



What's In Smoke?

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The 1994 Ontario Industrial Disease Standards Panel report says "it is estimated that 80 per cent of firefighters' injuries are due to smoke inhalation or oxygen deficiency and that over 50 per cent of line-of-duty deaths are due to smoke exposures."

Smoke

One definition of smoke is "a suspension of carbon particles in air and other gases." All smoke is hazardous and is potentially lethal at high concentrations. Just how dangerous smoke can be depends on the concentration, the chemistry of gases that are part of the smoke, the size of the particles in the smoke and duration of the exposure.

During a fire the carbon particles become coated with the chemicals released in the fire. The particles can then carry the chemicals deep into the lungs. When firefighters exert themselves during the fighting stage of the fire, they breathe rapidly and deeply. That could increase the amount of toxins inhaled by the firefighter.

Carbon monoxide

Carbon monoxide is a product of all fires and is perhaps the most hazardous chemical for firefighters. Carbon monoxide is odourless, colourless and tasteless. That means a firefighter cannot judge the amount of carbon monoxide in the air without a detector. Experts say there is no correlation between the amount of smoke and the amount of carbon monoxide at a fire site.

Chemicals

Fire can produce dangerous chemicals both during the working phase of a fire and after the main fire is out. One such chemical is polyvinyl chloride (PVC) which is used in making upholstery, wire, pipes and wall coverings. Burning PVC creates hydrogen chloride and phosgene.

Polyethylene and PVC are often more dangerous when smoldering than during the high heat of a working fire. They give off carbon monoxide, hydrogen cyanide, hydrochloric acid and other chemicals.

Concrete

Concrete can act like a sponge, retaining heat and gases and then releasing toxic fumes as the fire is extinguished and cooling takes place.