



TAKE5—Oxygen Deficiency

Five Minute Safety Talks

The Occupational Safety and Health Administration's (OSHA) Respiratory Protection Standard 1910.134 defines oxygen deficiency as an atmosphere with an oxygen content below 19.5% by volume. OSHA's Permit-Required Confined Space Entry Standard 1910.146 and Grain Handling Standard 1910.272 also recognize that an atmosphere with less than 19.5% oxygen is hazardous.

Causes

In general, oxygen deficiency occurs when another gas displaces oxygen in a poorly ventilated space. For example, decomposition of organic material or smoldering grain can consume oxygen within a space. Grain that is high in moisture or poor in quality can result in elevated levels of carbon dioxide. Carbon dioxide can displace the oxygen within spaces such as grain bins, silos, tanks, and even flat storage buildings. Carbon Dioxide is denser than air. Therefore, it can accumulate in low-lying areas adjacent to hazardous spaces.

Effects on the Body

A person will immediately begin to feel the health effects associated with lack of oxygen with decreases of 1 to 2 percent. Healthy individuals are unable to work strenuously or lose coordination when oxygen levels are between 15 and 19 percent. When oxygen levels are between 10 to 12 percent respiration increases, lips turn blue and judgement is impaired. Fainting and unconsciousness occur when oxygen levels are between 8 and 10 percent. Death can occur within eight minutes if the oxygen level is between 6 and 8 percent.

Prevention

In order to prevent exposure to oxygen deficient atmospheres, always:

- ☐ Test the air within the hazardous space/area with a calibrated atmospheric monitor with an oxygen sensor.
- ☐ Ensure that atmospheric monitors are calibrated in accordance with manufacturer recommendations.
- ☐ Bump test the monitor prior to use to ensure that the sensors alarm when exposed to the bump test gas.
- ☐ Ensure that the monitor is fully charged prior to use
- ☐ Test the atmosphere within the hazardous space prior to and continually throughout the entry.
- ☐ Ventilate hazardous spaces prior to and during entry.
- ☐ Follow your employer's permit-required confined space and grain storage structure entry procedures.



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Group Discussion Notes/Comments:
