

EMC Insurance Companies®

Gas- and electric-fired kilns are commonly found in school art rooms, artisan shops and manufacturing facilities. As with other types of heat-producing equipment, the risks of fire and personal injury can occur during kiln operation. To reduce these risks, several guidelines should be followed.

Ventilation

The clay firing process produces carbon monoxide and various other combustion gases. According to OSHA standards, long-term exposure to carbon monoxide at 35 parts per million (ppm) or short-term exposure at 200 ppm may cause adverse health effects. Studies have shown carbon monoxide levels around operating kilns to be in excess of 400 ppm, well above the OSHA standard. In addition to the hazards associated with carbon monoxide, certain clays, glazes and fuels also produce gases (e.g., chlorine, fluorocarbons, sulfur dioxide, nitrogen oxides, and ozone) that may be released during the firing process. For these reasons, it is essential to provide adequate ventilation when operating kilns. At a minimum, kilns should be equipped with a ventilation hood, ductwork and an exhaust fan that will remove gases and harmful byproducts of the firing process to the outside. The ventilation system should be designed and installed by a qualified contractor, balanced to handle the maximum amount of air flow and vented directly to the outside environment.

The best option for ventilation is to use a downdraft ventilation system, as this method removes combustion gases prior to them entering the surrounding room. Canopy-type hoods can also be used to provide ventilation; however, this method may not be as effective. The effectiveness of a canopy hood depends on the distance of the hood above the kiln and the amount of makeup air coming into the room. To be efficient, the hood should be 12 to 30 inches above the kiln, and at least 250 cubic feet per minute (cfm)

of makeup air should be delivered into the room.

Carbon monoxide alarms should be installed when using natural gas- or propane-fired kilns. If excess carbon monoxide

is detected, move all individuals out of the room, shut off the gas at the source and power down the kiln. High carbon monoxide levels are usually caused by an improperly designed or poorly operating ventilation system and should be repaired by a qualified contractor or ventilation professional.

Clearances

Kilns should be located at least 18 inches from noncombustible surfaces and 36 inches from combustible surfaces. Kilns should be placed on noncombustible flooring (i.e., solid masonry or concrete 2 inches thick) extending 12 inches beyond the base of the kiln. When determining clearances, users should remember to allow adequate room for opening, loading, and routine maintenance tasks around the kiln. As always, read and follow manufacturer's recommendations regarding kiln placement.



Continued

Fire Prevention

Several precautions should be taken to avoid kiln fires. Combustible materials should be kept at least 36 inches from the kiln during operation, and items such as paper, solvents, and flammable liquids should be kept at an even greater distance. A multipurpose dry chemical fire extinguisher should be kept near the kiln, and those using it should be trained annually on the proper use of the extinguisher.

Electrical

Before installing an electric kiln, make sure the correct voltage, amperage and phase are available. A licensed electrician should be employed to install the proper electrical supply. Kilns should be properly grounded and installed in accordance with all national and local electrical and fire codes. Do not use an electric kiln in wet conditions, and be sure to unplug all equipment when conducting any type of servicing or maintenance.

Personal Protective Equipment

Personal protective equipment (PPE) should be used at all times when working with a kiln. Heat-resistant gloves should be used for removing peepholes and when unloading fired items. Shade #3 welding glasses should be used when looking into an operating kiln. These glasses offer protection against infrared radiation, which is hazardous to the eyes and has been shown to cause cataracts after years of exposure. Everyone working with kilns should be trained to use proper PPE, and usage should be enforced at all times.

For Additional Information

U.S. Environmental Protection Agency:

www.epa.gov

- Ceramic Kilns

Texas Department of Insurance:

www.tdi.state.tx.us

- Electric Kiln Safety