

# FIRE PREVENTION PLAN (FPP)

University of California Riverside (UCR) Main Campus Fire Prevention Plan covers those designated actions UCR personnel must take to minimize the likelihood of unwanted fires in the workplace as required by the California Code of Regulations (CCR) Title 8, Section 3221.

*University of  
California Riverside*

# Overview

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## Introduction

The following elements are included in this plan

- Potential fire hazards and their proper handling and storage procedures, potential ignition sources (such as welding, smoking and others) and their control procedures, and the type of fire protection equipment or systems which can control a fire involving them;
- Names or regular job titles of those responsible for maintenance of equipment and systems installed to prevent or control ignitions or fires; and
- Names or regular job titles of those responsible for the control of accumulation of flammable or combustible waste materials.

## Summary

The Campus Fire Marshal creates and maintains this Fire Prevention Plan which is a campus-level plan intended to guide campus personnel on actions to prevent and respond safely to fires. Nothing in this plan shall be construed in a manner that limits the use of good judgment and common sense in matters not foreseen or covered by the elements of the plan or any appendices. This plan sets forth the operational fundamentals that will be used to minimize the risk of unwanted fires at UCR.

## Authority

The University Fire Prevention Plan is created and distributed in accordance with UCR Campus Policy 425-24.

## Purpose

The purpose of this plan is to establish the procedures for campus personnel to protect life and minimize the risk of injury and property damage from fire.

## Approvals

The University of California Riverside Fire Prevention Plan has been reviewed and approved by:

**Scott Corrin**

*Campus Fire Marshal*

**Russell Vernon, Ph.D.**

*Director of Environmental Health & Safety*

**Nida Niravanh**

*Director of Risk Management*

*Implementation Date: July 20, 2012*

*Date of last Revision: July 20, 2012*

*This Fire Prevention Plan will be reviewed at least annually in December.*

# Potential Fire Hazards

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## Wood Products

Although most of the buildings contain large amounts of concrete and steel, many buildings contain finish materials that are wood or wood products. Doors, flooring, paneling, trim and moldings, and similar building materials are predominantly wood. Furniture, bookcases, cabinets, shelves, and similar fixtures may also contain significant amounts of wood. Paper, is probably the most common wood product found on campus, in the form of books, packaging materials, newspapers, notes and correspondence, stored in files or often stacked in piles.

## Factors affecting degree of hazard

### a. Physical Form

The physical form of wood or wood products directly relates to the severity of the fire hazard of the material. Thus, the more surface area involved, the greater the fire hazard. For example, a single sheet of paper would be more susceptible to fire spread than a closed book. Similarly, sawdust or wood shavings would be more susceptible to fire spread than a solid block of wood.

### b. Moisture content

The amount of moisture in the material has an effect on the potential fire hazard of the material. Moisture absorbs heat and increases the duration of heat exposure necessary to have the material burn readily. Therefore, the drier the material the more readily it will ignite.

### c. Rate and Period of Heating

The rate and duration of heating influence the susceptibility of wood and wood products to ignition. Remember that when a material burns it has been heated to a temperature at which combustible vapors are released and that the vapors are burning, not the material itself. For example, a steam pipe in contact with wood may ignite the wood after a long period of time, but a torch applied to wood for a short period of time may only scorch but not burn the wood despite the higher temperature of the torch flame. The time necessary to heat a material to its ignition temperature is based upon the temperature of the ignition source.

## Textiles / Fibers

### Clothing

Many types of clothing are easily ignited. Fire hazards are increased if clothing has absorbed flammable vapors or has had flammable liquids spilled on them. Loose or dangling clothing (such as neckties) should not be worn around open flames or other ignition sources. Many synthetic fibers are additionally hazardous in that they may melt and adhere to the skin under fire conditions.

## Curtains, draperies, wall coverings and decorative materials

The use of curtains, drapes and other decorative materials are regulated closely in California. Use of such decorations should not be excessive or be comprised of materials considered extremely flammable by their size, type or arrangement.

## Upholstered furniture and mattresses

The materials used in furniture upholstery can contain many combinations of fibers noted above. Various standards have evolved to reduce the potential fire hazards in public buildings. Minimum flammability standards should be considered in the purchase of any upholstered furniture. The predominant hazard from this use is the toxic gases and smoke produced from smoldering fires.

## Carpeting

Standards for flammability of carpeting materials used on floors and walls of buildings, are designed to reduce the generation of smoke, heat, flames and toxic gases. New construction and remodeling of existing facilities normally specify materials that are correct for the particular application.

## Tents and tarpaulins

The nature of textiles used in tent- type structures creates fire hazards similar to those of drapes or wall coverings. This type of fire can quickly envelope the occupants, resulting in a high risk of loss of life.

## Flammable & Combustible Liquids

Flammable liquids and combustible liquids are classified using a system that considers flash point, vapor pressure, boiling point, and anticipated ambient temperature conditions. The major groups are: Class I flammable liquids, flash point <100 ° F; Class II combustible liquids, flash point greater than or equal to 100 ° F and <140 ° F; and Class III combustible liquids, flash point greater than or equal to 140 ° F and less than or equal to 200 ° F.

## Physical Properties

Many flammable and combustible liquids will float on water. This is important to remember since fighting a flammable or combustible liquid fire with water may spread the fire unless the material is water soluble. Also, because the vapors from flammable liquids are heavier than air, they will concentrate quickly at the floor. Ignition sources should therefore be eliminated in the proximity and in the areas below where flammable and combustibles are to be used before work is begun.

## Quantity Limits

All facilities on campus that may involve the use of flammable or combustible liquids are allowed to store only a specified amount of a given material based upon the size, location and type of building use involved. The purpose of these limitations is to reduce the development of excess quantities that if involved in a fire or explosion could contribute to the loss of life and property. EH&S will periodically inspect all facilities on campus to assure that quantities do not exceed safe amounts.

## Storage

All flammable and combustible liquids must be stored in proper containers. As the container size increases, the type of container material and other safeguards increase in safety. There are specific limits to the amounts allowed to be stored within a given building or location. Contact EH&S for an evaluation prior to increasing the quantity of flammable and combustible liquids normally used.

## Dispensing

Use or transfer of flammable or combustible liquids is the time when the liberation of vapors is the greatest, increasing the risk of fire. No dispensing should occur unless it has been determined that all sources of ignition are eliminated and adequate ventilation is present. Gravity dispensing of flammable liquids is not allowed.

## Flammable Aerosol Sprays

Most aerosol sprays (WD-40, spray paint, etc.) now contain flammable propellants. These sprays should be used only in well ventilated areas and stored where they will not be exposed to temperatures greater than 120 ° F. Before using, the area should be checked to assure that there are no ignition sources present.

## Flammable & Combustible Gases

Besides flammability, additional fire hazards are present for compressed and liquefied gases. In the heat of a fire, the container pressure may increase and rupture a container.

## Use

All hoses, connections, manifolds, regulators, etc. should be checked initially and at regular intervals to assure that no leaks are present. Only equipment designed for use with the particular gas and for the particular application should be used.

## Storage

Where possible, cylinders of flammable gasses should be secured at TWO points; at 1/3 and 2/3 the cylinder height. This will keep cylinders secure during most seismic activity. Cylinders should be stored in the upright position with the valve protection caps in place when not in use.

## Reactive Chemicals

### Water Reactive Materials

Water reactive materials are materials which explode, violently react, produce flammable or toxic gases, or evolve enough heat to cause self-ignition or ignition of nearby flammables or combustibles upon exposure to water or moisture. Water reactive materials include sodium metal, calcium carbide and concentrated sulfuric or oleic acid. These materials must be stored separately from flammables, and where possible, in unbreakable containers. When stored in breakable containers the materials should have secondary containment in water-tight, unbreakable containers.

### Oxidizers

Although oxidizers don't usually burn themselves, they promote burning of other flammable and combustible materials. Oxidizers may promote burning sufficient as to cause explosions or fires without the introduction of ignition sources. Oxidizers include ammonium nitrate fertilizers, oxygen, nitric acid, chromic acid and perchloric acid. These materials should be stored in proper containers, avoiding locations under sinks, hoods or cabinets where plumbing, conduit or piping may become corroded. These materials must be stored separately from flammable materials.

### Pyrophorics

Pyrophoric materials spontaneously ignite in air below 130 ° F. These materials must be properly stored to prevent contact with air. Pyrophorics should also be stored in locations away from traffic areas or other places where they may be knocked over or be subject to container breakage. Secondary containment is recommended.

## Housekeeping

### Physical Plant

Building Services is responsible for scheduled removal of ordinary trash and recyclable material from designated receptacles.

### Environmental Health & Safety

Hazardous wastes are picked up upon request by Environmental Health & Safety in accordance with federal, state and local waste regulations.

### Housekeeping

Work areas should be kept free of clutter and cleaned up at the end of each operation and at the end of each day. Fire extinguishers and other emergency equipment should be unobstructed at all times. Departments/Units/Building Occupants are responsible for submitting a Request for Chemical Pick-up to EH&S for removal of hazardous wastes and are responsible for making arrangements to remove ordinary trash and recyclables generated by special occurrences and events when normal waste procedures are insufficient to control the accumulation of flammable and combustible materials.

## Ignition Sources and Control Measures

### Electrical

Electrical fires are the leading cause of industrial fires. Most electrical fires start in wiring and motors.

#### Control measures

- Insure that the electrical load does not exceed the circuit capacity.
- Do not use extension cords as permanent wiring.
- Insure proper maintenance of cords, plugs, outlets and switches.
- Give special attention to equipment in hazardous locations and in storage areas.

### Smoking

Smoking is a potential cause of fire almost everywhere.

#### Control measures

- Smoking is strictly prohibited in University buildings and vehicles.
- Smoking is prohibited outdoors in dangerous areas such as those involving flammable liquids, battery charging areas, or fuel pumps.

### Hot Surfaces

Examples of hot surfaces include heat from boilers, furnaces, hot ducts and pipes, electric lamps, hot plates, and space heaters, all of which have the potential to ignite flammable and combustible material.

#### Control measures

- Design and maintain ample clearances.
- Insulate hot surfaces.
- Allow air circulation between hot surfaces and combustibles.

### Burner Flames

Burner flames could provide an ignition source for flammable and combustible materials. Examples include portable torches, water heaters, dryers, ovens, furnaces, portable heating units and Bunsen burner flames.

#### Control measures

- Use tools and equipment with burner flames only for tasks which the tools or equipment is designed and operate in accordance with manufacturer's instructions.
- Insure regular maintenance and adequate ventilation.
- Keep open flames away from flammable and combustible material.

### Friction

Friction may produce large amounts of heat from hot bearings, misaligned or broken machine parts, choking or jamming of material, and poor adjustment of power drives and conveyors.

#### Control measures

- Insure regularly scheduled inspections, maintenance and lubrication.
- Insure prompt correction of problems noted during inspections or use.

### Static Sparks

Static sparks may ignite flammable vapors, dusts and fibers by a discharge of accumulated static electricity on equipment, materials, or on the human body.

#### Control measures

- Insure proper grounding and bonding.
- For extreme static hazards, ionization or humidification may be used.

### Overheated Materials

Abnormal process temperatures, especially resulting heating flammable liquids or combustible materials in ovens, autoclaves, heated baths and reaction vessels, have the potential to cause fires.

#### Control measures

- Carefully supervise and insure operators understand safe procedures.
- Temperature controls should be checked regularly and well maintained.
- In accordance with the Chemical Hygiene Plan, special safeguards should be developed for unattended heating operations, particularly overshoot cutoff devices.

### Spontaneous Ignition

Oily waste and rubbish, deposits in dryers, ducts and flues, and some wastes may ignite spontaneously.

#### Control measures

- Insure good housekeeping and proper process operation.
- Remove waste daily, frequently clean ducts, flues and isolated storages subject to spontaneous heating.

### Metal Grinding, Cutting and Welding

Potential fire hazards arise when sparks, arcs and hot metal from metal grinding, cutting and welding operations occur.

## Control measures

- Using guards and exhaust systems on grinding and cutting equipment.
- Use a permit system for welding operations.
- Insure that the area is clear of combustibles before beginning work.

## Molten Substances

Fires may be caused by molten metal escaping from ruptured furnaces or spilled during handling; and by glass and tempering salts.

### Control measures

- Use equipment only for tasks for which the equipment is designed and operate in accordance with manufacturer's instructions.
- Insure regular maintenance.

## Chemical Reaction

Fires may be caused when chemical processes get out of control, chemicals react with other materials, or unstable chemicals decompose.

### Control measures

- Carefully supervise and insure personnel understand safe procedures.
- Insure that instrumentation and controls for the chemicals involved are used.
- Properly store and insure adequate separation of incompatible materials.
- In accordance with the Chemical Hygiene Plan, never change the proportions or scale of an experiment without proper authorization.

## Fire Protection Systems and Equipment

### Fire alarms and detection

All major buildings on the campus are provided with a fire alarm system designed to alert the building occupants of emergency conditions which include manual fire alarm pull stations located at all major exits. Selected areas on campus have automatic detection systems (i.e., heat detectors or smoke detectors) which are intended to provide early warning of smoke or fire conditions. Upon sensing smoke or heat conditions or the activation of a manual pull station by building occupants, the alarm systems will sound bells, horns or horn/strobe devices. Upon hearing or seeing any of these devices all building occupants should evacuate the building from the nearest exit and report to their designated assembly area. At the assembly area, details of the incident and the "all-clear" notice will be provided to evacuees by the Building Supervisor of Emergency Conditions (BSEC) or other emergency responders. In many buildings the alarm systems may only sound for 5 to 10 minutes and then stop. This does not mean you should remain in the building, nor does it mean the problem is resolved. Permission to return to the building should be provided by the BSEC or other emergency responders such as police or fire personnel.

## Automatic sprinkler systems

Recently constructed buildings and portions of older buildings are provided with automatic fire sprinkler systems, in addition to alarm systems. A fire sprinkler system is designed to automatically apply water to a fire within a building. The sprinkler heads respond to heat in immediate proximity of the ceiling above a fire. Only the sprinkler heads over the fire will open and spray water to extinguish or reduce the spread of the fire. Historically, fire sprinkler systems are over 95% effective in controlling or extinguishing small fires with less than four sprinkler heads operating. In those cases where sprinklers were considered not effective, the major cause was closed valves on water supplies. An additional cause for fire sprinkler systems not controlling small fires is that the use of the room or space has changed, resulting in an increase in the relative fire hazards within the space.

## Fire Hose Stations

Many of the older buildings on Campus are also provided with fire hose stations for occupant use. They are generally located near the exit stairways on each floor of buildings where they are provided. They are connected to the buildings water supply and typically consist of a cabinet housing a valve and rack with 100 feet of lined 1-1/2" fire hose. The nozzle on the end of hose length is an adjustable type for use by persons trained in the proper use of the system. It is important to not block these cabinets with equipment, storage or other obstructions.

In addition, some buildings also have piping systems used to replace extensive hose lays by the fire department. The fire department connects their large hose streams to these piping systems built into the buildings to expedite suppression of a fire, and thereby avoiding the need to drag large hose lines throughout a building. These connections are typically located within stair shafts or other protected locations and must be kept free of obstructions.

## Fire Extinguishers

The most prevalent and common fire protection devices found throughout the campus are portable fire extinguishers. All faculty and staff are annually provided the opportunity to receive hands-on training and experience in using portable fire extinguishers. Only those individuals who have had this training within the last year should attempt to use a portable extinguisher to put out a fire. All buildings are provided with sufficient portable fire extinguishers so that the travel distance from any room or space to the nearest extinguisher does not exceed 75 feet. One should be aware of the location of the nearest two fire extinguishers within their work space. Extinguishers should be visually checked monthly to assure that it has not been tampered with and is readily available for use.

# Maintenance of Fire Protection Systems and Equipment

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All fire and life safety systems and appurtenances are installed and maintained in accordance with codes and standards adopted by the State of California. This includes periodic scheduled inspections by personnel from EH&S and Physical Plant. If any described fire protection system or device is missing, damaged, appears inoperative or used in an emergency, contact EH&S to report the condition. EH&S will follow-up to assure that any required maintenance or repairs will be completed as soon as possible.

## Responsibilities

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The following are job titles of persons and names of departments who can be contacted for further information or explanation of duties under the plan.

Department	Job Title(s)	Responsibility
<b>Environmental Health &amp; Safety</b> <a href="http://ehs.ucr.edu">http://ehs.ucr.edu</a> Phone: (951) 827-5528 Fax: (951) 827-5122	Campus Fire Marshal Fire Inspector Director  Hazardous Waste Technician	<ul style="list-style-type: none"> <li>• Inspections and testing of equipment and systems</li> <li>• Provide further information or explanation of duties under this plan</li> <li>• Control of Accumulation of flammable or combustible waste materials</li> </ul>
<b>Physical Plant</b> <a href="http://pplant.ucr.edu">http://pplant.ucr.edu</a> Phone: (951) 827-4214 Fax: (951) 827-3651	Maintenance Electrician – Fire Alarm Spec. Maintenance Electrician – Fire Alarm Maintenance (B) – Fire Sprinkler Supervisor, Fire & Security Alarm	<ul style="list-style-type: none"> <li>• Maintenance of equipment and systems</li> </ul>