

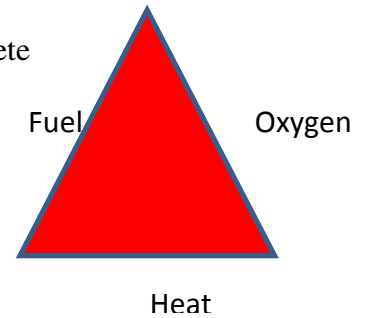
Tech Tip Carbon Monoxide Part 1



Carbon Monoxide is a byproduct of incomplete combustion.

Forced air furnaces in use today typically develop a small amount of CO. This is then vented up the flue and out of the residence.

For complete combustion, exact amounts of Fuel (Natural gas), Oxygen (combustion air), and Heat (ignition source, flame temperature) are needed. Altering these by adding more or providing less will generate incomplete combustion. This incomplete combustion produces CO.



Causes of incomplete combustion

- Dirty burners
- Insufficient air or Excess fuel
- Poor mix of fuel and air - if oxygen does not come into contact with all of the fuel, some of the fuel will be unburned.
- Insufficient temperature - a flame touching a cooler surface.
- Poor venting - products of combustion cannot get away from the combustion process and are re-circulated back with combustion air.

Physical Properties of Carbon Monoxide

- Carbon monoxide is a highly toxic (poisonous) gas
- It is colorless, odorless, and tasteless
- Specific gravity is 0.980 – (slightly lighter than air)
- Disperses rapidly and evenly into the air in a house
- It is carried readily with convection air currents within the home

CO and the Human Body

- CO can kill humans and animals.
- Absorbed by the body through the lungs directly to the blood
- Binds with blood hemoglobin
- Displaces oxygen
- 242 times more attracted to blood cells than oxygen
- Restricts oxygen flow to the body's vital organs

CO levels in the building

- OSHA maximum 50 ppm over 8 hours
- EPA maximum of 9 ppm over 24 hours
- Any reading of 5 ppm or greater should be an area of concern

CO levels in the flue pipe

- Consumer Product Safety Commission 400 ppm
- Typical maximum on start up 100 ppm
- Typical when running at steady state 20-50 ppm