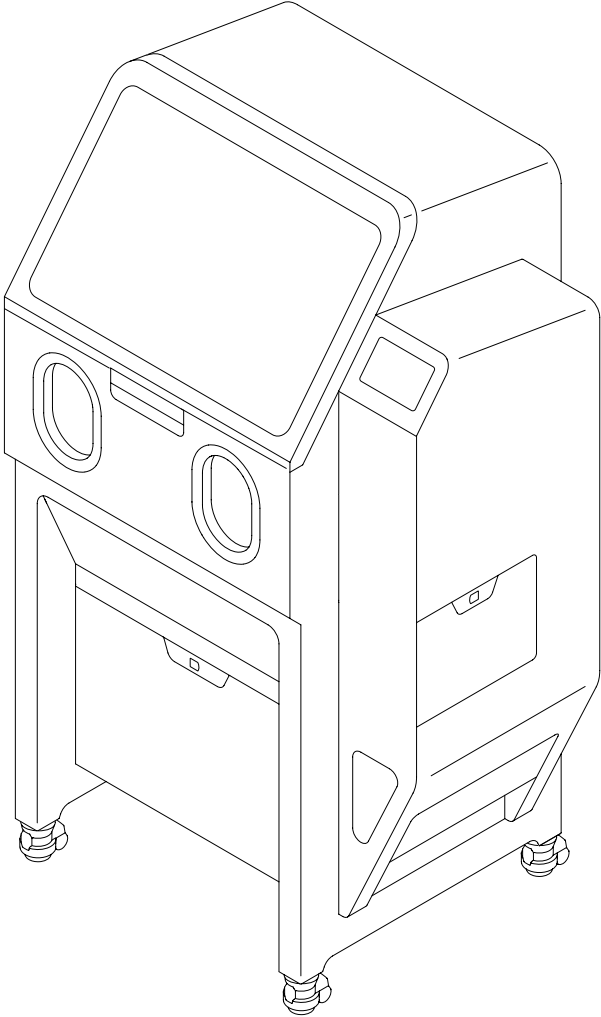


Manual | Fuse Blast



Installation and Usage Instructions

Fuse Blast

Automated and manual
SLS media blasting station

Original English instructions

Read this manual carefully and keep it for future reference.

January 2024

REV 01

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Read and understand this manual and its safety instructions before using the Fuse Blast. Failure to do so can result in serious injury or death.



DISCLAIMER

Formlabs has made every effort to make these instructions as clear, complete, and correct as possible. The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation, and testing of the products with respect to the relevant specific application or use thereof. Neither Formlabs nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information that is contained herein. Notify us if you have any suggestions for improvements or amendments or have found errors in this publication.

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support.formlabs.com

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DOCUMENT REVISIONS

Date	Version	Document changes
Jan 2024	REV 01	Initial publication

1 Preface

Congratulations on purchasing the Fuse Blast. On behalf of the Formlabs team, we thank you for your purchase.

The Fuse Blast is an automatic media blasting station for SLS printed parts, specifically designed for the Formlabs Fuse Series ecosystem. It offers automatic media blasting that provides a hands-off workflow for cleaning residual powder, removing Surface Armor, and surfacing SLS printed parts. Manual mode allows for careful manipulation and cleaning of delicate or oversized parts using the built-in glovebox. An in-line ionizer rinses off abrasive dust and residual powder and leaves parts clean to the touch and ready for end-use. Passive media filtering separates worn media and powder and significantly extends media life to reduce waste. A fully sealed enclosure with a HEPA filter, cabinet rinse procedure, and quiet operation provides an office-friendly package and minimizes powder mess. Presets and configurable time, RPM, and pressure settings allow for repeatable, reliable results.

This manual explains how to set up, use, and properly maintain the Fuse Blast, as well as providing design guidance for optimizing print results.

The manual is intended for anyone who is installing, operating, maintaining, or otherwise interacting with the Fuse Blast. Supervise young or inexperienced users to ensure enjoyable and safe operation.

1.1 Read and retain instructions

Read and understand this manual and its safety instructions before using the Fuse Blast. Failure to do so can result in serious injury or death. Keep all safety information and instructions for future reference and provide them to subsequent users of the product.

Follow all instructions to avoid fire, explosions, electric shocks, or other hazards that may result in damage to property and/or severe or fatal injuries.

The Fuse Blast shall only be used by persons who have fully read and understand the contents of this manual. Ensure that each person who uses the Fuse Blast has read these warnings and instructions and follows them. Formlabs is not liable for cases of material damage or personal injury caused by incorrect handling or non-compliance with the safety instructions. In such cases, the warranty will be voided.

1.2 Obtaining documentation and information

Visit formlabs.com to:

- Access your **Formlabs store** (formlabs.com/store) and **Dashboard** accounts (formlabs.com/dashboard).
- Find **certified service providers** in your region (formlabs.com/company/partners).
- Access the **Terms of Service** (formlabs.com/terms-of-service) and the **Privacy Policy** (formlabs.com/privacy-policy).

Visit support.formlabs.com to:

- Access the latest version of all Formlabs product documentation.
- Contact [Formlabs Support](https://support.formlabs.com) to request documentation, manuals, repair guides, and technical information.
- Submit any comments or feedback regarding what is good and what can be improved. Formlabs values comments from its users.
- Request additional training.

1.2.1 **Support and service**

Retain a record of the original purchase to request warranty services. Service options depend on the status of the specific product's warranty. Include the serial name of the product when contacting [Formlabs Support](#) or a [certified service provider](#) for product support.

Instead of a serial number, Formlabs products have a serial name, which is a unique identifier to track the history of manufacturing, sales, and repair, and to distinguish usage when connected to a network. The serial name is on the back panel of the machine in the format **Blast-AdjectiveAnimal**.

Service providers of Formlabs products also provide support and service. To the extent that Formlabs or a certified service provider offers other or extended warranties, the terms of the separate offer may apply.

For products purchased from certified service providers, contact the original service provider for assistance before contacting Formlabs Support.

For any support or service requests, including product information, technical assistance, or assistance with instructions, contact [Formlabs Support](#):

support.formlabs.com

USA

Formlabs, Inc.
35 Medford St.
Somerville, MA, USA, 02143

USA

Formlabs, Inc.
220 E Buffalo St.
Milwaukee, WI, USA 53202

Germany

Formlabs GmbH
Nalepastrasse 18
12459 Berlin, Germany

Hungary

Formlabs
Andrássy út 9
1061 Budapest, Hungary

Japan

1F Kitashinagawa 369 Building
3 Chome-6-9 Kitashinagawa
Shinagawa City
Tokyo 140-0001, Japan

Taiwan

No. 282號21號之9, Shizheng
North 2nd Rd, Xitun District
Taichung City, Taiwan 407

1.2.2 **Warranty**

This product is protected under warranty. Formlabs offers a warranty for all Formlabs branded hardware. Unless otherwise expressly stated, the **Terms of Service**, including the **Warranty**, constitute the entire agreement between you and Formlabs with respect to the **Service** and any product you purchase from Formlabs and supersedes all prior or contemporaneous communications, proposals, and agreements, whether electronic, oral, or written, between you and Formlabs.

Read the warranty for more details on the Formlabs warranty for your region:

US

[formlabs.com/terms-of-service](https://support.formlabs.com/terms-of-service)

EU (EN)

[formlabs.com/eu/terms-of-service](https://support.formlabs.com/eu/terms-of-service)

EU (DE)

[formlabs.com/de/terms-of-service](https://support.formlabs.com/de/terms-of-service)

EU (FR)

[formlabs.com/fr/terms-of-service](https://support.formlabs.com/fr/terms-of-service)

EU (ES)

[formlabs.com/es/terms-of-service](https://support.formlabs.com/es/terms-of-service)

EU (IT)

[formlabs.com/it/terms-of-service](https://support.formlabs.com/it/terms-of-service)

2 Introduction

2.1 Intended use

The Fuse Blast is a commercial, precision tool intended for use in the additive manufacture of end-user supplied designs from SLS powder. The final performance characteristics of sintered SLS powder may vary according to your compliance with the instructions for use, application, operating conditions, material combined with, end use, or other factors.



NOTICE

The Fuse Blast is not for residential use.



NOTICE

In some cases, the additive manufacturing process may inherently result in variable performance characteristics between manufacturing runs or within a specific part. Such variances may not be apparent and may result in unexpected defects in additively fabricated parts.



NOTICE

IPX0: The product offers no special protection from water.



NOTICE

The Fuse Blast is classified as Pollution Degree 2: Normally only nonconductive pollution occurs. Temporary conductivity caused by condensation may be expected.



WARNING

You shall independently verify the suitability of additive manufacturing, Selective Laser Sintering (SLS), the Fuse Blast, and any specific designs or materials employed for the application and intended purpose before use. In no event shall Formlabs be liable for any loss, death, or bodily injury that you suffer, or that you cause to any third party, in connection with your use of Formlabs products. To the fullest extent legally permitted Formlabs EXPRESSLY DISCLAIMS ANY IMPLIED OR EXPLICIT WARRANTY OF FITNESS for a particular usage, the particular nature and circumstances of said usage being unforeseen and unforeseeable to Formlabs.



WARNING

Formlabs provides tools and materials that may be used in many applications, but makes no claims as to the safety or effectiveness of any specific devices made using Formlabs products. Certain Formlabs products, such as those commonly known in the industry as “biocompatible” materials, have been engineered to comply with relevant industry standards. The specific standards and most relevant technical specifications may be identified within the technical data sheets and have been tested according to relevant testing protocols for those standards and specifications. Biocompatible materials are a speciality product, developed for use by medical professionals, and should be used in accordance with the instructions for use.



WARNING

Do not modify. The Fuse Blast is intended for use as-is. Modifying the machine without explicit approval and directions from Formlabs or a certified service provider will void your warranty, and could potentially ruin the machine and cause you bodily harm.

2.2 Technical specifications

Parameter	Unit
Powder recovery station	Fuse Blast
3D printing technology	Selective Laser Sintering (SLS)
Printer compatibility	Fuse Series SLS 3D Printers Third-party powder bed fusion 3D printers
Minimum dimensions for convenient access (W × D × H)	145 × 150 × 210 cm 57.4 × 59.6 × 82.6 in Additional clearance of 76.2 cm (30 in) on all sides required
Product dimensions (W × D × H)	100 × 75 × 175 cm 39 × 29.6 × 68.7 in Height when open: 195 cm (76.8 in)
Product weight	164 kg 360 lb (without blasting media)
Tumbling basket dimensions	Internal diameter: 450 mm (17.7 in) Opening diameter: 345 mm (13.6 in) Basket depth: 250 mm (9.8 in) Basket is removable without tools. Fits a full Fuse 1 generation build volume.
Internal work area (W × D × H)	71 × 55 × 67 cm 27.9 × 21.6 × 26.3 in
Accessible work area (W × D × H)	57 × 50 × 67 cm 22.4 × 19.6 × 26.4 in (basket removed)
Hopper capacity	Media hopper capacity 8.3 L, equivalent to 13 kg of 200–300 μm glass media Waste hopper capacity 10.6 L
Operating environment	10–36 °C 50–96.8 °F Elevation up to 7500 ft / 2286 meters
Air handling	Negatively pressurized hood with replaceable HEPA filter Independent venting system
Power requirements	EU: 230 VAC, 3 A (no dedicated circuit or vacuum required) US: 120 VAC, 6 A (no dedicated circuit or vacuum required)
Overvoltage category	OVC II
Compressed air requirements	Supply at least 10 SCFM at 90 psi / 285 SLPM at 6 bar. Regulate pressure input between 90–120 psi / 6–8 bar. Typically achieved by a single 4 hp compressor.
Connectivity	Wi-Fi: 2.4 GHz Ethernet: 1000 Mbit USB: 2.0
Wi-Fi connectivity	Protocol: IEEE 802.11 b/g/n Frequency: 2.4 GHz Supported security: WPA/WPA2
Ethernet connectivity	RJ-45 Ethernet (10BASE-T/100BASE-TX/1000BASE-T) LAN port Connect with a shielded Ethernet cable (not included): minimum Cat5, or Cat5e or Cat6 for 1000BASE-T.
USB connectivity	USB (rev 2.0) C port with a USB A-C or C-C cable
Sound emission	Under normal use the machine does reach a time-weighted average of 85 dB(A). Hearing protection is not required.

Parameter	Unit
Product control	Interactive touchscreen, manual control pedals for manual media blast and air rinse control
Included Accessories	Transfer container Control pedals ESD wrist strap 7 mm socket wrench 3 mm blast orifice 4 mm blast orifice (installed) T20 Torx driver Floor mat
Alerts	Touchscreen alerts

2.3 Product components

2.3.1

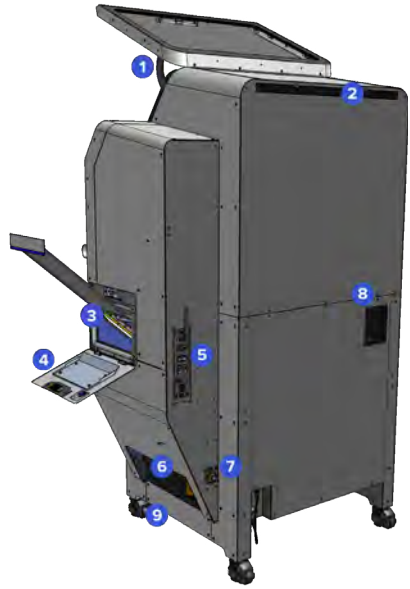
Fuse Blast – Front

- 1 Door latch: Secures the blasting chamber.
- 2 Blasting chamber door: A tempered glass window prevents powder and debris from leaving the Fuse Blast’s workspace and provides access to the tumbler basket and blast gun.
- 3 Blast lights: Provides light to the Fuse Blast’s workspace.
- 4 Tumbler basket: Rotates to agitate parts and ensure even coverage during automated media blasting.
- 5 Blast gun: Blasts printed parts with media and then cleans them with forced ionized air.
- 6 Blast arm: Holds blast gun in position for assisted manual blasting or an automatic blasting cycle.
- 7 Touchscreen: The LCD capacitive touch user interface displays cleaning cycle information, settings, and error messages.
- 8 Blast gloves: Allows users to manipulate and clean items while the Fuse Blast chamber doors are secured.
- 9 HEPA filter door: Sealed and interlocked door for accessing the HEPA air filter.
- 10 Media hopper window: Allows for visual check of powder level in the hopper.
- 11 Waste hopper window: Allows for visual check of waste level in the hopper.
- 12 Foot pedals: Manual controls for the air rinse and media blasting.
- 13 Media hopper valve: A knife valve used to close off and open the valve to empty the media hopper.
- 14 Work surface: A grated surface in the interior of the blasting chamber that also allows media and powder to drain into the chamber chute. Place parts here during manual blasting.
- 15 Grounding strap plug: A plug for attaching the included anti-static wrist strap used to protect users and electronics from static electricity build up. Recommended for manual mode.



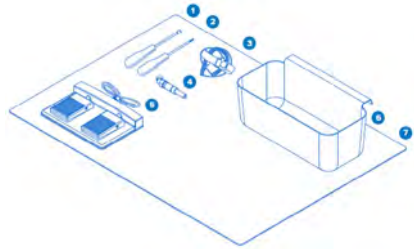
2.3.2 Fuse Blast – Side and rear

- 1 Door spring: Holds the blasting chamber door open.
- 2 Air inlet: Provides ventilation to the workspace.
- 3 Media filter mesh: Separates powder and degraded blasting media and recycles good media into the media hopper.
- 4 Waste hopper door: Sealed and interlocked door for accessing the waste hopper.
- 5 I/O panel: Panel for power supply, Wi-Fi antenna, and Ethernet connection.
- 6 Waste hopper valve: A knife valve used to close off and open the waste hopper.
- 7 Compressed air inlet: A 1/4" quick disconnect hose coupling for the air compressor.
 - If compatible fittings are not available, remove and replace with NW 7,2 to G3/8" male thread adapter (European standard)
- 8 Air exhaust: Blows circulated air out of the Fuse Blast.
- 9 Caster wheels: Allows users to move the Fuse Blast and lock it into position.



2.3.3 Fuse Blast accessories

- 1 7 mm socket wrench: Use the 7 mm socket wrench for maintaining and replacing parts.
- 2 T20 Torx driver: Use the T20 Torx driver for maintaining and replacing parts.
- 3 Grounding wrist strap: Attach to the grounding wrist plug to protect users and electronics from static electricity build up. Recommended for manual mode.
- 4 3 mm blast nozzle orifice: Interchangeable blast nozzle orifice for lower flow compressed air supply
- 5 Foot pedals: Connect the pedals to the Fuse Blast to manually control the air rinse and media blast.
- 6 Parts transfer bin: Storage container for transferring printed parts from the Fuse Sift to the Fuse Blast.
- 7 Floor mat: Place the floor mat underneath the Fuse Blast to prevent the pedals from sliding.



2.3.4 Additional Fuse Blast package components

- 1 Power cable: Compatible with the Fuse Blast, Fuse Sift, and Fuse 1 generation printers.
- 2 Wi-Fi antenna: Establish an internet connection on the Fuse Blast.

2.4 Fuse Blast user interface

For detailed guidance and visual assistance, visit support.formlabs.com.

The Fuse Blast's display includes a touchscreen user interface for controlling the system. The touchscreen displays system information and status, settings, information about the blasting media, chamber pressure, lights, fan, and error messages.

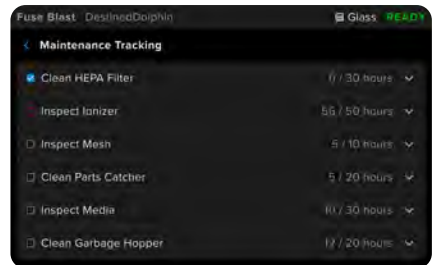
The home screen displays the media blast time and psi, air rinse time and psi, tumbler speed, current blasting media, and device status. Select a custom preset media blasting cycle or choose a cycle by pressing the up or down arrows for each option. When ready, press the **Start** button.



The Fuse Blast displays error messages on the touchscreen when an error occurs. Follow on-screen instructions to resolve. Scan the QR code or visit Formlabs Support for written and visual instructions to resolve the error.



The Fuse Blast requires periodic maintenance and notifies users when a procedure is due. Each procedure is organized in a checklist with due tasks highlighted red. Tap the **v** next to each procedure for more information and a link to support.formlabs.com for written and visual instructions. When a task is completed, the Fuse Blast keeps track of procedure intervals in the background.



3 Safety



Read and understand this manual and its safety instructions before using the Fuse Blast. Failure to do so can result in serious injury or death.

Supervise young or inexperienced users to ensure enjoyable and safe operation. The instructions contain warnings and safety information, as explained below:



DANGER indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



NOTICE indicates information considered important, but not hazard-related.



DANGER: Dry powders can build static electricity charges, creating an explosive risk.



ENVIRONMENTAL HAZARD: Unsintered SLS powder is classified as a microplastic, a group of plastics that are hazardous to aquatic life.



CAUTION: Moving parts present crushing and tangling hazards. Take caution when opening and closing the blasting chamber door.



CAUTION: Moving parts present crushing and tangling hazards. Do not reach into the blasting chamber while the automatic blasting cycle is running.



MANDATORY ACTION: Refer to instruction manual/booklet.



MANDATORY ACTION: Disconnect before carrying out maintenance or repair.



MANDATORY ACTION: Grounding required.

3.1 Component and subsystem safety

3.1.1 General



The Fuse Blast requires a 230 VAC (50 Hz), 3 A power supply (EU) or 120 VAC (60 Hz), 6 A power supply (US) for nominal operation. Unless explicitly instructed by Formlabs Support, do not disassemble or tamper with the product beyond what is explicitly outlined for typical maintenance. Tampering with, or disassembling the Fuse Blast prior to disconnecting the power cable and waiting approximately ten minutes can subject users to potentially fatal electrical hazards.



Do not lift or reposition the Fuse Blast:

- By grabbing or pulling on the workspace hood, workspace lip, blasting chamber latch, or power cable.
- By pushing on any side of the unit while caster wheels are locked in place.



The Fuse Blast requires a dry, indoor operating environment that is low in ambient humidity and static electricity. Refer to section 4.1 Location and environs for the recommended operating environs. When performing maintenance or testing with the exterior paneling of the machine removed, ground equipment to the grounding stud marked with this protective earth symbol.

3.1.2 Air compressor system

The Fuse Blast requires a separate air compressor system capable of supporting at least 10 SCFM airflow at 90 psi or 285 SLPM at 6 bar for regular usage. The maximum input pressure is 120 psi, and should be regulated between 90–120 psi.

Follow all safety instructions and warnings for your air compressor system.

3.1.3 Powder



Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Therefore: avoid dust generation and dispersal of dust in air; dust deposits should not be allowed to accumulate on external surfaces; clean dust residues at regular intervals; do not use brooms or compressed air hoses to clean surfaces; only use vacuums approved for dust collection that are grounded; use only non-sparking tools; keep powder containers tightly closed when not in use.



Consult the safety data sheet (SDS) as the primary source of information to understand safety and handling of Formlabs powders. Respect Formlabs powder like any household chemical. Follow standard chemical safety procedures and Formlabs powder handling instructions. In general, Formlabs powder is not approved for use with food, drink, or medical applications on the human body. Refer to the safety data sheet (SDS) for each specific powder as well as support.formlabs.com for more detail.

3.1.4 **Blasting media**



Blasting media propelled at high speeds can damage skin. Do not operate in manual mode if there are tears or holes in the blast gloves.

3.2 **Personal protective equipment (PPE)**

In typical operation, Fuse Blast provides a sealed environment which does not require PPE to operate. However, certain PPE may be used depending on your environment when transferring parts or performing maintenance. Refer to the relevant material SDS for recommended protective measures.

3.3 **Specification of tools to be used**

The Fuse Blast shall only be used with supplied accessories and additional tools recommended by Formlabs or a certified service provider. Third-party accessories and materials may cause damage. Refer to sections 3.2 Personal protective equipment (PPE) and 6.1 Tools and supplies for more information.

Purchase additional supplies:

- **Glass media**
200–300 μm (50/70 mesh) glass bead media is recommended to efficiently recycle media. Smaller media sizes will be filtered into the waste hopper. Larger sizes may not clean effectively.
- **Disposal bags**
Standard garbage bags are acceptable.
- **Antistatic vacuum that is grounded and bonded (e.g., NFPA 652-compliant)**
Certified for use with materials whose finite particles present an explosive risk when in the vicinity of potentially malfunctioning electrical equipment.
- **Compressed air supply with minimum 10 SCFM airflow at 90 psi**
The Fuse Blast requires a compressed air supply that can support 10 SCFM airflow at 90 psi or 285 SLPM at 6 bar and regulate pressure input between 90–120 psi / 6-8 bar, equal to a 4 hp compressor motor. 4 hp motors typically require 230 VAC. Components are supplied for 3 mm and 4 mm air compressor systems. Using the smaller blast orifice is possible with lower air consumption, but may take longer to media blast printed parts or clean parts less effectively.

3.4 **Emergency and exceptional situations**

Formlabs has made every effort to provide updated safety data sheets (SDS) for every Selective Laser Sintering (SLS) powder product, in accordance with the latest government guidelines. Always consult the safety data sheet (SDS) as the primary source of information to understand safety and handling of Formlabs materials and required accessories.

3.4.1 **Fire**



Do not use water to extinguish an electrical fire. Dousing an electrical fire with water increases the risk of electrocution, and may cause the fire to spread by allowing electricity to conduct across additional flammable surfaces.

If a localized fire develops either inside or outside of the machine, immediately take the following actions.

If the fire is inside the Fuse Blast:

1. Immediately disconnect the machine from its power source.
2. If possible, open the blast chamber door by releasing the chamber door latch.
3. Use an ABC fire extinguisher to cover the affected area generously.

If the fire is too large to control:

1. Immediately leave the area and close the door of the room behind you.
2. Evacuate the building according to your organization's emergency protocols.
3. Call emergency services once you have reached a safe distance from the fire.

3.4.2

Powder



In an emergency involving powder, always refer to the safety data sheet (SDS) and/or seek help from a medical professional.

3.4.3

Air compressor

The Fuse Blast requires a compressed air supply that can support 10 SCFM airflow at 90 psi or 285 SLPM at 6 bar and regulate pressure input between 90–120 psi / 6-8 bar, equal to a 4 hp compressor motor. 4 hp motors typically require 230 VAC.

Follow all guidelines laid out by the air compressor supplier.

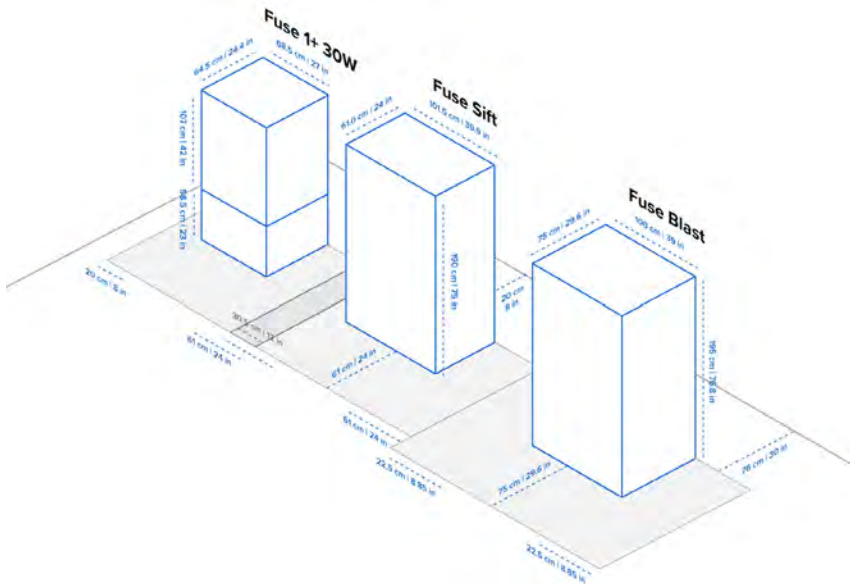
4 Preparation and setup

4.1 Location and environs

Prepare a space to install and operate the Fuse Blast and house the necessary accessories and consumables. Unlike standard media blasting cabinets, Fuse Blast can share a space with the Fuse 1 generation printer or Fuse Sift without risk of media contamination.

To prepare the workspace for the Fuse Blast:

1. Choose a dry, indoor location separate from any machinery or tooling that generates dust or sparks, such as wood or metal working equipment.
2. The Fuse Blast is a free standing system. Reserve the following minimum dimensions for the most convenient access:



- **Fuse Blast (W × D × H):** 145 × 150 × 210 cm (57.4 × 59.6 × 82.6 in)
 - The Fuse Blast footprint is 100 × 75 × 175 cm (39 × 29.6 × 68.7 in). With the blasting chamber door open, the Fuse Blast is 195 cm (76.8 in) in height. Leave at least 76.2 cm (30 in) on all sides of the unit free for access.
 - Place the Fuse Blast at least 76.2 cm (30 in) from nearby walls.
- 3. Ensure proper ventilation is installed.
- 4. Purchase additional supplies:
 - Antistatic vacuum that is grounded and bonded (e.g., NFPA 652-compliant vacuum)
 - Particulate filtering respiratory protection (N95 or better)
 - Non-reactive nitrile gloves
 - Safety glasses
 - Blasting media (200–300 μm for best media filtering performance)

- Air compressor (must support 10 SCFM airflow at 90 psi, such as a 4 hp compressor)
- Air fittings to connect Fuse Blast to compressed air source:
 - 3/8" NPT Female to 1/4" industrial quick-disconnect hose coupling
 - EPDM air hose, 3/8 NPT male
 - Other fittings as required for the compressor (filter, pressure regulator, etc.)
- Shielded Ethernet cable (minimum Cat5, or Cat5e or Cat6 for 1000BASE-T)

4.2 Power and networking

For detailed guidance and visual assistance, visit support.formlabs.com.

Only use the supplied power cord or an alternative that meets the unit's power requirements. Using an inadequately-rated power cable can damage your equipment or present a fire hazard.



The Fuse Blast requires an AC circuit that can provide at least 3 A at 230 VAC (EU) or 6 A at 120 VAC (US), as well as reliable grounding. Power surges may disrupt operation and/or permanently damage sensitive components, jeopardizing the reliability of the product. Formlabs suggests the use of line conditioners or UPS in regions with voltage fluctuations $\leq 10\%$.

Connect the air compressor system to a separate electrical circuit from the Fuse Blast. Ensure that the machine maintains a constant connection to a secured network. Refer to section **4.6 Setting up a network connection** for more information.

4.3 Unboxing the machine

For detailed guidance and visual assistance, visit support.formlabs.com.

Prior to unboxing, ensure that the suitable workspace has been prepared according to section **4.1 Location and environs**.



The Fuse Blast is a heavy object. A two person lift is required to prevent injury and avoid damage to the machine.

4.3.1 Receiving

The standard Fuse Blast package ships on one pallet and contains the Fuse Blast media blasting station, tumbler basket, transfer container, foot pedals, ESD wrist strap, 7 mm socket wrench, 3 mm blast orifice, 4 mm blast orifice (installed), T20 Torx driver, and floor mat. If you are in a building with palletized deliveries, ensure you have access to the loading dock.

	Fuse Blast	Pallet including product and boxes (if applicable)
Shipping dimensions	100 × 75 × 175 cm 39.4 × 29.8 × 69 in	117 × 91 × 194 cm 46 × 35.8 × 76.4 in
Shipping weight	194 kg 427.7 lb	243 kg 535.7 lb
Product weight	164 kg 360 lb	N/A

4.3.2 Unboxing

The custom packaging the Fuse Blast arrives in is specially designed to protect the machine during shipping. During unboxing, inspect the product for any damage or missing items. In the case of damage or missing items, contact Formlabs Support or a certified service provider.



Removing the machine from its packaging requires at least two people that are comfortable moving large and heavy objects.

To unbox the machine:

1. Position the Fuse Blast's packaging near the machine's designated area, leaving enough room for two people to comfortably maneuver throughout the area. Stand the packaging upright and ensure it is level. Ensure there is 2 m (6.6 ft) of clearance in front of the packaging for unloading the Fuse Blast.
2. Cut and remove the outer strapping securing the packaging.
3. Remove the eight clips securing the exterior cardboard shell. Retain all fastening hardware and packaging for future use.
4. Open the machine's box from the top by removing the lid, then consecutively remove the two C-shaped shells from the left and right sides.
5. Remove the three protective foam core supports from inside the machine.
6. Locate and remove the accessory box from the front of the machine.
7. Locate and remove the power cable box from the right side of the machine.
8. Locate and remove the ramp from the package.
9. Attach the ramp to the pallet. Align the top edge of the ramp to the front edge of the pallet. Using the velcro attached to the ramp, secure the ramp to the pallet in front of the Fuse Blast. The ramp surface should not be above the pallet platform.
10. Remove the bottom protective foam core support.
11. Rotate the wheel nuts clockwise to release the wheels.
12. With two people, carefully roll the machine off the pallet and into its workspace.
13. Once in position, lock the wheels on the feet to prevent the Fuse Blast from moving.
14. Remove any additional wrapping and packaging from the Fuse Blast.
15. Open the blasting chamber door and remove the Fuse Blast tumbler basket from the packaging. Using two hands, carefully slide the tumbler basket onto the tumbler basket shaft.
16. Install the media blast gun onto the blast arm. Ensure that the blast gun fits snugly on the blast arm.
17. Place the foot pedals underneath the Fuse Blast. Plug them into the connector on the back of the unit.
18. Remove the grounding strip from the accessories box and attach it to the front of Fuse Blast.
19. Attach your compressed air supply to the Fuse Blast using the compressed air inlet (1/4" quick disconnect coupling), with a compressed air supply regulated to at most 120 psi.
20. Remove the power cord from the accessories box and connect the machine to power.



The original packaging is designed to be kept and reused for transporting or shipping the machine for service. Save the complete packaging including any inserts for your convenience.

4.4 Accessing the serial name

For detailed guidance and visual assistance, visit support.formlabs.com.

The serial name is a unique identifier used to track the history of manufacturing, sales, and repair. The serial name for the Fuse Blast is located on a sticker next to the A/C input on the I/O panel in the format **Blast-AdjectiveAnimal**. For a Fuse Blast, the serial name is also available on the touchscreen on the top-left corner of the home screen.

To access the serial name on the touchscreen:

1. Tap the gear icon in the bottom-left corner to enter the **Settings** menu. The **Settings** menu appears.
2. Tap **System**. The **System** screen appears.
3. Tap **Device Details**. The **Device Details** screen appears.
4. The serial name is listed in the top-left corner.

4.5 Installing the machine

For detailed guidance and visual assistance, visit support.formlabs.com.

After selecting a dry, indoor location for the Fuse Blast, install the accessories if you did not do so during the unboxing process: insert the tumbler basket, connect the blast gun to the blast arm, connect the air compressor cables, connect the foot pedals, install the Wi-Fi antenna, check the valves, and then connect the Fuse Blast to a power source to turn on the machine.

4.5.1 Installing the tumbler basket

Remove the Fuse Blast tumbler basket from the pallet. Open the blasting cabinet, and locate the basket shaft on the back wall of the cabinet interior. Using two hands, carefully and firmly slide the tumbler basket onto the tumbler basket shaft until the position bottoms out. The shaft lays flush on the basket interior.

4.5.2 Installing the blast gun

The blast arm is wrapped and zip tied in the home position. Cut the zip ties to release the gun and remove the packaging. To move the arm into the blasting position, pull the arm forward from the home position, then to the left to rest in front of the tumbler basket.

Ensure that the tubing is free to move and unobstructed.

4.5.3 Attaching the grounding strap

Remove the grounding strap from the accessories box and attach it to the grounding port on the front right leg of the Fuse Blast.

4.5.4 Connecting the foot pedals

Place the floor mat underneath the Fuse Blast. Place the foot pedals on the floor mat underneath the Fuse Blast. Attach the cable to the I/O panel to the rear of the machine.

4.5.5 Connecting the compressed air supply

Attach your air compressor to the Fuse Blast using the compressed air inlet. The compressed air supply must be regulated to between 90–120 psi. Do not set the air compressor above 120 psi.



NOTICE

The Fuse Blast contains a pressure relief valve to protect the hardware from air pressures higher than 120 psi. If the compressed air supply is above 120 psi, the pressure relief valve will release and make a loud hissing noise, even if the machine is turned off.

4.5.6 **Connecting the cables**

Plug the included power cable into the power port on the back of the unit and connect the power cable to an adequate circuit.

For Ethernet, connect the unit to your LAN. Refer to section 4.6 Setting up a network connection for more information.

4.5.7 **Installing the Wi-Fi antenna**

Install the Wi-Fi antenna to connect the machine to a wireless network.

To install the Wi-Fi antenna, screw the Wi-Fi antenna onto the jack on the I/O panel to the rear of the machine.

4.5.8 **Checking the valves**

Before turning on the machine, ensure that the following elements are in the correct position:

1. Media hopper knife gate: This should not be retracted.
2. Waste hopper knife gate: This should not be retracted.

4.5.9 **Turning on**

To turn on the machine:

1. Plug the included power cable into the power port on the back of the unit and connect the power cable to a dedicated circuit.
2. Flip the breaker switch on the back of the Fuse Blast to the **ON** position to turn on the machine.

To turn off the machine, refer to section **6.6.3 Turning off**.

4.6 Setting up a network connection

For detailed guidance and visual assistance, visit support.formlabs.com.

Connect the Fuse Blast to a secure network via Wi-Fi or Ethernet, providing it internet access for remote troubleshooting, sending diagnostic logs, and receiving firmware updates. The Fuse Blast can connect directly to a computer with a USB cable.

The Fuse Blast supports both wired (Ethernet) and wireless (Wi-Fi) connections.

For a Windows operating system, after installing PreForm, check to ensure that Bonjour is properly installed. Bonjour is third-party software that is required to connect over Wi-Fi or Ethernet. Visit support.apple.com for assistance with Bonjour. The USB connection can still be used while the Fuse Blast is connected to a LAN.

When the Fuse Blast is connected to a LAN, its current status can be monitored with Dashboard: formlabs.com/dashboard.

4.6.1 **Connecting with Wi-Fi**

The Fuse Blast's built-in Wi-Fi (IEEE 802.11 b/g/n) supports WPA/WPA2 security. Use the touchscreen to configure a wireless network connection.

To connect with Wi-Fi:

1. Tap the gear icon on the **Home** screen. The **Settings** screen appears.
2. Tap **Connectivity > Wi-Fi**. The **Wi-Fi** screen appears.
3. Toggle **Use Wi-Fi** to **ON**. The toggle turns blue.
4. Tap the desired wireless network.
5. If prompted, enter your network password and tap the checkmark to confirm.

4.6.2 **Connecting with Ethernet**

The rear of the unit is equipped with a RJ-45 Ethernet (10BASE-T/100BASE-TX/1000BASE-T)

1000 Mbit LAN Port. Use a shielded Ethernet cable (not included); minimum Cat5, or Cat5e or Cat6 for 1000BASE-T.

To connect with Ethernet:

1. Plug one end of the Ethernet cable into the Ethernet port on the I/O panel on the back of the unit.
2. Connect the other end of the Ethernet cable to your LAN.

4.6.3

Connecting with USB

Use the included USB cable for connecting a computer directly to the machine.

To connect with USB:

1. Plug one end of the USB cable into the USB port on the back of the unit.
2. Connect the other end of the USB cable to a computer's USB port.

4.7

Updating firmware

Formlabs regularly releases updated firmware to fix bugs and improve functionality. Download the latest firmware version for your Formlabs device with PreForm, then upload and install the firmware file on the machine. Review the firmware downloads and release notes to learn more about the improvements that come with each version's release.

To update the firmware via PreForm:

1. Open PreForm.
2. Connect the machine to the computer via Wi-Fi, USB, or wire the device to an Ethernet network.
3. In the menu bar, click **File > Accessories**. The **Accessory List** window opens.
4. Click the machine's serial name. The **Device Details** window opens.
5. Click **Update** in the upper-right corner of the **Device Details** window. The **Firmware Update** window opens.
6. Follow the on-screen instructions to download the latest firmware and then upload the file to the machine. To upload firmware, the device must be connected to the computer via USB or the machine must be connected to an Ethernet network.
7. The machine may automatically recognize that you have sent a firmware update. Tap **Continue** on the touchscreen to finish the installation.
8. If you are not prompted to **Continue**, continue the firmware update manually. Tap **Settings > System > Firmware Update**.
9. After the firmware update installs, confirm the system restart on the touchscreen or wait 30 seconds for an automatic restart.

4.8

Transporting the machine

For detailed guidance and visual assistance, visit support.formlabs.com.

Refer to section **4.3.1 Receiving** for product weight and dimensions. Keep the packaging for transportation or shipping.

The complete packaging kit consists of:

- one (1) pallet, wood and foam
- one (1) inner C-fold, cardboard
- eight (8) clips, plastic
- one (1) outer C-fold, cardboard
- six (6) protective supports, foam
- one (1) topper, cardboard

- one (1) ramp, wooden and foam
- one (1) accessory box, cardboard
- two (2) accessory box inserts, foam
- two (2) ramp adhesives, plastic
- one (1) power cable box, cardboard

4.8.1 **Preparing for transportation**

Before repackaging, vacuum the workspace and empty the hoppers. Remove the tumbler basket and blast gun and re-package as received. Safely tuck the pedals away. Refer to section **4.3.1 Receiving** for product weight and dimensions. Keep the packaging for transportation or shipping.



The Fuse Blast is a heavy object. If the machine can not be rolled, a two person lift is required to prevent injury and avoid damage to the machine.



Do not ship the machine with the blasting media inserted in the chamber or hopper, or with powder and media in the waste hopper. Powder or media left inside the machine can leak during transit, which may lead to additional fees or void the warranty.

To prepare the machine:

1. Vacuum the Fuse Blast's work surface and chamber interior, or wipe down with a wet cloth.
2. Place a container with at least 9 L capacity under the media hopper valve. Open the media hopper valve to drain the hopper. Unused blasting media can be reused for future blasting. Vacuum the media hopper valve.
3. Place a container or bag with a least 11 L capacity under the waste hopper outlet. Open the waste hopper knife gate to drain the hopper. Dispose of the waste hopper contents. Open the waste hopper door, and vacuum the interior of the waste hopper and the media filter mesh.
4. Remove the tumbler basket from the back of the machine.
5. Remove the blast gun from the blast arm.
6. Open the HEPA filter door and vacuum the filter. Close the HEPA filter door.
7. Unplug the compressed air supply from the air compressor inlet.
8. Flip the breaker switch on the back of the unit to the **OFF** position to turn off the machine.
9. Unplug all cables and peripherals (manual control pedals, power, Ethernet, and Wi-Fi antenna) from the back of the unit. Place inside the accessories box with the accessory box foam inserts for shipping.

4.8.2 **Packaging**

Thoroughly read and follow the instructions to properly package the machine. Skipping any of the following steps may result in shipping damage and void the warranty.

To package the machine:

1. Unplug all cables and hoses from the machine. Unscrew and remove the Wi-Fi antenna and hose coupling.
2. Place the pallet and the ramp near the Fuse Blast.
3. Unlock the caster wheels on each of the Fuse Blast's leveling feet.
4. Push the machine into position near the pallet. Align the right side of the pallet with the right side of the machine.

5. With two people, carefully roll the machine up the ramp onto the pallet. Take care as the Fuse Blast may become unbalanced and tip over.
6. Rotate the wheel nuts counterclockwise to lower the rubber feet and lock the caster wheels into position so the machine does not move.
7. Open the blast chamber door. Unhook the tumbler basket from its mounted position inside the Fuse Blast. Place the tumbler basket inside the blast chamber so that it lies flat on the work surface.
8. Move the blast arm into the idle position.
9. Insert the internal foam core support inside the blast chamber. Close and latch the blast chamber shut.
10. Place the three protective foam supports on the machine.
11. Place the accessories in the accessory box. Place the accessory box at the bottom of the pallet, next to the bottom foam support.
12. Encase the front and the back of the machine with the two C-fold segments.
13. Place the topper on top of the C-fold segments.
14. Insert the eight plastic clips to the C-fold segments and close the box.
15. Wrap a nylon binding strap (commercially available) horizontally around the C-folds. Position the strap approximately 50 cm (20 in) up from the bottom of the C-fold. Tighten and crimp the strap.
16. Loop two nylon binding straps vertically around the machine, passing them underneath the pallet. Position the two straps approximately 25 cm (10 in) from the left and right sides of the machine, respectively. Tighten and crimp the straps.

5 Usage

Always consult the safety data sheet (SDS) as the primary source of information to understand safety and handling of Formlabs materials.

5.1 Operational environment

The operating temperature for the Fuse Blast is 10–36 °C (50–96.8 °F), with low ambient humidity (30–80% RH). For optimal post-processing, do not exceed these limits. Operating above recommended humidity levels can impact media transport and lead to clogging.

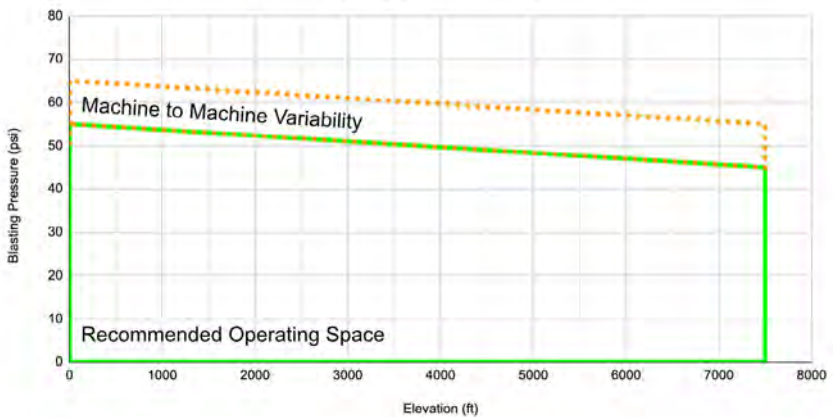
For detailed guidance and assistance, please contact Formlabs Support.

After printing, parts need to cool in the Fuse 1's print enclosure and extracted from the build chamber in the Fuse Sift before being moved into the Fuse Blast for cleaning and finishing.

5.1.1 Altitude & Blasting Pressure

The Fuse Blast is operational up to 2286 m (7500 ft) in altitude. For optimal post-processing, do not exceed these limits.

Maximum blasting pressure is dependent on installation altitude. The altitude chart below shows the recommended safe operating space; blasting at or above this recommended pressure may cause the Fuse Blast to clog.



5.2 Filling the media hopper

The Fuse Blast media hopper holds 8.3 L (2.2 gal) of blasting media. The total weight of that blasting media varies based on which media blasting material is used. For example, the Fuse Blast media hopper can hold roughly 10 kg (22 lbs) of 200–300 µm glass media.



NOTICE

Do not overfill the media hopper or you may clog the air inlet.

To fill the media hopper:

1. Turn the media valve underneath the machine clockwise to ensure it is firmly closed.
2. On the touchscreen, tap the **Fan** button. Wait a few seconds for the fan to audibly start.

3. Open the blasting chamber door.
4. Carefully pour blasting media directly onto the work area and allow it to fall through the grate. Monitor the media level when pouring and ensure it does not block the air inlet. The air inlet is located below the work area grate, on the left side of the machine.
5. Wait 15 minutes while the fan is blowing for the media to move through the system into the hopper. Do not overfill the hopper. If the media level is above the fill line, put a suitable container under the media hopper valve, open the valve to remove excess media, and close the valve when the media level is below the fill line.
6. Check the media hopper window to ensure the blasting media is diverted to the correct hopper. If the blasting media was diverted into the waste hopper, check the media filter mesh for damage.



5.3 Cleaning printed parts

Fuse 1 generation printers surround each printed part with Surface Armor, a semi-sintered shell that minimizes potential thermal inconsistencies which can adversely affect your parts. Media blasting is necessary to remove Surface Armor from parts printed with Nylon 12 GF. Formlabs recommends media blasting your parts for the best possible finish.

The Fuse Blast exposes parts to blasting media from all directions. The ionizing air rinse prevents loose dust and media from re-settling on the parts.

The Fuse Blast extends the life of blasting media with passive media recycling. Waste powder and degraded media naturally filter out into the waste hopper over time.

5.3.1 Post-processing with the Fuse Sift and Fuse Blast

Thanks to Fuse Blast's passive media recycling, media life is dramatically extended relative to standard blasting cabinets. Waste powder and degraded media will naturally filter out of the usable media over time, giving you significantly longer life before saturation.

5.3.2 Operating the blast arm and blast gun

Use the blast gun to remove extraneous powder and Surface Armor from parts. The Fuse Blast's compressed air supply pulls blasting media into the air line and propels it through the blast nozzle.

The blast arm supports the blast gun and swivels between two positions. The blast arm features a wire guide to change its orientation between the active cleaning position and the idle position. When idle, the blast arm is positioned vertically on the right side of the blasting chamber. In its active position, the blast arm is in front of the tumbler basket.



Blast arm in idle position



Blast arm in active position

The blast gun can also rotate on the end of the blast arm. Grip and squeeze the locking lever to release the blast gun. Pivot the blast gun towards the tumbler for the automatic cleaning position or down to the work surface for the assisted manual position. The blast gun is removable for hand-held manual operation.



Blast gun in automatic cleaning position



Blast gun in assisted manual position



Blast gun being used in hand-held manual operation

5.3.3 **Setting the blasting pressure**

Formlabs recommends setting the blasting pressure at 30 psi. Higher blasting pressures are not required to clean parts, except for parts printed in Nylon 12 GF Powder. Setting the air compressor pressure above 30 psi may result in damaged parts.

5.3.4 **Cleaning printed parts with an automatic cleaning cycle**

After extracting printed parts from the powder cake with the Fuse Sift, clean and media blast printed parts with the Fuse Blast's automatic cleaning cycle:

To clean printed parts with an automatic cleaning cycle:

1. Collect printed parts in the supplied transfer container for ease of transportation to the Fuse Blast.
2. Unlatch and open the Fuse Blast's chamber door.
3. Move the blast arm to the right into the idle position. The blast arm should be out of the way of the tumbler.
4. Place the printed parts inside the tumbler basket.
5. Move the blast arm to the front of the chamber in the active cleaning position. Ensure the blast gun points towards the tumbler basket.
6. Close and latch the blasting chamber door.
7. On the touchscreen, choose the settings for your desired cleaning cycle or use the preset settings:

- a. **Blast:** Tap up or down arrows to set the duration of the media blasting cycle. Drag the slider up or down to set the air stream pressure for the blasting cycle. Formlabs recommends setting the blasting pressure at 30 psi.
 - b. **Rinse:** Tap the up or down arrows to set the duration of the ionizing air rinse. Drag the slider up or down to set the air stream pressure for the ionizing air rinse.
 - c. **Speed:** Tap the up or down arrows to set the speed of the tumbler basket's rotation.
8. Tap **Start**. The Fuse Blast activates and the timer starts. Use the touchscreen to pause the cycle.



Moving parts present crushing and tangling hazards. Do not reach into the blasting chamber while the automatic blastic cycle is running.

Powder and blasting media may escape the Fuse Blast when the chamber door is open. Wait for dust to settle before opening the chamber door. The Fuse Blast has interlocks to prevent blasting operation while the chamber door is open.

9. When the cleaning cycle is complete, wait 30 seconds for dust particles to settle before opening the blasting chamber door.
10. Inspect parts.
11. If necessary, repeat the media blasting cycle until the parts are clean.

5.3.5

Cleaning printed parts with a manual cleaning cycle

Formlabs recommends a manual cleaning cycle for removing powder from tight corners, fragile parts, large interior cavities, or parts too large to tumble effectively. There are two options for manually cleaning parts in the Fuse Blast:

- Assisted manual cleaning: With the blast gun mounted on the blast arm in the active position, point the blast nozzle down towards the grate and manipulate the part with both hands
- Hand-held manual cleaning: With the blast arm in the idle position, hold the blast gun with one hand and the part in the other hand.

The blast gun mounts directly on the blast arm. To remove the blast gun for hand-held manual blasting, slide the blast gun directly up and off the blast arm. To mount the blast gun, slide the blast gun onto the blast arm.

After extracting printed parts from the powder cake with the Fuse Sift, clean and media blast printed parts with the Fuse Blast's manual cleaning mode:

To clean printed parts manually:

1. Collect printed parts in the supplied transfer container for ease of transportation to the Fuse Blast.
2. Unlatch and open the Fuse Blast's chamber door.
3. Move the blast arm to the right into the idle position. The blast arm should be out of the way of the tumbler.
4. Place the printed parts inside the tumbler basket for storage.
5. If you plan to clean your parts with the blast gun mounted on the blast arm, move the blast arm to the front of the chamber in the active cleaning position with the blast nozzle pointed down.

6. Close and latch the blasting chamber door.
7. Ground yourself before touching any electronics in the unit by using the grounding strap attached to the Fuse Blast.
8. On the touchscreen, choose the settings for your desired cleaning cycle or use the preset settings:
 - a. **Blast:** Drag the slider up or down to set the air stream pressure for the blasting cycle. Formlabs recommends setting the blasting pressure at 30 psi.
 - b. **Rinse:** Drag the slider up or down to set the air stream pressure for the ionizing air rinse.



CAUTION



Blasting media propelled at high speeds can damage skin. Do not operate in manual mode if there are tears or holes in the blast gloves.



NOTICE

Powder and blasting media may escape the Fuse Blast with the chamber door open. Wait for dust to settle before opening the chamber door. The Fuse Blast has interlocks to prevent blasting operation while the chamber door is open.



NOTICE

The tumbler basket will not rotate if the user taps the manual control pedal to start the manual media blast.

9. Place your hands in the Fuse Blast gloves.
10. If using manual hand-held configuration, remove the blast gun from the blast arm and grip it in one gloved hand.

The blast and air rinse functions are controlled with the two foot pedals under the Fuse Blast.

- The right foot pedal controls the blasting media stream, which removes compacted powder and Surface Armor.
 - The left foot pedal controls the ionized air stream, which rinses off loose powder to leave parts clean to the touch.
11. Step lightly on the right foot pedal to start the media blasting. The media blasting continues as long as there is pressure on the foot control pedal.
 12. Pick up the printed part and orient it as required in the blast stream. Continue until all of the Surface Armor and compacted powder is removed from the part.
 13. Step off the right foot pedal to stop the flow of media. Step lightly on the left foot pedal to start the ionizing air rinse.
 14. Pick up the printed part and manually rinse the part with the air nozzle to remove any loose or settled powder.
 15. Repeat steps 11–14 as many times as needed.
 16. If you were using the manual hand-held configuration, mount the blast gun on the blast arm.
 17. Wait 30 seconds for the dust particles to settle before opening the blasting chamber door.
 18. Inspect parts. Repeat the media blasting cycle until the parts are clean.

5.4 Emptying the waste hopper

Check the waste hopper window before using the Fuse Blast and empty the waste hopper as needed. The Fuse Blast will not run if the waste hopper is full. Do not reuse media blasting materials from the waste hopper.



NOTICE

Turn off Fuse Blast before emptying the waste hopper. Always close the waste hopper valve before operating the Fuse Blast. Failure to do so will cause particulates to bypass the waste hopper and saturate the HEPA filter.



CAUTION

The waste hopper valve is a pinching hazard. Keep hands clear when opening and closing the valve knife gate.

To empty the waste hopper:

1. Place a 11 L (3 gal) container or disposal bag under the waste hopper valve.
2. Pull out the waste hopper knife valve to drain the hopper. If no waste flows out, use a blunt implement to make sure there is no internal obstruction.
3. Allow the waste to drain out of the hopper into the container.
4. Close the waste valve knife valve.
5. Dispose of the waste according to local waste disposal regulations.



NOTICE

Unsintered used SLS powder must be disposed of in accordance with applicable ordinances and environmental regulations for plastic waste. Particular caution must be taken with powdered plastic, as it is a microplastic and poses severe environmental repercussions.

5.5 Emptying the media hopper

The Fuse Blast is designed to be used with only one blasting media type at a time. Make sure to empty the media hopper thoroughly before switching blasting media types.



CAUTION

The media hopper valve is a pinching hazard. Keep hands clear when opening and closing the valve knife.



NOTICE

Always close the media hopper valve before operating the Fuse Blast. Failure to do so will cause media to drain out onto the floor.

To empty the media hopper:

1. Place a 9 L (2.4 gal) container under the media hopper valve.
2. Pull out the media hopper knife gate to open. If no media flows out, use a blunt implement to ensure there is no internal obstruction.
3. Allow the media to drain out of the hopper into the container.
4. Close the media valve.
5. Dispose of the used blasting media according to local waste disposal regulations. Unsintered used SLS powder must be disposed of in accordance with applicable ordinances and environmental regulations for plastic waste. Particular caution must be taken with powdered plastic, as it is a microplastic and poses severe environmental repercussions.

5.6 Managing the machine

For detailed guidance and visual assistance, visit support.formlabs.com.

5.6.1 Turning off

The Fuse Blast is designed to remain powered on when not in use. Flip the breaker switch on the back of the unit to the **OFF** position to turn off the machine completely and conserve power. When moving or storing the machine, unplug the unit from its power source in addition to flipping the breaker switch.

6 Maintenance

To maintain the most efficient and long-lasting machine, ensure regular conservation and maintain your machine as needed. Formlabs provides instructions to advise in installing, operating, and maintaining the machine. It shall only be maintained by a qualified and trained person. Unauthorized disassembly or repair procedures may damage the machine. There are two groups of maintenance procedures: regular, which should be done after every use, and intermittent maintenance, which only needs to be done occasionally. Please keep a log detailing when each intermittent maintenance procedure was last performed.



Tampering with, or disassembling the Fuse Blast prior to disconnecting the power cable and waiting approximately ten minutes can subject users to potentially fatal electrical hazards.



Wear personal protective equipment (PPE) when performing maintenance tasks. Use tools only as described.



When removing the exterior paneling, disconnect the machine from its power source before maintenance. Moving parts present crushing and tangling hazards.



- Formlabs provides instructions to advise skilled and unskilled persons in installing, operating, and maintaining the Fuse Blast. The Fuse Blast shall only be maintained by a qualified and trained person.
- Do not open the Fuse Blast and/or investigate internal components unless under the guidance of Formlabs Support or a certified service provider. Contact Formlabs Support or a certified service provider for any additional guidance.
- Unauthorized disassembly or repair procedures may damage the machine and void the warranty.

6.1 Tools and supplies

Only use tools, chemicals, or procedures to maintain the Fuse Blast that are outlined in this manual, by prompts on the touchscreen, and on **support.formlabs.com**.

Do not use any tools, chemicals, or unapproved procedures with the Fuse Blast unless otherwise instructed to do so by Formlabs or a certified service provider.

- Blasting media (200-300 μm glass bead media)
Add fresh blasting media to the Fuse Blast to clean and finish printed parts. The level of available powder is visible through the media hopper window.
- Recycled media
Good quality media circulates through the system and accumulates in the media hopper on the right side of the Fuse Blast. The level of accumulated media is visible through the media hopper window.

- Anti-static vacuum that is grounded and bonded (e.g., NFPA 652-compliant)
Used to regularly remove loose SLS powder from the Fuse 1's and Fuse Sift's workspace.
- 2.5 mm Allen wrench or hex driver
Used to remove the screws holding the Fuse Blast's body paneling to the frame.
- 7 mm socket wrench
Used to maintain and replace parts.
- T20 Torx driver
Used to maintain and replace parts.

6.2 Inspection and maintenance

6.2.1 Before each use

Inspect	Refer to	Section
Installation environment	Operational environment	5.1
Media hopper	Filling the media hopper	5.2
Waste hopper	Emptying the waste hopper	5.4
Parts catcher	Cleaning the parts catcher	6.3.2

6.2.2 Periodic maintenance

Inspect	Refer to	Section
HEPA air filter	Cleaning the HEPA air filter	6.4.1
Media filter mesh	Cleaning the media filter mesh	6.4.2
Blasting media type	Emptying the media hopper Filling the media hopper	5.5 5.2
Blast gun	Cleaning the blast gun	6.4.4

6.3 Tasks between uses

Powder and media collects onto Fuse Blast's media filter mesh and HEPA air filter over time. In order to preserve the reliability of Fuse Blast, it is important to regularly inspect and clean affected components and assemblies, and maintain hoppers at appropriate levels.

6.3.1 Emptying the waste hopper

See section **5.4 Emptying the waste hopper**.

6.3.2 Cleaning the parts catcher

The Fuse Blast parts catcher is a fine mesh located beneath the work surface grate in the blasting chamber. The parts catcher prevents small parts and debris that fall through the work surface from entering the air handling system.

Over time, the parts catcher may become clogged. If that happens, powder and blasting media will not be able to drain from the chamber, causing the media supply to run out. Inspect the parts catcher and clean it as needed to keep your Fuse Blast working optimally.

To inspect the parts catcher:

1. If the Fuse Blast was recently in use, wait for any powder plumes to settle.
2. Unlatch and open the blasting chamber door to access the work area.

3. Lift the access hatch in the work surface grate and inspect the bottom of the blasting chamber. The parts catcher grate should be visible at the bottom of the chamber.
4. If there is significant build-up obstructing your view of the parts catcher, the parts catcher is clogged and must be cleared of debris.

If debris on the parts catcher is impeding the flow of powder or blasting media through the grate, clean it.

To clean the parts catcher:

1. If the Fuse Blast was recently in use, wait for any powder plumes to settle.
2. Tap the fan icon on the Fuse Blast touchscreen to turn on the blower fan.
3. Unlatch and open the blasting chamber door.
4. Lift the access hatch on the work surface grate to access the parts catcher.
5. If there is visible debris on the parts catcher but no accumulated blasting media, remove the debris from the parts catcher with a gloved hand. If the blasting media has accumulated and obscures the parts catcher, proceed to the next step.
6. Using a gloved hand, feel through the media to the parts catcher mesh at the bottom. Run your hand over the parts catcher to dislodge any debris. The blasting media should drain freely when the obstructions are cleared.
7. If the blasting media still is not draining freely, use a scoop to remove the majority of the accumulated media and transfer it to a container. Continue doing so until you can see and dislodge the debris on the parts catcher.
8. If a scoop is not available, an anti-static grounded vacuum cleaner (such as an NFPA-652 compliant vacuum) can be used to clear the accumulated media.
9. When you next add fresh blasting media to the Fuse Blast or use it to clean printed parts, ensure that blasting media and powder flow easily through the parts catcher.

6.4 Periodic maintenance

The Fuse Blast requires regular maintenance and care. The standard cycle for the following procedures is outlined in the table below.

Inspect	Frequency	Refer to	Section
HEPA air filter	30 hours	Cleaning the HEPA air filter	6.4.1
Media filter mesh	10 hours	Cleaning the media filter mesh	6.4.2
Blasting media	As needed to maintain media level	Replacing the blasting media	6.4.3
Blast gun	50 hours	Cleaning the blast gun	6.4.4
Ionizer	50 hours	Inspecting the ionizer	6.4.5

6.4.1 Cleaning the HEPA air filter

During regular use, the HEPA filter collects powder and media. Inspect the HEPA filter every 30 hours. If saturated, the HEPA filter must be cleaned with a vacuum.

To vacuum the HEPA filter:

1. Unlatch the HEPA filter door.

2. Inspect the filter visually; if material deposits are visible, proceed to steps 3–4.
3. Starting from the top and moving from left-to-right, vacuum powder out of the filter pleats. Note any loose powder that falls down into the work area.
4. Move down and across until the entire filter has been vacuumed and loose powder stops falling out.
5. Latch the HEPA filter door shut.
6. Vacuum any powder that fell into the work area below the Fuse Blast.

6.4.2

Cleaning the media filter mesh

The media filter mesh separates and recycles powder into the media hopper. Over the course of regular use, clumps and hardened material can collect on the mesh and must be removed to ensure the continued collection of recycled powder. The media filter mesh should be cleaned after processing approximately 10 hours.



Dry powders can build static electricity charges when subjected to friction. Do not use brooms or compressed air hoses to clean the media filter mesh. Only use antistatic vacuums that are grounded and bonded (e.g., NFPA 652-compliant vacuums).

To vacuum the media filter mesh:

1. Unlatch the waste hopper door to access the media filter mesh.
2. Remove the media filter mesh. Take care to not directly touch the mesh with your hand.
3. Starting from the top and moving from left to right, vacuum the media filter mesh. Note any loose powder that falls down into the work area. Move down and across until the entire mesh has been vacuumed and loose powder stops falling out.



Do not apply pressure or touch the mesh with your hand, vacuum, or any stiff tool. Any force may break the mesh and prevent the component from properly filtering out unusable powder.

4. Firmly reseat the media filter mesh back into the Fuse Blast.
5. After reinstalling the media filter mesh, close the waste hopper door. Secure the door with its latch.
6. Vacuum any loose powder that falls into your workspace from cleaning the mesh.

6.4.3

Replacing the blasting media

During regular use, the blasting media loses effectiveness and must be replaced. Deteriorated blasting media will fall through the media filter mesh into the waste hopper instead of returning to the media hopper. Formlabs recommends topping up the blasting media as needed.

To replace the blasting media:

1. Ensure that the media hopper valve is firmly closed.
2. On the touchscreen, tap the **Fan** button. Wait a few seconds for the fan to start.
3. Open the blasting chamber door.
4. Carefully pour new blasting media directly onto the work area. The blasting media will fall through the grate.
5. Wait 15 minutes while the fan is blowing for the media to fill the hopper. Do not overflow.

Visually inspect the media hopper window to confirm media has accumulated in the hopper.

6.4.4 **Cleaning the blast gun**

During regular use, the blast gun may become dirty and clogged. Inspect the blast gun regularly and clean as needed.

To clean the blast gun:

1. With the blasting chamber door open, remove the blast gun from the blast arm.
2. Unscrew the blast nozzle from the blast gun.
3. Inspect the interior and clean any clogs with a cotton swab or other fine, blunt implement. Do not use a wire brush or you may damage the blast gun.
4. Clean the blast gun nozzle down with a clean, damp toothbrush or other synthetic fiber brush.
5. Dry the blast gun nozzle with a new paper towel. Ensure the blast gun nozzle is completely dry before reinstalling.
6. Screw the blast nozzle onto the blast gun until finger tight, and replace the blast gun on the blast gun arm.

6.4.5 **Inspecting the ionizer**

During regular use, the ionizer may become dirty and clogged. Inspect the ionizer tip regularly and clean as needed.

To clean the ionizer:

1. With the blasting chamber door open, remove the blast gun from the blast arm.
2. Inspect the ionizer tips. Clear any clogs with a cotton swab.

6.5 **Intermittent maintenance**

Task	Frequency	Refer to	Section
Blast gun	As needed	Unclogging the blast nozzle	6.5.1

6.5.1 **Unclogging the blast gun nozzle**

The blast gun nozzle may become clogged, especially if blasting media is saturated with powder. If this happens repeatedly, replace your blasting media (see section **6.4.3 Replacing the blasting media**).

To unclog the blast nozzle:

1. With the blasting chamber door closed, place hands into the blast gloves.
2. With the blast gun nozzle pointed into the workspace, step on the right manual control pedal to initiate a manual blast.
3. While stepping on the manual blast manual control pedal, place one gloved palm on the nozzle of the blast gun to block airflow, then remove for a pulse of air to release from the blast gun. Repeat several times until the blast gun functions normally.
4. If the issue persists, you may need to manually unclog the blast gun. With the media blasting turned off, open the blasting chamber door.
5. Remove the blast gun from the blast arm.
6. Unscrew the blast nozzle from the blast gun.
7. Inspect the interior and clean any clogs with a cotton swab or other fine, blunt implement.

- Do not use a wire brush or you may damage the blast gun.
8. Clean the blast gun nozzle down with a clean, damp toothbrush or other synthetic fiber brush.
 9. Dry the blast gun nozzle with a new paper towel. Ensure the blast gun nozzle is completely dry before reinstalling.
 10. Screw the blast nozzle onto the blast gun until finger tight, and replace the blast gun on the blast gun arm.
- If these steps do not resolve the clog, please contact Formlabs Support for more details.



NOTICE

Follow specified maintenance procedures when unclogging the blast gun nozzle or tubing.

7 Troubleshooting

For detailed guidance and visual assistance, visit support.formlabs.com.

7.1 Collecting diagnostic logs

The Fuse Blast maintains diagnostic logs to provide detailed information about the machine that may expedite issue investigation. After experiencing any error or unusual behavior on the Fuse Blast, include the diagnostic logs with other relevant observations and details when contacting Formlabs Support or a certified service provider. The options for sharing diagnostic logs vary depending on the machine's connection type.

7.2 Performing a factory reset



Do not perform a factory reset immediately before contacting Formlabs Support or a certified service provider. The stored diagnostic information may be helpful to Formlabs Support or a certified service provider to assist with troubleshooting. A factory reset erases diagnostic information and custom settings, including networked connections.

7.3 Troubleshooting errors or abnormal activity

In the case of errors, abnormal activity, or print failures with the Fuse Blast, reference the following errors, causes, and proposed solutions. Complete the initial troubleshooting steps and carefully document all results. Contact Formlabs Support or a certified service provider for additional guidance. Provide diagnostic logs if requested.

7.3.1 Resolving abnormal functions

Error	Cause	Solution
Unresponsive machine The Fuse Blast does not turn on.	<ul style="list-style-type: none">The power cable is disconnectedThe breaker switch on the machine is set to OFF	<ol style="list-style-type: none">Check whether the circuit has power, and that the power cable is securely connected to the outlet.Check whether the breaker switch on the back of the unit is in the ON position. <p>If the machine still does not turn on, contact Formlabs Support for additional guidance.</p>
Unresponsive touchscreen or control panel Controls on the touchscreen or control panel do not respond to input.	<ul style="list-style-type: none">One-off firmware glitchLoose connection with the touchscreen	<ol style="list-style-type: none">Power cycle the machine by flipping the breaker switch on the back of the unit to OFF and then ON.Check whether the machine is running the latest firmware and update the firmware if needed. <p>If the touchscreen repeatedly stops responding after trying these steps, contact Formlabs Support for additional guidance.</p>

7.3.2 Resolving failures and errors

If failures persist after following these steps, contact Formlabs Support or a certified service provider for additional guidance. Provide clear, focused photographs of the issue to help diagnose the issue.

Error	Cause	Solution
Parts are not clean	<ul style="list-style-type: none"> • Insufficient blasting media • Insufficient psi for the blast nozzle • Malfunctioning ionizing air rinse 	<ol style="list-style-type: none"> 1. Check the media window and ensure there is sufficient blasting media. Refer to section 5.2 Filling the media hopper for more information. 2. Check the blast pressure on the air compressor. Ensure the blast pressure is set for 30–40 psi for glass media. 3. Check the ionizer status. Press down on the left manual control pedal and look for a green LED light on the ionizer on the blast gun. If the ionizer is not working, contact Formlabs Support.
Door Open error message	Blast chamber door is open	Close and latch the blast chamber door.
Media Filter Door Open error message	Media filter door is open	Close the media filter door on the right side of the machine.
Air Filter Door Open error message	HEPA filter door is open	Close the air filter door on the front of the machine.
Air Filter Not Installed error message	HEPA filter is not installed	<ol style="list-style-type: none"> 1. Unlatch the HEPA filter door at the bottom front of the Fuse Blast. 2. Unlatch the wire retainer and swing it outward. 3. Install the HEPA filter by inserting it behind the wire retainer with the pull tabs facing out. Ensure that the filter is fully and evenly seated in its housing. 4. Swing the wire retainer inward and latch it. 5. Latch the HEPA filter door shut.
Media or Waste Valve Open error message	A hopper valve is open	Ensure that the knife valves at the bottom of the media and waste hoppers are fully shut.

Error	Cause	Solution
Filter Clogged error message	The HEPA air filter is clogged	<ol style="list-style-type: none"> 1. Unlatch the HEPA filter door at the bottom front of the Fuse Blast. 2. Starting from the top and moving from left to right, vacuum powder out of the filter pleats using an antistatic vacuum that is grounded and bonded (e.g., NFPA 652-compliant). Clean any loose powder that falls from the filter. 3. Move down and across until you have cleaned the entire filter and no additional loose powder falls from it. 4. Latch the HEPA filter door shut. 5. Vacuum any powder that fell into the work area below the Fuse Blast.
No Pressure error message	No compressed air supply detected	Ensure that a compressed air supply that meets the machine's requirements is connected and pressurized.
Low Pressure error message	Insufficient supply air pressure detected	Ensure that a compressed air supply that meets the machine's requirements is connected and pressurized.
Clog Detected - Blast Line error message	Clog detected on media blast line	<ol style="list-style-type: none"> 1. Unlatch and open the blast chamber door. 2. Inspect and clean the blast gun nozzle. Refer to the section 6.5.1 Unclogging the blast gun nozzle for more information.
Tumbler Malfunction error message	Tumbler stopped due to an obstruction or other issue	<ol style="list-style-type: none"> 1. Unlatch and open the blast chamber door. 2. Clear any obstructions around the tumbler. 3. Close and latch the blast chamber door. 4. Lower the tumbler speed. 5. Retry the cleaning cycle.
Pedal Pressed During Auto error message	Foot pedal pressed during automatic cleaning cycle	When running an automatic cleaning cycle, do not press the foot pedals. To use the foot pedals to clean your printed parts manually, end the current automatic cleaning cycle.

Error	Cause	Solution
Ionizer Malfunction error message	ionizer malfunction detected	<ol style="list-style-type: none"><li data-bbox="732 129 1013 183">1. Unlatch and open the blast chamber door.<li data-bbox="732 183 1013 290">2. Inspect and clean the ionizer. Refer to the section 6.4.5 Inspecting the ionizer for more information.

8 Disassembly and repair



All steps that involve opening the machine and/or investigating internal components should be done by skilled persons under the guidance of Formlabs Support or a certified service provider. Any damage resulting from attempting disassembly and/or repair without prior authorization from Formlabs Support or a certified service provider is not covered by warranty.

8.1 Tasks

Contact Formlabs Support or a certified service provider to receive repair instructions and authorization, including how to disassemble or remove the exterior paneling.

Task	Frequency
Replacing the HEPA filter	When advised by Formlabs Support or a certified service provider
Replacing the media filter mesh	When advised by Formlabs Support or a certified service provider
Replacing the blasting chamber door window	When advised by Formlabs Support or a certified service provider
Replacing the blast gloves	When advised by Formlabs Support or a certified service provider
Replacing the blast gun nozzle	When advised by Formlabs Support or a certified service provider

Any other maintenance or repair tasks not listed in section **6 Maintenance** requires servicing the machine. Contact Formlabs Support or a certified service provider to request in-field service or an RMA (short for “return to manufacturer authorization”).

9 Recycling and disposal

9.1 Disposal of blasting media

9.1.1 Unused blasting media

Blasting media must be disposed of in accordance with applicable ordinances and environmental regulations for plastic or glass waste.

9.1.2 Used blasting media

Used blasting media contains amounts of unsintered or sintered SLS powder. Unsintered used SLS powder must be disposed of in accordance with applicable ordinances and environmental regulations for plastic waste. Particular caution must be taken with powdered plastic, as it is a microplastic and poses severe environmental repercussions.



Unsintered SLS powder is classified as a microplastic, a group of plastics that are hazardous to aquatic life. Do not dispose of unsintered used powder into drains or household waste streams. Safe and appropriate disposal methods of unsintered used powder vary by location. Consult the safety data sheet (SDS) from the powder supplier as the primary source of information to understand safe disposal of unsintered material.

9.1.3 Sintered powder or cleaned parts

Discard cleaned parts and sintered powder with household items as trash. Cleaned parts and sintered powder cannot be recycled.

9.2 Recycling of blasting media

9.2.1 Blasting media

Fuse Blast's passive media recycling extends the working life of blasting media by filtering out broken-down abrasives and loose powder. Over time the media will still saturate and lose efficacy. Do not reuse media blasting materials once filtered into the waste hopper.



Formlabs does not operate a recycling program.

9.2.2 Sintered powder or cleaned parts

Discard cleaned parts and sintered powder with household items as trash. Cleaned parts and sintered powder cannot be recycled.

9.3 Disposal of cleaning agents

Safe and appropriate disposal methods of used solvent vary by location.

To safely dispose of used solvent:

1. Consult the safety data sheet (SDS) from the solvent supplier as the primary source of information.
2. Research the approved methods of disposal for your area. This will most likely involve hiring a waste disposal service. For smaller amounts, check with a hazardous disposal service to see if they have any suggestions for removal.
3. Inform your waste disposal service that your bottle contains solvent with small amounts of

lauro lactam and microplastics. Have a copy of the Formlabs powder safety data sheet (SDS) on hand in case the disposal service attendant needs more information.

9.4 Disposal of electronic components



The symbol on the product, the accessories, or packaging indicates that this device shall not be treated as nor disposed of with household waste. When you decide to dispose of this product, do so in accordance with environmental laws and guidelines. Dispose of the device via a collection point for the recycling of waste electrical and electronic equipment. By disposing of the device in the proper manner, you help avoid possible hazards for the environment and public health that could otherwise be caused by improper treatment of waste equipment. The recycling of materials contributes to the conservation of natural resources. Therefore do not dispose of your old electrical and electronic equipment with the unsorted municipal waste.

9.5 Disposal of packaging waste

The packaging is made of cardboard and plastic-based materials. Dispose of packaging through waste and recycling facilities. By disposing of the packaging waste in the proper manner, you help avoid possible hazards for the environment and public health.



NOTICE

The original packaging is designed to be kept and reused for transporting or shipping the machine for service. Save the complete packaging including any inserts for your convenience.

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11 Glossary

Term	Meaning
Air compressor	An air compressor connects to the air compressor inlet and provides the pressure needed to media blast printed parts. Pressure should be regulated between 90–120 psi for correct operation.
Blast arm	The blast arm is located inside the blasting chamber and holds the blast gun. The blast arm can be moved into an idle or active position.
Blasting chamber	A tempered glass window prevents powder and debris from leaving the Fuse Blast's workspace and provides access to the tumbler basket and blast gun.
Blast gloves	A pair of gloves located below the blasting chamber allow users to manipulate and clean items while the Fuse Blast chamber doors are secured.
Blast gun	The blast gun attaches to the blast arm inside the blasting chamber. Blasts printed parts with media, forced air, and ionized air to clean parts.
Blasting media	Abrasive media propelled at printed parts to remove Surface Armor and loose powder.
Control panel	A touchscreen and physical controls for interfacing with the Fuse Blast.
Foot pedals	Two pedals located underneath the Fuse Blast control the manual air rinse and media blasting.
Grounding strip	An anti-static device used to protect users and electronics from static electricity build up.
HEPA filter	A HEPA air filter prevents blasting media and SLS powder from escaping the unit.
Media hopper	A fixed container that holds blasting material in a tapered basin for dispensing into the blast nozzle.
Micron (μm)	An SI derived unit of length equalling 1×10^{-6} meter, or one millionth of a meter (or one thousandth of a millimeter, 0.001 mm, or about 0.000039 inch).
Nylon	An industrial thermoplastic that bends before returning to its original form without fracturing, making it suitable for structural, load bearing, or mechanical parts.
Personal protective equipment (PPE)	Garments or articles of clothing designed to protect individuals from physical, electrical, heat, chemicals, biohazards, and airborne particulate matter.
Plume	A localized emission of dust or powder suspended in the air.
PreForm	Formlabs' print preparation software that uses advanced, proprietary calculations to generate support structures and optimize print settings for each model.
Selective Laser Sintering (SLS)	An additive manufacturing process that uses a high-powered laser to sinter uniform beads of plastic together, drawing out individual 2D layers (or slices) that eventually form a 3D part.

Term	Meaning
Surface armor	A print process component of the Fuse 1 that surrounds parts with a semi-sintered shell of material to alleviate thermal inconsistencies which may adversely affect the accuracy of a part.
Surface grate	A protective grate that prevents large objects from falling into and clogging the air handling system.
Tumbler basket	Located inside the blast chamber, the tumbler basket rotates to agitate parts and provides a work surface for media blasting.
Valve knife	The valve knife is used to close off and open the waste hopper valve or the media hopper valve.
Waste hopper	A fixed container that holds used blasting material and powder debris in a tapered basin for dispensing into a container.
Waste hopper valve	The primary opening for emptying the waste hopper. The waste hopper valve is opened and closed via the valve knife.

12 Product compliance

The Fuse Blast complies with the following machinery and electrical safety standards:

CE	ETL
Machinery Directive 2006/42/EC Radio Equipment Directive 2014/53/EU RoHS Directive 2011/65/EU EMC Directive 2014/30/EU	UL SUBJECT 2011:2022 Ed. 7 CSA C22.2#301:2016 Ed. 1
Others	
FCC IEC 60204-1:2016 Ed. 6 IEC 61010-1:2010 Ed. 3+A1	

