

安全时刻



NO. 009
2024年3月1日

光固化3D打印安全指引

打印前

- 请勿将 UV 固化树脂暴露于热源、火焰、火花或任何其他火源。
- 如果 UV 固化树脂装在密封墨盒中：在将其装入打印机之前检查墨盒是否有破损或泄漏，请勿使用泄漏或损坏的墨盒。
- 倒树脂时避免树脂泄漏。
- 装入树脂槽时请戴上手套。

打印期间

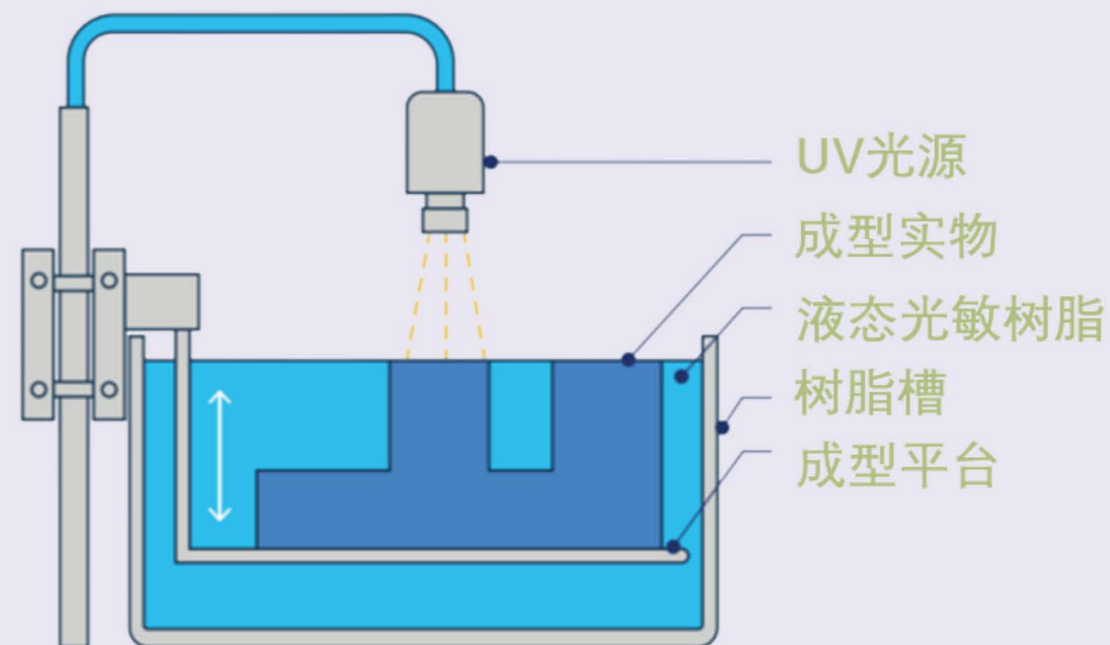
- 限制在 3D打印机运行时靠近观察的时间。请勿在打印机附近徘徊，可以考虑使用摄像头或观察窗进行观察。
- 请勿直视紫外线灯。

打印后

- 直接处理来自打印机的部件时，请戴上手套。
- 使用清洁剂、酒精或异丙醇清洁所有接触过树脂的设备或物品表面，然后再用肥皂和水清洗。
- 可能被未固化树脂材料污染的工具可使用清洁剂、酒精或异丙醇清洁，然后用肥皂和水清洗。
- 请勿将用过的未固化树脂倒回新的树脂瓶中。
- 当装载树脂/化学品时，请勿让打印机或印后设备盖子处于打开状态。

后期处理

- 使用制造商推荐的溶剂（如异丙醇或酒精）清洗部件，处理化学溶剂时要戴手套。使用酒精时要当心，酒精易燃，当心火灾隐患。
- 使用UV光固化后，在不戴手套处理打印对象前，应遵循清洗步骤。
- 确保所有 3D 打印物体根据制造商的说明暴露在紫外线光源下完全后固化。
- 使用工具去除支撑材料时，请佩戴适当的防割手套。
- 如果空间没有除尘系统，则在打磨或后精加工零件时佩戴防尘面罩。



光固化

处理废物

- 请勿将用过的、未固化的树脂倒回新的树脂瓶中。
- 打印过程中产生的废物可能是危险废物。可参考HSE发布的危险废物指引，了解如何正确处理废弃物。

贮存

- 将 UV 固化树脂密封在容器中，避免阳光直射，并保持在制造商建议的温度范围内。
- 装载树脂/化学品时，请勿让打印机或印后设备盖子处于打开状态。
- 查阅材料 SDS，以正确存储设备、配件和打印耗材或原料。
- 遵循所有制造商建议，进行正确的维护和清洁程序，包括相关的过滤器维护和更换时间表。

一般安全

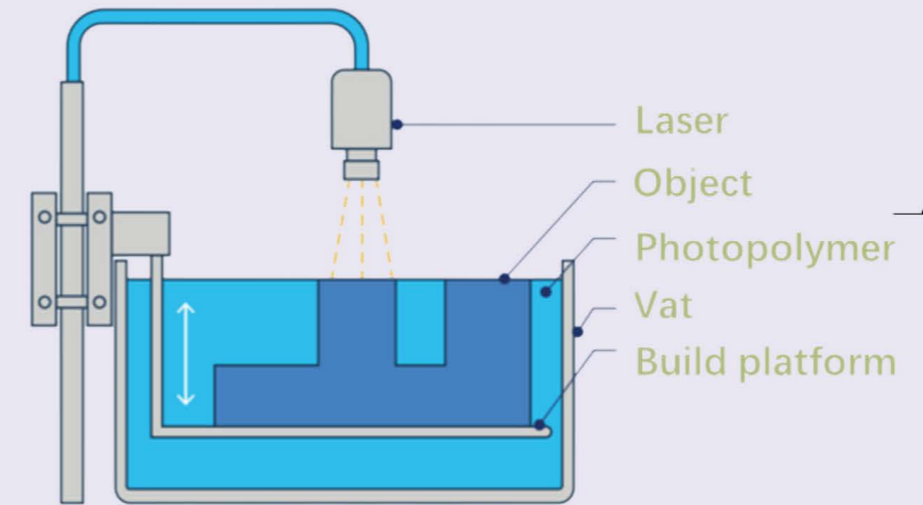
- 使用前确认3D打印机的电源电压需求，选择合适的插座，以满足电气安全要求。
- 请注意内部电气组件的故障、加热打印平台、打印机喷嘴或内部电气组件的故障可能会导致火灾。
- 请勿改装任何电气组件，例如打印平台加热器。
- 由于火灾风险，请勿在无人看管的情况下操作 3D 打印机。
- 某些 3D 打印机中未加防护的电气组件可能会带来触电风险。
- 请注意，3D 打印机运行时，移动部件可能会造成伤害（夹伤、撞伤等）。
- 接触热表面可能会导致烧伤。
- 接触紫外线灯可能导致灼伤。
- 暴露于紫外线光源可能会损伤眼睛和皮肤。
- 请勿将紫外线固化树脂暴露于热源、火焰、火花或任何其他火源。

Safety Moment



NO. 009
Mar 1, 2024

Safety Guidelines for Vat Photopolymerization 3D Printing



VAT PHOTOPOLYMERIZATION

Before printing

- Do not expose UV curable resin to heat, flames, sparks, or any source of ignition.
- If UV curable resin comes in a sealed cartridge: Inspect the cartridge before loading it into the printer. Do not use a cartridge that is leaking or damaged.
- Avoid spills and drips of resin when pouring resins.
- Wear gloves when loading the resin tank.

During printing

- Limit time spent observing close to the 3D printer while it is operational. Do not hover near the printer but consider cameras or observation windows for observation.
- Do not look directly into the UV lamp.

After printing

- Wear gloves when handling parts directly from the printer.
- Clean any surfaces that have been exposed to resin with window cleaner, or a denatured or isopropyl alcohol, followed by washing with soap and water.
- Tools that may be contaminated with uncured resin material should be cleaned with window cleaner, or denatured or isopropyl alcohol, followed by washing with soap and water.
- Do not pour used, uncured resin back into new resin bottles.
- Do not leave printer or post-printing unit open when loaded with resins/chemicals.

Post-processing

- Wash the parts before post-cure using a manufacturer's recommended solvent like isopropyl or rubbing alcohol. Wear gloves when handling chemical solvents. Be careful dealing with alcohols since they are flammable.
- Post-curing using UV light should follow the wash step before the printed object is handled without gloves.
- Ensure that all 3D printed objects are fully post-cured by exposure to a UV light source according to the manufacturer's instructions.
- Wear appropriate cut-resistant gloves when removing support materials with tools.
- If the space does not have a dust collection system, wear a dust mask when sanding or post-finishing parts.

Handling Waste

- Do not pour used, uncured resin back into new resin bottles.
- Waste products from the printing process may be hazardous waste. Refer to the Hazardous Waste guidelines issued by HSE for the proper disposal of waste.

Storage

- Keep UV curable resins sealed tightly in containers out of direct sunlight and within the temperature range suggested by the manufacturer.
- Do not leave printer or post-printing unit open when resins/chemicals are loaded.
- Check with material SDS or manufacturer's instruction for proper storage of devices, accessories, and printing filaments or feedstock materials.
- Follow all manufacturer recommendations for proper maintenance and cleaning procedures including relevant filter maintenance and replacement schedules.

General Safety

- Confirm the power voltage requirements of the 3D printer before use and select the appropriate socket to meet the electrical safety requirements.
- Beware that malfunctions of the heated build platform, printer nozzles, or internal electrical components could result in fire.
- Do not modify any electrical components such as the build platform heater.
- Do not operate 3D printers unattended due to fire risk.
- Unguarded electrical components in some 3D printers could pose a risk of electrical shock.
- Beware that moving parts can cause injury while the 3D printer is operating.
- Contact with hot surfaces can result in burns.
- Contact with the UV lamp can result in burns.
- Exposure to the UV light source can damage eyes and skin.
- Do not expose UV curable resin to heat, flames, sparks, or any source of ignition.