



Operational Permit Application

Additive Manufacturing



www.cityofvancouver.us/departments/fire-department

International Fire Code as adopted by VMC 16.04 (Washington State Fire Code)

Permitting Requirements

An **operational permit** is required to conduct additive manufacturing operations regulated by WSFC Section 320 (WSFC 105.5.1).

Additive manufacturing is defined by WSFC as a process of joining materials to make objects from 3D model data, usually layer upon layer, sometimes referred to as 3D printing. The two types of additive manufacturing are industrial additive manufacturing and nonindustrial additive manufacturing. **Industrial additive manufacturing** is defined as 3D printing operations that typically utilize combustible powders or metals, an inert gas supply, a combustible dust collection system, or that create a hazardous (classified) location area or zone outside the equipment. **Nonindustrial additive manufacturing** is defined as 3D printing operations that do not create a hazardous (classified) location area outside the equipment and do not utilize an inert gas supply or a combustible dust collection system.

Project Information

Site Address		Owner Name	
Other			

Applicant Information

Company Name		Address		
Contact Name				
Office Phone		Cellular		Email

Contractor

Company Name		Address		
Contact Name				
Office Phone		Cellular		Email

Type: Industrial Nonindustrial

Description of Work

Electronic Plan Standards

File Naming Standards:

Electronic plans and documents shall be named as specified in the City of Vancouver [ePLANS](#) system:

<https://www.cityofvancouver.us/business/permits-licenses-and-inspections/eplans/>



Acceptable File Types:

Plans, calculations, specifications and supporting documents shall be uploaded as a PDF file.

Plan Sheet Standards:

All plans shall be drawn to scale, as identified in the checklist, and each sheet shall state the scale and show a measurable scale on the page for measurement calibrations.

Document Orientation:

All plans must be uploaded in "Landscape" format in the horizontal position with a north indicator. All other documents can be in "Portrait" format.

Stamped:

Where documentation contains a code analysis or engineering calculations, such documents shall be stamped by the design professional.

Minimum Submittal Checklist for Upload to ePLANS

- Completed Fire Installation Permit Application – Additive Manufacturing (this document) Check all *Permit Conditions* checkboxes that are applicable to your project
- Completed Hazardous Materials Inventory Statement (HMIS) and applicable Hazardous Materials Management Plan (HMMP) documents (See *Document Details* below)
- Site plans and floor plans (see *Plan Details* below)

Document Details

HMMP Guide: <https://www.cityofvancouver.us/wp-content/uploads/2023/10/Hazardous-Materials-Management-Plan.pdf>

See *Vancouver Fire Department HMMP Guide* for direction on completing required HMMP and/or supplemental forms

Does your business...	If YES, please complete these pages of the HMMP (linked above):	
Conduct industrial additive manufacturing (3D printing) operations	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> Facility Information Forms <input type="checkbox"/> HMIS <input type="checkbox"/> Site Map & Storage Plan <input type="checkbox"/> Additive Manufacturing Permit Application (this document)
Conduct operations involving fiberglass or fiberglass resin	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> Facility Information Forms <input type="checkbox"/> HMIS <input type="checkbox"/> Site Map & Storage Plan
Conduct operations, such as woodworking, that produce combustible dust?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> Facility Information Forms <input type="checkbox"/> HMIS <input type="checkbox"/> Site Map & Storage Plan <input type="checkbox"/> Combustible Dust Permit Application

Conduct cutting and welding or other hot work operations?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> Facility Information Forms <input type="checkbox"/> HMIS <input type="checkbox"/> Site Map & Storage Plan <input type="checkbox"/> Cutting and Welding and/or Hot Work Permit Application(s)
Store or use Hazardous Production Materials?	<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> HMMP (all documents) <input type="checkbox"/> Hazardous Materials Permit Application

An HMMP must contain the following minimum elements:

- Facility Information Form: Business Activities Declaration page
- Facility Information Form: Business Owner/Operator Identification page
- Hazardous Materials Inventory Statement (HMIS)
- HMIS Hazard Class Summary Report
- Emergency Response/Contingency Plan
- Employee Training Plan
- Recordkeeping
- Facility Site Plan & Storage Map

If using industrial additive manufacturing, in addition to the HMMP documents listed above, provide the following documents:

- Standard Operational Procedures. Dust-producing equipment and all associated equipment, including dust-collection equipment, shall be maintained in accordance with the manufacturer's instructions and specifications and applicable codes. The inspection, testing and maintenance program shall include the following, as applicable:
 - Fire and explosion protection and prevention equipment, as applicable, in accordance with the appropriate NFPA standards.
 - Dust-control equipment.
 - Control of potential ignition sources.
 - Electrical, process and mechanical equipment, including applicable process interlocks.
 - Lubrication of bearings for dust-collection, dust-handling and dust-producing equipment.
 - Additional maintenance in accordance with the manufacturer's instructions and specifications for dust-collection, dust-handling and dust-producing equipment. Records shall be kept of maintenance and repairs performed.
- Combustible dust material information:
 - Dust type
 - Dust volume per day
 - Dust particle sizes
 - Critical depth layer size.
- Emergency response plans.
- Employee training plans and procedures. Plans and procedures shall be reviewed annually and updated as required by process changes. Provide a document describing initial and annual refresher training to be provided to employees who are involved in operating, maintaining, and supervising facilities that handle combustible dust. This narrative shall include:
 - Workplace hazards.
 - General orientation, plant diagrams, and plant safety rules.
 - Process description or flowchart.
 - Equipment operation, safe startup and shutdown, and response to hazard conditions or an incident.
 - The location and use of all related fire and explosion protection and prevention systems.

- Equipment maintenance requirements and practices, including visual inspections of conveyors and ducts.
- Housekeeping requirements, including the maintenance of the critical depth layer in WSFC Section 2203.1.
- Emergency response plans as required in WSFC Section 2203.7.

Plan Details

The following is a list of information required on all plan submittals for review of an Additive Manufacturing permit. The plan shall be drawn to 1/8"= 1'-0" minimum scale. The applicant is required to submit all applicable information so an accurate and timely review may be done:

- Site plan to include a north arrow, a measurable scale for calibration purposes, fire hydrants, emergency access lanes and doors, vehicle gates, Fire Department Connection, points of assembly/accountability for evacuees, electrical room, gas meters, sprinkler riser, fire alarm control panel, Knox Box, roof access (if provided), and any outdoor hazardous storage
- Interior plans showing all access points, hazardous materials storage rooms and/or cabinets, hazardous equipment or operations areas, proposed additive manufacturing area and associated equipment
- Fire-resistance rated construction
- Type and volume of mechanical ventilation (if required)
- Portable fire extinguisher locations per WSFC Section 906.
- Areas of open flames and sparks, hot surfaces, or other ignition sources

Permit Conditions

The following is a list of WSFC requirements related to additive manufacturing operations. Use this form to confirm that all applicable requirements are met. Non-applicable requirements can be left blank.

Nonindustrial Additive Manufacturing:

- 3D printers used in nonindustrial additive manufacturing shall be listed and labeled in accordance with UL 2011, UL 60950-1 or UL 62368-1. The listing shall also verify:
 1. The 3D printers are self-contained and utilize maximum 30-liter prepackaged production materials.
 2. The operation of the 3D printers shall not create a hazardous (classified) electrical area or zone outside the unit.
 3. If any hazardous (classified) electrical area or zone exists inside the unit's outer enclosure, the area shall be protected by intrinsically safe electrical construction or other acceptable protection methods.
 4. The 3D printers shall not utilize inert gas or an external combustible dust collection system.

Industrial Additive Manufacturing:

- 3D printers used in industrial additive manufacturing shall be listed and labeled in accordance with UL 2011 or approved for the application based on a field evaluation conducted by an approved agency.
- Industrial additive manufacturing operations that store, use or produce combustible dust, combustible particulate solids, or combustible metals shall comply with WSFC Chapter 22.
- Printing powders used in industrial additive manufacturing operations shall be tested for combustibility in accordance with NFPA 484 or NFPA 652 as applicable. A copy of test reports shall be provided to the fire code official upon request.
- Industrial additive manufacturing operations that store, use or produce combustible (nonmetallic) dusts shall comply with NFPA 654.
- Industrial additive manufacturing operations that store or use combustible metals shall comply with NFPA 484.
- Industrial additive manufacturing operations that store or use hazardous materials exceeding the maximum allowable quantity limits shall comply with WSFC Chapter 50.
- Additive manufacturing processes that utilize inert gases shall comply with WSFC Chapter 53. Ventilation or gas detection shall be provided in accordance with WSFC Section 5307.

NOTE: *This is not intended to be an all-inclusive list. The WSFC requirements listed are intended to ensure that we have adequate information to begin a review of the application. Additional information may be required.*

I understand that all applicable codes apply and that other regulatory codes may also apply. Errors and/or omissions on the plans and corrections from field inspections are the responsibility of the owner/contractor. All work is subject to compliance with City of Vancouver ordinances and laws of the State of Washington.

APPLICANT NAME: _____ APPLICATION DATE: _____

APPLICANT SIGNATURE: _____