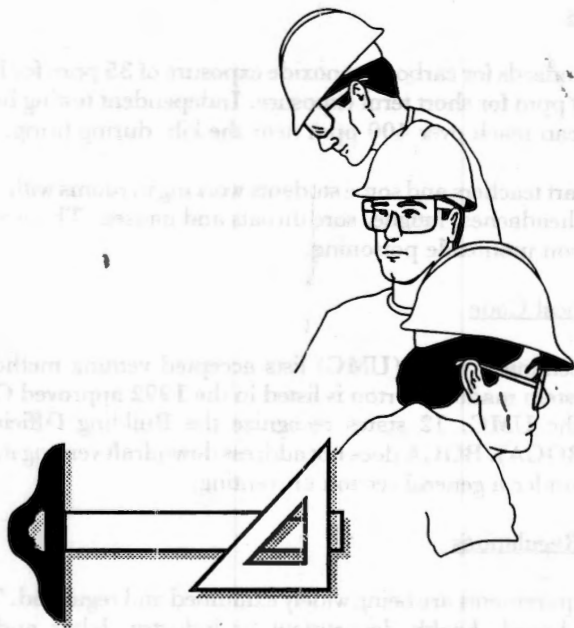


What Engineers & Architects Need to Know About Venting a Kiln



answers to questions about
the venting of electric ceramic kilns

**Orton**

®

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Why is venting important?

Ceramics are made from clays and other materials which produce undesirable fumes during firing. The primary fume is carbon monoxide. This is produced during the oxidation of organic material. Fumes can also contain sulfur oxides, hydrogen fluoride and volatilized metals. These fumes are unhealthy and should not be breathed.

Because gases expand when heated, the fumes will not stay inside the kiln unless the kiln is kept under negative pressure. From a health and safety standpoint, it is important to remove fumes from the work area.

What regulations am I dealing with?

OSHA Standards

OSHA has set standards for carbon monoxide exposure of 35 ppm for long term exposure and 200 ppm for short term exposure. Independent testing has shown that these fumes can reach over 400 ppm near the kiln during firing.

In schools, many art teachers and some students working in rooms with unvented kilns complain of headaches, fatigue, sore throats and nausea. These are classic symptoms of carbon monoxide poisoning.

Uniform Mechanical Code

The Uniform Mechanical Code (UMC) lists accepted venting methods. The downdraft vent system made by Orton is listed in the 1992 approved Code. 38 states recognize the UMC. 12 states recognize the Building Officials Code Administration (BOCA). BOCA does not address downdraft venting in its code, but does allow it under a general section on venting.

State and Local Regulations

Indoor venting requirements are being widely examined and regulated. The local and state health board, health department or industry, labor and human relations board should have current information. State Administrative Code can also be checked.

In some cases, regulations may refer to the EnviroVent as an example of an acceptable system. EnviroVent is a trade name used by one of Orton's licensees. EnviroVent uses the generic patented technology of the Orton system. Orton also has other licensees, but they use the Orton KilnVent or KilnVent II name.

What are the main issues to be considered?

There are two basic methods of venting. One is to vent the room. The other is to vent the kiln.

Venting the Room

When venting the room, fumes are allowed to escape from the kiln into the classroom or workroom. Using an exhaust system, room air is exchanged with fresh make-up air. Considerable make-up air is needed to adequately remove fumes.

Venting the Kiln

Two methods can be used to vent a kiln. A hood can be placed over the kiln, or a downdraft vent system can be used to keep the kiln under negative pressure. Gases are exhausted outside the building.

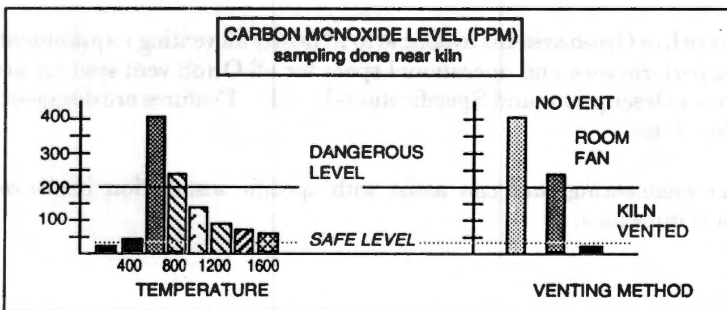
The downdraft venting method is superior to hoods because it removes all of the fumes and requires less make-up air. Fumes are not released into the classroom or workroom. The downdraft vent also improves firing conditions inside the kiln.

With a hood system, fumes are released into the classroom or workroom before they are collected. The effectiveness of the hood depends on how close it is to the kiln and the volume of air being removed from the room. Rarely does a hood remove more than 85% of the fumes. Make-up air of more than 250 CFM is required.

The downdraft system made by Orton and other manufacturers allows the kiln to remain closed throughout the firing. It also keeps the kiln under a slight negative pressure. This means all the fumes are exhausted and the air needed to fire the ceramics is brought into the kiln. This eliminates the practice of propping the lid of the kiln during early firing and removes a safety hazard created when closing the hot kiln lid.

Both methods for venting a kiln can bring carbon monoxide to safe levels. However, the downdraft system is more effective in removing fumes, it improves firing by bringing air into the kiln and it usually costs less than hood systems. Made of stainless steel and equipped with a heavy duty blower, the Orton system will provide many years of service under normal operating conditions.

The chart below shows the effectiveness of removing carbon monoxide fumes which are developed during the firing of clay based ceramics.



Why should I specify a local exhaust ventilation system like the Orton vent rather than a built-in engineered system?

The Orton Vent is an engineered system. The venting method is patented and has become the venting standard in the United States and Canada.

The cost for the Orton vent is low and the unit can easily be incorporated into a building's central exhaust system. This is an advantage for today's budget and health conscious schools and businesses.

What are the costs associated with the Orton System?

The low cost is one of the great things about the Orton vent. The cost for the vent is under \$300. That includes 8' of ducting and other parts needed for installation.

The cost to run the vent is about 1¢ an hour. For an 8 hour firing, that's only 8¢ to fire safely and remove fumes. Compared to hood systems, the Orton vent can save \$1.00 a day for the needed make-up air.

What installation requirements do I have to plan around?

The Orton vent uses standard flexible aluminum dryer ducting. Up to 48 feet can be used without affecting the draw of the system. A single duct that expands to 8 feet is supplied.

The ducting can be exhausted out a window or through an outside wall via a dryer vent flap. It can also be connected to an existing building exhaust system.

Multiple vents can be connected using elbow connectors to a central duct. Our instruction manual illustrates how to do this and Orton can supply this information if needed for planning.

What are the specifications for the Orton vent - size, electrical, power etc.?

There are five Orton systems available to fit nearly all venting requirements. The precise performance and operational specs for all Orton vent systems are listed in Orton's Descriptions and Specifications booklet. Features are discussed in our sales brochure.

Orton's engineering staff can assist with specific installation issues or other technical questions.