

1. IDENTIFICATION

COMPANY IDENTIFICATION

United States

Purity Zinc Metals, LLC.
498 International Boulevard
Clarksville, TN 37040
(931) 552-8080 Phone
(931) 552-5588 Fax
(800) 388-3952 Toll Free

Canada

Purity Zinc Metals
A Division of North American Zinc Company
290 Arvin Avenue
Stoney Creek, ON L8E 2M1 Canada
(905) 662-4802 Phone
(905) 664-3944 Fax

PRODUCT

| | | |
|-------------------|------------------|----------------------|
| Product Name: | Purity Zinc Dust | UP Grades |
| Chemical Name: | Zinc (Zn) Dust | |
| Trade Name: | Purity Zinc Dust | UltraPure™ Zinc Dust |
| Chemical Formula: | Zn | |
| CAS# | 7440-66-6 | |

EMERGENCY TELEPHONE

(800) 388-3952

DATE REVISED

February 20, 2014

All previous versions are superseded by the current version

Recommended Usage: Zinc dust is used to coat steel for corrosion protection (galvanizing, electroplating and electro-galvanizing), as an alloying element in bronze, brass, aluminum and other metal alloys, for zinc die casting alloys, for zinc dry cell and zinc/air batteries, for the production of various architectural products and as a reducing agent in organic chemistry and for other chemical applications.

Restrictions on Use: Any use of this product other than as described above, is beyond the prevue of this SDS and no guarantees or warranties, explicit or implied, on performance or safety of the product, its usage, the process or results is given.

2. HAZARD IDENTIFICATION

WARNING!

MAY FORM COMBUSTIBLE DUST CONCENTRATIONS IN AIR (DURING PROCESSING)



Eye and Respiratory Irritant: Use of eye and respiratory protection recommended when handling fine particulate powders including this product. See Exposure Controls and Personal Protection recommendations in Section 8 for guidance.

Emergency Overview: A greyish metal powder with the potential to be combustible under circumstances described in Section 9. Contact with alkalis generates flammable hydrogen gas which can accumulate in

poorly-ventilated areas. Zinc is a relatively non-toxic chemical and poses little immediate health hazard to personnel or the environment in an emergency situation.

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS# | Weight% |
|---------------|-----------|-----------|
| Total Zinc | | 99.0 Min |
| Metallic Zinc | 7440-66-6 | 96.0 Min |
| Zinc Oxide | 1314-13-2 | 2-4 |
| Lead | 7439-92-1 | 0.002 Max |
| Cadmium | 7440-43-9 | 0.001 Max |
| Iron | 7439-89-6 | 0.002 Max |
| Copper | 7440-50-8 | 0.001 Max |

See section 8 for information on OEL, PEL, TVL and LD₅₀/LC₅₀ data.

4. FIRST-AID MEASURES

Acute Exposure Symptoms:

Inhalation: Inhalation of zinc oxide fume from fire or welding on zinc-coated surfaces may cause zinc shakes or metal fume fever (a benign transient flu-like condition), stomach cramps or diarrhea.

Ingestion: Large oral intake may produce gastro-intestinal irritation.

Skin Contact: Zinc dust contact causes skin dryness.

Eye Contact: Becomes a mechanical irritant in the eye.

Carcinogenicity: This product is not listed by the NTP or IARC and is not regulated as a carcinogen by OSHA.

Recommendation for Exposures:

Inhalation: Remove the exposed person to fresh air immediately. Seek medical attention as soon as possible.

Ingestion: Give two (2) to three (3) cups of water or milk if victim is conscious. Do not induce vomiting. Get medical attention immediately.

Skin: Wash with soap and water. Seek medical attention if irritation persists.

Eyes: Flush eyes and under eyelids with warm, gently running water for at least fifteen (15) minutes. If irritation persists consult a physician.

5. FIRE-FIGHTING MEASURES

Explosion: Avoid generating dust; fine dust dispersed in air in sufficient concentrations and in the presence of an ignition source is a potential dust explosion hazard.

Means of Extinction: Blanket with Class D dry powder type extinguisher or smother with dry sand. Avoid water. Do not disturb until extinguished. Contact with acids and alkali hydroxides results in

generation of potentially explosive hydrogen gas. Firefighters should wear PPE and SCBA with full face piece operated in positive pressure mode.

Method of Cleanup: Wet zinc dust should be collected into an open container and set into an open, well ventilated area to allow for drying. Once dry, zinc dust can be disposed of in accordance with local, state, provincial and national regulations.

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures: Evacuate the area to prevent inhalation of zinc dust by unprotected workers. Remove potential for ignition by turning off sources of flame and other ignition sources. Allow airborne dust to settle then sweep up dust and dispose of in accordance with local, provincial, state or national regulations.

Environmental Precautions: Transfer wet zinc to an open container and move to an open well ventilated area to allow for drying. Store in a dry area and avoid wetting. Report leakage to water to local environmental authorities for appropriate clean up measures. Leakage to roadways and ground should be swept up and nuisance dust kept to a minimum.

Chemical Hazards from Fire: Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Avoid dispersal in the air (i.e., clearing dust surfaces with compressed air). When exposed to fire zinc dust decomposes to zinc oxide. Zinc oxide fume may be hazardous if inhaled.

7. HANDLING AND STORAGE

Safe Handling: Wear PPE in accordance with Section 8 when handling zinc dust. Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmosphere.

Storage: Store zinc dust in manufacturer's containers when possible. Tightly reseal any open containers and ensure presence of desiccant packets if originally supplied by the manufacturer to product specifications. Containers of zinc dust should be stored in well ventilated and dry areas to prevent the zinc dust from becoming wet.

Storage Incompatibilities: Alkalis, sulphur, strong acids and bases, oxidizers, chlorinated solvents and water or other sources of moisture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Control: It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen deficient environment. Ensure that dust handling systems (such as exhaust ducts, dust collectors, vessels and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). Use only appropriately classified electrical equipment and powered industrial trucks.

Personal Protection: Recommended PPE include (but is not limited to) NIOSH N98-N99 respirator filters, latex, nitrile or other rubber gloves, eye protection as described under ANSI Z87.1 2003 standard and clothing sufficient to provide coverage from skin contact to airborne dusts.

Regulatory Limits:

| Component | CAS# | Limit | Value |
|-----------------|-----------|------------------------------------|--|
| Metallic Zinc | 7440-66-6 | OSHA PEL | None Established |
| Metallic Zinc | 7440-66-6 | LD ₅₀ /LC ₅₀ | None Established |
| Zinc Oxide Dust | 1314-13-2 | OSHA PEL | 15mg/m ³ (total), 5mg/m ³ (respirable) |
| Zinc Oxide Fume | 1314-13-2 | OSHA PEL | 5mg/m ³ |
| Zinc Oxide | 1314-13-2 | ACGIH TVL | 2mg/m ³ (respirable) |
| Zinc Oxide | 1314-13-2 | ACGIH STEL | 10mg/m ³ (respirable) |
| Zinc Oxide | 1314-13-2 | NIOSH REL | 5mg/m ³ |
| Zinc Oxide | 1314-13-2 | NIOSH TWA | 15mg/m ³ (10 hour ceiling) |
| Zinc Oxide | 1314-13-2 | NIOSH STEL | 10mg/m ³ (15 minute sample) |

| | |
|-------|---|
| ACGIH | American Conference of Governmental Industrial Hygienists |
| NIOSH | National Institute for Occupational Safety & Health |
| OSHA | Occupational Safety & Health Administration |
| PEL | Permissible Exposure Limit |
| REL | Recommended Exposure Limit |
| STEL | Short Term Exposure Limit |
| TVL | Threshold Limit Value |
| TWA | Time Weighted Average |

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties:

| | |
|------------------|------------------|
| Physical State | Blue-grey powder |
| Odor | Odorless |
| Specific Gravity | 7.0-7.1 |
| pH | Not Applicable |
| Flash Point | Not Applicable |
| Melting Point | 787°F (419°C) |
| Boiling Point | 1665°F (906°C) |

Explosive Properties:

| | |
|--|--------------|
| Minimum Ignition Energy (mJ) | 1,000-10,000 |
| Minimum Ignition Temperature °C (Dust Cloud) | 610-620 |
| Minimum Ignition Temperature °C (Dust Layer) | >400 |
| Minimum Explosible Concentration (g/m ³) | 700-750 |

Explosion Severity (20L Sphere):

| | |
|----------------------------------|-----|
| Maximum Explosion Pressure (bar) | 4.9 |
| Maximum Rate of Pressure (bar/s) | 130 |

K_{ST} Value (bar.m/s)

35

10. STABILITY AND REACTIVITY

Conditions to avoid: Heat, flames, ignition sources and incompatibles like sulphur, strong oxidizing agents and alkaline hydroxides.

Hazardous Decomposition: Heat generated zinc oxide fume. Contact with acids or alkaline hydroxides may generate hydrogen gas, which is flammable. Reactivity with water is similar but very slow. Under normal conditions, zinc dust is stable.

11. TOXICOLOGICAL INFORMATION

Routes of Exposure:

Inhalation: Inhalation of zinc oxide fume from fire or welding on zinc-coated surfaces may cause zinc shakes, metal fume fever, stomach cramps and/or diarrhea.

Ingestion: Large oral intake may produce gastro-intestinal irritation.

Skin Contact: Zinc dust contact causes skin dryness.

Eye Contact: Becomes a mechanical irritant in the eye.

Acute Exposure Symptoms:

Inhalation: Inhalation of zinc oxide fume from fire or welding on zinc-coated surfaces may cause zinc shakes or metal fume fever (a benign transient flu-like condition), stomach cramps or diarrhea.

Ingestion: Large Oral intake may produce gastro-intestinal irritation.

Skin Contact: Zinc dust contact causes skin dryness.

Eye Contact: Becomes a mechanical irritant in the eye.

Carcinogenicity: This product is not listed by the NTP or IARC and is not regulated as a carcinogen by OSHA.

12. ECOLOGICAL INFORMATION

Zinc in the metallic dust form is insoluble but its processing or extended exposure in the aquatic and terrestrial environments may lead to the release of zinc in bioavailable forms. Zinc is mobile and can be toxic in the aquatic environment with water hardness, pH and dissolved organic carbon content being regulating factors. It bio accumulates in both plants and animals as well as in terrestrial and aquatic systems. Zinc is moderately mobile in soils and is dependent on soil conditions such as cat ion exchange capacity, pH, redox potential and chemical species present in the soil. Zinc also bio accumulates in terrestrial plants, vertebrates and mammals with plant uptake dependent on soil composition.

13. DISPOSAL CONSIDERATIONS

If material cannot be returned to manufacturer with approval, dispose of in accordance with applicable local, state, provincial or national regulations.

14. TRANSPORT INFORMATION

| | |
|--|------------------------------|
| Proper Shipping Name | Zinc Powder or Zinc Dust |
| U.S. DOT Classification | §172.332 & §172.560 |
| Transport Canada Hazard Classification | TDGA, Product is Unregulated |
| Marine Pollutant | No |
| Packaging Restrictions | UN 3077 Class 9 |

This product only falls under UN 3077 Class 9 when an individual package exceeds 999 lbs. net product weight.

Examples:

- 14.1. One pallet, net weight 2,000 lbs. of 27 x 3.5 gallon cans, would not meet the requirement for UN 3077 Class 9 as $2,000/27=74.07$ lbs. each (net).
- 14.2. One pallet, net weight 1,000 lbs. of 1 x bulk bag would require UN 3077 Class 9. $1,000/1=1,000$ lbs.

15. REGULATORY INFORMATION

This product was laboratory tested to determine classification for transportation according to flammable solids, self-heating substances and substances which on contact with water emit flammable gasses against the following regulations:

- 15.1. U.S. Code of Federal Regulations, Transportation, Chapter 49, Parts 100 to 177, Revised as of Oct. 1 – 1992, Part 173, Appendix E
- 15.2. Transportation of Dangerous Goods Act and Regulations (Canada)
- 15.3. International Marine Dangerous Goods Regulations
- 15.4. Dangerous Goods Regulations 1995 International Air Transport Association (IATA) Flammable Solids Division 4.1

Test results confirm that this product did not meet the criteria for inclusion into class 4.1, 4.2 and 4.3 Packaging Group I, II, or III. As such zinc dust containers are not subject to hazardous labeling 4.1, 4.2, or 4.3.

16. OTHER INFORMATION

HMIS

| | |
|---------------------|----------|
| Health | 1 |
| Flammability | 1 |

| | |
|------------------------|----------|
| Physical Hazard | 1 |
|------------------------|----------|

NFPA

**Disclaimer:**

Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. Purity Zinc Metals, LLC provides no warranties either expressed or implied and assumes no responsibility for the accuracy or completeness of the data contained herein and expressly disclaims all liability for reliance thereon. The SDS for this product is provided as a guide for safe handling and usage. Those using the product should read and understand the information herein and properly train those using this product.

Refer to NFPA 654, *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids*, for further safe handling precautions and techniques.

///END OF SDS///