

Diesel Exhaust Gases – Nitrogen Dioxide (NO₂)



Health Hazard Information Card HH-26

Miners working with or around diesel equipment in an underground coal mine are likely to be exposed to diesel exhaust gases. Some components of diesel exhaust can be toxic. One of the gases of health concern in coal mines is nitrogen dioxide (NO₂). The concentration of this gas that is found in the mine atmosphere varies depending on many factors including: ventilation, engine maintenance, fuel quality, and the number of diesel units.

Where is NO₂ found?

NO₂ is heavier than air. Therefore it seeks the low areas, along the floor.



Specific Gravity
Air - 1.00
NO₂ - 1.59

How can you tell that you are being exposed to NO₂?

At low concentrations, NO₂ that is exhausted from diesel equipment can only be identified using detectors.

What are the symptoms of overexposure?

- Nose/throat irritation
- Increased breathing rate
- Coughing
- Chest Pain
- Difficulty breathing
- Drowsiness
- Eye irritation
- Fluid in the lungs

What are the harmful effects of overexposure?

When NO₂ is inhaled, it reacts with moisture forming an acid that irritates the lining of the respiratory system (nose, throat, and lungs). After a severe overexposure the lungs fill with fluid, leading to an inflammation of the lungs and possible death.

What must operators do?

- Regularly inspect and maintain all diesel powered equipment.
- Monitor NO₂ during each shift while diesel equipment is operating.
- Maintain air quantities over each piece of diesel equipment.

Where is NO₂ monitoring required?

- In the return from a section using diesel equipment.
- Section loading point, if using diesel face haulage.
- Any other location designated by the District Manager and specified in the ventilation plan.

What are the MSHA standards for NO₂?

- Full-shift average 5 ppm*
- Ceiling 5 ppm*
- Action level◇ 2.5 ppm*

* ppm - parts of NO₂ per million parts of air

◇ Action level - the concentration at which the mine operator must take steps to reduce the NO₂ concentration in the mine atmosphere.

If you have any questions about any occupational health matter, feel free to ask us. Our job is to protect your health.

For more information, contact your local MSHA office or MSHA's national office at (202) 693-9899.

*U.S. Department of Labor
Mine Safety and Health Administration
Visit our Web site at www.msha.gov*

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