

California Institute of Technology

Fire Prevention Plan



Caltech Environment, Health, and Safety Office
1200 E. California Blvd., M/C 25-6
Pasadena, CA 91125
Phone: 626.395.6727
Fax: 626.577.6028
Email: safety@caltech.edu
Website: www.safety.caltech.edu

Contents

Scope3

Responsibilities.....3

Storage and Handling of Potential Fire Hazards.....3

Potential Ignition Sources.....5

Housekeeping Practices6

Fire Protection Systems.....6

Fire Protection Maintenance and Inspection Frequencies.....6

Training6

Program Review.....6

Scope

The purpose of the fire prevention plan is to ensure fire prevention is a functional process for eliminating hazards from the workplace in compliance with [California Code of Regulations \(CCR\), Title 8, § 3221](#). It provides faculty, staff, and students with information and guidelines which will assist them in recognizing, reporting, and controlling fire hazards.

This plan applies to all employees of the Institute. Outside contractors will be expected to comply with sound fire prevention techniques and methods during their contracted jobs.

Responsibilities

The Senior Director of Design and Construction is responsible for the identification and installation of fire detection and fire suppression systems for new construction and existing facilities renovation projects. Additional responsibilities include assisting with registration/permitting with the Pasadena Fire Department for applicable Public Event gatherings, as well as monitoring these events for compliance with applicable fire code regulations.

The Senior Director of Facilities Operations is responsible for the maintenance of fire suppression systems installed to prevent or control ignitions of fires.

The Director of Environment, Health, and Safety is responsible for the inspection and maintenance of fire extinguishers.

The Director of Buildings and Grounds is responsible for the control of accumulation of combustible waste materials in buildings.

The Division Chairs and Department Heads are responsible for controlling the accumulation of flammable and combustible materials and wastes in their respective laboratories.

Storage and Handling of Potential Fire Hazards

A. Electrical Fire Hazards

To prevent electrical fires, employees shall:

1. Make sure worn wires, plugs, or cords are replaced;
2. Use only appropriately rated fuses;
3. Never use extension cords as substitutes for permanent wiring;
4. Use only approved power strips or surge protectors [i.e., those with the Underwriters Laboratory (UL) or FM Global (FM) label];
5. Don't overload power strips or surge protectors with high drawing current electrical devices;
6. Never "gang" or "daisy chain" multiple power strips or surge protectors;
7. Never break off a third prong (Ground Pin) on a plug to plug it into a two-pronged outlet;
8. Always disconnect an electrical plug by pulling the plug not the cord;
9. Check wiring in hazardous locations where the risk of fire is especially high; and

10. Check electrical equipment to ensure that it is either properly grounded or double insulated.

B. Portable Heaters

Portable electrical heaters shall have tip-over protection that automatically shuts off the unit when it is tipped over. Adequate clearance between the heater and combustible furnishings or other materials shall be maintained at all times. Don't overload power strips or surge protectors with multiple portable heaters.

C. Office Fire Hazards

1. Avoid overloading circuits with office equipment;
2. Turn off nonessential electrical equipment at the end of each work day;
3. Keep storage areas clear of rubbish; and
4. Ensure that power strips or surge protectors are not placed under carpets or rugs.

D. Cutting, Welding, and Open Flame Work

1. All necessary hot work permits have been obtained prior to work beginning;
2. Cutting and welding are done in designated areas whenever possible by authorized personnel;
3. Adequate ventilation is provided;
4. Torches, regulators, pressure-reducing valves, and manifolds are United Laboratories (UL) or FM Global (FM) approved;
5. Oxygen-fuel gas systems are equipped with listed and/or approved backflow valves and pressure relief devices;
6. Cutting or welding is prohibited in sprinkled areas while sprinkler protection is out of service;
7. Cutting or welding is prohibited in areas where explosive atmospheres of gases, vapors or dusts could develop in confined spaces;
8. Confined spaces such as tanks shall be tested to ensure that the atmosphere is not over ten percent of the lower flammable limit before cutting or welding on or near the tank; and
9. Fire watches must be established.

E. Flammable and Combustible Material

1. Class A Combustibles

These include common combustible material (wood, paper, cloth, rubber, and plastics) that can act as fuel.

To handle Class A combustibles safely:

- a. Keep trash in receptacles;
- b. Dispose of waste in a timely manner;
- c. Keep work areas clean;
- d. Keep combustibles away from potential ignition sources;

- e. Store oily rags in metal bins with lids; and
- f. Do not store excessive amounts of combustibles.

2. Class B Flammables or Combustibles

These include flammable and combustible liquids (oils, greases, and lacquers), flammable gases, and flammable aerosols.

To handle Class B combustibles safely:

- a. Use only approved pumps to dispense liquids from tanks, barrels, drums, or similar containers;
- b. Do not dispense flammable liquids into containers unless the nozzle and container are electrically interconnected by contact or by a bonding wire and either the container or nozzle must be grounded;
- c. Store, handle, and use Class B combustibles only in approved locations where vapors are prevented from reaching ignition sources, such as heating or electric equipment, open flames, or mechanical or electric sparks;
- d. Five gallons or more of a Class B combustible must be stored in a flammable liquid storage cabinet equipped with a self-closing mechanism;
- e. Store materials such as oxidizers and organic peroxides in an area separate from flammable liquids and gases;
- f. Do not use, handle, or store Class B combustibles near exits or stairwells;
- g. Do not weld, cut, grind, or use unsafe electrical equipment near Class B combustibles; and
- h. Do not generate heat or allow an open flame near Class B combustibles.

Potential Ignition Sources

Ignition Source	Control Procedures
Brazing and Welding	Control procedures are outlined in Caltech's Hot Work Permit Program .
Electrical	Control procedures are outlined in Caltech's Electrical Safety Program for Campus Facilities
Natural Gas	<ul style="list-style-type: none"> • Building natural gas meters have seismic shutoff devices installed on them and Maintenance staff has been instructed on shut off locations for natural gas meters. • The Central Utility Plant has manual shut-off valves for natural gas feeds to the Co-Gen and the Boilers.
Smoking	Adopted and posted signage for Pasadena Municipal Code (PMC) 8.78.070 and 8.78.072

Housekeeping Practices

The following practices are used to control accumulations of flammable and combustible materials and wastes at the Institute:

Type of Fire Hazard	Fire Prevention Practices
Flammable and combustible liquids	Fire Prevention Practices are outlined in the Chemical Hygiene Plan . Inspections are conducted under the Injury and Illness Prevention Program .
Flammable gases	Fire Prevention Practices are outlined in the Chemical Hygiene Plan . Inspections are conducted under the Injury and Illness Prevention Program .
Paper	Office trash cans are emptied twice a week.
Plastic	Recycling Cans are emptied on a weekly basis

Fire Protection Systems

Fire Protection Maintenance and Inspection Frequencies

The Senior Director of Operations and Maintenance is responsible for the annual, semi-annual, and five year testing of the Institute's fire suppression and detection systems.

These systems include:

1. Fire sprinkler systems (wet, dry, pre-action, and deluge);
2. Gaseous agents; and
3. Wet and dry chemical agents.

The Director of Environment, Health, and Safety is responsible for the monthly fire extinguisher inspections and the annual servicing of fire extinguishers.

Training

Supervisors will train employees about fire hazards associated with the specific materials and processes in fire prevention, and will maintain documentation of the training. Employee training will include the following:

1. The elements of this Fire Prevention Plan;
2. Proper response and notification in the event of a fire;
3. Evacuation procedures; and
4. Good housekeeping practices.

Program Review

This program shall be reviewed annually or as necessary.