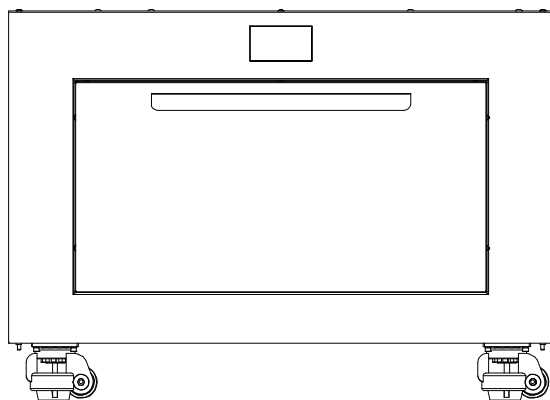闪铸科技®
FLASHFORGE

EN/CN-A01 Filament Drying Station 材料烘干箱

用户使用手册

USER GUIDE

中文P16

This guide is only applicable to FLASHFORGE Filament Drying Station
本手册仅适用于闪铸科技 材料烘干箱

Content

NOTICE

PLEASE STRICTLY FOLLOW ALL THE SAFETY WARNINGS AND NOTICES BELOW ALL THE TIME.

WORK ENVIRONMENT SAFETY

- Please keep the work table of the equipment clean and tidy.
- Please keep the equipment away from combustible gases, liquids and dust when working. The high temperature generated during the equipment operation may react with flammable liquids, gases, and airborne dust, thus causing fire.
- Children and untrained personnel are not allowed to operate the equipment alone.

ELECTRICAL SAFETY

- Be sure to ground the equipment. Do not modify the plug of the equipment.
- Ungrounded equipment/improperly grounded equipment/modified plug will inevitably increase the risk of electric leakage.
- Do not expose the equipment to damp or hot-sun environment. Humidity will increase the risk of electric leakage. Exposure to sunlight will accelerate the aging of plastic parts.
- Make sure to only use the power cord provided by Flashforge.
- Do not use the equipment during a thunderstorm.
  Please shut down the equipment and unplug it if it is not in use for a long time.

PERSONAL SAFETY

- Do not touch the high-temperature position directly when the equipment is in operation!
- Do not operate the equipment while you are tired or under the influence of drugs, alcohol or medication!

ENVIRONMENT REQUIREMENTS

- The room temperature should be between 15℃ and 30℃.
- The humidity should be between 20% and 70%.

EQUIPMENT PLACEMENT REQUIREMENTS

- The equipment must be placed in a dry and ventilated environment. At least a 10cm-distance must be reserved on the left side, right side and rear side of the equipment.

LEGAL STATEMENT

- The user has no right to make any modification to this user guide.
- Flashforge will not be responsible for any safety accidents caused by the disassembly or modification of the equipment by the customer. No one is allowed to modify or translate this guide without the permission of Flashforge.
- This guide is protected by copyright, and Flashforge reserves the right of the final interpretation of this guide.
- Flashforge reserves the right to modify the guide due to subsequent equipment upgrades.

- First Edition (March 2022)
 Copyright © 2022 Zhejiang Flashforge 3D Technology Co., Ltd. All Rights Reserved.

1. Introduction

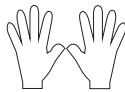## 1.1 Product Introduction

1. Storage Drawer
2. Drawer Pull
3. Temperature Probe
4. Drawer Sealing Strip
5. Stop Block
6. Display Screen
7. Caster
8. Protective Cover
9. Drawer Slide
10. Rear Cover Plate
11. Power Switch
12. Power Outlet
13. Back Plate
14. Air Inlet
15. Air Outlet
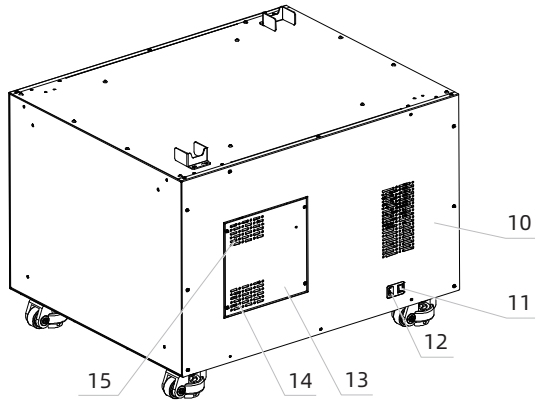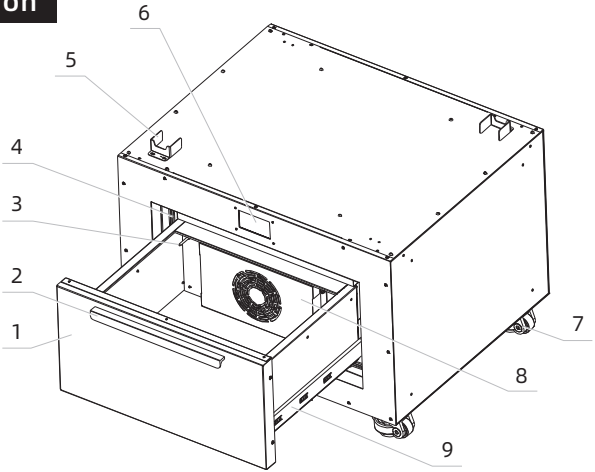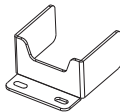

1.2 Packing List
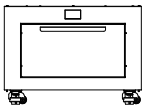
Filament Drying Station

Heat Insulating Gloves

Power Cord

Allen Wrench

Stop Block*2

Screw*4

1.3 Equipment Parameter

Size	840x*675y*600z mm (with casters)
Screen	4.3-inch touch screen
Language	Chinese/English/Japanese/German/French/Korean
Maximum drying temperature	120℃
Desiccant service time	1 year
Desiccant capacity	800g
Storage humidity control range	10-20%
Internal storage size	500*375*200 mm(WxDxH)
Power	500W
Bearing weight	120kg
Package size	980*780*830 mm
Package weight	100kg
Power during storing	Average: 30W; Maximum: 35W
Power during drying	Average: 100W; Maximum: 500W
(12hrs, 120℃)	
Power consumption	About 1.4KWh
(drying for 12hrs at 120℃)	
Applicable material	Moisture-sensitive materials:
	PVA / PVOH / BVOH / PVB / PA6 / PA12 / PA66 /
	PC / ABS / ABS Pro / HIPS / ASA / PET / PETG /
	WOOD / Metal Fill
	Moisture-sensitive fiber reinforced materials:
	PA6-CF / PA12-CF / PA66-CF / PET-CF / PP-CF /
	ASA-CF / PETG-CF / PLA-CF / PPS-CF / PA6-GF /
	PLA-GF

1.4 Combined Use

This filament drying station can be used together with Creator 4 series equipment, which can be placed above the filament drying station.

After finishing placing, tighten the installation fixing block with screws.
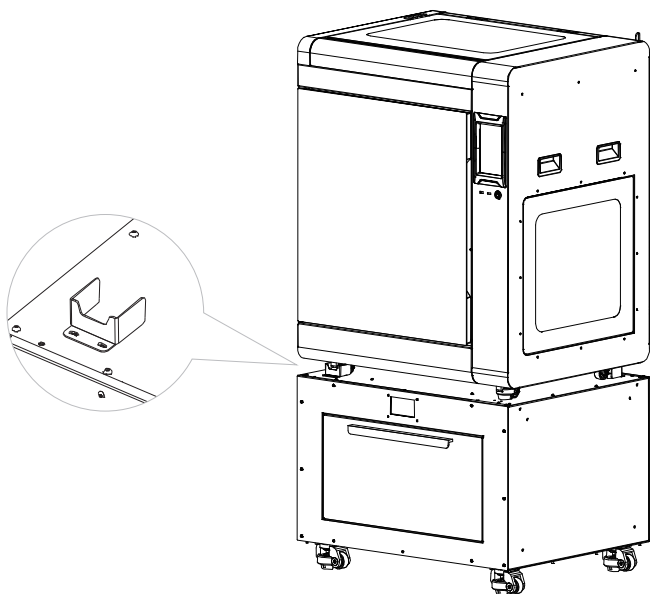
2. Equipment Operation Introduction

Connect the power supply, turn on the power switch, and start the machine;
If the filament has absorbed moisture, it is necessary to enable the drying function to dry the filament;
If the filament has not absorbed moisture, only the storage function needs to be enabled to store the filament.

2.1 Storage Function

The default storage range of the equipment is less than 15%; After starting up the equipment, the storage function is enabled by default;
The interface will display the current temperature and humidity of the filament chamber. The humidity value will change as the storage function is turned on until the humidity reaches the set humidity storage range.
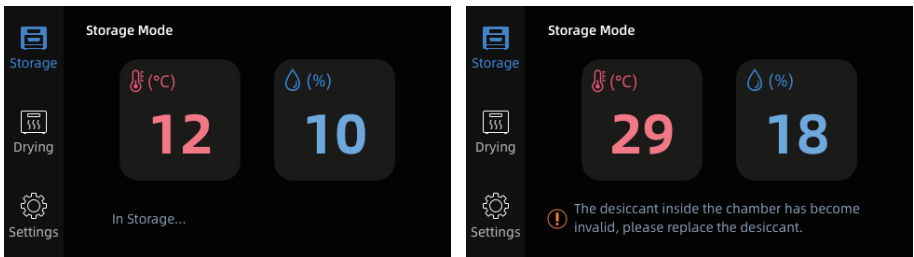
It adopts the renewable desiccant, which can be recycled, for storage; When the auto cycle function is enabled and the equipment detects that the desiccant is moisture-saturated, the humidity of the chamber will become higher, and at this time, the desiccant dehumidification function will be enabled automatically, so that the desiccant can be dried again. At this time, it is normal that the humidity display value may fluctuate.

There will be corresponding prompts in the interface.

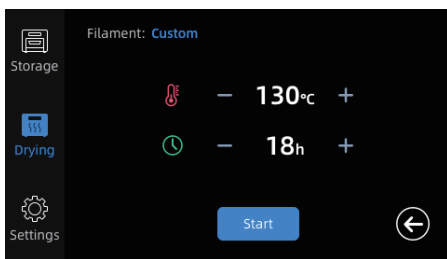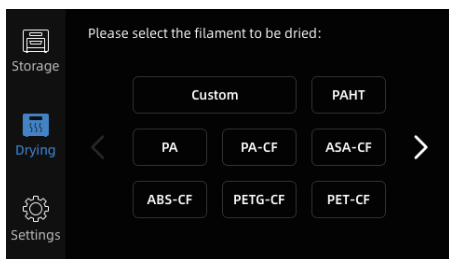> ⚠ Note   **Please be sure to keep the door closed during storage.**

2.2 Drying Function

Click on the drying function bar and select the filament to be dried. The default drying time and temperature has been set already when leaving the factory.
The interface will display the target drying temperature and actual temperature, total drying time and remaining time and chamber humidity value.
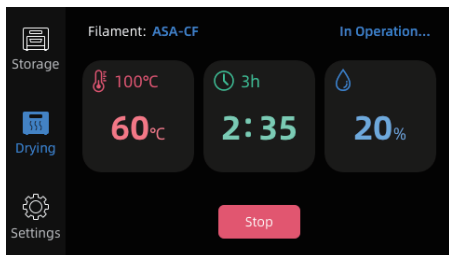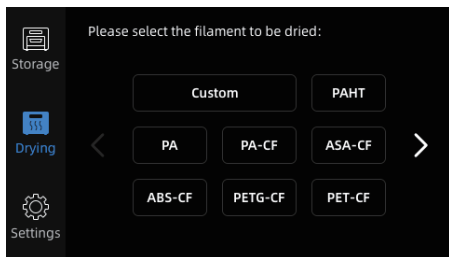
Users can also customize the material and set the required drying time and temperature for it.

⚠ **Note**

· **Please be sure to keep the door closed during drying;**
· **If the hot melt characteristics of the materials differ greatly, they can not be dried at the same time. For example, PLA material, of which the softening temperature is 53℃, is not suitable for drying together with high-temperature resistant materials such as PC and PA.**
· **The filament spool material is usually ABS/PC-ABS/PC material. If the temperature is too high, the filament spool may be deformed. For filaments shipped after May 2022, Flashforge will adopt PC-ABS material for the spool.**
· **Note that if the temperature displayed by the filament drying station exceeds 50℃ when taking the filament out, please wear heat insulating gloves to avoid scalding.**

The following softening temperatures of filaments are for reference only:
The heat deflection temperature varies under different experimental conditions.

Filament	Heat Deflection Temperature(℃)
PA12-CF15(9891BK)	90
PA6-CF10	200
PA66-CF10	150
PET-CF15(9780BK)	100
PETG-CF10	70
PLA-CF10	60
PC-ABS	123
PA6/66	85
PA1010	100
PAHT	90
PC	105
PP	113
HIPS	98
PLA PRO	53
PLA	53
PETG PRO	68
PETG	74
ABS PRO	103
PBT	127

2.3 Annealing Treatment

It is recommended that the engineering filaments should be annealed after finishing printing to eliminate the internal stress of the model, improve the properties of the model and slow down the second-time moisture absorption of the model. Place the filament in the filament drying station, enable the drying function and set the corresponding temperature and time, thus the annealing treatment is carried out.

Annealing treatment is recommended for the following materials:
PA, PAHT and PA12-CF should be annealed to improve the mechanical properties of the model samples.

Annealing conditions:
PA： Place the sample in the Filament Drying Station at 70℃ and dry it for 2 hours.
PAHT： Place the sample in the Filament Drying Station at 70℃ and dry it for 2 hours.
PA12-CF： Place the sample in the Filament Drying Station at 80℃ and dry it for 6 hours.

Comparison of material properties before and after annealing (this data is for reference only, and it varies under different testing environments and methods)

Comparison of tensile properties of PA, PAHT and PA12-CF before and after annealing (Mpa)

- Before annealing
- After annealing

Material	Before annealing	After annealing
PA	46	55
PAHT	63	79
PA12-CF	53	71
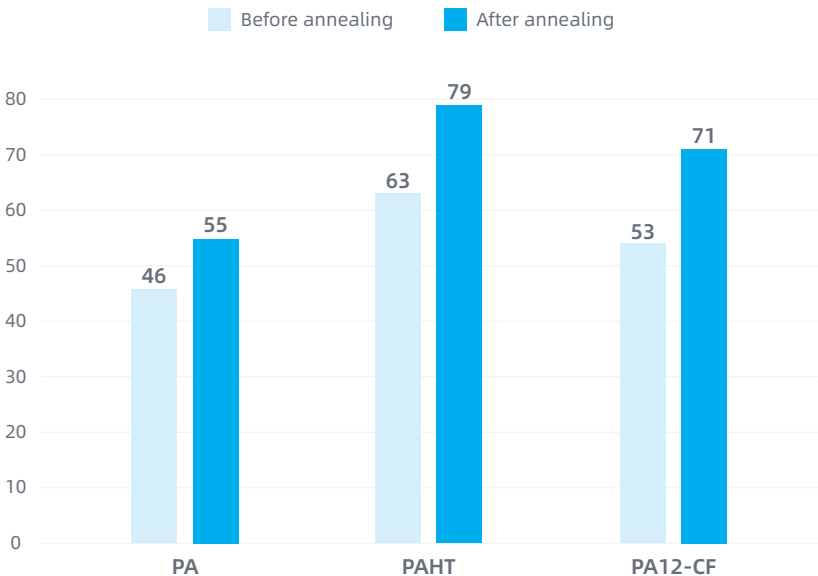
2.4 Filament Drying Station Setting

Storage Humidity Range

The settings include the storage humidity range, which can be used to set the humidity range for material storage.
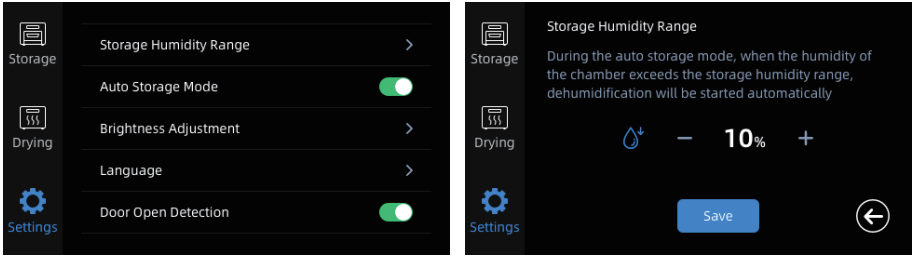
Recommended humidity for material storage

	PVA	PA	TPU	PLA	ABS	PETG	PC	PBT	Fiber Composite Material
<10%	Good	Good	Good	Good	Good	Good	Good	Good	Good
<15%	Medium	Good	Good	Good	Good	Good	Good	Good	Good
<20%	Poor	Medium	Medium	Good	Good	Good	Good	Good	Medium
>25%	Poor	Poor	Poor	Medium	Medium	Medium	Medium	Medium	Poor

Auto Storage Mode

It is turned on by default. When it is turned off, the desiccant dehumidification function will not be started even when the desiccant in the chamber has become moisture-saturated. Therefore, the storage function will fail as the desiccant becomes invalid.
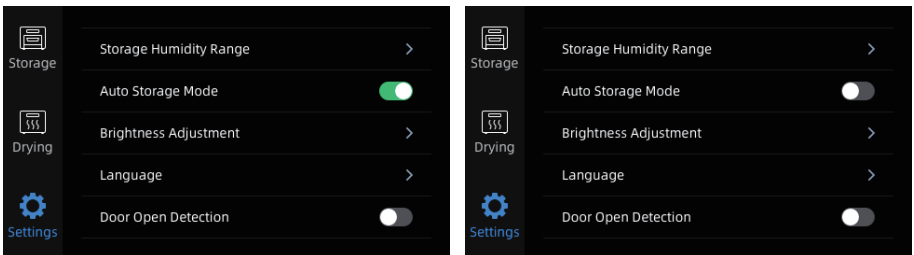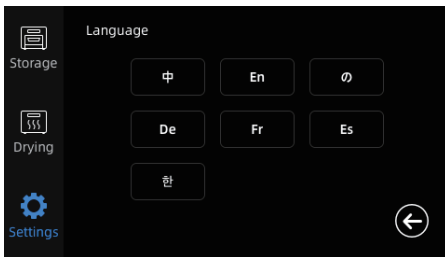
Brightness Adjustment

Adjust the screen brightness: the larger the number, the brighter the brightness.

Language

The equipment supports seven languages: Chinese, English, Japanese, German, French, Spanish and Korean.

⚠ **Note**

Please restart after switching languages.

Door Open Detection

If the door open detection function is turned on: when the equipment door is opened, the drying function and storage function will not be enabled in order to prevent shortening the service life of desiccant.
If the door open detection function is turned off: even if the equipment door is opened, the drying function and storage function can still be enabled. However, this will increase energy consumption.
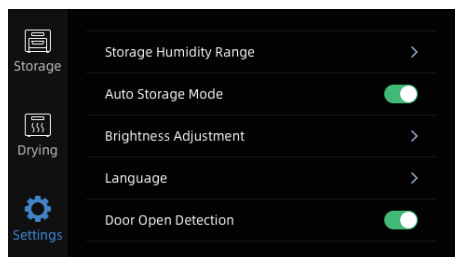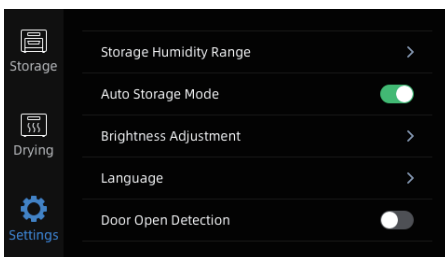
3. Replace the Desiccant

When the equipment gives a prompt to suggest replacing the desiccant, it means that the service life of the desiccant has arrived, and the desiccant needs to be replaced manually by the user.

The operation method is as follows:

· Turn off the power supply. Please note that the filament drying station should be in the cooling state to avoid accidental injury caused by high temperature;
· Open the back plate (unscrew the four screws);
· Loosen the sheet metal screws of the regeneration box with an Allen wrench, and remove the sheet metal, the sheet metal sealing ring and the heat insulation foam;
· Loosen the four screws shown in the figure with an Allen wrench;
  Turn over the aluminum substrate assembly in the direction of the arrow, and take out
· the desiccant bag inside. Put in a new desiccant bag；
· Re-lock each screw back in place.

Sheet metal
Sealing gasket
Heat insulation foam

① ③
② ④
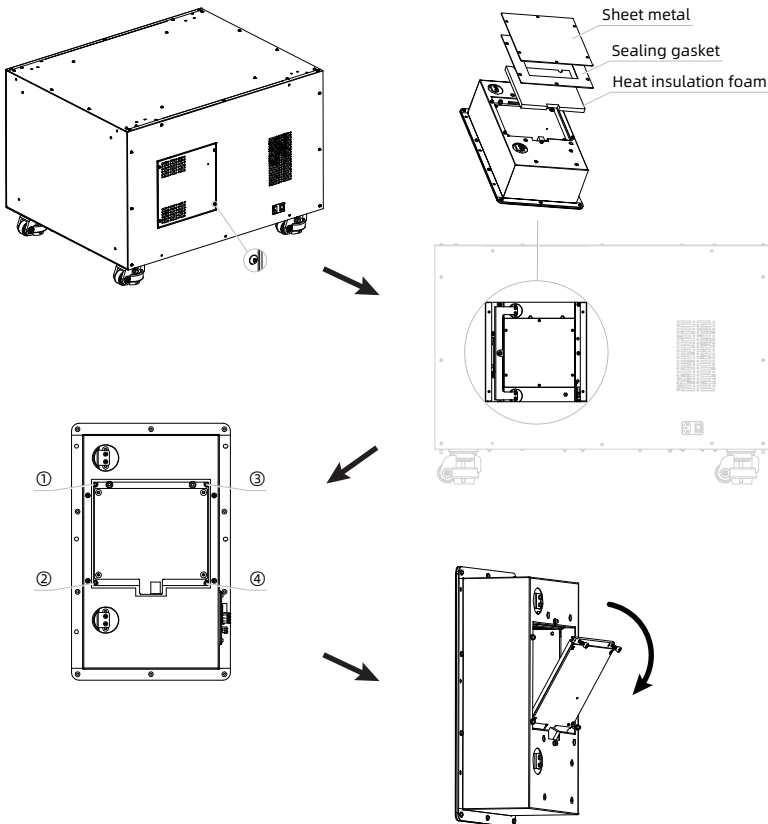
4. Q&A

Q: How often do you need to change the desiccant?

A: Generally, it can be recycled for 1-year use. If the desiccant is invalid, the equipment will prompt the user.

Q: Do filaments have to be dried before printing?

A: Standard filaments (materials with water absorption less than 0.3) do not necessarily need to be dried, but carbon fiber and glass fiber composite filaments are recommended to be dried before printing.

Q: Is the drying time of each material adjustable?

A: The drying time and temperature of related materials have been set in the equipment. However, the user can also adjust them according to the actual situation.

Q: Can the drying function and the storage function be used together?

A: No. Because it is in the same chamber, and the chamber will be heated to the set temperature during drying.

Q: Can different materials be put together for drying?

A: Not necessarily.
If the material characteristics are similar, such as PA12-CF and PA6-CF, they can be dried at the same temperature for 8 to 12 hours. If the temperature resistance characteristics of materials are far different, they can not be dried together. For example, materials such as PLA and PC; The heat deflection temperature of PLA is only about 55℃, therefore, too high a temperature will make PLA material deform.

Q: Can different materials be put for drying or storage?

A: As long as the humidity setting is kept low for storage, different materials can be put for storage.
During drying, because of the different heat deflection temperatures of materials, materials with different characteristics can not be put into the filament drying station for drying together.

Q: What happens when the desiccant is in the regenerative cycle mode?

A: At this time, the equipment is dehumidifying the desiccant to achieve the purpose of reuse. At this time, the humidity data may rise.

Q: Is there a door sensor function?

A: There is a door sensor function. If the door open detection function is turned on, the drying and automatic storage (drying) functions will be enabled only when the door is closed tightly. It is also feasible to turn off the door detection function and then there will be no further detection of whether the door is closed or not.

Q: Is it very power-consuming to keep the filament drying station on for a long time?

A: The power consumption will be high only in the drying mode, while there is almost no power consumption in the storage mode.

Q: What is the power consumption of the filament drying station drying for 12 hours?

A: When at room temperature, the target drying temperature is set at 120℃, the power consumption is about 1.4KWh.

Q: How long is the estimated time for the indoor humidity to drop from 50% to 10%?

A: It will take about half an hour to reduce the indoor humidity from 50% to 10%.

Q: How does the door detection sensor affect the functions of the equipment?

A: If the door detection is not triggered (the door is not closed properly), the equipment will not give any prompt, and will not carry out the storage mode or the drying mode. It is necessary to ensure whether the door is closed properly.
When the door detection function is turned off in the settings, the drying and storage functions will be enabled whether the door is closed properly or not.

5. Support and Service

Flashforge team is on standby and ready to help you with any challenges you may have with your 3D printer. If the issues or questions are not covered in this User Guide, you can seek for solutions on our official website or contact us via telephone.

There are solutions and instructions to common issues that can be found in our knowledge base. Have a look first as most basic questions are answered there. http://www.flashforge.com

The Flashforge support team can be reached by e-mail or phone between the working hours of 8:00 a.m. to 5:00 p.m. PST Monday through Saturday. In case you contact us during off-duty time, your inquiry will be answered the following business day.

Facebook Official Group Address: Flashforge Official User Group
Email: support@flashforge.com
Address: No.518 XianYuan Road, Jinhua City, Zhejiang Province, China

Note: Please provide the product serial number which is the barcode at the back of the Filament Drying Station before contacting our after-sales department.

S/N: FFAD******

目录

注意事项

请确保认真阅读以下安全提示

工作环境安全

- ◆ 请保证设备的工作台面干净整洁。
- ◆ 请保证设备工作时远离可燃性气体、液体及灰尘。设备运行产生的高温有可能会与空气中的粉尘、液体、可燃性气体反应引发火灾。
- ◆ 儿童及未经培训的人员请勿单独操作设备。

用电操作安全

- ◆ 请务必将设备接地；切勿改装设备的插头。未接地 / 未正确接地 / 改装插头必然会增加漏电风险。
- ◆ 请勿将设备暴露在潮湿或烈日的环境中。潮湿的环境会增加漏电的风险 / 暴晒会加速塑件老化。
- ◆ 请勿滥用电源线，务必使用闪铸科技提供的电源线。
- ◆ 切勿在雷雨天气使用设备。
- ◆ 如长时间不使用设备，请关闭设备并拔下电源线插头。

个人操作安全

- ◆ 在设备运行时，请勿直接触碰高温位置！
- ◆ 请勿在饮酒、服药之后操作设备！

设备运行环境要求

- ◆ 室内温度在15-30℃为宜；湿度在20%-70%为宜。

设备放置要求
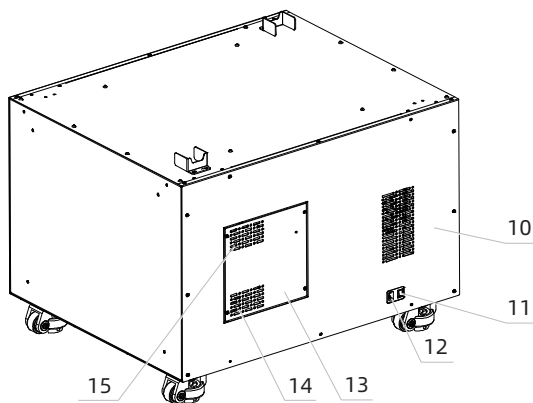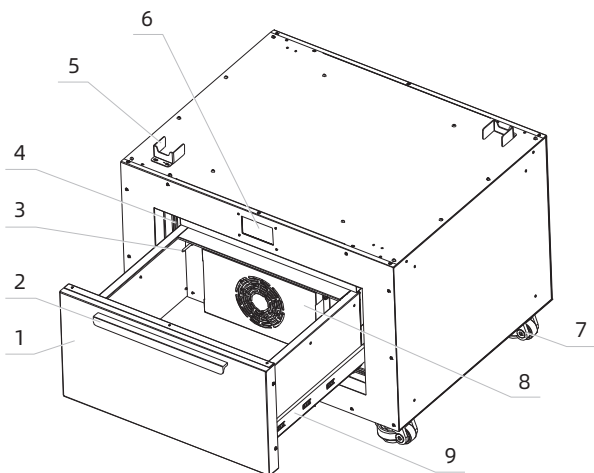
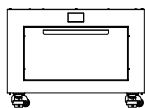- ◆ 设备需要放置于干燥通风的环境中。设备左侧、右侧以及后侧必须要留至少10cm的距离。

第一章 烘干箱介绍

1.1 整机介绍

1. 储存抽屉
2. 抽屉拉手
3. 温度探头
4. 抽屉密封条
5. 机器限位块
6. 显示屏
7. 福马轮
8. 保护罩
9. 抽屉导轨
10. 后盖板
11. 电源开关
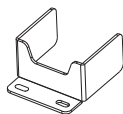12. 电源插口
13. 维修背板
14. 进风口
15. 出风口

1.2 装箱清单

材料烘干箱　　　隔热手套　　　电源线

内六角扳手套装　　　机器限位块*2　　　螺钉*4

1.3 设备参数

尺寸	840x*675y*600z mm（带脚轮）
屏幕	4.3英寸触控屏
屏幕语言	中 / 英 / 日 / 德 / 法 / 西 / 韩
烘干最高温度	120℃
干燥剂使用时间	1年
干燥剂容量	800g
存储湿度控制范围	10-20%
内部存储空间尺寸	500*375*200 mm（宽×深×高）
功率	500W
承重重量	120kg
包装尺寸	980*780*830 mm
包装重量	100kg
存储时的功率	平均：30W；最高:35W
烘干时功率（12小时，120℃）	平均：100W；最高:500W
耗电量（12小时烘干，120℃）	约1.4KWh
适合材料	易受潮材料：PVA / PVOH / BVOH / PVB / PA6 / PA12 / PA66 / PC / ABS / ABS Pro / HIPS / ASA / PET / PETG / WOOD / Metal Fill
	易受潮纤维强化材料：PA6-CF / PA12-CF / PA66-CF / PET-CF / PP-CF / ASA-CF / PETG-CF / PLA-CF / PPS-CF / PA6-GF / PLA-GF

1.4 配合使用

该材料烘干箱可以搭配金刚狼4系列设备使用，可将金刚狼4设备放置于材料烘干箱上方；放置后将安装固定块使用螺丝拧住。
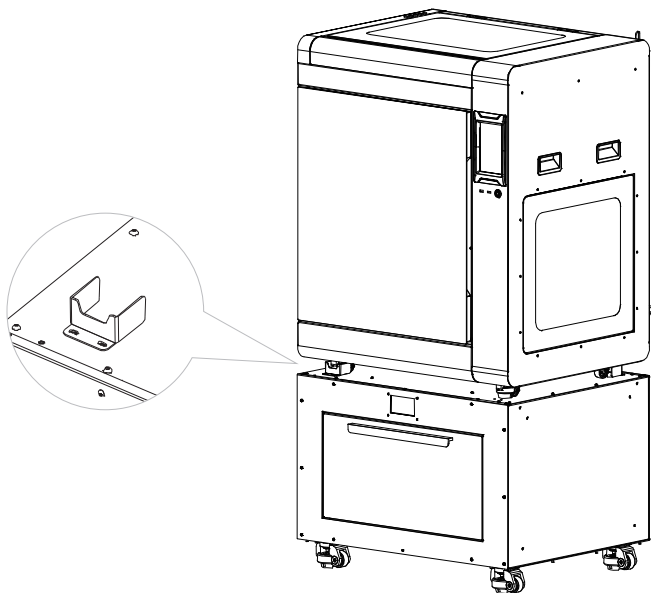
第二章 设备操作介绍

连接电源，拨动开关按钮，开机；
当耗材已受潮，需要使用烘干功能将耗材进行烘干；
当耗材未受潮，仅需使用存储功能进行耗材存储。

2.1 存储功能操作

设备出厂默认存储范围为<15%；开机默认存储功能启动；
界面中将显示当前耗材舱的温度，以及湿度情况。湿度将会随着存储功能开启，数字发生变化，直到湿度达到设定的湿度存储范围。
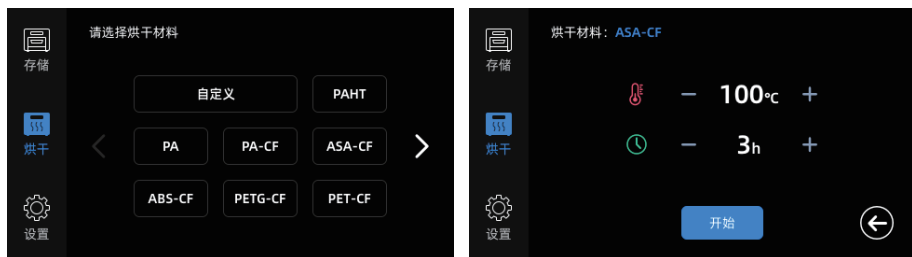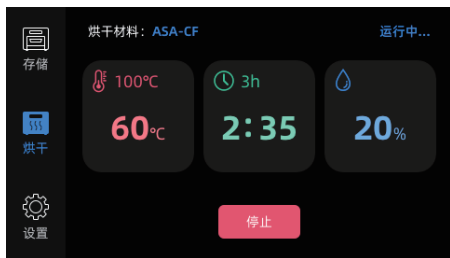

存储采用可再生干燥剂，可循环使用；开启自动循环功能时，设备检测到干燥剂处于吸水饱和状态时，舱体湿度会变高，此时将会自动开启干燥剂除湿功能，使得干燥剂恢复干燥。
此时湿度显示可能会存在波动属于正常现象。
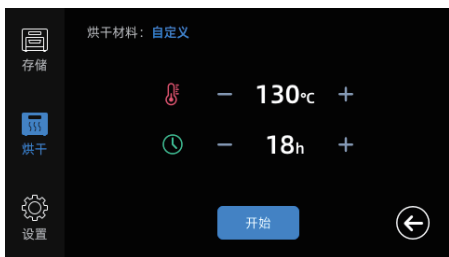界面中将有相应的提示。

⚠ 注意　**存储时请务必将舱门关闭。**

2.2 烘干功能

点击烘干功能栏，可选择需要烘干的材料，出厂已设置好默认烘干的时间与温度；
界面将显示烘干目标温度与实际温度，烘干总时长和剩余时长；舱体湿度值。

用户也可自定义材料，对其设置所需的烘干时间与温度。

> ⚠️ **注意**
>
> · 烘干时请务必将舱门关闭；
> · 若材料热熔融的特性相差较大，不可同时进行烘干；如PLA材料，其软化温度为53℃，则不适合与PC，PA等耐高温材料一起烘干；
> · 耗材料盘材质通常为ABS/PC-ABS/PC材料，温度过高，耗材盘可能引起变形，闪铸科技22年5月出货的耗材将会采用PC-ABS材料的耗材盘；
> · 注意取材料时若烘干箱显示温度超过50℃，请带上隔热手套操作，以免烫伤。

-- 如下材料软化温度仅供参考：不同实验条件热变形温度有所差异 --

材料	热变形温度(℃)	材料	热变形温度(℃)
PA12-CF15(9891BK)	90	PC	105
PA6-CF10	200	PP	113
PA66-CF10	150	HIPS	98
PET-CF15(9780BK)	100	PLA PRO	53
PETG-CF10	70	PLA	53
PLA-CF10	60	PETG PRO	68
PC-ABS	123	PETG	74
PA6/66	85	ABS PRO	103
PA1010	100	PBT	127
PAHT	90		

2.3 退火处理

工程材料在打印完成后建议进行退火处理，消除模型内部应力，可提升模型性能，以及减缓模型的二次吸潮。各材料的退火处理放置在烘干箱中，使用烘干功能，对应温度与时长设置，进行退火处理。

如下材料建议做退火处理：
PA、PAHT、PA12-CF对其进行退火处理，以提高模型样件的力学性能。
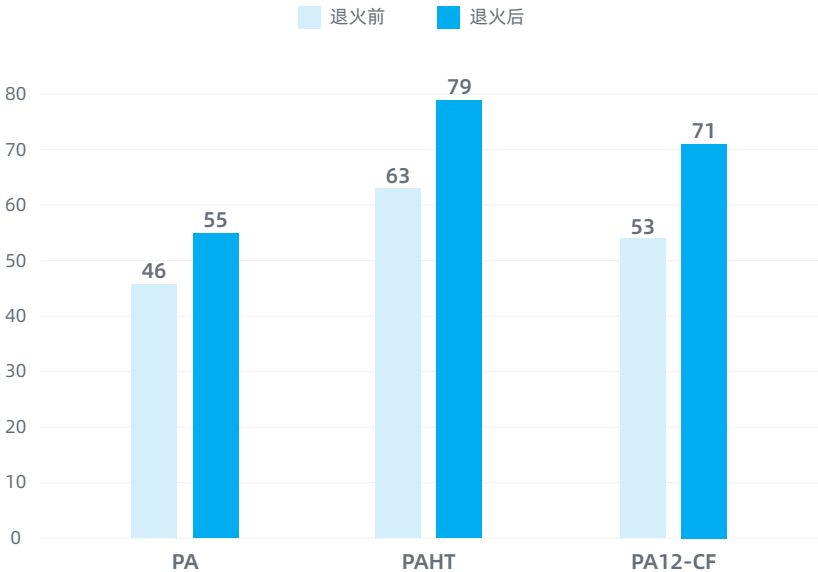
退火条件：
PA： 将样件放置于70℃的烘干箱中，烘烤2小时。
PAHT： 将样件放置于70℃的烘干箱中，烘烤2小时。
PA12-CF： 将样件放置于80℃的烘干箱中，烘烤6小时。

退火前后材料性能对比（该数据仅供参考，不同测试环境与方法存在差异）

PA、PAHT、PA12-CF退火前后的拉伸性能对比(Mpa)

退火前　　退火后

材料	退火前	退火后
PA	46	55
PAHT	63	79
PA12-CF	53	71

2.4 烘干箱设置

存储湿度范围

设置中包含存储湿度范围，可设置材料存储的湿度范围。

各材料存储件湿度建议

	PVA	PA	TPU	PLA	ABS	PETG	PC	PBT	纤维复合材料
<10%	好	好	好	好	好	好	好	好	好
<15%	一般	好	好	好	好	好	好	好	好
<20%	差	一般	一般	好	好	好	好	好	一般
>25%	差	差	差	一般	一般	一般	一般	一般	差

自动存储模式

默认开启，当关闭时，存储舱的干燥剂已吸收水分饱和时，也不会启动干燥剂除湿功能，因此，当干燥剂失效后，存储功能也会随之失效。

亮度调节

调节屏幕亮度，数据越大，亮度越亮。

语言

设备支持中、英、日、德、法、西、韩7种语言。

⚠️ **注意**　　切换语言后，请重新启动。

门开检测

门开检测开启时，当设备舱门打开，为了防止减短干燥剂使用寿命，烘干功能以及存储功能将不启动；
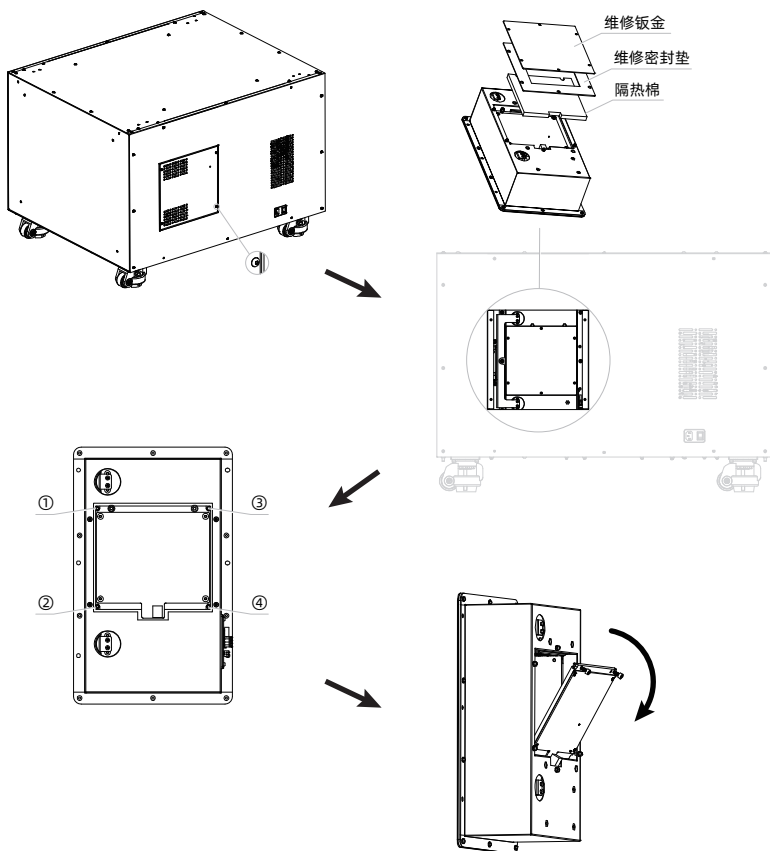若门开检测功能被关闭；即使设备舱门开启，烘干和存储功能也仍可启动。将会加大能耗。

第三章 如何更换干燥剂

当设备发出提示建议更换干燥剂时，说明干燥剂的循环使用寿命已到，需要更换干燥剂，需要用户手动进行干燥剂换新。

操作方式如下：

· 断开电源，注意此时材料烘干箱应处于冷却状态，避免高温引起误伤；
· 打开维修背板（拧开4颗螺钉）；
· 用内六角扳手松开再生盒维修钣金螺钉，取下维修钣金、维修钣金密封圈、隔热棉；
· 用内六角扳手松开所示的4颗螺钉；
· 按箭头方向翻转铝基板组件，取出内部的干燥剂包，放入新的干燥剂包；
· 将各个螺丝重新锁回去。

维修钣金
维修密封垫
隔热棉

① ③
② ④

第四章 Q&A

Q： 多久需要换干燥剂？

A： 一般可循环使用1年，若干燥剂无效，设备会进行提示。

Q： 耗材打印前一定要烘干吗？

A： 常规材料（吸水率低于0.3的材料）并不一定需要烘干，但是碳纤维玻璃纤维复合耗材建议打印前进行烘干。

Q： 每个材料的烘干时长是否可调节？

A： 设备已经设定好相关材料的烘干时间与温度。但用户也可以根据实际情况进行调节。

Q： 烘干功能和存储功能是可以一起用的吗？

A： 不能，因为是同一腔体，烘干时会对腔体进行加热到所设置的温度。

Q： 是否可以将不同材料一起放进去烘干？

A： 不一定，如果材料特性相似，例如PA12-CF和PA6-CF，可以使用相同的温度烘干8-12小时；如果材料耐温特性相差较远，则不可以一起烘干；例如PLA和PC材料；PLA热变形温度只有55℃左右，过高温度会使PLA材料变形。

Q： 是否可以放不同的材料进行烘干或者存储？

A： 存储只要保持较低湿度的设置，可以将不同材料放入存储。
烘干的时候由于材料热变形温度不同，不可以将特性相差较大的材料一同放入烘干箱进行烘干。

Q： 干燥剂在再生循环模式的时候是怎么回事？

A： 此时设备正在对干燥剂进行除湿，以达到重复利用的目的。此时有可能存在湿度数据上升的情况。

Q： 有无门传感功能？

A： 有门传感功能，如果开启开门检测功能，需要将门关闭严实，烘干和自动存储（干燥）功能才会启动。也可以关闭门检测功能，就不会再对是否关门进行检测。

Q： 烘干箱长期开机是不是很耗电？

A： 只有在烘干模式的时候耗电量才会大，储存模式时几乎不耗电。

Q： 烘干箱烘干12小时大约有多少耗电量？

A： 室温状态下烘干目标温度设定在120℃，大约消耗电量1.4KWh。

Q： 从室内湿度50%下降到10%预计时间多久？

A： 从室内湿度50%湿度的状态下，降低到10%，预计要半个小时。

Q： 门检测传感器对设备功能的影响？

A： 若门检测未被触发（门未关闭好），则设备没有任何提示，不进行存储模式，也将不进入烘干模式，需要确保门是否关闭到位。
当在设置中关闭门检测功能，无论门是否关闭好，烘干存储功能都会启动。

第五章 帮助与支持

　　闪铸专业的售后服务人员及业务员随时为您待命，非常乐意为您解决在你使用过程中遇到的任何问题。如果你的问题从用户手册中找不到答案，你可以进入我们的官方网站来搜索问题的解决方案，当然您也可以通过电话或QQ联系我们。

　　在我们的官网中可以找到一些常见问题的说明和解决方法。您的许多问题都可以在闪铸科技官方网站 www.sz3dp.com 得到解决。

　　您可以在周一到周六的上午8:00到下午5:00的时间段通过电话和 QQ 来联系闪铸的售后团队，为您解决问题。如果您刚好在下班时间联系我们，我们将在下个工作日的第一时间给您反馈，为您解决问题，若造成不便，我们万分抱歉。

售后服务热线：400-8866023
售后客服 QQ：2850862986 / 2850863000 / 2853382161
3D爱好者QQ群：206773820
公司地址：浙江省金华市婺城区仙源路518号

提示：联系售后时，请提供产品序列号，也就是烘干箱背部的条形码。

S/N: FFAD******

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