



Operational Permit Application

Combustible Dust



www.cityofvancouver.us/departments/fire-department

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

Permitting Requirements

Combustible dust is defined by the WSFC as finely divided solid material which is 420 microns or less in diameter and which, when dispersed in air in the proper proportions, could be ignited by a flame, spark, or other source of ignition. An **operational permit** is required for operations producing combustible dust, including but not limited to operating a grain elevator, a flour starch mill, a feed mill, or a plant pulverizing aluminum, coal, cocoa, magnesium, spices, or sugar (WSFC 105.5.7).

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	

Building

Fire Sprinklers	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Fire Alarm	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Emergency Power	<input type="checkbox"/> Yes	<input type="checkbox"/> No
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Description of Work

Electronic Plan Standards

File Naming Standards:

Electronic plans and documents shall be named as specified in the City of Vancouver [ePLANS](https://www.cityofvancouver.us/business/permits-licenses-and-inspections/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 Permit Application – Combustible Dust (this document) Check all *Permit Conditions* checkboxes that are applicable to your project
- Completed Hazardous Materials Inventory Statement (HMIS) if applicable
- Supporting documents listed below (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 operations 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
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 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

If a full HMMP is required, it 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

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
- Employee training 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 by WSFC Section 2203.7.

Plan Details

The following is a list of information required on all plan submittals. The plan shall be drawn to 1/8" = 1'-0" minimum scale. If scale drawings are not possible, all measurements shall be called out in the drawings. The applicant is required to submit all this information so an accurate and timely review may be completed:

Site plan/floor plan:

- 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
- Fire barrier locations and corresponding hourly fire-resistance ratings
- Classified electrical locations per NFPA 70 Class II, Division I
- Egress paths and doors
- Portable fire extinguisher types, sizes, and locations
- Explosion control provisions (WSFC Table 911.1)
- Equipment that produces dust and equipment that conveys and collects it.
- Venting locations

Mechanical dust conveyance and collection equipment:

- Dust collection and conveyance equipment details
- Minimum conveyor velocities
- Duct lining materials
- Dust cleanouts
- Dust collector locations

Potential ignition sources (check all that apply and show locations in plan submittal):

- Welding or hot work
- Open flames
- Static electricity
- Hot surfaces and equipment
- Powered industrial trucks
- Spark production devices
- Self-heating materials
- Fuel fired equipment
- Portable heaters

Regulatory signage locations:

- Near the dust-containing equipment with deflagration vents post the following warning:
**CAUTION: THIS EQUIPMENT CAN CONTAIN EXPLOSIVE DUST.
KEEP OUTSIDE THE MARKED AREA WHILE EQUIPMENT IS OPERATING.**
- Where dust collection systems and other equipment are provided with deflagration vents, vent closures shall be clearly marked as follows:
WARNING: EXPLOSION RELIEF DEVICE. STAY CLEAR.
- The following warning shall be posted in the vicinity of combustible dust-producing areas:
**NO WELDING. THE USE OF WELDING OR CUTTING EQUIPMENT IN OR NEAR THIS AREA
IS DANGEROUS BECAUSE OF FIRE AND EXPLOSION HAZARDS. WELDING AND CUTTING
SHALL BE DONE ONLY UNDER THE SUPERVISION OF THE PERSON IN CHARGE.**

- A no smoking warning shall be conspicuously posted in or adjacent to dust-producing or dust-handling areas

Permit Conditions

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

Combustibility:

- The City of Vancouver is authorized to require the owner or owner’s authorized agent to provide, without charge to the jurisdiction, a technical opinion and report regarding the combustible dust hazard. The opinion and report shall be prepared by a qualified engineer, specialist, laboratory, or fire safety specialty organization acceptable to the fire code official and shall analyze the fire safety properties of the design, operation or use of the building or premises and the facilities and appurtenances situated thereon, to recommend necessary changes (WSFC 104.8.2).
- If a dust hazard analysis (DHA) is required by the fire code official for new or existing facilities and operations, it shall be in accordance with NFPA 652. The DHA for existing facilities shall be in accordance with Section 7.1.1 of NFPA 652 (WSFC 2205.1.1).
- Where manufactured, generated or used in such a manner that the concentration and conditions create a fire or explosion hazard based on a DHA, then the building or control area shall be classified as an H-2 occupancy in accordance with the International Building Code (WSFC Table 5003.1.1(1) footnote q).
- Where combustibility or explosivity screening tests are required to analyze the combustible dust, they shall be in accordance with Section 5.4 of NFPA 652 (WSFC 2204.1).
- The fire code official is authorized to enforce additional industry- or material-specific provisions of the codes and standards listed in Table 2205.1 to prevent and control dust explosions, as applicable (WSFC 2205.1).

**TABLE 2205.1
EXPLOSION PROTECTION STANDARDS**

STANDARD	SUBJECT
NFPA 61	Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities
NFPA 68	Standard on Explosion Protection by Deflagration Venting
NFPA 69	Standard on Explosion Prevention Systems
NFPA 70	National Electrical Code
NFPA 77	Recommended Practice on Static Electricity
NFPA 85	Boiler and Combustion System Hazards Code
NFPA 120	Standard for Fire Prevention and Control in Coal Mines
NFPA 484	Standard for Combustible Metals
NFPA 654	Standard for Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids
NFPA 655	Standard for the Prevention of Sulfur Fires and Explosions
NFPA 664	Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities

Dust Explosion Prevention:

- The maximum dust layer on all surfaces shall not exceed the critical depth layer specified in Table 2203.1. The critical depth layer is permitted to be adjusted for explosion hazard where further evaluated in accordance with one of the following (WSFC 2203.1):
 1. Section 7.2.1.3 of NFPA 654.

2. Section 4.1.3.3 of NFPA 664 for wood flour.

**TABLE 2203.1
CRITICAL DEPTH LAYER**

TYPE OF DUST	CRITICAL DEPTH LAYER (INCHES)
Wood flour	1/8
All other dusts	1/32

For SI: 1 inch = 25.4 mm.

- Dust-producing equipment and dust-handling equipment, including but not limited to vacuums, dust collection systems, dryers, mixers, blenders, separators, conveyors, storage containers, silos, or other similar devices, shall be listed and shall be maintained in accordance with the manufacturer's recommended standards (WSFC 2203.2).
- Where dust collection systems and other equipment, systems or system components are provided with deflagration vents, the area within the deflagration vent's discharge area shall be marked in an approved manner (WSFC 2203.2.1.1).
- Dust-collection systems shall be designed to collect dust emissions from dust-producing equipment at the point of generation. Dust-collection systems shall be in accordance with Section 511 of the International Mechanical Code (WSFC 2203.3.1).

Exception:

1. Closed systems using listed equipment and designed in accordance with manufacturer's recommendations and specifications, where cleanouts are provided.
- Heating, ventilation, and air conditioning (HVAC) systems shall not be used as the means to collect dusts from localized sources.
 - Dust collectors shall be located outside of buildings (WSFC 2203.3.1.1).

Exceptions:

1. Dust collectors inside buildings complying with Section 511 of the International Mechanical Code.
 2. Wet-type dust collectors specifically listed for the type of dust conveyed shall be permitted inside buildings where in accordance with the manufacturer's instructions and specifications.
 3. Dust collectors designed to specific NFPA standards listed in Table 2205.1 for the specific type of dust conveyed.
- The minimum velocities within ducts used as part of the dust collection system shall be in accordance with Table 2203.3.1.2 (WSFC 2203.3.1.2).

**TABLE 2203.3.1.2
MINIMUM CONVEYING VELOCITIES**

TYPE OF PRODUCT	FEET PER MINUTE
Fine light dust such as cotton, lint and wood flour (100 mesh and under)	2,000
Dry dust such as fine rubber molding powder	2,500
Average dust such as sawdust, grinding dust and coal dust	3,500
Heavy dust such as metal turnings, including aluminum and magnesium powder	4,000

For SI: 1 foot per minute = 0.00508 m/s.

- Plastic, fiberglass, other nonconductive ducts, duct liners or pipes shall not be used as part of ducts and conveying systems. Ductwork utilizing a combustible lining shall be permitted only in high-impact areas and where approved. Flexible hose shall be permitted if designed and installed in accordance with the following requirements (WSFC 2203.3.2):
 1. Manufactured of static dissipative construction.
 2. Used only for connections and isolation purposes.
 3. Limited to 18 inches (457 mm) in length.
 4. Properly grounded.
- Openings in enclosed equipment and conveyors shall be provided to allow access to all parts of the equipment and conveyors to permit inspection, cleaning, maintenance and the effective use of portable fire extinguishers or hose streams. Cleanouts for

ducts used as part of the dust-collection system shall be in accordance with the International Mechanical Code (WSFC 2203.3.3).

- Classified electrical shall be in accordance with NFPA 70. Electrical motors and electrical components of the equipment shall not be installed in the dust-laden airstream unless listed for Class II, Division 1, locations (WSFC 2203.4.1).
- Bonding and grounding is required to minimize accumulation of static electric charge in the following locations (WSFC 2203.4.2):
 1. Dust-producing equipment.
 2. Dust-collection system.
 3. Pneumatic dust-conveying systems conveying combustible dust from one location to another, combustible dust conveyors, piping and conductive components. Conveying systems include transport modes such as railcars, hopper cars, boxcars, tank cars and trucks into which or from which commodities or products are pneumatically conveyed.
 4. Conveying systems using metallic piping.
- Hot work and similar spark-producing operations shall not be conducted in or adjacent to combustible dust-producing areas unless precautions have been taken to provide safety. Hot work shall be permitted only in safe, designated areas in accordance with WSFC Chapter 35. Hot work is prohibited on equipment that is operating (WSFC 2203.4.3).
- In areas where a dust explosion hazard or dust flash fire hazard exists, the temperature (in degrees Celsius) of external surfaces shall be maintained below 80 percent of the lower of the dust-surface ignition temperature or the dust-cloud ignition temperature for worst-case dusts. External surfaces shall include but are not limited to (WSFC 2203.4.4):
 1. Compressors.
 2. Steam, water or process piping.
 3. Ducts.
 4. Conveyors.
 5. Process equipment.
- Where steam pipes or hot surfaces occur in dust-producing or dust-handling areas, accumulation of dust on the surfaces shall be minimized by an approved method (WSFC 2203.4.4).

Exception: Drying apparatus listed for the intended use and installed in accordance with the manufacturer's instructions.
- Powered industrial trucks used in electrically classified areas shall be listed for such use (WSFC 2203.4.5).
- Spark-producing devices shall not be located within 20 feet of areas requiring classified electrical unless separated by a permanent partition (WSFC 2203.4.7).
- Materials in silos and other large storage piles of particulates prone to self-heating shall be in accordance with Section 9.4.11 of NFPA 652 (WSFC 2203.4.8).
- Production, maintenance, or repair activities that have the potential to release or force combustible dust to become airborne shall not be conducted within 35 feet (11 m) of an open flame or pilot flame (WSFC 2203.4.9.1).
- Fuel-fired space heaters drawing local ambient air shall not be located within electrically classified areas. Space-heating appliances in dust-producing or dust-handling areas shall be located where not subject to the accumulation of deposits of combustible dust (WSFC 2203.4.9.2).
- Fuel-fired process equipment shall be listed for its intended use and shall be operated and maintained in accordance with the manufacturer's instructions (WSFC 2203.4.9.3).
- Inspection and maintenance of fuel-fired process equipment shall include verification that significant combustible dust accumulations do not exist within or around the equipment (WSFC 2203.4.9.4).
- In Class II electrically classified locations, heating units shall be provided with a source of combustion air ducted directly from the building exterior or from an unclassified location (WSFC 2203.4.9.5).

Housekeeping:

- Accumulation of combustible dust on surfaces inside buildings shall be maintained below the critical depth layer in WSFC 2203.1. Pressurized air or similar methods shall not be used to remove dust from surfaces. Accumulated combustible dust shall be collected by one of the following methods (WSFC 2203.5):
 1. Portable vacuum cleaners listed for use in Class II, Group G, Division 1, atmospheres as defined in NFPA 70.
 2. Dust collection systems.
 3. Other approved means that will not place combustible dust into suspension in air.

Exception: Forced-air or similar methods shall be permitted to remove dust in accordance with NFPA 652, NFPA 654 or NFPA 664.

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: _____