



Commercial Cooking Systems UL-300 Listing



On **November 21, 1994**, a new Underwriters Laboratories test standard entitled UL 300, Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas went into effect. This new standard is the result of changes in fire hazards involving commercial cooking equipment.

Pre-engineered chemical suppression systems were first developed in the 1960's for the protection of commercial cooking equipment, plenums and ducts. Underwriter's Laboratories (UL) developed a series of fire tests for these systems designed to duplicate the potential fire hazard found in the work place. These tests established specific requirements (and limitations) affecting extinguishing agent, fire detection, piping limitations, nozzle coverage, etc.

Fats and Temperatures

At the time that these original tests were developed, rendered animal fat (lard) was typically used in commercial kitchens to fry various foods. Commercial cooking operations, appliances and supplies have changed drastically since the 1960's. Health concerns have reduced the use of lard. Efforts to cook faster have caused the use of insulated "high efficiency" fryers that heat faster and cool slower. Restaurant suppliers estimate that 70-75% of commercial kitchens use vegetable oils for frying in high-efficiency fryers.

These changes have significantly altered the fire hazard in cooking areas. Lard has a large percentage of saturated fat whereas vegetable oils have a very low percent of such fatty acids. The auto-ignition temperature of most animal fats is in the 550-600 degree F. range compared to the auto-ignition temperature of most vegetable oils which is at 685 degree F. and higher. The extinguishing agent employed in pre-engineered restaurant systems is an alkaline base. Fatty acids combine with alkalines to produce a soapy solution in a process known as saponification. Thus, when a suppression system is discharged on a burning deep fat fryer containing rendered animal fat, a soap blanket is formed cutting off the oxygen supply and containing the fire until the fuel (animal fat) is cooled below its auto-ignition temperature.

A similar fire involving vegetable oils creates a different set of circumstances. With only a limited amount of fatty acids saponification is greatly reduced and the higher temperature of such fires, enhanced by the insulation in a high efficiency fryer, causes the soap blanket to break down. Thus, the extinguishing capacity of older fire suppression systems is reduced.

Time for Change

While the **Superstition Fire & Medical District** has never considered any retroactive changes to be mandated, we have adopted a policy of requiring an upgrade to be made when an existing non-compliant system can no longer be serviced and maintained in a certified operational condition. Every six months your system is required to be serviced and tagged by a licensed technician, certifying the system for the next six months. At some point, because parts are no longer available for non-UL 300 listed systems, your service provider will no longer be able to certify your system. **This is the time that the upgrade needs to occur.** We will work with you to limit the impact both financially and business "downtime", by allowing upgrades to occur during off-peak seasons or at other special times as planned.

Final Remarks

The new UL 300 standard assures fire protection for a hazard that has gone through many changes. It presents the most significant advancements in testing of pre-engineered restaurant fire suppression systems in the past 20 years. The new UL Standard 300 addresses the problems in fire protection for commercial cooking environments which reflect changes in our diet and the way we prepare food. All of these changes have resulted in fires which are hot, stubborn and difficult to extinguish. Pre-engineered systems for commercial cooking operations will become more detailed, more technical, and yes, a little more expensive. They will also be safer, more reliable and perform their primary function better than ever before.