Lead(II) oxide

sc-211727

Material Safety Data Sheet

Hazard Alert Code
Key:

EXTREME  HIGH  MODERATE  LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Lead(II) oxide

STATEMENT OF HAZARDOUS NATURE

NFPA

SUPPLIER
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800

EMERGENCY
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Toxicity:</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Body Contact:</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Reactivity:</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Chronic:</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

CANADIAN WHMIS SYMBOLS
EMERGENCY OVERVIEW

RISK
Danger of cumulative effects.
May cause harm to the unborn child.
Possible risk of impaired fertility.
Harmful by inhalation and if swallowed.
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Skin contact may produce health damage.

*(limited evidence).

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED
■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

EYE
■ Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn).
Slight abrasive damage may also result.

SKIN
■ The material is not thought to be a skin irritant (as classified by EC Directives using animal models).
Abrasive damage however, may result from prolonged exposures.
■ Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED
■ Inhalation of dusts, generated by the material, during the course of normal handling, may be harmful.
■ The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models).
Nevertheless inhalation of dusts, or fumes, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.

CHRONIC HEALTH EFFECTS
■ Substance accumulation, in the human body, is likely and may cause some concern following repeated or long-term occupational exposure.
Ample evidence exists that developmental disorders are directly caused by human exposure to the material.
Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.
Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung. Prime symptom is breathlessness; lung shadows show on X-ray.
Lead, in large amounts, can affect the blood, nervous system, heart, glands, immune system and digestive system. Anaemia may occur.
If untreated muscles may become paralysed, and there may be brain damage. Symptoms include joint and muscle pain, weakness in the back of the forearm and wrist and in the shin muscles, headaches, dizziness, abdominal pain, diarrhoea or constipation, nausea, vomiting, blue line on gums, sleep disturbance and a metallic taste in the mouth. The pressure in the brain may increase with high doses, and cause brain damage, coma, and death. Early signs include loss of appetite and weight, constipation, tiredness and irritability, headache, weakness. Later there may be vomiting, nervousness, and muscle pains in the arms and legs. Serious cases cause severe vomiting, inco-ordination, stupor, permanent eye damage, high blood pressure, multiple nerve disorders of the head resulting in paralysis and loss of reflexes, delirium, convulsions and coma. The kidneys may become irreversibly damaged, and the nervous system may become affected causing mental retardation, cerebral palsy, and jerks and seizures.
Lead can cross the placenta, and cause miscarriage, stillbirths and birth defects. Exposure before birth can cause mental retardation, behavioural disorders and infant death. Lead can also cause reduced sex drive, impotence, sterility and damage the sperm of males, increasing the potential for birth defects. Periods in women can also be affected.
Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).
Lead can accumulate in the skeleton for a very long time.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS
Section 4 - FIRST AID MEASURES

SWALLOWED
- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
- For advice, contact a Poisons Information Centre or a doctor.
- Urgent hospital treatment is likely to be needed.
- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.

EYE
If this product comes in contact with the eyes:
- Wash out immediately with fresh running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Seek medical attention without delay; if pain persists or recurs seek medical attention.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN
If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

INHALED
- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

NOTES TO PHYSICIAN
- Gastric acids solubilise lead and its salts and lead absorption occurs in the small bowel.
- Particles of less than 1 um diameter are substantially absorbed by the alveoli following inhalation.
- Lead is distributed to the red blood cells and has a half-life of 35 days. It is subsequently redistributed to soft tissue & bone-stores or eliminated. The kidney accounts for 75% of daily lead loss; integumentary and alimentary losses account for the remainder.
- Neuasthenic symptoms are the most common symptoms of intoxication. Lead toxicity produces a classic motor neuropathy. Acute encephalopathy appears infrequently in adults. Diazepam is the best drug for seizures.

Section 5 - FIRE FIGHTING MEASURES

<table>
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<tr>
<th>Property</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Vapour Pressure (mmHg)</td>
<td>Negligible</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Specific Gravity (water=1)</td>
<td>9.53-9.6</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EXTINGUISHING MEDIA
- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).

FIRE FIGHTING
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use fire fighting procedures suitable for surrounding area.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS
- Non combustible.
- Not considered a significant fire risk, however containers may burn.
Decomposition may produce toxic fumes of: metal oxides. May emit poisonous fumes. When heated, can act as an oxidizing agent. Toxic dust and lead fumes may be generated in a fire situation.

**FIRE INCOMPATIBILITY**
None known.

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**Section 6 - ACCIDENTAL RELEASE MEASURES**

**MINOR SPILLS**
- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.

**MAJOR SPILLS**
- DO NOT touch the spill material.
- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water courses.

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**Section 7 - HANDLING AND STORAGE**

**PROCEDURE FOR HANDLING**
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.

**RECOMMENDED STORAGE METHODS**
- CARE: Packing of high density product in light weight metal or plastic packages may result in container collapse with product release.
- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.

For low viscosity materials:
- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

**STORAGE REQUIREMENTS**
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.

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**Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION**

**EXPOSURE CONTROLS**

<table>
<thead>
<tr>
<th>Source</th>
<th>Material</th>
<th>TWA ppm</th>
<th>TWA mg/m³</th>
<th>STEL ppm</th>
<th>STEL mg/m³</th>
<th>Peak ppm</th>
<th>Peak mg/m³</th>
<th>TWA F/CC</th>
<th>Notes</th>
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<tbody>
<tr>
<td>US ACGIH</td>
<td>lead monoxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TLV® Basis: CNS &amp; PNS impair; hematologic eff; BEI</td>
</tr>
<tr>
<td>Threshold Limit</td>
<td>(Lead and inorganic compounds, as Pb)</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PERSONAL PROTECTION**
RESPIRATOR

EYE
• Safety glasses with side shields
• Chemical goggles.
• Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lenses should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]

HANDS/FEET
• Wear chemical protective gloves, eg. PVC.
• Wear safety footwear or safety gumboots, eg. Rubber
Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
• frequency and duration of contact,
• chemical resistance of glove material,
• glove thickness and
• dexterity

OTHER
• Overalls.
• Eyewash unit.
• Barrier cream.
• Skin cleansing cream.

ENGINEERING CONTROLS
Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard “physically” away from the worker and ventilation that strategically “adds” and “removes” air in the work environment.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES
Solid.
Does not mix with water.
Sinks in water.

<table>
<thead>
<tr>
<th>State</th>
<th>Divided solid</th>
<th>Molecular Weight</th>
<th>223.20</th>
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<tbody>
<tr>
<td>Melting Range (°F)</td>
<td>1630-1634</td>
<td>Viscosity</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Boiling Range (°F)</td>
<td>2682decomposes</td>
<td>Solubility in water (g/L)</td>
<td>Immiscible</td>
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<tr>
<td>Flash Point (°F)</td>
<td>Not Applicable</td>
<td>pH (1% solution)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Decomposition Temp (°F)</td>
<td>Not Applicable</td>
<td>pH (as supplied)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Autoignition Temp (°F)</td>
<td>Not Applicable</td>
<td>Vapour Pressure (mmHg)</td>
<td>Negligible</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not applicable</td>
<td>Specific Gravity (water=1)</td>
<td>9.53-9.6</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not applicable</td>
<td>Relative Vapour Density (air=1)</td>
<td>Not applicable</td>
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<tr>
<td>Volatile Component (%vol)</td>
<td>Negligible</td>
<td>Evaporation Rate</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
APPEARANCE
Very dense, odorless powder. Does not mix with water but classed as "soluble" under the provisions of SP 199 of the UN Transport Code. Insoluble in alcohol. Soluble in acetic acid, dilute nitric acid, and warm alkali hydroxide solutions.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY
- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

STORAGE INCOMPATIBILITY
- Lead oxide: yellow lead
  - is a strong oxidiser
  - reacts explosively with 90% performic acid, rubidium acetylide
  - reacts violently with strong oxidisers, boron, chlorine, fluorine, dichloromethylsilane, calcium sulfide, ethylene, hydrogen peroxide, hydrogen trisulfide (ignites) hydroxylamine (ignites), lithium carbide, metal acetylides, metal powders when heated (e.g., aluminium, boron, molybdenum, zirconium, sodium, titanium, silicon etc.), perchloric acid, red phosphorus, selenium oxychloride, sodium
- is incompatible with aluminium carbide, barium sulfide, silicon, sulfuryl chloride
- Metals and their oxides or salts may react violently with chloride trifluoride and bromine trifluoride.
- These trifluorides are hypergolic oxidisers. They ignite on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.
- The state of subdivision may affect the results.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

LEAD MONOXIDE

TOXICITY AND IRRITATION
- The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

CARCINOGEN

<table>
<thead>
<tr>
<th>Lead compounds, inorganic</th>
<th>International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead and compounds (inorganic)</td>
<td>US EPA Carcinogens Listing</td>
<td>Carcinogenicity</td>
</tr>
<tr>
<td>Lead and inorganic compounds, as Pb</td>
<td>US ACGIH Threshold Limit Values (TLV) - Carcinogens</td>
<td>Carcinogen Category</td>
</tr>
<tr>
<td>lead monoxide</td>
<td>US - Rhode Island Hazardous Substance List</td>
<td>IARC</td>
</tr>
<tr>
<td>LEAD(II) OXIDE</td>
<td>US Environmental Defense Scorecard Recognized Carcinogens</td>
<td>Reference(s)</td>
</tr>
<tr>
<td>LEAD COMPOUNDS</td>
<td>US Environmental Defense Scorecard Recognized Carcinogens</td>
<td>Reference(s)</td>
</tr>
<tr>
<td>Lead and lead compounds (inhalation)</td>
<td>US Air Toxics Hot Spots TSD for Describing Available Cancer Potency Factors</td>
<td>IARC Class</td>
</tr>
<tr>
<td>Lead and lead compounds (oral)</td>
<td>US Air Toxics Hot Spots TSD for Describing Available Cancer Potency Factors</td>
<td>IARC Class</td>
</tr>
<tr>
<td>lead monoxide</td>
<td>US - Maine Chemicals of High Concern List</td>
<td>Carcinogen</td>
</tr>
</tbody>
</table>

Section 12 - ECOLOGICAL INFORMATION

For incompatible materials - refer to Section 7 - Handling and Storage.
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. This material and its container must be disposed of as hazardous waste. Avoid release to the environment. Refer to special instructions/safety data sheets.

**Ecotoxicity**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
<th>Bioaccumulation</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>lead monoxide</td>
<td>No Data Available</td>
<td>No Data Available</td>
<td>LOW</td>
<td></td>
</tr>
</tbody>
</table>

**Section 13 - DISPOSAL CONSIDERATIONS**

**US EPA Waste Number & Descriptions**

**A. General Product Information**

Toxicity characteristic: use EPA hazardous waste number D008 (waste code E) if this substance, in a solid waste, produces an extract containing greater than 5 mg/L of lead.

**Disposal Instructions**

All waste must be handled in accordance with local, state and federal regulations.

- Containers may still present a chemical hazard/danger when empty.
- Return to supplier for reuse/recycling if possible.

Otherwise:

- If container cannot be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. In most instances the supplier of the material should be consulted.

- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Bury residue in an authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

**Section 14 - TRANSPORTATION INFORMATION**

**DOT:**

<table>
<thead>
<tr>
<th>Symbols:</th>
<th>None</th>
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<tbody>
<tr>
<td>Hazard class or Division:</td>
<td>6.1</td>
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<tr>
<td>Identification Numbers:</td>
<td>UN2291</td>
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<tr>
<td>PG:</td>
<td>III</td>
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<tr>
<td>Label Codes:</td>
<td>6.1</td>
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<tr>
<td>Special provisions:</td>
<td>138, IB8, IP3, T1, TP33</td>
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<tr>
<td>Packaging: Exceptions:</td>
<td>153</td>
</tr>
<tr>
<td>Packaging: Non-bulk:</td>
<td>213</td>
</tr>
<tr>
<td>Quantity limitations:</td>
<td>100 kg</td>
</tr>
</tbody>
</table>

7 of 9
**Quantity Limitations:** Cargo aircraft only: 200 kg  
Vessel stowage: Location: A  
Hazardous materials descriptions and proper shipping names:  
Lead compounds, soluble, n.o.s.

**Air Transport IATA:**  
ICAO/IATA Class: 6.1  
UN/ID Number: 2291  
Special provisions: A92  
Cargo Only  
Packing Instructions: 677  
Maximum Qty/Pack: 200 kg  
Passenger and Cargo  
Packing Instructions: 670  
Maximum Qty/Pack: 100 kg  
Limited Quantity  
Packing Instructions: Y645  
Maximum Qty/Pack: 10 kg  
Shipping name: LEAD COMPOUND, SOLUBLE, N.O.S. (contains lead monoxide)

**Maritime Transport IMDG:**  
IMDG Class: 6.1  
UN Number: 2291  
EMS Number: F-A,S-A  
Limited Quantities: 5 kg  
Marine Pollutant: Yes  
Shipping name: LEAD COMPOUND, SOLUBLE, N.O.S. (contains lead monoxide)

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**Section 15 - REGULATORY INFORMATION**

Lead monoxide (CAS: 1317-36-8) is found on the following regulatory lists;  
Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

- Skin contact may produce health damage*.

* (limited evidence).

- Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at: www.chemwatch.net/references.

- The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

- For detailed advice on Personal Protective Equipment, refer to the following U.S. Regulations and Standards:

  OSHA Standards - 29 CFR:
  1910.132 - Personal Protective Equipment - General requirements
  1910.133 - Eye and face protection
  1910.134 - Respiratory Protection
  1910.136 - Occupational foot protection
  1910.138 - Hand Protection
  Eye and face protection - ANSI Z87.1
  Foot protection - ANSI Z41
  Respirators must be NIOSH approved.

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