

SANTA ROSA FIRE DEPARTMENT FIRE PREVENTION BUREAU STANDARD



INDUSTRIAL OVEN INSTALLATION

PURPOSE

This standard pertains to the design and construction of Industrial Baking Ovens where flammable and combustible vapors may be burned in the drying process or found in the exhaust plume. This standard is a summary of Fire Department interpretations of City and State codes. Information herein applies to typical instances and may not address all individual circumstances.

CODE REFERENCES

2007 California Building Code (CBC)
2007 California Fire Code (CFC) Chapter 2
2007 California Mechanical Code Chapters 4 and 13
2007 NFPA 86

2101.1 Scope. This Standard shall apply to the installation and operation of industrial ovens and furnaces. Industrial Ovens and furnaces shall comply with the applicable provisions of NFPA 86, California Mechanical Code, and this Standard. The terms “ovens” and “furnaces” are used interchangeably in this chapter.

2101.2 Permits. Permits shall be required as set forth in the CFC Appendix Chapter 1, Sections 105.6 and 105.7 and in the current Santa Rosa Fire Department Permit Fee Schedule.

2101.1 Definitions. The following words and terms shall, for the purposes of this Standard have the meanings shown herein.

Furnace Class A. An oven or furnace that has heat utilization equipment operating at approximately atmospheric pressure wherein there is a potential explosion or fire hazard that could be occasioned by the presence of flammable volatiles or combustible materials processed or heated in the furnace.

Note: Such flammable volatiles or combustible materials can, for instance, originate from the following:

1. Paints, powders, inks, and adhesives from finishing processes, such as dipped, coated sprayed and impregnated materials.
2. The substrate material.
3. Wood, paper and plastic pallets, spacers or packaging materials.
4. Polymerization or other molecular rearrangements.
Potentially flammable materials, such as quench oil, water-borne finishes, cooling oil or cooking oils that present a hazard are ventilated according to Class A standards.

Furnace Class B. An oven or furnace that has heat utilization equipment operating at approximately atmospheric pressure wherein there are no flammable volatiles or combustible materials being heated.

Furnace Class C. An oven or furnace that has a potential hazard due to a flammable or other special atmosphere being used for treatment of material in process. This type of furnace can use any type of heating system and includes a special atmosphere supply system. Also included in the Class C classification are integral quench furnaces and molten salt bath furnaces.

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Furnace Class D. An oven or furnace that operates at temperatures from above ambient to over 5,000 degrees F and at pressures normally below atmosphere using any type of heating system. These furnaces can include the use of special processing atmospheres.

2103 LOCATION

2103.1 Ventilation. Enclosed rooms or basements containing industrial ovens or furnaces shall be provided with combustion air in accordance with the *California Mechanical Code*, and with ventilation air in accordance with section 510 of the *California Mechanical Code*.

2103.2 Exposure. Location of ovens, oven heaters and related equipment the possibility of a fire resulting from overheating or from the escape of fuel gas or fuel oil and the possibility of damage to the building and injury to persons resulting from explosion shall be considered.

2103.3 Ignition source. Industrial ovens and furnaces shall be located so as not to pose an ignition hazard to flammable vapors, mists or combustible dusts.

2103.4 Temperatures. Roofs and floors of ovens shall be insulated and ventilated to prevent temperatures at combustible ceilings and floors from exceeding 160 degrees F.

2104 FUEL PIPING

2104.1 Fuel-gas piping. Fuel-gas piping serving industrial ovens shall comply with the *California Mechanical Code*. Piping for other fuel sources shall comply with this section.

2104.2 Shutoff Valves. Each industrial oven or furnace shall be provided with an approved manual fuel shutoff valve in accordance with the *California Mechanical Code*.

2104.2.1 Fuel Supply Lines. Valves for fuel supply lines shall be located within 6 feet of the appliance served.

Exception: When approved and the valve is located in the same general area as the appliance served.

2104.3 Valve position. The design of manual fuel shutoff valves shall incorporate a permanent feature which visually indicates the open or closed position of the valve. Manual fuel shutoff valves shall not be equipped with removable handles or wrenches unless the handle or wrench can only be installed parallel with the fuel line when the valve is in the open position.

2105 INTERLOCKS

2105.1 Shut down. Interlocks shall be provided for Class A ovens so that conveyors or sources of flammable or combustible materials shall shut down if either the exhaust or recirculation air supply fails.

2106 FIRE PROTECTION

2106.1 Required protection. Class A and B ovens which contain, or are utilized for the processing of, combustible materials shall be protected by an approved automatic fire-extinguishing system complying with Chapter 9 of the California Fire Code.

2106.2 Fixed fire-extinguishing systems. Fixed fire-extinguishing systems shall be provided for Class C or D ovens to protect against such hazards as overheating, spillage of molten salts or metals, quench tanks, ignition of hydraulic oil and escape of fuel. It shall be the user's responsibility to consult with the fire code official concerning the necessary requirements for such protection.

2106.3 Fire extinguishers. Portable fire extinguishers complying with Section 906 of the California Fire Code shall be provided not closer than 15 feet or a maximum of 50 feet from the oven, furnace unit of other related equipment.

2107 OPERATION AND MAINTENANCE

2107.1 Furnace system information. An approved, clearly worded, and prominently displayed safety design data form or manufacturer's nameplate shall be provided stating the safe operating condition for which the furnace system was designed, built, altered or extended.

2107.2 Oven materials. Safety data for Class A solvent atmosphere ovens shall be furnished on the manufacturer's nameplate. The nameplate shall provide the following design data:

1. The solvent used.
2. The number of gallons used per batch or per hour of solvent entering the oven.
3. The required purge time.
4. The oven operating temperature.
5. The exhaust blower rating for the number of gallons of solvent per hour or batch at the maximum operating temperature.

Exception: For low-oxygen ovens, the maximum allowable oxygen concentration shall be included in place of the exhaust blower ratings.

2107.3 Training. Operating, maintenance and supervisory personnel shall be thoroughly instructed and trained in the operation of ovens or furnaces.

2107.4 Equipment maintenance. Equipment shall be maintained in accordance with the manufacturer's instructions.