

# Firehouse.com WEEKLY DRILL

## DRILL # 47: CARBON MONOXIDE

### Introduction

The fireground is a dangerous place with all the hazards being present, but there are several hazards that firefighters cannot see; carbon monoxide (CO) is one of them. For years firefighters have been exposed to CO and have never given it much thought. This practice needs to change!

Carbon monoxide is a toxic gas and a direct product of incomplete combustion of organic materials due to the lack of oxygen. Does this sound like an environment that many firefighters are found working without their self-contained breathing apparatus (SCBA)? The answer is yes! Many firefighters remove their facepiece once the fire has been knocked down, but there is still plenty of smoke lingering in the atmosphere. Within that smoke is any number of toxic gases, CO being one of them.

### What We Need To Know

What are some of the characteristics of CO that we should know about?

- Its highly toxic
- Its colorless
- Its odorless
- Its tasteless

All this make it very difficult to detect. For this reason, many fire departments are having their Safety Officers check the levels of CO before allowing their firefighters to remove their facepieces.

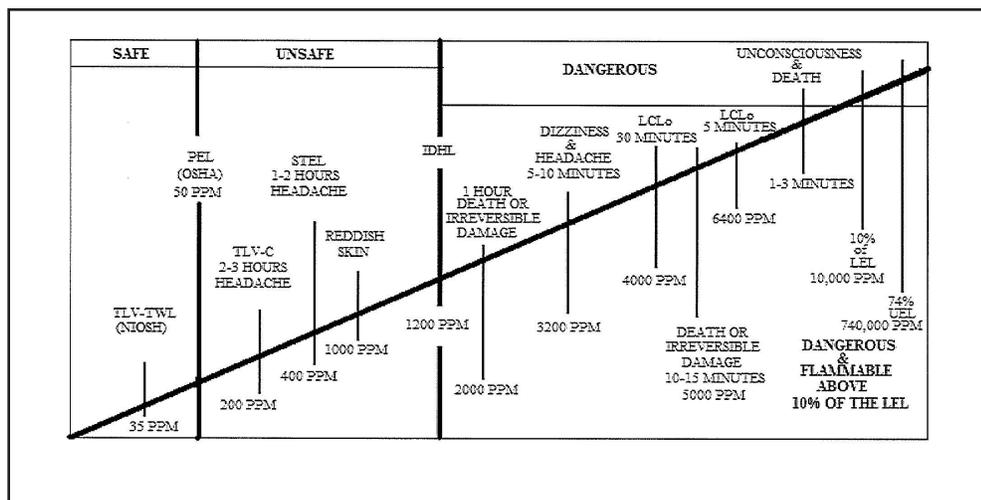
CO is easily absorbed through the lungs and, being non-irritating, is not readily recognized by firefighters until it is too late. An acute poisoning from CO will have firefighters complaining of headaches, nausea, malaise and/or fatigue. If any of your firefighters start mentioning that they are not feeling well, have them checked out by medical personnel right away.

Breathing CO is harmful because it displaces oxygen in the blood which then has an effect on the vital

organs in the body like the heart and brain. Large amounts of CO can cause a person to lose consciousness within minutes. See the chart below on the different affects for the different exposures.

### Learn the Facts

One of the best things firefighters can do is educate themselves. The Occupational Safety and Health Ad-



ministration (OSHA) has published some standards that should help firefighters understand the hazards of CO.

OSHA standards prohibit workers exposure to more than 50 parts per million (PPM) during an 8-hour period. This is often referred to as the Permissible Exposure Limit (PEL). The National Institute for Occupational Safety and Health (NIOSH) has established a recommended exposure limit of 35 ppm as their 8-hour time weighted average (TWA) with a 200 ppm ceiling.

One important factor that many firefighters forget about is that CO is very flammable when levels exceed 10% LEL. CO has a lower explosive limit (LEL) of 12 % and an upper explosive limit (UEL) of 75%. Keep in mind that below the explosive or flammable range the mixture is too lean to burn, and above the upper explosive or flammable limit, the mixture is too rich to burn.

—Prepared by Russell Merrick