Rules for 3D Printing

Our makerspace is dedicated to fostering creativity and innovation in a safe and supportive environment. To ensure that all members and visitors can enjoy and benefit from our facilities, we adhere to the following our rules

- 3D Printing Regulations and Rules
- Enforcement
- Prohibited Printing Filaments
- Approved Printing Filaments
- Payment for 3D Printing Services at Bellingham Makerspace
- Cleaning Procedure

3D Printing Regulations and Rules

This Wiki entry outlines the key rules and guidelines for using the facilities at Bellingham Makerspace. Adhering to these rules ensures a safe, productive, and welcoming environment for all members and visitors.

Rules and Regulations

1. **Training Requirement**
   - **Objective:** Ensure competence in safely operating equipment.
   - **Rule:** No use of complex machinery, like 3D printers, without prior training and authorization from makerspace staff.
2. **Weapons Prohibition**
   - **Objective:** Maintain a safe environment.
   - **Rule:** The possession or use of weapons is strictly forbidden on makerspace premises.
3. **Recycling and Waste Disposal**
   - **Objective:** Promote environmental sustainability and cleanliness.
   - **Rule:** Dispose of all waste materials and scraps in designated recycling bins with proper segregation.
4. **Cleanliness**
   - **Objective:** Maintain an organized workspace ready for use.
   - **Rule:** Clean workspace and return all tools and materials to their designated places after completing projects.
5. **Equipment Care**
   - **Objective:** Prevent equipment damage and ensure maintenance.
   - **Rule:** Do not attempt to repair or modify any equipment. Report issues immediately to staff, leading to an incident report.
6. **Payment for Prints**
   - **Objective:** Simplify and ensure transparency in transactions for 3D printing services.
   - **Rule:** Pay for prints either at the counter immediately upon collection or online via PayPal link as provided in the payment procedures.

Prohibited Items, See Weapons Policy and Enforcement

Enforcement

Enforcement

At Bellingham Makerspace, our "No Weapons" policy extends to all aspects, including the manufacturing of firearms or related components. We strictly adhere to regulations outlined in RCW 9.41.190 of the Washington State Legislature, which prohibits the manufacture of certain firearms, bump-fire stocks, undetectable firearms, short-barreled shotguns, and short-barreled rifles, along with any parts intended for such use.

Our staff diligently monitor the premises to ensure compliance with these rules. If any member or visitor is found engaging in the manufacture of prohibited items, immediate action will be taken. This may include expulsion from our makerspace and, if necessary, reporting to the appropriate local authorities or federal agencies in accordance with the law.

We take these measures seriously to maintain a safe and secure environment for all members and visitors at Bellingham Makerspace.

Prohibited Printing Filaments

For the Bambu P1P 3D printer without an enclosure, we've created a list of materials that are not recommended due to the printer's open design and the need for proper ventilation and temperature control:

1. **ABS (Acrylonitrile Butadiene Styrene)**: ABS is known for emitting potentially harmful fumes and requiring high temperatures for proper printing. These conditions are difficult to maintain without an enclosure, which can result in warping and poor air quality.
2. **ASA (Acrylonitrile Styrene Acrylate)**: Similar to ABS, ASA also emits fumes during printing and requires high temperatures that are best managed in an enclosed environment.
3. **PC (Polycarbonate)**: PC needs very high printing temperatures and is susceptible to moisture absorption, which can negatively impact print quality. Enclosures help maintain the necessary temperature and protect the material from environmental factors.
4. **Nylon**: This material is tough and flexible but also requires high temperatures for printing. It absorbs moisture from the air, which can degrade its quality and performance without proper storage and printing conditions.
5. **HIPS (High Impact Polystyrene)**: Commonly used as a support material with ABS, HIPS requires similar printing conditions, including a heated environment to minimize warping, which is typically achieved with an enclosure.

Each of these materials presents specific challenges when used without an enclosure, such as the need for stable high temperatures and controlled ventilation to manage fumes and ensure print quality. When selecting filaments for the Bambu P1P, it's crucial to consider these factors to maintain safety and achieve optimal results (3DSourced) (Printing It 3D) (Manufacturing on Demand) (Wevolver).

Approved Printing Filaments

Approved 3D Printing Materials for Bambu P1P Without Enclosure

The following list includes materials that are recommended for use with the Bambu P1P 3D printer when not using an enclosure. These materials are chosen for their ease of printing, low emission during printing, and the lack of a need for controlled environment conditions.

PLA (Polylactic Acid)

- **Printing Temperature**: 180°C - 220°C
- **Properties**:
  - PLA is one of the most popular 3D printing materials due to its ease of use and environmental friendliness. Derived from renewable resources like corn starch, it's biodegradable under industrial composting conditions and prints with minimal odor, making it ideal for educational and household use.
  - Known for its good detail and low warping, PLA does not require a heated print bed, simplifying its use in open environments.

PETG (Polyethylene Terephthalate Glycol)

- **Printing Temperature**: 220°C - 250°C
- **Properties**:
  - PETG offers a balance between the ease of PLA and the strength of ABS. It features good flexibility, strong layer adhesion, and resistance to chemical and moisture. PETG is more durable than PLA and does not emit harmful gases during printing, making it suitable for use without an enclosure.
  - Its slight flexibility and high durability make it appropriate for functional parts that require a degree of sturdiness not provided by PLA.

PLA+ (Enhanced PLA)

- **Printing Temperature**: 190°C - 220°C
- **Properties**:
  - PLA+ is an enhanced version of standard PLA, designed to be tougher and more durable. It retains all the printing ease of regular PLA but with increased strength and slightly higher resistance to heat.

    - Suitable for projects that demand a bit more from the material without the need for stringent printing conditions.

TPE (Thermoplastic Elastomers)

- **Printing Temperature**: 210°C - 230°C
- **Properties**:
    - TPE is a category of flexible 3D printing materials known for their elasticity and flexibility. These materials are easy to print and provide exciting options for items that require bending and stretching capabilities.
    - Ideal for producing objects like gaskets, hoses, and wearable items, TPE can be printed without an enclosure, though care should be taken to ensure the material feeds smoothly into the printer due to its flexibility.

These materials are suitable for printing on the Bambu P1P without an enclosure due to their lower operational temperatures and minimal hazardous emissions.

Payment for 3D Printing Services at Bellingham Makerspace

Overview

This page outlines the payment procedures for 3D printing services at Bellingham Makerspace. Understanding these procedures ensures that members can efficiently manage transactions, contributing to the sustainable operation and improvement of our community's resources.

Why We Charge for 3D Printing

- **Operational Costs**: 3D printing involves maintenance and upkeep of machines, software updates, and material costs. Charging helps cover these expenses.
- **Responsible Usage**: Implementing a fee encourages members to optimize resource use, reducing waste and promoting careful planning of print jobs.
- **Sustainability**: Revenue from printing services is reinvested into the makerspace, allowing for upgrades, new equipment purchases, and cost reductions over time.
- **Community Growth**: Fees support community workshops and educational programs, fostering learning and collaboration within the makerspace.
- **Fair Access**: Charging for services helps regulate demand, ensuring all members have equal access to 3D printing capabilities.

Payment Methods

At the Counter:

1. **Review Your Bill**: Staff will provide a detailed cost breakdown for your print job, including materials used and any other applicable fees.
2. **Payment Options**:
   - Acceptable methods include cash, credit/debit cards, and electronic payments like Apple Pay or Google Wallet.
3. **Receipt**: You will receive a receipt upon payment, important for your records.

Via PayPal Link:

PayPal

1. **Payment Link**: After your 3D print order is placed, you will receive a PayPal link via email or on your user dashboard.

2. **Completing the Transaction**:
   - You can pay using your PayPal account or credit/debit card through PayPal's guest checkout.
   - Include "3D Printing" in the notes
3. **Confirmation**: After payment, you will receive confirmation emails from both PayPal and Bellingham Makerspace.

Example Cost Calculation for 25 Grams

- **Material Cost**: 25 grams × $0.15/gram = $3.75
- **Flat Fee**: $3.00
- **Total Cost**: $3.75 + $3.00 = $6.75

This example illustrates a typical cost for a small print job, helping members estimate their expenses.

Conclusion

Bellingham Makerspace offers flexible payment options to accommodate all members. By contributing to the cost of printing, you help sustain and grow the resources available to our community.

Cleaning Procedure

Quick Cleaning Procedure for 3D Printing Area

Total Time: 8 Minutes

1. **Preparation (1 Minute)**

- **Gather Cleaning Supplies**: Collect all necessary cleaning tools and materials, such as isopropyl alcohol, microfiber cloths, plastic scrapers, a small broom, dustpan, and waste bins.

2. **Clear the Build Area (2 Minutes)**

- **Remove Debris**: Carefully remove any loose filament strands, failed prints, and raft materials from the build plate and surrounding area.
- **Dispose of Waste**: Immediately place all debris into the designated recycling bin or trash depending on the material type.

3. **Clean the Build Plate (2 Minutes)**

- **Wipe Down**: Spray a small amount of isopropyl alcohol on the build plate and gently wipe with a microfiber cloth to remove any adhesive residue or leftover filament.
- **Check for Stickiness**: Ensure the surface is not sticky; if residue persists, use a plastic scraper gently to remove any stubborn spots.

4. **Sweep the Area (1 Minute)**

- **Sweep Up**: Use a small broom to sweep the floor and areas around the printer, focusing on gathering any dust, filament fragments, and other small debris.
- **Collect with Dustpan**: Pick up the swept debris with a dustpan and dispose of it properly.

5. **Inspect and Wipe Printer Exterior (1 Minute)**

- **Quick Inspection**: Visually inspect the printer for any spilled materials or dust.
- **Clean Exterior**: Wipe down the exterior surfaces of the printer with a dry microfiber cloth to remove dust and potential spills.

6. **Organize Supplies (1 Minute)**

- **Return Supplies**: Put back all cleaning materials and tools to their designated storage spots.

- **Ready for Next Use**: Ensure that the printer is set up for the next user, with the build plate correctly aligned and the filament guide clear.

By incorporating sweeping into the cleaning routine, you ensure that the area not only stays free of large debris but also maintains a level of cleanliness that prevents dust and small particles from affecting printer operation and product quality.