NO. 008 | 2024年2月22日

安全时刻

材料挤出式3D打印安全指引

打印前

- 每次使用前，清洁*3D* 打印机喷嘴和打印平台。
- 请遵循制造商关于底板胶或胶水应用的说明。
- 避免在打印平台上过度使用胶水，尤其是在加热的情况下。
- 将喷嘴和底板温度设置为最低的推荐温度。

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。
- 如果打印机发生故障，请停止打印作业，但让打印机冷却后，其排放的气体或颗粒消散后，再进行故障排除或重新启动。

打印后

- 打印机冷却并且排放气体或颗粒消散后再接触产品或进行清洁。
- 每次使用后清洁 3D 打印机喷嘴和打印平台。
- 用湿布清洁打印机和外壳表面，以除去沉积的颗粒。
- 及时清洁地板、家具表面，可使用具有高效微粒过滤(HEPA) 功能的真空吸尘器。
- 及时洗手，避免化学品和颗粒从手到口，尤其是在进食前。

后期处理

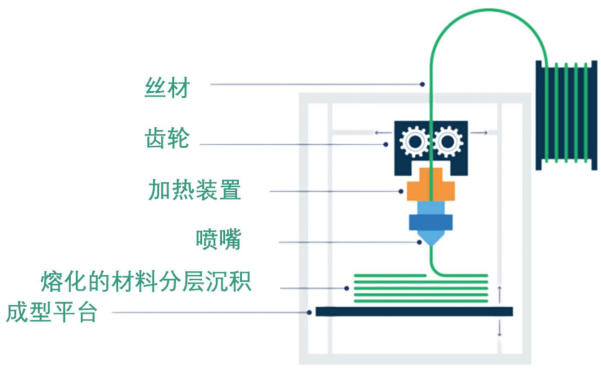
- 使用工具刮擦打印平台板或移除支撑材料时，请佩戴适当的防割手套。
- 使用化学溶解物移除支撑材料时，请佩戴适当的耐化学手套。
- 如果现场没有除尘系统，则在打磨、后经加工零件或移除支撑材料时请佩戴防尘面罩。

处理废物

- 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

- 将耗材存放在装有干燥剂的密封容器中，以防止因环境暴露而发生变化。
- 查阅材料SDS和出厂说明，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，了解正确的维护和清洁程序包括相关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。

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Safety Moment

Safety Guidelines for Material Extrusion 3D Printing

Before printing

- Ensure the 3D printer nozzle and build plate are clean before each use.
- Follow manufacturer instructions for base plate glue or tape application.
- Avoid excessive application of glue or tape on the build plate especially if heated.
- Set the nozzle and base plate temperatures at the lowest recommended settings that produce desired print quality.

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.
- If the printer malfunctions, stop the print job but let the printer cool and emissions dissipate before troubleshooting or restarting.

After printing

- Wait until the printer has cooled and emissions have dissipated before accessing the product or cleaning up.
- Clean the 3D printer nozzle and build plate after each use.
- Clean the printer and enclosure surfaces with a damp cloth to remove deposited particles.
- Vacuum floors, surfaces, and furniture frequently using a vacuum with high efficiency particulate filtration (HEPA).
- Wash hands to avoid hand-to-mouth transfer of chemicals and particles, especially before eating.

Post-processing

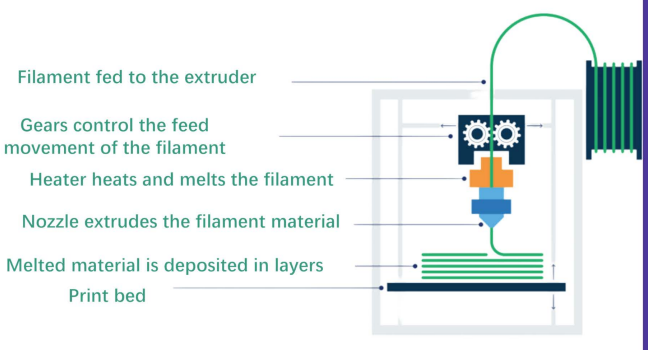
- Wear appropriate cut-resistant gloves when scraping the build plate or removing support materials with tools.
- Wear appropriate chemical-resistant gloves when removing support materials with chemical dissolution.
- If the space does not have a dust collection system, wear a dust mask when sanding or post-finishing parts.

Handling Waste

- 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

- Store filaments in sealed containers with desiccant to prevent changes due to environmental exposure.
- Check with material SDS or manufacture'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.