

INTERPRETATIONS & PROCEDURES



FIRE PREVENTION DIVISION

SUBJECT:		Plant Extraction Systems	CODE SECTION(S): 2012 IFC 105.6 & Chapter 57
ISSUED BY			
NAME: Ken Carlson	SIGNATURE: <i>Ken Carlson</i>		ISSUE DATE: March
TITLE: Fire Marshal			NUMBER: 2015-1

ATTACHMENTS

SUPERSEDES _____

This policy is meant to address Marijuana/other plant extraction processes for most common conditions and situations and is based on currently available information. In any given occupancy, many other Fire Code requirements may be applied. These will be addressed by the Fire Inspector during a premises inspection. Questions can be addressed to the Fire Prevention Division office at (425) 452-6872.

I. SCOPE

This policy covers the safety requirements as they pertain to the use of plant extraction systems. These include: Systems designed to extract plant material using flammable gases, flammable liquids, carbon dioxide, alcohol and/or any other method of plant oil extraction.

Exemption: Extraction processes using cold water only.

II. OTHER REQUIREMENTS

These hazardous processes are regulated by the International Fire, Building and Mechanical Codes and Electrical Code as adopted and amended by the City of Bellevue and [Washington Administrative Code 314-55-104](#).

Any construction permits that are required for the extraction process (i.e. exhaust hoods, electrical upgrades, etc.) must be obtained and the associated work completed and inspected prior to the issuance of the Marijuana Extraction Operational Permit.

Where hazardous material storage amounts exceed International Fire Code permissible amounts (ref.: International Fire Code Section 105.6), additional Operational Permits are required.

III. OPERATIONAL PERMITS

An annual Operational Permit shall be obtained for a Plant Extraction System as defined in the scope. All permits shall be kept on site for inspection. To obtain an Operational Permit, the following information must be provided when submitting the permit application:

- Site address
- Contact name and phone number
- Property/business owner name, phone number, fax number, and address
- Installation/Maintenance contractor's business name and address, phone number, fax number
- List the type of process proposed
- List the type of machine used in the process
- Technical specification on any machine or safety equipment proposed for use (extraction devices and/or hood systems)
- List total cubic feet or equivalent pounds or gallons of gas or liquid on site; include inside and outside use and/or storage.
- **Diagram of site location indicating gas or liquid use/storage area**
- Specify any local hydrocarbon, CO₂, or other hazardous material detector provided

To obtain the required permit(s), the business owner or company representative must complete and sign the Operational Permit application [form](#) to include the information noted above. Separate [permit applications](#) will be required for use and storage of flammable gases, LPG, or flammable liquids if they exceed exempted amounts (ref.: International Fire Code Table 105.6.20). A compressed gas permit will be required for CO₂ use and storage in amounts over 100 pounds.

IV. SITE INSPECTION

Upon approval of the extraction system and associated equipment, an Operational Permit will be issued, and a Bellevue Fire Prevention Officer will conduct a field inspection of the site. Compliance with Fire Code requirements shall be maintained at **all** times. The permit shall be posted on site and is valid for business/property owner, time frame, and site address indicated on the permit. Permit will be revoked if:

1. Any of the conditions or limitations set forth in the permit have been violated.
2. Compliance with written order has not been achieved.
3. False statements or misrepresentations of information provided in the permit application are made.
4. The permit is issued in error, in violation of City ordinance or the Fire Code.

V. SPECIFICS AND CONDITIONS:

- **Inspection and testing of equipment.** All sensors, alarms and storage containers must be inspected and tested annually or as prescribed by the manufacturer. A written record of all required inspection and testing shall be maintained on the premises for a period of three years. Testing of emergency devices or systems required by this policy shall be conducted by persons trained and qualified in these systems.

- **Training.** All employees shall receive annual training in hazard identification, physical properties and emergency procedures. Training records shall be available to inspectors upon request.
- **Electrical:** The use of extension cords is prohibited as an alternative to permanent wiring. Extension cords are only permitted to serve as temporary wiring for portable appliances other than electric heaters. Portable electric heaters are required to be plugged directly into an outlet.
- **Flammable liquid storage and handling:** Quantities of flammable and combustible liquids in excess of 10 gallons shall be stored in flammable liquid storage cabinets meeting the requirements of International Fire Code Section 5704.3.2.

Class I liquids (such as ethanol) shall be transferred by one of the following methods:

- From original shipping containers with a capacity of 5.3 gallons or less,
 - From safety cans meeting UL30,
 - Through an approved closed piping system,
 - From containers or tanks by an approved pump taking suction through an opening in the top,
 - From containers or tanks by gravity through an approved self-closing or automatic closing valve when the area is provided with spill control and secondary containment in accordance with International Fire Code Section 5703.4.
- **Fire extinguishers:** Provide portable fire extinguishers in accordance with International Fire Code section 906. The grow areas are considered to be ordinary hazard occupancies with Class A fire hazards, and processing areas are considered to be extra hazard occupancies with Class B fire hazards.
 - **Smoking:** Smoking is prohibited in areas where flammable liquids or combustible materials are stored or handled. "No Smoking" signs shall be provided in a conspicuous location in each location where smoking is prohibited.

VI. CARBON DIOXIDE (CO₂) GAS ENRICHMENT SYSTEMS. There are a variety of methods used to generate CO₂, including natural gas and LP gas fueled generators, dry ice, fermentation methods, distribution of gas from portable or fixed tanks and cylinders, etc. The use of heaters designed for outdoor use to generate CO₂ is prohibited.

- **CO₂ Control System.** Any area or room where CO₂ gas is discharged or generated shall be provided with a control system that utilizes CO₂ sensor(s) and limits the CO₂ levels to a maximum of 5,000 ppm.
- **CO₂ Alarm System.** The room or area where CO₂ extraction systems are located shall be provided with a CO₂ alarm system. The alarm system shall consist of continuous gas detection that activates a local alarm within the room or area and on the outside of the entrance to each area when CO₂ accumulations reach 5,000 ppm. In addition, the alarm shall be transmitted to an on-site location that is staffed by trained personnel.

Signage shall be provided on the entry doors to areas or rooms using CO₂ extraction systems stating:



VII Flammable Gas related extractions:

Location: The storage and use of LP or Butane Gas is prohibited in basements.

- **Extraction Equipment.** Plant extraction systems are required to be professional grade closed loop extraction systems designed to recover the solvents. The extraction equipment is required to be listed, or alternatively, the design and installation of extraction equipment must be evaluated by licensed engineer.

For non-listed extraction systems, the licensed engineer is required to prepare a report that identifies all applicable standards and verifies the installation meets [WAC 314-55-104](#), all applicable ASME and NFPA standards for the operating pressures it will be subject to, has pressure relief devices on any trapped gas sections, and confirms that all hoses, fittings, vacuum pumps etc. are compatible with the specific flammable gas used in the equipment.

The engineering report is required as part of the permit application for approval by the Fire Department.

- Where closed extraction systems use refrigeration recovery systems, the unit is required to be rated for hydrocarbon refrigerants. Vacuum ovens shall be suitable for use with flammable solvents.
- The release of LP or butane gas to the atmosphere is prohibited.
- Refrigerators and freezers used for the storage of flammable gases are required to be appropriate for use in a location requiring Class I Division 2 electrical.
- **Exhaust System:** The room or area where plant extraction is conducted shall be provided with an exhaust system providing a minimum of 6 air changes per hour or 1 cfm/sq. ft. of the room or area. The system shall use explosion-proof or intrinsically safe fans, have air inlets located no more than 3 ft. above floor level, and have supply air in accordance with the International Mechanical Code. The exhaust system shall be interlocked with the extraction system (or other approved interlock), unless Class I Division 2 electrical equipment and appliances are provided as detailed below. In addition to Class I Division 2 electrical, a non-

interlocked ventilation system requires an activation switch in the vicinity of the extraction equipment with a sign stating "EXHAUST SYSTEM MUST BE IN OPERATION DURING THE EXTRACTION PROCESS".

- **Electrical Systems and Appliances:** Plant extraction rooms or areas that are not provided with an interlocked exhaust system as described above shall be provided with Class I Division 2 electrical. The rated electrical is required to be provided in a zone defined as a 25 feet radius from the extraction equipment at heights between the floor level and 3 feet above the floor. In addition to the 25 feet zone, the Class I Division 2 electrical is also required within a 5 feet radius of the extraction equipment, including above the equipment. Class I Division 2 applies to any appliance in the room as well as electrical installations.

Equipment with heated surfaces having a temperature sufficient to ignite vapors shall not be located in locations where Class I Division 2 electrical equipment is required.

- **Hydrocarbon Alarm System:** Any room or area where flammable gas extraction is conducted shall be provided with a hydrocarbon alarm system. The system shall include a hydrocarbon detector that activates an alarm throughout the room or area and on the outside of the entrance to such areas when gas concentrations reach 25 percent of the Lower Explosive Limit. In addition, the alarm shall be transmitted to an on-site location that is staffed by trained personnel.

VIII. PLANT EXTRACTION SYSTEMS USING CO₂ GAS

- **Extraction Equipment:** Plant extraction systems are required to be professional grade closed loop extraction systems. The design and installation of the extraction equipment is required to be listed, or alternatively, must be evaluated by a licensed engineer.

For non-listed extraction systems the licensed engineer is required to prepare a report that identifies all applicable standards and verifies the installation meets WAC 314-55-104 and all applicable ASME and NFPA Standards for the operating pressures it will be subject to.

The engineering report is required as part of the permit application for approval by Fire Department.

- **CO₂ Alarm System:** The room or area where CO₂ extraction systems are located shall be provided with a CO₂ alarm system. The alarm system shall consist of continuous gas detection that activates a local alarm within the room or area and on the outside of the entrance to each area when CO₂ accumulations reach 5,000 ppm. In addition, the alarm shall be transmitted to an on-site location that is staffed by trained personnel.
- **Signs:** Signage shall be provided on the entry doors to areas and/or rooms using CO₂ extraction systems stating:



IX PLANT EXTRACTION SYSTEMS USING FLAMMABLE LIQUIDS

- **Exhaust System:** Extraction processes using alcohol or other flammable liquids are required to be conducted under a fume hood in accordance with the International Mechanical Code. Alternatively, the room or area can be provided with ventilation and Class 1 Division 2 electrical as detailed below. The room ventilation system shall provide a minimum of 6 air changes per hour or 1 cfm/sq. ft. of the room or area. The system shall use explosion proof or intrinsically safe fans, have air inlets located no more than 3 feet above floor level, and have supply air in accordance with the International Mechanical Code.

Exhaust systems shall be in operation at all times during the extraction process unless the extraction equipment is UL listed as a Solvent Recovery Unit. Where interlocks are not provided for fan operation to ensure operation, signage must be posted at the switch "EXHAUST MUST BE IN OPERATION DURING EXTRACTION PROCESS".

- **Electrical Systems and Appliances:** Flammable liquid plant extraction operations that are not located under a fume hood as described above shall be provided with Class I Division 2 electrical. The Class I Division 2 electrical is required to be provided in a zone defined as a 25 feet radius from the extraction equipment at heights between the floor level and 3 feet above the floor. In addition to the 25 feet zone, the Class I Division 2 electrical is also required within a 5 feet radius of the extraction equipment, including above the equipment. Class I Division 2 electrical applies to any appliance in the room as well as electrical installations. Equipment with heated surfaces having a temperature sufficient to ignite vapors shall not be located in locations where Class I Division 2 electrical equipment is required. Vacuum ovens shall be suitable for use with flammable solvents.