



PROCESSING AND EXTRACTION FACILITIES

TECHNICAL BULLETIN

FIRE-39-1

City of San Diego

Development Services Department

June 2020

The purpose of this technical bulletin is to describe the fire and life safety requirements for cannabis plant processing and/or extraction facilities. Note that all cannabis plant processing and extraction facilities are required to obtain a Cannabis Production Facility (CPF) Conditional Use Permit (CUP) prior to any construction permits. See Information Bulletin 171, How to Apply for a Conditional Use Permit for Cannabis Production Facility for further information.

I. GENERAL

A. Definitions for Terms Used in this Technical Bulletin:

Desolventizing is removing solvents from a material.

Distillation is separating components from a liquid mixture by selective boiling and condensation.

Extraction is the process of removing oils and fats from the plant by use of a solvent, desolventizing the raw material, production of the miscella, distillation of the solvent from the miscella and solvent recovery.

Cannabis plant processing or extraction facilities (CPF) include all building or structures used for cultivation, harvesting, grinding, wholesale distribution, storage, production of goods from cannabis products, extracting, desolventizing, and distillation of the cannabis plant.

Miscella is a mixture, in any proportion, of the extracted oil or fat and the extracting solvent.

Nonvolatile solvent is any solvent used in the extraction process that is not considered a volatile solvent (i.e. Carbon Dioxide).

Registered Design Professional is approved by the City of San Diego to prepare technical reports for CPFs. The Registered Design Professional preparing the technical report must be a California licensed Chemical, Electrical, Fire Protection or Mechanical Engineer. Any other California registered design professional would be required to submit qualifications to the City of San Diego for approval.

Volatile Solvent is any solvent, such as butane, hexane or ethanol, that is or produces a flammable gas or vapor that, when present in the air in sufficient quantities, will create explosive or ignitable mixtures.

Winterization is the heating or pressurizing of the miscella to other than normal pressure or temperature.

B. Permits

1. **Building Permits.** In addition to the CPF Conditional Use Permit, a building permit and any associated electrical, mechanical, plumbing, and fire permits must be obtained. All CPFs are considered change of use and/or change of occupancy. Also, any change to process or procedure to an existing CPF requires a building permit to review and inspect the change of use and/or occupancy.

2. **San Diego Fire Department (SDFD) Permits.** The following operations and systems require permits from SDFD.

- a. **Technical Services Hazardous Materials Permits.** Customers must obtain a Hazardous Materials Permit from SDFD Technical Services in the Community Risk Reduction Division when hazardous materials exceed the permit amounts. Permit amounts for common hazardous materials used at CPFs are shown below. Call 619-533-4477 to schedule an appointment. It is recommended to attach a copy of the Hazardous Materials permit application at the time of building permit submittal. See Information Bulletin 116, Submittal Requirements for Hazardous Materials for further information and additional uses that require SDFD permits.
 - i. To store, handle or use Class I Flammable liquids in excess of 5 gallons in a building or in excess of 10 gallons outside a building.
 - ii. To store, handle or use Class II or Class IIIA Combustible liquids in excess of 25 gallons in a building or in excess of 60 gallons outside a building, except for fuel oil used in connection with oil-burning equipment.
 - iii. Tanks containing more than 60 gallons of flammable or combustible liquids or liquefied petroleum gases (LPG).
 - iv. To store, handle or use compressed gases as follows:
 - a) Corrosive gases in excess of 200 cu. ft.
 - b) Flammable gases in excess of 200 cu. ft.
 - c) Oxidizing gases in excess of 504 cu. ft.
 - d) Any amount of toxic or highly toxic gases.
 - e) Carbon dioxide in excess of 875 cu. ft. used in enrichment systems.
 - f) Inert and simple asphyxiant gases in excess of 6,000 cu. ft.
 - v. To produce, store, transport on site, use, handle or dispense cryogenic fluids as follows:
 - a) Flammable cryogenic fluids exceeding 1 gallon inside a building or 60 gallons outside building
 - b) Oxidizing cryogenic fluids exceeding 10 gallons inside a building or 50 gallons outside building
 - c) Inert cryogenic fluids exceeding 500 gallons outside building.
- b. **Plant Extraction Systems.** Facilities performing cannabis plant extraction must obtain a permit for the installation or modification to a plant extraction system prior to operation. Email SDFDFPBMT@sandiego.gov with questions regarding this permit.

- C. **Systems, Equipment and Processes Involving Hazardous Materials.** Systems, equipment and processes utilized for storage, dispensing, use or handling of hazardous materials shall comply with the general requirements of CFC Section 5003.2, and other applicable provisions of the CFC, the California Building Code (CBC) and the California Mechanical Code (CMC).

II. SUBMITTAL REQUIREMENTS

In addition to the requirements contained within the Project Submittal Manual, Section 2, Construction Permits, provide the following information when submitting for a building permit:

- A. **Scope of Work.** Clearly indicate the scope of work including all processes, procedures, storage and methods. Identify any change of use and/or occupancy for all spaces specifically in the scope. Include CUP Number on the plans.
- B. **Occupancy Classification.** Provide occupancy classification for all spaces in the entire building, including areas not in the scope of work.
- C. **Process Flow.** Provide a detailed description of the process flow. At a minimum, include the following in the description:
 - 1. Materials used in the process, at what state, operating temperature, pressure, etc.

2. Equipment used in the processing / extraction process from start to finish. Identify all listed and non-listed equipment.
3. Indicate all forms of raw material(s) at the beginning of the process and all finished product(s) type, storage of and any packaging performed.
4. Where gas detection is required, clearly state where and how it will affect the system proposed.

III. EXTRACTION PROCESS

- A. **Prohibited Occupancies.** Extraction processes utilizing flammable gases or flammable cryogenic fluids shall not be located in any building containing a Group A (Assembly), E (Educational), I (Institutional) or R (Residential) occupancy.
- B. **Extraction Location.** All extraction equipment and extraction processes using hydrocarbon solvents must be located in a room or area solely used for extraction.
- C. **Systems and Equipment / Technical Report.** All systems and equipment used for the processing and extraction of oils from plant material must be listed or approved for the specific use. If the system or equipment is not listed or approved for the proposed use, a Registered Design Professional, as defined in Section I, must prepare a technical report. It may be necessary to have multiple Registered Design Professionals prepare a technical report for complex processes/projects involving multiple disciplines. At a minimum, provide the following information in the technical report:
 1. Manufacturer information
 2. Preparer of Record of the Technical Report
 3. Date of review and report revision history
 4. Signature page, including all of the following:
 - a. Author of the report.
 - b. Date of report.
 - c. Date and signature of registered design professional of record performing the design or peer review.
 5. Model number of the item evaluated. If the equipment is provided with a serial number, the serial number shall be included for verification at the time of site inspection.
 6. Methodology of the design or peer review process used to determine minimum safety requirements. Methodology shall consider the basis of design, and shall include a code analysis and code path to demonstrate whether specific codes or standards are applicable.
 7. Equipment description. A list of every component and subassembly, such as fittings, hose, quick disconnects, gauges, site glass, gaskets, valves, pumps, vessels, containers and switches, of the system or equipment, indicating the manufacturer, model number, material and solvent compatibility. Manufacturer's data sheets shall be provided.

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8. A general flow schematic or general process flow diagram of the process. Post-processing or winterization shall be included in this diagram. Primary components of the process equipment shall be identified and match the equipment list. Operating temperatures, pressures and solvent state of matter shall be identified in each primary step or component. A piping and instrumentation diagram shall be provided.
 9. Analysis of any vessel pressurized beyond standard atmospheric pressure. Analysis shall include all purchased and fabricated components.
 10. Structural analysis for any frame systems supporting equipment.
 11. Process safety analysis of the extraction system, from the introduction of raw product to the end of the extraction process.
 12. Comprehensive process hazard analysis. Include all failure modes and points of failure throughout the process. The analysis must include a review of the emergency procedure information provided by the manufacturer of the equipment or process and not that of the facility, building or room.
 13. Review of the assembly instructions, operational and maintenance manuals provided by the manufacturer.
 14. List of references used in the analysis.
- D. Site Inspection by Registered Design Professional.** Prior to the operation of the extraction equipment, a Registered Design Professional must inspect the site of the extraction process once all equipment has been installed. The Registered Design Professional must verify that all equipment has been installed for compliance with the technical report and the building analysis. The Registered Design Professional must provide a report of the findings and the observations to the structural inspector prior to final inspection. The Field Inspection Report authored by the Registered Design Professional shall include the serial number of the equipment used in the process and shall confirm that the equipment installed is the same model and type of equipment identified in the Technical Report.
- E. Hazardous Exhaust Fume Hood.**
1. A hazardous exhaust fume hood rated for exhausting flammable vapors must be provided where flammable / combustible liquids are used for liquid extraction processes where the liquid is boiled, distilled or evaporated.
 2. Electrical equipment used within the hazardous exhaust fume hood must be rated for use in flammable atmospheres. The use of a heating element not rated for flammable atmospheres may be permitted where documentation from the manufacturer, or approved testing laboratory, indicates that the element is rated for heating of flammable liquids. All documentation must be submitted for review at the time of building permit. Heating of flammable or combustible liquids over an open flame is prohibited.
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- F. Gas Detection Systems.** Extraction processes using flammable gases as solvents require a continuous gas detection system.
1. The flammable gas detection system must be listed or approved and must be calibrated for the types of gases used. The control units must be listed and labeled in accordance with UL 864 or UL 2017. Gas detectors shall be listed and labeled in accordance with UL 2075 for use with the gases and vapors being detected.
 2. The gas detection system must be designed to activate when the level of flammable gas exceeds 25% of the lower flammable limit (LFL). Lower thresholds may be used.
 3. Activation of the gas detection system shall:
 - a. Initiate distinct audible and visual alarm signals in the extraction room;
 - b. Deactivate all heating systems located in the extraction room;
 - c. Activate mechanical ventilation system, where interlocked with gas detection; and
 - d. Disable all light switches and electrical outlets within the extraction room.
 4. Failure of the gas detection system shall:
 - a. Deactivate the heating system;
 - b. Activate mechanical ventilation system, where interlocked with gas detection; and
 - c. Initiate a trouble signal to sound in an approved location.
- G. Emergency Shutoff.** Extraction processes using gaseous hydrocarbon-based solvents shall be provided with emergency shutoff systems. Provide approved manual or automatic emergency shutoff valves that can be activated at each point of use and at each source.
1. **Source.** A manual or automatic fail-safe emergency shutoff valve shall be installed on supply piping at the cylinder or bulk source. Manual or automatic cylinder valves are allowed to be used as the required emergency shutoff valve where the source of supply is limited to unmanifolded cylinder sources.
 2. **Point(s) of Use.** A manual or automatic emergency shutoff valve shall be installed on the supply piping at each point of use or at a point where the equipment using the gas is connected to the supply system.
- IV. OTHER PROCESSES**
- A. Ovens.** The use of an industrial oven must comply with CFC Chapter 30.
- B. Post-Process Purification and Winterization.** Post-process purification and winterization involving the heating or pressurizing of the miscella to other than normal pressure or temperature must be conducted in an appliance listed for such a use. Domestic or commercial cooking appliances shall not be used.
- C. Cultivation.** All processes for cultivation proposed must be fully described in detail on the plans, including the method of growth, fertilizers and the method(s) of fumigation. In addition, list all drying, cutting and/or grinding processes.
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- D. Production of Food or Other Products.** All processes proposed for the production of food and/or beverage products must be fully described in the plans. This must include the types of materials, temperatures of both the mixture and the cannabis extraction, all equipment used and the packaging.
- E. Technical Assistance for Non-Listed Equipment or New Technologies / Processes not Associated with Processing or Extracting.** To determine the acceptability of technologies, processes, products, facilities, materials and uses attending the design, operation or use of a building or premises, the owner or owner's authorized agent shall provide, without charge to the jurisdiction, a technical opinion and report. The opinion and report shall be prepared by a qualified engineer, specialist, laboratory or fire safety specialty organization acceptable to the City of San Diego 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. The City of San Diego is authorized to require the technical report to be prepared by, and bear the stamp of, a registered design professional.

V. INSPECTIONS

- A. Development Services Inspections.** Depending upon the scope of work for the CPF, Structural, Mechanical, Electrical, Plumbing, Fire Alarm and Sprinkler inspections may be required. See Information Bulletin 120, Project Inspections for further information.
- B. SDFD Inspections.** Projects requiring Hazardous Materials and Plant Extraction permits will require inspections by the SDFD.

Documents referenced in this Technical Bulletin

- California Fire Code ([CFC](#))
- California Building Code ([CBC](#))
- California Mechanical Code ([CMC](#))
- [Form DS-165](#), Hazardous Materials Reporting Form
- [Information Bulletin 116](#), Submittal Requirements for Hazardous Materials
- [Information Bulletin 120](#), Project Inspections
- [Information Bulletin 171](#), How to Apply for a Conditional Use Permit for Cannabis Production Facility
- [Project Submittal Manual, Section 2, Construction Permits—Structures](#)