

## KILN BEST PRACTICES

Gas- and electric-fired kilns are commonly found in school art rooms or recreation centers. As with other types of heat-producing equipment, fire, and personal injury risks can occur during kiln operations. To reduce these risks, let's review several best practices.

### Ventilation

The clay firing process produces carbon monoxide and various other combustible gases. According to PEOSH standards, long-term exposure to carbon monoxide at 35 parts per million (ppm) or short-term exposure sat 200 ppm may cause adverse health effects. Studies have shown the carbon monoxide levels around operating kilns are over 400 ppm, well above the PEOSH standard. In addition to the hazards associated with carbon monoxide, certain clays, glazes, and fuels also produce gases that may be released during the firing process.

Kilns should be equipped with a ventilation hood, ductwork, and an exhaust fan that will move gases and harmful byproducts of the firing process outside. The ventilation system should be designed and installed by a qualified contractor, balanced to handle the maximum airflow, 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 before entering the surrounding room. Canopy-type hoods can also provide ventilation; however, this method may be less effective.

Carbon monoxide alarms should be installed when using natural gas or propane-fired kilns. High carbon monoxide levels are usually caused by an improperly designed or poorly operating ventilation system and should be cleaned regularly and repaired by a qualified contractor or ventilation professional.

### Fire Prevention

Several precautions should be taken to avoid kiln fires. Kilns should be located at least 18 inches from non-combustible surfaces and 36 inches from combustible surfaces. Kilns should be placed on non-combustible flooring such as solid masonry or concrete at least two inches thick and extending 12 inches beyond the base of the kiln. Users should allow adequate room for opening, loading, and routine maintenance tasks around the kiln when determining clearances. Read and follow the manufacturer's recommendations regarding kiln placement.

Combustible materials should be kept at least 36 inches from the kiln during operation. Solvents and flammable liquids should be kept in a flammable liquids cabinet away from the kiln. A multipurpose dry chemical fire extinguisher should be kept near the kiln, and employees should be trained annually on the proper use of the extinguisher.

Before installing an electric kiln, ensure the correct voltage, amperage, and phase are available. A licensed electrician should be employed to install following all national and local electrical and fire codes. Do not use an electric kiln in wet conditions and be sure to unplug all equipment and follow proper lockout/tagout procedures when servicing or maintaining the equipment.

### Personal Protective Equipment

Personal protective equipment (PPE) should always be used when working with a kiln. Heat-resistant gloves should be used to remove peepholes and unload fired items. When looking into an operating kiln, eye protection should include safety glasses with a shade #3 welding rating. These glasses offer protection against infrared radiation, which is hazardous to the eyes and has been shown to cause cataracts after years of exposure. Employees working with kilns should be trained to use proper PPE, and usage should consistently be enforced.