SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Zinc Skimming (Block)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Code</td>
<td>None</td>
</tr>
<tr>
<td>Supplier</td>
<td>Noranda Income Limited Partnership, 860 Gérard Cadieux Boulevard, Salaberry-de-Valleyfield (Quebec) Canada J6T 6L4</td>
</tr>
<tr>
<td>Information Contact</td>
<td>Viviane DeQuoy, Industrial Hygienist</td>
</tr>
<tr>
<td>Phone Number (Business hours)</td>
<td>1 (450) 373-9144 Extension 2394</td>
</tr>
<tr>
<td>Phone Number (Emergency)</td>
<td>1 (450) 373-9144 Extension 2220</td>
</tr>
<tr>
<td>Synonym</td>
<td>Zinc (Oxide)</td>
</tr>
</tbody>
</table>

NAME / CHEMICAL FORMULA: Zinc / Zn

Chemical Family: Metal

Utilization: Steel galvanizing; Alloying; Batteries.

SECTION 2. COMPOSITION AND INFORMATION ON INGREDIENTS

Exposure Limits

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>Percentage (%)</th>
<th>ACGIH (U.S.A.) 2009</th>
<th>OSHA (U.S.A.)</th>
<th>QUÉBEC (CA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>60-70</td>
<td>Not established</td>
<td>Not established</td>
<td>Not established</td>
</tr>
<tr>
<td>Zinc (Oxide)</td>
<td>1314-13-2</td>
<td>30-40</td>
<td>2 (respirable fr.)</td>
<td>5 (fumes, respirable fr.)</td>
<td>15 (total dust)</td>
</tr>
</tbody>
</table>

ACGIH: American Conference of Governmental Industrial Hygienists. OSHA: Occupational Safety and Health Administration.

Note: Zinc: LD50 and LC50: Not available. (RTECS).

Zinc (Oxide): ACGIH TLV-STEL: 10 mg/m³ (Respirable fraction). NIOSH REL-TWA (≤10 hours): 5 mg/m³ (Dust; Fumes); IDLH: 500 mg/m³ (Dust; Vapours). QUEBEC STEL: Total dust containing no asbestos and <1% crystalline silica; STEL: 10 mg/m³ (Fumes). ORAL acute (LD50): 7 950 mg/kg (Mouse). INHALATION acute (LC50): 2 500 mg/kg (Mouse). INTRAPERITONEAL acute (LD50): 240 mg/kg (Rat). (RTECS).

Consult local authorities for acceptable exposure limits.

SECTION 3. RISK IDENTIFICATION FOR HUMAN HEALTH

Routes of Entry: Ingestion. Inhalation (Vapours).

Carcinogenicity: Zinc; Zinc (Oxide): NOT A CARCINOGEN (IARC, OSHA, NTP); NOT LISTED (ACGIH).

Mutagenicity: Not applicable.

Tératogenicity: Not applicable.

Acute Effects: Solid form: No health hazards. Conditions and work practices, which generate dust or fumes, should be avoided or controlled. Zinc: Vapour inhalation (Oxides), probably formed when heated to temperatures near or above the boiling point, may cause metal fume fever, a delayed, generally benign, transient, reversible flu-like condition.

SECTION 4. FIRST AID MEASURES

Eye Contact: Not applicable
Skin Contact: Not applicable
Inhalation: Not applicable
Ingestion: Not applicable

SECTION 5. FIRE AND EXPLOSION DATA

Flash Point: Not applicable
Flammable Limits: Not applicable
Auto-Ignition Temperature: Not applicable
Products of Combustion: Zinc oxide
Fire Hazard: Not a fire hazard. Avoid melting moist metal.
Explosion Hazard: Not explosive (Mechanical impact; Static discharge).

Only DRY metal should be added to a molten bath: Preheated between 150°C and 300°C to eliminate water (porous material) and to reduce metal loss due to oxidation. Exposure to excessive moisture may result in water infiltration into metal cavities. When added to a molten bath, this could lead to bubbling and possibility of explosion if the water is trapped within the internal cavities. NEVER spray water on burning metal because of the risk of explosion which would splatter flaming particles of metal to great distances.

Fire Fighting (Instructions): NON-FLAMMABLE. Use fire fighting materials and procedures adapted to the immediate environment. Firefighters must wear full protective clothing and self-contained breathing apparatus (SCBA).
**SECTION 6. ACCIDENTAL RELEASE MEASURES**

**Spill**
Use appropriate tools to pile up blocks in a secure way. Use appropriate tools to put the spilled shots in a convenient recycling container.

**Personal Protection**
Safety glasses. Coveralls. Work gloves and boots.

**SECTION 7. HANDLING AND STORAGE**

**Handling**
DO NOT inhale dust and vapours. Follow good personal hygiene practices. Observe best foundry practices when storing, handling and processing this material.

**Storage**
Away: Moisture, incompatible substances (Acids).

**SECTION 8. ENGINEERING CONTROLS AND PERSONAL PROTECTION**

**Engineering Controls**
No special ventilation requirements

**Personal Protection**
Safety glasses. Coveralls. Work gloves and boots.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

**Physical State and Appearance**
Solid (Block)

**Molecular Weight**
65.37

**pH (1% soln/water)**
Not applicable

**Boiling Point**
908°C (1666.4°F)

**Melting Point**
420°C (788°F)

**Critical Temperature**
Not available

**Specific Gravity**
7.14 (Water = 1)

**Vapour Pressure**
1 mm Hg at 487°C

**Solubility**
No (Water, methanol, diethyl ether, n-octanol, acetone); Yes (Acid, alkali).

**Odour**
Odourless

**Taste**
Metallic

**Colour**
Greyish

**Vapour Density**
Not available

**% Moisture**
Not available

**Odour Threshold**
Not available

**Water/Oil Dist. Coeff.**
Insoluble (Water, oil)

**Ionicity (in Water)**
Not applicable

**Dispersion**
Not available

**SECTION 10. STABILITY AND REACTIVITY DATA**

**Stability**
Yes

**Conditions of Instability**
Not applicable

**Incompatibilities**
Zinc: With ammonium nitrate, barium dioxide, barium dinitrate, chlorates, chlorides, fluorides, chlorine trifluoride, chromic trioxide, hydrazine mononitrate, hydroxylamine, performic acid, potassium nitrate, dipotassium peroxyde, selenium, sodium peroxyde, tellurium, sulfur, sodium hydroxide, nitrobenzene, oxidants; Dust or very fine powder with water.

Zinc (Oxide): Violent reaction with: Magnesium. Reacts with hydrochloric acid to produce zinc chloride, with sulfuric acid to produce zinc sulfate. When heated to decomposition: Release of zinc oxide toxic fumes.

**Corrosivity**
None

**SECTION 11. TOXICOLOGICAL INFORMATION**

**Chronic Effects**
No known effects from chronic exposure.

**Toxicity**
Eating, drinking and smoking must be prohibited in areas where this material is handled and processed. Wash hands and face before eating, drinking and smoking.

**SECTION 12. ECOTOXICOLOGICAL INFORMATION**

**Ecotoxicity**
Zinc: Rainbow trout (LC50, 96h): 1.2 ppm; (LC50, 48 h): 4.76 ppm; Zebra fish (LC50, 48 h): 136 ppm.

**Toxicity to Animals**
Not available

**Biodegradation Products**
Not applicable

**Biodegradation Products (Toxicity)**
Not applicable

**Remarks on Environment**
No hazard for the environment

**BOD5 and COD**
Not available

**SECTION 13. DISPOSAL ARRANGEMENTS**

**Waste Disposal**
Recycle to process, if possible. Consult local or regional authorities.

**SECTION 14. TRANSPORT INFORMATION**

**TDG (Pictograms)**
Not regulated (Canada)

**PIN**
Not applicable

**Special Provisions (Transport)**
No additional remarks
SECTION 15. OTHER REGULATIONS

Labeling (EEC)

Zinc (Oxide): N Dangerous for the environment (Pictogram)
Annex I Index number: 030-013-00-7; EU Consolidated Inventories: EC Number 215-222-5
R: 50/53; S: 60, 61.

EU: Consolidated Inventories: Listed.
Zinc: EU Consolidated Inventories: EC Number 231-175-3
Not listed in the Annex I of Council Regulation No (EC) 304/2003
Not listed in a priority list (as foreseen under Council Regulation (EEC) No 793/93

Risk Phrases (EEC)
R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases (EEC)
S60- This material and/or its container must be disposed of as hazardous waste.
S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

CEPA DSL (CANADA)
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): On the Domestic Substances List (DSL); Acceptable for use under the provisions of CEPA

Regulation (U.S.A.)
CERCLA Section 103 Hazardous substances (40 CFR 302.4): Listed.
Zinc (Final RQ): *1 000 pounds (454 kg)
CERCLA Section 103 Hazardous substances (40 CFR 302.4); SARA Section 313, Toxic Chemicals (40 CFR 372.65): List.
Zinc (oxyde): no RQ is assigned to this generic or broad class, although the class is a CERCLA hazardous substance. See 50 Federal Register 13456 (April 4, 1985).

Zinc; Zinc (Oxide).
* No declaration required if the diameter of the piece of solid metal released is equal to or exceeds 100 micrometers (0.004 inches).

Classifications HCS (U.S.A.)
Not regulated

NFPA (National Fire Protection Association) (U.S.A.)

Fire Hazard 0  Reactivity 0  Health 0  Special Hazard

DOT (U.S.A.) (Pictograms)  DSCL (Europe) (Pictograms)  ADR (Europe) (Pictograms)

SECTION 16. OTHER INFORMATION

References
- ESIS: C&L (Classification and Labelling), substances or preparations in accordance with Directive 67/548/EEC (substances) and 1999/45/EC (preparations),
- ESIS: EINECS (European Inventory of Existing Commercial chemical Substances) O.J. C 146A, 15.6.1990
- Patty's Industrial Hygiene and Toxicology, 3rd Revised Edition
- Règlement sur les produits contrôlés (Canada)
- RTECS (2009). Registry of Toxic Effects of Chemical Substances, NIOSH, CDC
- Toxicologie industrielle & intoxication professionnelle, 3e édition, Lauwerys

Glossaire
CSST: Commission de la Santé et de la Sécurité du Travail (Québec).
HSDB: Hazardous Substances Data Bank.
IARC: International Agency for Research on Cancer.
NIOSH: National Institute of Occupational Safety and Health.
ZINC SKIMMING (BLOCK)

NTP : U.S. National Toxicology Program.
RTECS : Registry of Toxic Effects of Chemical Substances

Written by : Groupe STEM Consultants / Noranda Income Limited Partnership
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            Xstrata Canada, Queen’s Quay Terminal, 207 Queen’s Quay West, Suite 800, Toronto (Ontario), Canada M5J 1A7

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