solutions or contact the corresponding store customer service. Our professional after-sales technical team will be dedicated to serving you.



牙科3D打印机

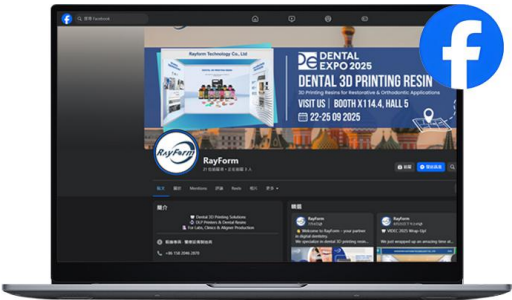
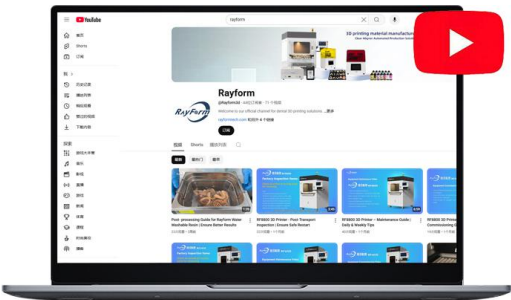
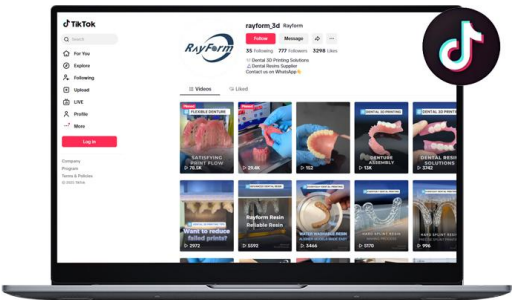
使用指南

感谢您选择锐沣科技产品！

如果您之前购买过锐沣科技设备或熟悉3D打印技术，我们仍然建议您仔细阅读此说明书，文中的注意事项及使用技巧能更好地避免错误的安装和使用。

为了更好的开始3D打印之旅，您可以先了解以下信息：

- 1. 锐沣科技官网:<https://rayformtech.com> 锐沣科技官网包含软件、组装和使用教学视频、多语言说明书、模型下载及FAQ手册。在使用设备过程中，如遇到此说明书中未包含的疑问或问题，请联系客服人员，我们将全力为您解决问题。
- 2. 社媒平台：
官方社媒平台将定期发布更新的3D打印行业动态、前沿的技术资讯及常见产品技术指南。



RayForm Official

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注意事项

在组装、使用时请时刻谨记以下注意事项，不遵守这些警告可能会使机器损甚至造成人身伤害。

1. 收到货后，若缺少任何配件，请联系客服进行补发！
2. 如遇紧急情况，请直接关闭RayForm 3D打印机的电源。
3. UV光对眼睛有害，请避免直接接触。操作时，应配戴护目镜和手套等个人防护用品。
4. RayForm 3D打印机包含高速运动的工作部件，谨防夹手。
5. 使用铲刀时请注意安全。机器和工具有部件较尖锐，请谨慎使用。
6. 请将Rayform 3D打印机及其配件放在儿童触碰不到的地方。
7. 请于宽敞、平整、通风良好的环境下使用RayForm 3D打印机。
8. 长时间不使用机器，请注意对RayForm 3D打印机进行防雨、防潮保护。
9. 环境温度建议为8°C-40°C，湿度为20%-50%，在此范围之外使用，可能带来不良的打印效果。同时，需要避免阳光照射。
10. 严禁私自拆装RayForm 3D打印机，如自行拆装出现问题，保修条款失效。客户自费维修费用。

售后服务

工艺支持: support@rayformtech.com

客户服务: contact@rayformtech.com

FC CE RoHS



FCC-ID:2AXYK-MONO4ULTRA

CMIIT ID:24J44VY80436

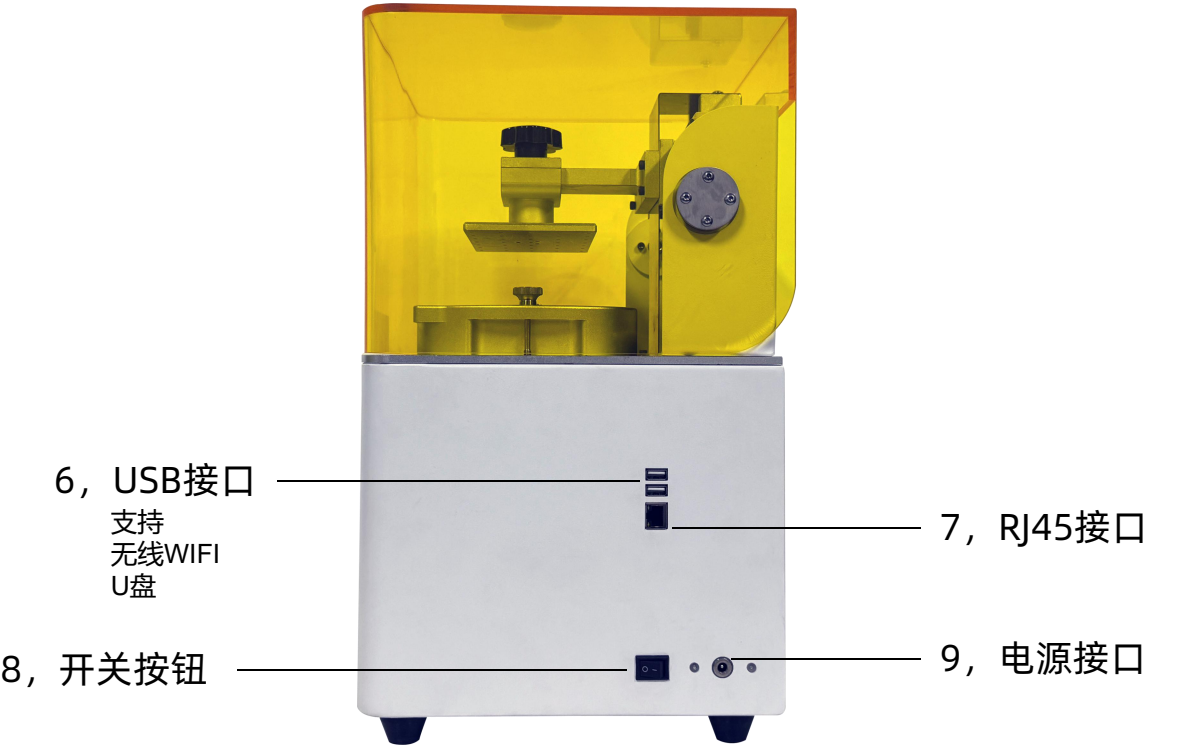
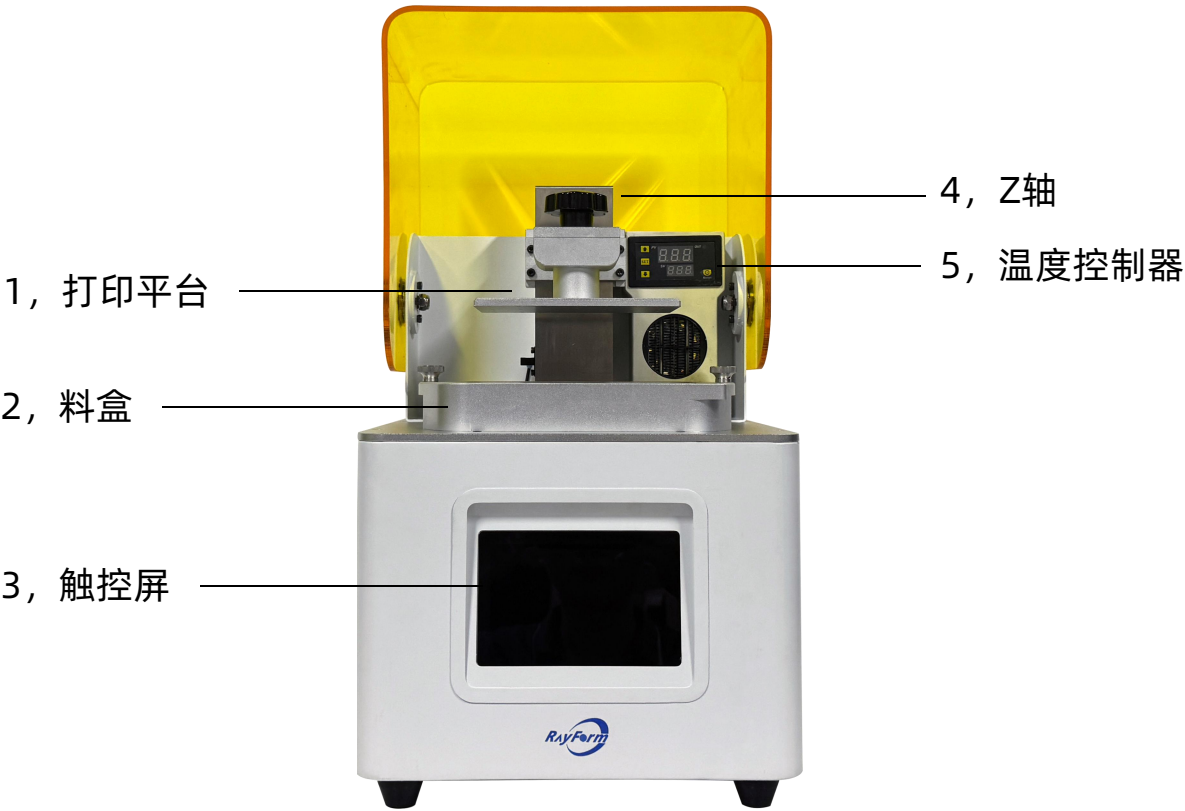


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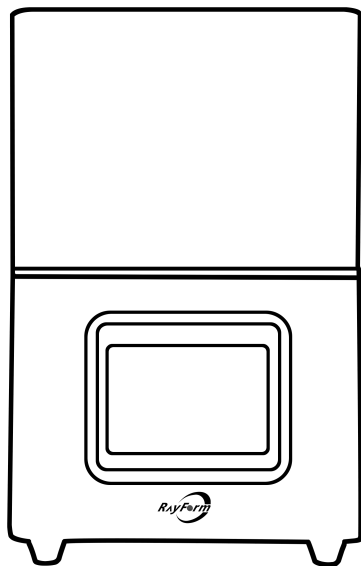
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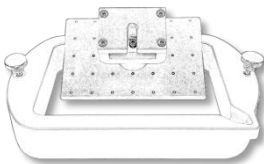
设备概览



装箱清单



RF-3024D



打印平台



电源



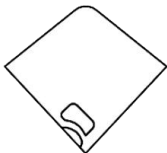
说明书



U盘



金属铲刀



滤网



口罩



防护手套



塑料铲刀

设备参数

操作系统

系统	RayForm 3D Printer System
操作屏	5寸电容触摸屏
切片软件	ChiTuBox (支持.ctb格式)
连接方式	U盘，网线

技术规格

LCD屏规格	6.6寸 4K
光源技术	COB光源
XY分辨率	4098*2560
Z轴精确度	0.01 mm
层厚度	0.01~0.15 mm
电源输出	24V - 3A

物理参数

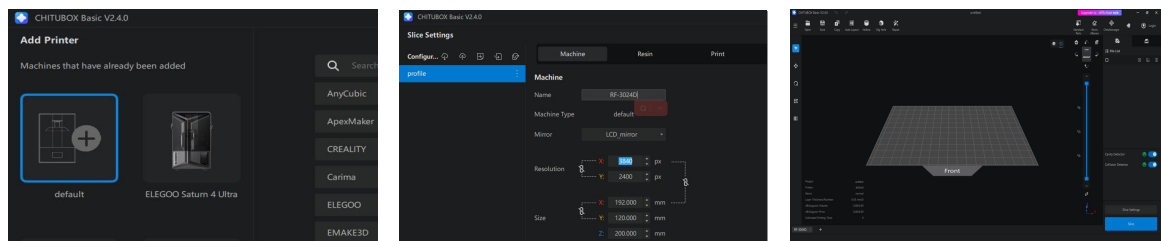
机器尺寸	300(L)*280(W)*430(H) mm
打印体积	A: 143(L)*90(W)*80(H) mm B: 85(L)*85(W)*80(H) mm
重量	13kg

网络

接口	RJ45 100M
WIFI	2.4Ghz

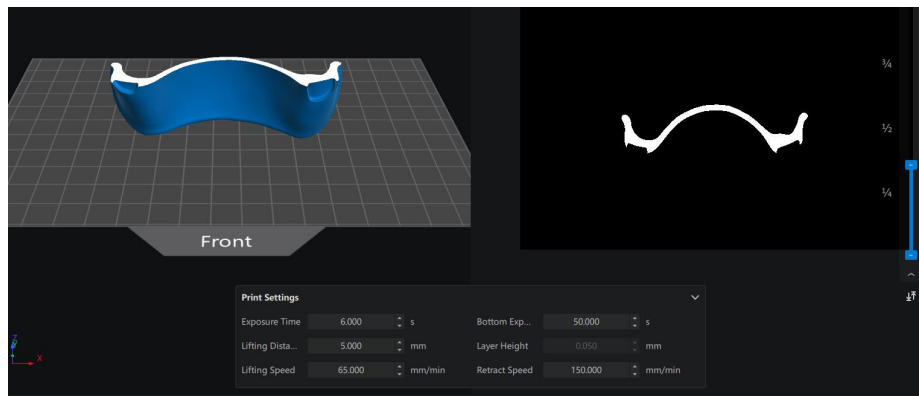
切片文件

- 1. 可以选择U盘中提供的或官网(www.chitubox.com)下载切片软件安装到您的电脑上。
- 2. 由于RF-3024D是创新型三平台集合3D打印机，使用CHITUBOX Basic时需新增设备信息和打印平台参数设置。(2种不同平台参数设置)



Platform	Name	Resolution		Size		
		X	Y	X	Y	Z
	Normal	4098	2560	143	90	80
	Small			85	85	80
	Dual			143	90	80

- 3. 将3D模型导入CHITUBOX Basic中，进行修复、抽壳、打孔和添加支撑等操作。软件安装包及操作指南详见链接：<https://docs.chitubox.com/en-US/chitubox-basic/latest/ui-and-features/configure-print-parameters>
- 4. 在软件中设置打印参数时，您可以在树脂选项中修改设置需求的参数组。附赠U盘中，也提供了正畸牙模、弹性基托、临时冠三种树脂模型的测试切片文件。可根据实际需要，选择合适的文件打印。更多其他树脂及模型可联系我们获取。



- 5. 完成设置后进行切片，并保存切片文件为 .ctb 格式，再导入U盘中。

建议打印参数

参数组	牙模树脂	弹性基托	临时牙冠
层厚	0.05 mm	0.05 mm	0.05 mm
正常曝光时间	3.5 s	6.5 s	3.7 s
关灯时间	1.5 s	0 s	0 s
底部曝光时间	20 s	30 s	35 s
底部层数	3	4	4
抬升距离	7 mm	8 mm	7 mm
抬升速度	7 mm	8 mm	7 mm
回退速度	120 mm/min	60 mm/min	90 mm/min
抗锯齿等级	2		
使用须知	1, RF-3024D适用众多牙科案例应用，上述数据仅供参考，具体效果以实际环境为准。 2, 所有RayForm生产树脂都能适应设备使用，更多打印参数及设置可访问官网或咨询我们。 3, 树脂打印环境温度建议在20°C-30°C(68°F-86°F),如周围环境温度过低，可打开温度控制器调节打印室内温度。将PV温度调高于SV温度，大于2°C，加热器自动开启工作。 4, 初次使用请先按照我们的参数去测试，勿随意修改，如需提高打印速度，请先联系我们。 5, ACF离型膜的使用可供正常打印45000层，如需更换请使用同类型的。		

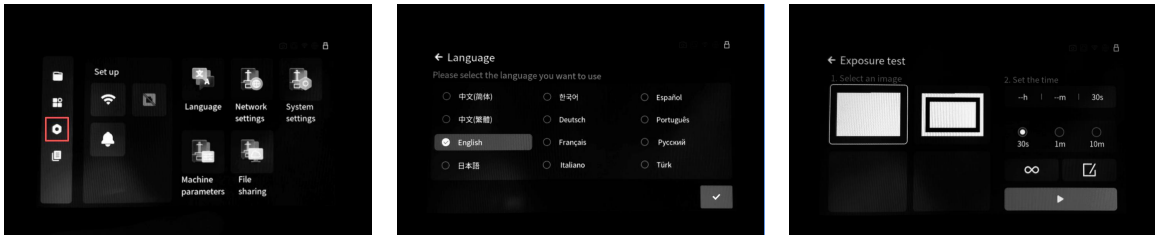
--以上数据来源于RayForm实验室，仅供参考

开始打印

- 1. 将设备放置在平稳的工作台上，置于通风良好的环境中，避开强紫外线，如荧光灯紫外消毒灯等，以免异常固化影响打印效果。
- 2. 根据需打印的物品选择合适的打印平台 and 对应的料盒安装好，接通电源，打上开机键，倒进需要的树脂。(注意：长时间静置的有色树脂，使用前需摇晃2-3分钟)



- 3. 在系统界面设置中选择合适的语言，然后选择图案进行曝光检测

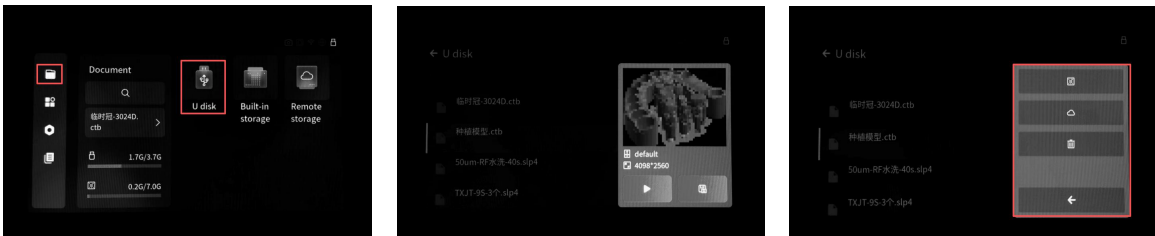


- 4. 将准备好的切片文件导入U盘，然后将U盘插入打印机右侧USB接口



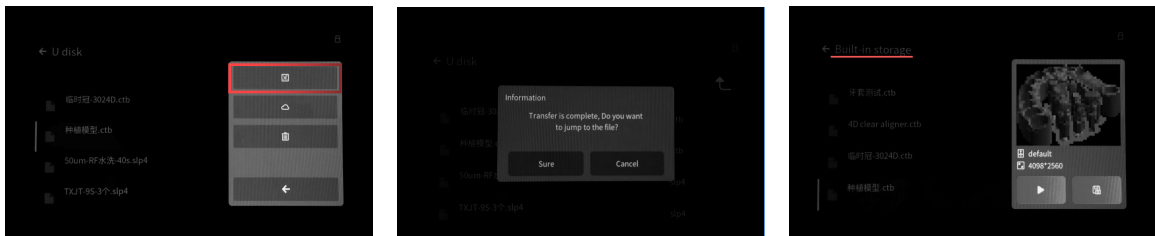
U盘使用建议：
① 建议使用随机附赠的U盘。如果使用其他U盘，需要确保U盘容量在4G以内，且格式支持FAT/FAT32。
② 请将打印文件放置在U盘根目录下，避免文件读取异常。

- 5. 在打印机触控屏上选择需要打印的模型文件，进入详情页。

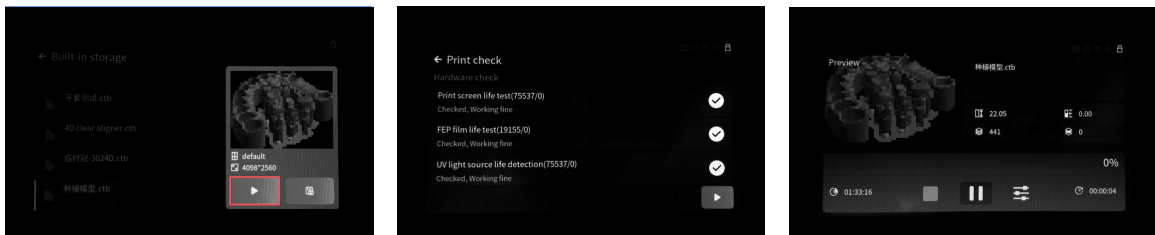


开始打印

- 可将U盘文件复制到内部存储中，下次打印可以直接在设备上发起。



- 选中需要打印的文件，点击确认打印。

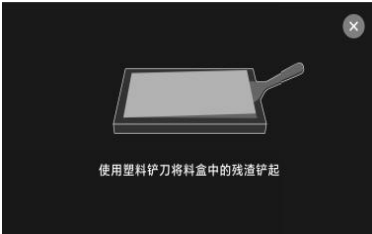
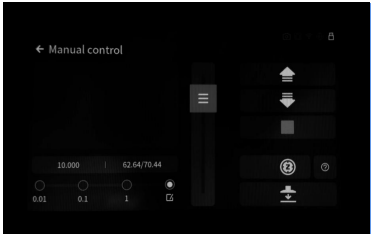
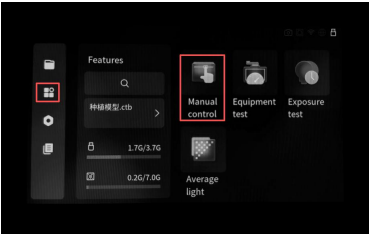


- 打印完成抬升至顶:打印完成后，打印平台自动抬升至Z轴顶部。

6. 打印前，打印机将会进行智能监测，确保打印可以正常进行。若检测过程发现异常，机器将自动报错并根据指引处理。

回收树脂

- 1. 打印完成后，待平台上的残留树脂不再下滴，取下平台。然后用金属铲刀将模型铲下，并用95%浓度的酒精(或其他清洗剂)冲洗模型表面残留的液态树脂。清洗干燥后，对模型进行后固化等其他后处理。
- 2. 料盒中有部分固化的树脂时，可使用塑料铲子清理料盒。不及时清理将影响后续打印，甚至引起离型膜和曝光屏损坏。



- 3. 取下料盒，从料盒斜口倒出剩余树脂，并用滤网和漏斗过滤树脂。附赠U盘中已提供漏斗模型文件，如有需要可以打印使用。

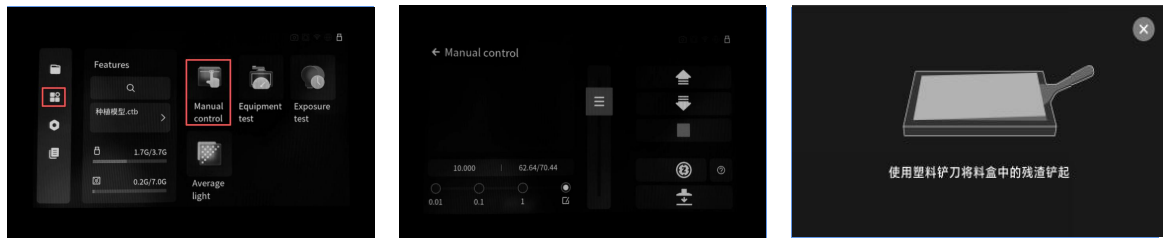


- 4. 长时间不使用机器，请彻底清理料盒，并将树脂储存在避光、密封的容器内以免影响下次使用。
- 5. 长时间不使用的储存树脂，下次使用前需要摇晃2-3分钟，避免色素等有机物沉淀，影响打印结果。

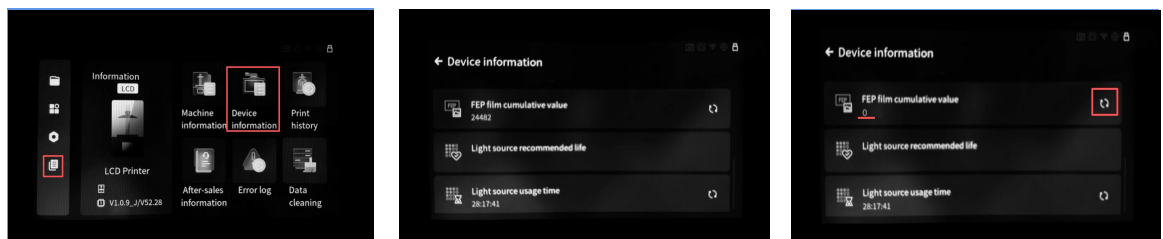
设备维护

料盒维护

- **清理残留在离型膜上的树脂:** 使用料盒清理功能。最后一步请使用塑料铲刀将固化的树脂整层铲起;切勿用尖锐物品刮铲离型膜, 以免损坏。



- **更换离型膜:** 用户可以在设备自检界面查看累计的打印层数, 并根据实际情况及时更换离型膜, 以免影响打印效果或造成树脂渗漏。



更换后重置打印层数

- 48小时内不使用, 请将树脂过滤后储存在避光、密封的容器内。
- 料盒上沾到树脂时, 请及时擦拭干净。

Z轴维护

如Z轴工作过程中发出摩擦异响, 请在Z轴丝杆上涂抹适量润滑油脂。



设备维护

固件升级

- **本地升级:** 在官网下载最新固件并拷贝到U盘中，注意需要删除U盘中其他版本的固件。再将U盘插入打印机，自动完成升级。

机器清理

- **清理打印平台:** 用纸巾直接擦干净或用酒精清洗。
- **保护固化屏:** 若有树脂固化在防刮花膜上，请立即更换防刮花膜。
- **清理机身:** 用酒精清理干净。

常见问题

参考以下解决方案完成初步问题排查，或者联系售后支持获取额外帮助。

打印

1. 模型不粘平台

- 底层曝光时间不足，请增加曝光时间。
- 模型底面与平台接触面积小，需要添加底阀。

2. 模型断层开裂

- 打印过程中机器晃动。
- 离型膜长时间使用后松动，需更换。
- 打印平台或者料盒没有拧紧。
- 抬升速度过快。
- 抽壳模型未打孔。

3. 模型有错层纹、变形

- 检查是否支撑太少。
- 降低抬升速度。

4. 料盒里或模型上附着类似海带的絮状物。

- 过曝导致，需要减少底部曝光时间和正常曝光时间。

网络连接

1. WLAN连接失败

- WLAN名称或密码错误。重置网络后，尝试重新连接。
- WLAN信号差或没有网络。确保当前网络环境正常后，重置网络并重新连接。

2. 无法添加打印机

- 检查“服务器所在地”。中国大陆地区请选择“中国”，其他国家和地区选择“全球”



电子元件的处理

此标志表明本设备不得与生活垃圾一起处置。当设备使用寿命结束时，请根据当地环保法规妥善处理。可以通过电气和电子设备废弃物回收点进行回收处理。通过适当的方式处理设备，可以避免电子废弃物不当处理而对环境和健康造成危害。回收也有助于保护自然资源。请勿将本产品与未分类的生活垃圾一同丢弃。

再次感谢您选用RayForm产品！我们为产品(及配件)提供最高1年质保期。如遇任何问题，请登录RayForm官方网站(<https://www.rayformtech.com/>) 查询解决方案或联系对应店铺客服，将有专业的售后技术团队倾力为您服务。