



# Construction/Operation Permit Application

## Cryogenic Liquids



[www.cityofvancouver.us/departments/fire-department](http://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 produce, store, transport on site, use, handle or dispense *cryogenic fluids* in excess of the amounts listed in Table 105.5.11. A **construction permit** is required for installation or alteration to outdoor stationary cryogenic fluid storage systems where the system capacity exceeds the amounts listed in WSFC Table 105.5.11.

Maintenance performed in accordance with the WSFC is not considered to be an alteration and does not require a construction permit. Permits are not required for vehicles equipped for using cryogenic fluids as a fuel for propelling the vehicle or for refrigerating the cargo load.

### 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
Application type:	<input type="checkbox"/> Installation	<input type="checkbox"/> Operational	<input type="checkbox"/> Both Installation and Operational
Installation by:	<input type="checkbox"/> Contractor	<input type="checkbox"/> Owner	<input type="checkbox"/> Tenant
Related Permits:	FRI _____	CMI _____	DEF _____ MPE _____

### Description of Work


Quantities			
Cryogenic Fluid	GAL	Cryogenic Fluid	GAL

**TABLE 105.6.10**  
**PERMIT AMOUNTS FOR CRYOGENIC FLUIDS**

TYPE OF CRYOGENIC FLUID	INSIDE BUILDING (gallons)	OUTSIDE BUILDING (gallons)
Flammable	More than 1	60
Inert	60	500
Oxidizing (includes oxygen)	10	50
Physical or health hazard not indicated above	Any Amount	Any Amount

## 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 Fire Installation Permit Application – Cryogenic Liquids (this document) Check all *Permit Conditions* checkboxes that are applicable to your project
- Completed hazardous materials Inventory statement (HMIS) and hazardous materials management plan (HMMP)
- Supporting documents listed below (See *Document Details* below)
- Site plans and floor plans (see *Plan Details* below)

## Document Details

- Listing documents for all proposed equipment to be used
- Supporting documents including listing sheets for tanks, piping, valves, and pressure relief devices.

## Plan Details

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

- Site plan to include a measurable scale for calibration, indication of the north direction, fire hydrants, fire access lanes, emergency doors, emergency shutoff locations, Fire Department Connections, points of assembly for occupant evacuation, electrical room, gas meters, sprinkler riser, fire alarm panel, Knox Box, and location size of the proposed tank(s) and piping system.
- Cryogenic fluid storage container information such as type, material, safety features and integral equipment or devices
- Materials to be stored, used or trans-loaded/transported.
- Foundation details that show proper construction of the foundation supporting stationary tanks and it should include dimensions and materials used in construction.
- Separation measurements of all cryogenic containers and systems in storage or use that provide adequate distance for outside placement from materials and conditions which pose exposure hazards (5504.3.1.2).
- Stationary containers separated from exposure hazards in accordance with the provisions applicable to the type of fluid contained and the separation distances (5504.4.1.1).
- Indication of the portions of containers in contact with foundations or saddles which will be required to be painted for protection against corrosion.
- Labeled dispensing areas, stating if said areas will be dispensing fluids outside on inside. If dispensing indoors, include the construction of those areas showing their accordance with the IBC.

TABLE 5504.3.1.2.1  
SEPARATION OF PORTABLE CONTAINERS  
FROM EXPOSURE HAZARDS

EXPOSURE	MINIMUM DISTANCE (feet)
Air intakes	10
Building exits	10
Combustible materials such as paper, leaves, weeds, dry grass or debris	15
Lot lines	5
Other hazardous materials	In accordance with Chapter 50
Wall openings	1

## Permit Conditions

The following is a list of WSFC requirements related to the installation, storage, and use of cryogenic fluid systems. Use this form to confirm that all applicable requirements are met. Non-applicable requirements can be left blank.

### General:

- Containers, cylinders, tanks, and systems that could be exposed to physical damage shall be protected. Guard posts or other approved means shall be provided to protect cryogenic containers, cylinders, tanks, and systems indoors and outdoors from vehicular damage (312).
- Pressure relief devices shall be provided in accordance with WSFC 550.3.2.1 through 550.3.2.7 to protect containers and systems containing cryogenic fluids from rupture in the event of overpressure. Pressure relief devices shall be designed in accordance with CGA S-1.1, CGA S-1.2 and CGA S-1.3 (5503.2)
- Pressure relief devices shall be arranged to discharge unobstructed to the open air in such a manner as to prevent impingement of escaping gas on personnel, containers, equipment, and adjacent structures or to enter enclosed spaces. (5503.2.5)  
*Exception:* DOT-specified containers with an internal volume of 2 cubic feet or less.
- Vent piping shall have a cross-sectional area not less than that of the pressure relief device opening and shall be constructed and arranged so as to remain functional not restricting flow and direct the flow of gas to a safe location. All piping and drains in the vent lines shall be arranged so that escaping gas will discharge unobstructed to the open air and not impinge on personnel, containers, equipment, and adjacent structures or enclosed spaces (5503.3.1 and 5503.3.2).
- Cryogenic containers shall be secured against accidental dislodgement and unauthorized access. Containers and systems shall be secured against unauthorized entry and safeguarded in an approved manner (5503.5.1 through 5503.5.4).
- Wiring and any electrical equipment shall be in accordance with NFPA 70. Ensure containers and systems are not located where they could become part of an electrical circuit (5503.6.1 through 5503.6.2).
- Lighting, including emergency lighting, shall be provided for fire appliances and operating facilities such as walkways, control valves and gates ancillary to stationary containers (5503.10)

- The area surrounding stationary containers shall be provided with a means to prevent accidental discharge of fluids from endangering personnel, containers, equipment, and adjacent structures or to enter enclosed spaces. The stationary container shall not be placed where spilled or discharged fluids will be retained around the container (5504.3.1.1.5 and 5504.3.1.2.3).
- Shutoff valves shall be installed in piping containing cryogenic fluids where needed to limit the volume of liquid discharged in the event of piping or equipment failure. Shutoff valves shall be provided with access thereto and located as close as practical to the container (5505.1.2.3.1).
- Shutoff valves shall be installed in piping containing cryogenic fluids where needed to limit the volume of liquid discharged in the event of piping or equipment failure. Pressure relief valves shall be installed where liquid is capable of being trapped between shutoff valves in the piping system (5505.1.2.3.2).
- Identify the type of pipe, design pressure, maximum operating pressure and test pressure of vessels and associated piping. All of the piping shall be identified in accordance with ASME A13.1.
- The piping systems shall be tested and proven free of leaks after installation as required by the standards by which they were designed and constructed. The test pressures shall not be less than 150 percent of the maximum allowable working pressure when hydraulic testing is conducted or 110 percent when testing is conducted pneumatically (5505.1.2.6).
- Provisions for safe dispensing, emptying or refilling containers including vehicle access, over-fill protection, "dead-man" controls and internal transport carts and trucks to be used.

#### **Emergency Shutoff Valves:**

- Outdoor use requires that manual or automatic emergency shutoff valves shall be provided to shut off the cryogenic fluid supply in case of an emergency. An emergency shutoff valve shall be located at the source of supply and at the point where the system enters the building (5505.3.2).
- Emergency shutoff valves shall be identified, and the location shall be clearly visible and indicated by means of a sign.

#### **Use and Handling:**

- Indoor areas where cryogenic fluids are dispensed shall be ventilated in accordance with the requirements of the International Mechanical Code in a manner that captures any vapor at the point of generation (5505.4.1.1).  
*Exception:* Cryogenic fluids that can be demonstrated not to create harmful vapors do not require ventilation
- Where cryogenic containers are moved by hand cart, hand truck or other mobile device, such carts, trucks, or devices shall be designed for secure movement of the container. Carts and trucks used to transport cryogenic containers shall be designed to provide a stable base for the commodities to be transported and shall have a means of restraining containers to prevent accidental dislodgement (5505.5.1).
- Pressurized containers shall be transported in closed conditions. Containers designed for use at atmospheric conditions shall be transported with appropriate loose-fitting covers in place to prevent spillage (5505.5.2).

#### **Marking and Signage:**

Visible hazard identification signs in accordance with NFPA 704 shall be provided at entrances to buildings or areas in which cryogenic fluids are stored, handled, or used. Markings shall be visible from any direction of approach. Buildings, rooms, containers, and piping systems containing cryogenic liquids shall be labeled in accordance with WSFC 5503.4, NFPA 704 and ASME A13.1 as follows:

- Stationary and portable containers shall be marked with the name of the gas contained:
  1. Stationary above-ground containers shall be placarded in accordance with WSFC 5003.5 and 5003.6.
  2. Portable containers shall be identified in accordance with CGA C-7.
- Stationary containers shall be identified with the manufacturing specification and maximum allowable working pressure with a permanent nameplate. The nameplate shall be installed on the container in a location provided with ready access. The nameplate shall be marked in accordance with the ASME Boiler and Pressure Vessel Code or DOT-49 CFR Parts 100–185

- Container inlet and outlet connections, liquid-level limit controls, valves and pressure gauges shall be identified with one of the following:
  1. A permanent tag or label identifying the function.
  2. A schematic drawing that portrays the function and designates whether the connection is to the vapor or liquid space of the container. Where provided, this drawing shall be attached to the container and maintained in a legible condition.
- Piping shall be labeled with the content and direction of flow and in accordance with ASME A13.1. Markings used for piping systems shall consist of the content's name and include a direction-of-flow arrow. Markings shall be provided at each valve; at wall, floor, or ceiling penetrations; at each change of direction; and at not less than every 20 feet or fraction thereof throughout the piping run.

Exceptions:

1. Piping that is designed or intended to carry more than one gas at various times shall have appropriate signs or markings posted at the manifold, along the piping, and at each point of use to provide clear identification and warning.
2. Piping within gas manufacturing plants, gas processing plants, refineries and similar occupancies shall be marked in an approved manner.

**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: \_\_\_\_\_