PART 2

General Safety Provisions

Chapters 3 and 4

- **Chapter 3** General Requirements
- **Chapter 4** Emergency Planning and Preparedness

A basic concept of the *California Fire Code* (CFC) is to prevent the ignition of materials inside and outside buildings. Controlling fuels and ignition sources limits the potential for fire. Chapter 3 contains requirements for combustible waste materials, control or elimination of ignition sources, open flames, recreational fires and the use of smoking materials. Certain equipment can also be a source of ignition, and Chapter 3 addresses the proper operation of asphalt kettles, powered industrial trucks, mobile food preparation vehicles and 3D printing. In occupancies such as assembly uses or covered malls, controls are specified for certain hazardous materials or displays of vehicles. Chapter 3 also contains requirements for the protection from vehicle impact to prevent the release of compressed gas, flammable liquid or hazardous materials.

Chapter 4 requires that evacuation plans be prepared, that a hazardous materials communication program be established and that employees be trained to identify fire hazards and safely evacuate building occupants. ■

319

~~Mobile Food Preparation Vehicles~~ Reserved

320, 202

Additive Manufacturing (3D Printing)

321, 321.1

Exterior Artificial Combustible Vegetation

322

Storage of Lithium-Ion and Lithium Metal Batteries

405.1, 405.2 (New), Table 405.3, 405.5

Emergency Drills

319

~~Mobile Food Preparation Vehicles~~ Reserved

CHANGE TYPE: Modification

CHANGE SUMMARY: Sections 319.1 through 319.10.3 regarding mobile food preparation vehicles are not adopted in California and are not printed in the *California Fire Code* (CFC).

2022 CODE TEXT: **319 ~~Mobile food preparation vehicles~~ *Reserved***

105 Permits

~~**105.5.32 Mobile food preparation vehicles.** A permit is required for mobile food preparation vehicles equipped with appliances that produce smoke or grease-laden vapors.~~

202 Definitions

~~**Mobile food preparation vehicles.** Vehicles that contain cooking equipment that produce smoke or grease-laden vapors for the purpose of preparing and serving food to the public. Vehicles intended for private recreation shall not be considered mobile food preparation vehicles.~~

CHANGE SIGNIFICANCE: The deletion of "mobile food preparation vehicles" from the CFC has been made in coordination with the California Department of Housing and Community Development (HCD) based on concerns about conflicting requirements between California Code of Regulations (CCR), Title 25 special purpose commercial modular (SPCM) regulations. Additionally, CFC Sections 105.5.32, 202 and 319 and other reference requirements for "mobile food preparation vehicles" have been deleted.

Health and Safety Code Section 18025 and CCR, Title 25, Section 4525(b) direct HCD as the construction (and fire safety) authority for the kitchen of an SPCM. Prescriptive construction requirements can be found in CCR, T25, Sections 4526–4534.

Health and Safety Code Division 104, Part 7, Chapter 10 and CCR, Title 25, Section 4525(e) provide statutory direction for (operational) permitting through the California Retail Food Code administered by the health department, the local authority for the retailing and preparation of food for a Mobile Food Facility (SPCM MFF).

The following were HCD concerns and recommendations:

1. Delete "mobile food preparation vehicles" language from fire (operational) permitting requirements of CFC 105.6.30, that suggests compliance with the provisions for these mobile food preparation vehicles, potentially in conflict with regulatory requirements for SPCM MFF.
2. Delete "MOBILE FOOD PREPARATION VEHICLES" from Definitions CFC Section 202. MFFs defined by HSC include more than those vehicles "generating smoke or grease-laden vapors." A statutory definition is provided here and in the regulations.
3. Delete "mobile food preparation vehicles" language from Chapter 3 User note, that suggests compliance with the provisions for these mobile food preparation vehicles, potentially in conflict with regulatory requirements for SPCM MFF.

Typical mobile food vendor on city street.

4. Delete CFC Section 319 requirements throughout. Exiting, electrical, mechanical, fuel gas, plumbing, and other constructed and HCD-permitted requirements are taken from referenced regulations above and CCR, Title 24 Parts 2, 3, 4 & 5.

HCD agrees that there would be an expectation for fire marshals to have jurisdiction over safety inspections (especially for fire protection equipment and systems inspections, testing and maintenance) for participating SPCM MFF during special events requiring CFC Section 105.6 operational permits (such as Carnivals and Fairs, Exhibits and Trade Shows, or local codified "Special Events" …).

320, 202

Additive Manufacturing (3D Printing)

CHANGE TYPE: Addition

CHANGE SUMMARY: Requirements for 3D printing operations are added to the code.

2022 CODE TEXT: **NOTE:** Due to the extent of the code text, an outline of Section 320 is shown below. For the full text, see the 2022 CFC.

320 Additive manufacturing (3D printing)

320.1 General.

320.1.1 Scope.

320.1.2 Installation, operation and maintenance.

320.1.3 Production materials.

320.2 Nonindustrial additive manufacturing.

320.2.1 Listing.

320.2.2 Occupancies.

320.3 Industrial additive manufacturing.

320.3.1 Permits required.

Photo courtesy of Getty Images

This 3D printer is producing a steel part utilizing the additive manufacturing process.

320.3.2 Listing.

320.3.3 Combustible dusts and metals.

320.3.4 Powder evaluation.

320.3.5 Combustible (nonmetallic) dusts.

320.3.6 Combustible metals.

320.3.7 Ancillary equipment.

320.3.8 Hazardous materials.

320.3.9 Inert gas.

320.3.10 Technical assistance.

320.3.11 Performance-based design alternative.

320.3.12 Occupancies.

202 Definitions

3D printer. A machine used in the additive manufacturing process for fabricating objects through the deposition of a material using a print head, nozzle or other printer technology.

Additive manufacturing. A process of joining materials to make objects from 3D model data, usually layer upon layer, sometimes referred to as 3D printing. This code recognizes two types of additive manufacturing:

> **Industrial additive manufacturing.** 3D printing operations that typically utilize combustible powders or metals, an inert gas supply, a combustible dust collection system, or that create a hazardous (classified) location area or zone outside of the equipment.
>
> **Nonindustrial additive manufacturing.** 3D printing operations that do *not* create a hazardous (classified) location area outside of the equipment and do not utilize an inert gas supply or a combustible dust collection system.

CHANGE SIGNIFICANCE: The use of additive manufacturing, also referred to as 3D printing, is becoming more prevalent in industrial, business and personal (nonindustrial) applications. Definitions are added to the code to differentiate between industrial and nonindustrial equipment. This differentiation is critical because the requirements differ between the applications.

Generally, for business and personal (nonindustrial) additive manufacturing processes, relatively inexpensive 3D printers are available for use in residences, classrooms, offices and businesses for producing customized products and prototypes. Four criteria, found in the definition and Section 320.2.1, are critical for these systems:

1. They do not create a hazardous (classified) location with regard to electrical equipment design or ignition source restrictions.
2. They do not utilize inert gases for operation of the printer.
3. They do not utilize a dust collection system.
4. The prepackaged production materials do not exceed a capacity of 30 liters.

These criteria are typically covered by the equipment listing. If the 3D printing equipment does not qualify as a nonindustrial additive manufacturing process, then it must comply with industrial additive manufacturing process requirements.

Section 320.2 establishes basic safety requirements for this nonindustrial additive manufacturing equipment. The 3D printing process occurs in equipment that is entirely self-contained and includes pre-packaged production materials with a maximum size of 30 liters. The equipment listing required in Section 320.2.1 is relied upon to verify that the equipment operates safely and does not create a hazardous (classified) area outside of the unit. Three new UL standards have been added as applicable to nonindustrial additive manufacturing equipment. Because the equipment is listed as a stand-alone piece of equipment similar to an ink jet or laser printer, these 3D printers are allowed in any occupancy.

All 3D printing equipment not covered by Section 320.2 is considered industrial additive manufacturing equipment and is regulated in Section 320.3. These 3D printing processes are typically larger operations using external powder feed supplies and dust collection systems with or without an inert gas supply. In short, the industrial additive manufacturing process presents a greater safety hazard. These hazards include potential explosions due to the use of combustible nonmetallic and metallic powders during both use and storage. There are also a number of hazards related to worker safety that are not specifically covered by the code. These include ingestion hazards of nano-size particulates by equipment operators, asphyxiation hazards with argon and other gases used to inert the environment within the equipment and static electricity control considerations.

Some of the requirements for industrial operations are as follows:

- Industrial additive manufacturing process is required to obtain an operational permit. A permit is not required for the nonindustrial additive manufacturing equipment.
- Industrial 3D printers must be listed to UL 2011, but non-listed equipment can be approved based on a field evaluation.
- Section 320.3.10 authorizes the code official to obtain technical assistance and require a report from an approved source evaluating the industrial additive manufacturing operation.

- Several NFPA standards are referenced to address the hazards associated with powders utilized in the 3D printing process.
- Use of inert gases must comply with CFC Chapter 53.
- Industrial 3D printing is only allowed in manufacturing facilities.
- If the quantities of hazardous materials exceed the maximum allowable quantity per control area, the room or building will become a Group H occupancy.

321, 321.1

Exterior Artificial Combustible Vegetation

CHANGE TYPE: Addition

CHANGE SUMMARY: Artificial combustible vegetation is regulated when it is located on a roof or within close proximity to a building.

2022 CODE TEXT:

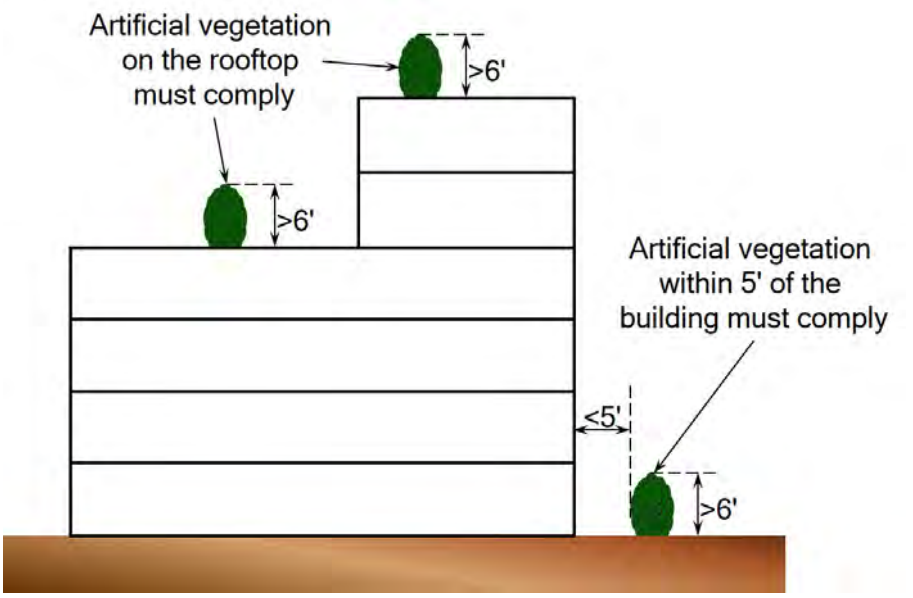
321 Artificial combustible vegetation

321.1 Artificial combustible vegetation on roofs and near buildings. Artificial combustible vegetation exceeding 6 feet (1829 mm) in height and permanently installed outdoors within 5 feet (1524 mm) of a building or on the roof of a building shall comply with Section 807.4.1. The placement of artificial combustible vegetation shall also comply with Sections 806.3 and 807.4.2.

Exception: Artificial decorative vegetation located more than 30 feet (9144 mm) from the exterior wall of a building.

CHANGE SIGNIFICANCE: The new trend to occupy rooftops areas has resulted in an increased use of decorative artificial vegetation on roofs. Artificial combustible vegetation is placed on occupied roofs, adjacent to building entrances and in courtyards or break areas. When placed in close proximity to a building they can spread fire to a building if ignited. Outdoor use poses weathering problems due to moisture, UV exposure or cleaning chemicals necessary to freshen up the vegetation.

Decorative artificial vegetation is largely composed of plastic materials. When the decorative vegetation ignites, the fire spreads rapidly and produces large volumes of thick, black smoke.



Regulations for artificial combustible vegetation on roofs and near buildings.