



FIRE PREVENTION MANUAL

FIRE EXTINGUISHING SYSTEMS

405.011 KITCHEN FIRE SPRINKLER DESIGN & INSTALLATION (FMC 10-50903.6)

EFFECTIVE: JUNE 2008

SCOPE

This policy clarifies the Fresno Fire Department's (FFD or Department) requirements for the installation of a kitchen fire sprinkler as noted within the Fresno Municipal Code.

PURPOSE

The purpose of this policy is to establish a higher level of safety within dwelling units which have previously had a fire, where the damage in the kitchen area from the fire exceeded the threshold amounts noted in the Fresno Municipal Code.

BACKGROUND

Forty-six percent (46%) of residential fires originate in the kitchen. Fires where cooking equipment was involved resulted in injuries forty-four percent (44%) of the time and death nineteen percent (19%) of the time. Research funded by the US Fire Administration and performed by the National Institute of Testing Standards has shown that a single, low pressure fire sprinkler head can effectively control a residential kitchen stove top grease fire.

As noted in the *California Health and Safety Code (H&S)*, the fire code official has the authority to make modifications to building standards after a finding has been made, subject to specific conditions. Additionally, under the *California Fire Code (CFC)* the fire code official has the authority to formulate policies they deem necessary based upon local conditions related to fire sprinkler installations.

As mandated by City of Fresno amendments to the *CFC*, any dwelling unit kitchen that sustains fire damage requiring permitted construction and where the permit fee is more than \$1,000, the dwelling unit must be retrofitted with fire protection consisting of a single residential fire sprinkler head, UL listed residential wet chemical extinguishing system, or other approved pre-engineered fire suppression system.

There is no national standard for a single kitchen fire sprinkler installation; however, this design and installation policy is based on the installation standards found in

National Fire Protection Association (NFPA) 13D for water supply and fire sprinkler location.

REQUIREMENTS

Water supply point of connection:

As with a complete *NFPA 13D* residential sprinkler system, the kitchen sprinkler is supplied by the residential domestic water piping system. A series of at least two separate, connection points to the domestic water supply are required for the kitchen fire sprinkler for pipe sizes of $\frac{3}{4}$ inches or larger.

For domestic water supply piping $\frac{3}{4}$ inches or larger, a loop from the existing cold water line shall be made. This loop shall be connected as close as possible to the main kitchen fixture in order to keep friction loss in the supply line to the sprinkler at a minimum. The piping shall incorporate a standard tee fitting with the fire sprinkler supplied by the center nipple of the tee, and the supply piping shall enter the tee ends. No dead end runs are permitted.

For $\frac{1}{2}$ inch domestic water supply piping, a networked sprinkler supply (as described in *NFPA 13D*, section 3.3.11.4) is required. This supply shall consist of at least three separate connection points to the domestic water supply. A loop as noted above for $\frac{3}{4}$ inches or larger piping shall be supplied, as well as a third point of connection from the next closest fixture supply. The piping shall include a 4-way side outlet tee fitting with the fire sprinkler supplied by the center nipple of the tee, and the supply piping shall enter the tee ends. No dead end runs are permitted.

Domestic water to fire sprinkler transition:

Any materials approved for multipurpose residential sprinkler piping systems may be used from the domestic water connection(s) to the fire sprinkler.

Fire sprinkler head:

Any residential fire sprinkler that is listed for low lead content (“LL”/AB1953/NSF 61 Annex “G”) is required.

Below are examples of three types of residential sprinklers that may be used; a semi-recessed type, a domed concealed type, and a flat concealed sprinkler.

Note: The fire sprinkler or cover plate cannot be painted (factory colors other than white are available).

RECESSED



DOMED CONCEALED



FLAT CONCEALED



The following residential sprinklers are currently listed to NSF 61 Annex "G" for ultra-low lead content:

- Reliable RFC 4LL SIN 3316 (semi-recessed and domed concealer) & RFC49LL SIN 3216 (flat concealer).
- Viking Freedom Residential Pendant (SIN VK 4660) and Concealer (SIN VK 4740) lead free.
- All Senju residential models meet NSF 61 Annex "G"

Fire sprinkler installation location:

The installation of the fire sprinkler head shall be as follows:

The sprinkler head shall be centered on the ceiling in front of the range (stovetop, cooktop, etc.) no less than 4 feet, but no more than 6 feet, away from the leading edge of the range.

Where impractical, the sprinkler head may be offset horizontally from the center of the ceiling 1 foot in either direction to clear obstructions.

In the case of unconventional ceiling designs, the sprinkler head may be installed as noted in *NFPA 13D Table 7.5.6.3*.

No obstructions (including surface mounted lighting and ceiling fans) shall be located between the sprinkler head and the range. For the purposes of sprinkler head positioning, a range hood is not considered an obstruction.

Permits and Inspections:

An over the counter permit (no plan submittal) is required to be obtained by a C-16 or C-36 licensed contractor for one and two family dwelling units subject to these requirements.

Apartments or condominiums containing three units or more must be done by a licensed C-16 contractor; C-36 licensees are not permitted to complete these installations.

For installations in multiple apartment or condominium units that are not being piped directly from each individual unit's domestic water supply, an installation plan shall be required for review.

All kitchen fire sprinkler head permits shall be issued and inspected by the Fire Department.

A minimum of two inspections are needed:

1. Before the kitchen fire sprinkler supply piping is covered. All piping shall be filled with water at normal domestic water system pressure.
2. A final inspection completed after painting, texturing and all other ceiling fixtures have been installed.

Occupant information sheet:

The installing contractor shall provide an information sheet on the kitchen fire sprinkler to the dwelling unit owner which advises the owner of the presence of the kitchen fire sprinkler and includes emergency procedures.

If the dwelling unit is not owner occupied, the installing contractor shall provide a copy of the information sheet to the property manager.

It is recommended that the sheet be permanently mounted in the kitchen area. The recommend location is on the inside of a kitchen cabinet door, which is directly adjacent to the range. See Exhibit A for a copy of the information sheet.

CROSS REFERENCES

Home Fires Involving Cooking Equipment (NFPA 2016)

NFPA 13D

Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes



EXHIBIT A

**IMPORTANT INFORMATION
ABOUT YOUR KITCHEN FIRE SPRINKLER HEAD**

Over 80 percent (80%) of all fires occur in single and multi-family dwellings. Forty-six percent (46%) of these residential fires are directly related to cooking equipment. The fire sprinkler installed in your kitchen adjacent to the stove will protect your family and dwelling against this very common type of fire.

The fire sprinkler is operated by a heat sensitive device which responds to elevated ceiling temperature, resulting from a significant fire on the stove.

If a fire occurs while cooking:

- Do not attempt to carry the pan to the sink or outside!!!
- Put a lid on the pan and turn off the burner.
- Use a portable fire extinguisher, if available and it is safe to do so.
- If these efforts do not extinguish the fire, the fire sprinkler will automatically activate and control the fire.
- Evacuate your dwelling and call 911.
- Do not re-enter your dwelling until the Fire Department indicates it is safe to do so.

The fire sprinkler head is connected to the house domestic water supply and can only be turned off at the outside shut-off valve adjacent to the house or apartment building. In the event of a kitchen fire, **DO NOT** turn off the water valve. Let the firefighters perform this task when they arrive. Turning off the water too early may result in the fire re-starting. The Fire Department will assist with water removal after a fire incident; however, the fire sprinkler must be replaced by a fire protection (C-16 license) or plumbing (C-36 license) contractor.

The fire sprinkler head requires no routine maintenance; however, there are several precautions that must be taken to make sure the fire sprinkler will operate properly:

- Do not paint the fire sprinkler head or cover plate (painted sprinklers may not activate in a fire).
- Do not hang anything from the fire sprinkler head (it may break).
- If the fire sprinkler has a cover plate and it becomes dislodged or falls off, do not attempt to re-attach the cover with glue or tape (doing so may render the sprinkler ineffective). Contact a fire protection or plumbing contractor for a replacement cover plate.
- If a leak or other problem occurs with the fire sprinkler that is not related to an actual fire, contact your landlord or a C-16 or C-36 licensed contractor.