

Lead Concentrate

SDS Preparation Date (mm/dd/yyyy): 03/29/2017

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SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

Product identifier used on the label

: **Lead Concentrate**

Product Code(s) : No information available.

Recommended use of the chemical and restrictions on use

: Raw material used for the production of lead.

Chemical family : Mixture of: Metal compounds; Minerals

Name, address, and telephone number of the supplier:

American Zinc Recycling

4955 Steubenville Pike, Suite 405
Pittsburgh, Pennsylvania, USA
15205

Supplier's Telephone # : (724) 773-2223

24 Hr. Emergency Tel # : Chemtrec 1-800-424-9300 (Within Continental U.S.); Chemtrec 703-527-3887 (Outside U.S.).

Name, address, and telephone number of the manufacturer:

Refer to supplier

SECTION 2. HAZARDS IDENTIFICATION

Classification of the chemical

White / grey powder. Odorless.

Most important hazards:

Harmful if swallowed or if inhaled. May cause serious eye damage. May cause respiratory irritation. Suspected of causing genetic defects. May cause cancer. May damage fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure. Occupational exposure to the substance or mixture may cause adverse effects. For further information, please refer to section 11 of the SDS.

Very toxic to aquatic life with long lasting effects. Avoid release to the environment. See Section 12 for more environmental information.

This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:

Acute toxicity - Category 4 (Oral; Inhalation)

Eye damage/irritation - Category 1

Germ cell mutagenicity - Category 2

Carcinogenicity - Category 1A

Reproductive toxicity - Category 1A

Specific target organ toxicity, single exposure - Category 3

Specific target organ toxicity, repeated exposure - Category 1

Label elements

Hazard pictogram(s)



Signal Word
DANGER!

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Hazard statement(s)

Harmful if swallowed or if inhaled.
Causes serious eye damage.
May cause respiratory irritation.
Suspected of causing genetic defects.
May cause cancer.
May damage fertility or the unborn child.
Causes damage to organs through prolonged or repeated exposure.

Precautionary statement(s)

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust or fume. Wash exposed skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area. Wear protective gloves/clothing and eye/face protection.

IF exposed or concerned: Get medical advice/attention.

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth.

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Dispose of contents/container in accordance with local regulation.

Other hazards

Other hazards which do not result in classification:

Inhalation of fumes may result in metal fume fever, a flu-like illness. May cause mild skin irritation. May cause gastrointestinal irritation.

Environmental precautions:

Very toxic to aquatic life with long lasting effects. Avoid release to the environment. See Section 12 for more environmental information.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Lead concentrate is a lead and zinc rich chloride/sulfate/oxide base raw material. Lead content is approximately 12 - 20%. This material contains the following components:

<u>Chemical name</u>	<u>Common name and synonyms</u>	<u>CAS #</u>	<u>Concentration (% by weight)</u>
Zinc sulfate	Sulfuric acid, zinc salt Zinc sulfate anhydrous	7733-02-0	12.0 - 20.0
Lead dichloride	Lead (II) chloride	7758-95-4	12.0 - 20.0
Zinc chloride	Zinc chloride, anhydrous	7646-85-7	10.0 - 15.0
Zinc oxide	Zinc monoxide	1314-13-2	3.0 - 5.0
Cadmium oxide	Cadmium monoxide	1306-19-0	0.5 - 5.0
Lead sulfate	Lead (II) sulfate	7446-14-2	3.0 - 5.0
Potassium fluoride	Potassium fluoride anhydrous	7789-23-3	1.0 - 3.0
Sodium fluoride	Sodium monofluoride	7681-49-4	0.5 - 1.5
Lead fluoride	Lead (II) fluoride	7783-46-2	0.2 - 0.5

The % concentrations for the above listed chemicals will vary from batch to batch. Concentrations listed represent the actual concentration range for each chemical.

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SECTION 4. FIRST-AID MEASURES

Description of first aid measures

- Ingestion* : IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth. Do NOT induce vomiting. Never give anything by mouth to an unconscious person.
- Inhalation* : IF INHALED: Remove person to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen by qualified medical personnel only. If breathing is irregular or stopped, administer artificial respiration. Call a POISON CENTER or doctor/physician if you feel unwell.
- Skin contact* : For skin contact, wash with soap and water while removing contaminated clothing. If exposed or concerned: Get medical advice/attention. Launder contaminated clothing before reuse, or discard.
- Eye contact* : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Flush eyes with water for at least 15 minutes. Immediately call a POISON CENTER or doctor/physician.

Most important symptoms and effects, both acute and delayed

- : Harmful if swallowed or if inhaled. Inhalation can cause severe respiratory irritation. Higher concentrations could cause inflammation of the lung tissue (chemical pneumonitis), chemical bronchitis with severe asthma-like wheezing, severe coughing spasms and accumulation of fluid in the lungs (pulmonary edema). Symptoms of pulmonary edema (chest pain, shortness of breath) may be delayed. Ingestion of large doses can cause anemia and stomach symptoms with nausea, vomiting, abdominal pain, diarrhea and, in severe cases, vomiting of blood.
- Causes serious eye damage. Symptoms may include severe pain, tearing, redness, swelling and blurred vision. May cause irreversible eye damage.
- Suspected of causing genetic defects.
- May cause cancer. Symptoms may include persistent coughing, shortness of breath, coughing up blood and wheezing.
- May damage fertility or the unborn child. Effects of excessive exposures may include: Deformity; Delayed development; Functional disorders in fetus; Sterility; Reduced fertility; Menstruation disorders.
- Causes damage to organs through prolonged or repeated exposure. Lead accumulates in body tissues and prolonged overexposure to even low levels may eventually result in lead toxicity syndrome which may result in permanent damage or death. Lead poisoning is characterized by a metallic taste in the mouth, loss of appetite, indigestion, nausea, vomiting, constipation, abdominal cramps, disturbance of rest and sleep, and weakness. Lead may damage kidney function, the blood forming system and the reproductive system. Evidence from experimental animal systems indicates a potential neurotoxic hazard for cadmium. Heavy exposure to Cadmium has been associated with olfactory impairment. Studies performed on a limited number of occupationally-exposed subjects are suggestive of an effect of Cadmium on the peripheral and central nervous systems.
- Inhalation of fumes may result in metal fume fever, a flu-like illness. Symptoms of metal fume fever may include fever, fatigue, vomiting, muscle aches and shortness of breath.

Indication of any immediate medical attention and special treatment needed

- : Immediate medical attention is required. Causes serious eye damage. Provide general supportive measures and treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing media

- Suitable extinguishing media* : Use media suitable to the surrounding fire such as water fog or fine spray, alcohol foams, carbon dioxide and dry chemical.
- Unsuitable extinguishing media* : None known.

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Special hazards arising from the substance or mixture / Conditions of flammability

- : The product itself does not burn.

Flammability classification (OSHA 29 CFR 1910.106)

- : Not classified as flammable.

Hazardous combustion products

- : May produce the following hazardous combustion or decomposition products when exposed to extreme heat: Metal oxides; Hydrogen chloride; Chlorine; Hydrogen fluoride; Other irritating fumes and smoke.

Special protective equipment and precautions for firefighters

Protective equipment for fire-fighters

- : Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Firefighters should wear proper protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode.

Special fire-fighting procedures

- : Move containers from fire area if safe to do so. Use water spray to cool unopened containers. Do not allow run-off from fire fighting to enter drains or water courses. Dike for water control.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

- : All persons dealing with the clean-up should wear the appropriate personal protective equipment. Keep people away from and upwind of spill/leak. Restrict access to area until completion of clean-up. Refer to protective measures listed in sections 7 and 8.

Environmental precautions

- : Prevent product from entering drains, sewers, waterways and soil. Discharge into the environment must be avoided.

Methods and material for containment and cleaning up

- : Ventilate the area. Prevent further leakage or spillage if safe to do so. Clean up promptly by sweeping or vacuum. Avoid dust formation. Keep in properly labelled containers. Refer to Section 13 for disposal of contaminated material. Contact the proper local authorities.

Special spill response procedures

- : If a spill/release in excess of the EPA reportable quantity is made into the environment, immediately notify the national response center in the United States (phone: 1-800-424-8802).
US CERCLA Reportable quantity (RQ): Zinc sulfate (1000 lbs / 454 kg); Lead dichloride (10 lbs / 4.54 kg); Zinc chloride (1000 lbs / 454 kg); Lead sulfate (10 lbs / 4.54 kg); Sodium fluoride (1000 lbs / 454 kg); Lead fluoride (10 lbs / 4.54 kg)

In Canada: Contact appropriate local and provincial environmental authorities for assistance and/or reporting requirements.

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling

- : Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
Use only outdoors or in a well-ventilated area. Wear suitable protective equipment during handling. Wear protective gloves/clothing and eye/face protection. Do not breathe dust or fume. Avoid contact with skin, eyes and clothing. Keep away from heat. Avoid contact with incompatible materials. Avoid and control operations which create high vapor or dust concentrations. Wash thoroughly after handling. Keep container tightly closed when not in use.

Conditions for safe storage

- : Store in a cool, well-ventilated area. Inspect periodically for damage or leaks. Store away from incompatible materials. Storage area should be clearly identified, clear of obstruction and accessible only to trained and authorized personnel. Store locked up.

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Incompatible materials : Strong oxidizing agents; Strong acids; Strong bases

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<u>Chemical Name</u>	<u>ACGIH TLV</u>		<u>OSHA PEL</u>	
	<u>TWA</u>	<u>STEL</u>	<u>PEL</u>	<u>STEL</u>
	Zinc sulfate	N/Av	N/Av	N/Av
Lead dichloride	0.05 mg/m ³ (as Pb)	N/Av	50 µg/m ³ (as Pb)	N/Av
Zinc chloride	1 mg/m ³ (fume)	2 mg/m ³ (fume)	1 mg/m ³ (fume)	N/Av
Zinc oxide	2 mg/m ³ (respirable)	10 mg/m ³ (respirable)	5 mg/m ³ (fume); 15 mg/m ³ (total dust); 5 mg/m ³ (respirable)	N/Av
Cadmium oxide	0.01 mg/m ³ ; 0.002 mg/m ³ (respirable particles)	N/Av	5 µg/m ³ (as Cd)	N/Av
Lead sulfate	0.05 mg/m ³ (as Pb)	N/Av	50 µg/m ³ (as Pb)	N/Av
Potassium fluoride	2.5 mg/m ³ (as 'Fluoride')	N/Av	2 mg/m ³ (as 'Fluoride')	N/Av
Sodium fluoride	2.5 mg/m ³ (as 'Fluoride')	N/Av	2.5 mg/m ³ (as 'Fluoride')	N/Av
Lead fluoride	0.05 mg/m ³ (as Pb)	N/Av	50 µg/m ³ (as Pb)	N/Av

Exposure controls

Ventilation and engineering measures

- : Use only outdoors or in a well-ventilated area. Apply technical measures to comply with the occupational exposure limits. Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction. In case of insufficient ventilation wear suitable respiratory equipment.

Respiratory protection

- : Use a NIOSH approved full-face respirator if dust levels exceed exposure limits. Respirators should be selected based on the form and concentration of contaminants in air, and in accordance with OSHA (29 CFR 1910.134) or CSA Z94.4-02. Advice should be sought from respiratory protection specialists.

Skin protection

- : Wear protective gloves/clothing. The suitability for a specific workplace should be discussed with the producers of the protective gloves. Wear resistant clothing and boots.

Eye / face protection

- : Wear eye/face protection. Use of a NIOSH approved full-face respirator will provide suitable protection.

Other protective equipment

- : Ensure that eyewash stations and safety showers are close to the workstation location. Other equipment may be required depending on workplace standards.

General hygiene considerations

- : Do not breathe dust or fume. Avoid contact with skin, eyes and clothing. Do not eat, drink or smoke when using this product. Wash hands and face before breaks and immediately after handling the product. Wash contaminated clothing before reuse. Handle in accordance with good industrial hygiene and safety practice.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : White / grey powder.
Odor : Odorless.

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Odor threshold : N/Av
pH : 6 - 6.5 (as aqueous solution)
Melting/Freezing point : N/Av
Initial boiling point and boiling range
: > 732°C (1350°F) (based on ingredients)
Flash point : N/Av
Flashpoint (Method) : N/Av
Evaporation rate (BuAe = 1) : N/Av
Flammability (solid, gas) : The product is not flammable.
Lower flammable limit (% by vol.)
: N/Av
Upper flammable limit (% by vol.)
: N/Av
Oxidizing properties : None known.
Explosive properties : Not explosive
Vapor pressure : N/Av
Vapor density : N/Av
Relative density / Specific gravity
: 3 - 3.5
Solubility in water : 50% soluble in water
Other solubility(ies) : N/Av
Partition coefficient: n-octanol/water or Coefficient of water/oil distribution
: N/Av
Auto-ignition temperature : N/Av
Decomposition temperature : N/Av
Viscosity : N/Av
Volatiles (% by weight) : N/Av
Volatile organic Compounds (VOC's)
: N/Av
Absolute pressure of container
: N/Av
Flame projection length : N/Av
Other physical/chemical comments
: No additional information.

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Not normally reactive.
Chemical stability : Stable under normal conditions.
Possibility of hazardous reactions
: Hazardous polymerization does not occur.
Conditions to avoid : Do not use in areas without adequate ventilation. Avoid contact with incompatible materials.
Incompatible materials : Strong oxidizing agents; Strong acids; Strong bases
Hazardous decomposition products
: None known, refer to hazardous combustion products in section 5.

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SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure:

Routes of entry inhalation : YES

Routes of entry skin & eye : YES

Routes of entry Ingestion : YES

Routes of exposure skin absorption
: NO

Potential Health Effects:

Signs and symptoms of short-term (acute) exposure

Sign and symptoms Inhalation

- : Harmful if inhaled. Can cause severe respiratory irritation. Higher concentrations could cause inflammation of the lung tissue (chemical pneumonitis), chemical bronchitis with severe asthma-like wheezing, severe coughing spasms and accumulation of fluid in the lungs (pulmonary edema). Symptoms of pulmonary edema (chest pain, shortness of breath) may be delayed. Inhalation of fumes may result in metal fume fever, a flu-like illness. Symptoms of metal fume fever may include fever, fatigue, vomiting, muscle aches and shortness of breath.

Sign and symptoms ingestion

- : Harmful if swallowed. Ingestion of large doses can cause anemia and stomach symptoms with nausea, vomiting, abdominal pain, diarrhea and, in severe cases, vomiting of blood.

Sign and symptoms skin

- : Direct skin contact may result in little or no irritation.

Sign and symptoms eyes

- : Direct eye contact may produce severe irritation with possible eye damage. Prolonged exposure may cause eye damage. Symptoms may include stinging, tearing, redness, swelling and blurred vision. May cause irreversible eye damage.

Potential Chronic Health Effects

- : Pneumoconiosis, or "dusty lung" disease, may result from chronic exposure to any dust. Repeated or prolonged inhalation of fine dusts may cause an increase in mucous production. This product contains a lead and/or lead compounds. Overexposure to lead dust and fumes adversely affects blood and blood forming tissues, kidneys, liver and the central/peripheral nervous systems and male/female reproductive organs.

Mutagenicity

- : This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Germ cell mutagenicity - Category 2. Suspected of causing genetic defects.
Contains: lead compounds; Cadmium compounds.
Lead is known to cause mutations in both non-reproductive (somatic) cells and reproductive (germ) cells.
Cadmium may cause irreversible effects in non-reproductive (somatic) cells, based on animal data.

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Carcinogenicity

- : This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Carcinogenicity - Category 1A. May cause cancer. Symptoms may include persistent coughing, shortness of breath, coughing up blood and wheezing.
Contains: lead compounds; Cadmium compounds.
Lead is classified as possibly carcinogenic by IARC (Group 2A), the ACGIH (Category A3), the NTP (reasonably anticipated) and OSHA.
Cadmium and Cadmium compounds are classified as carcinogenic by IARC (Group 1), the ACGIH (Category A2), the NTP (Known human carcinogen) and OSHA.

Reproductive effects & Teratogenicity

- : This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Reproductive toxicant: Category 1A. May damage fertility or the unborn child. Effects of excessive exposures may include: Deformity; Delayed development; Functional disorders in fetus; Sterility; Reduced fertility; Menstruation disorders.
Contains: lead compounds; Cadmium compounds.
Lead compounds are known to cause certain reproductive effects in both males and females. Lead compounds are known to cause embryotoxicity.
Cadmium and Cadmium compounds are known to cause reproductive effects in both males and females based on animal studies.

Sensitization to material

- : Not expected to be a skin or respiratory sensitizer.

Specific target organ effects

- : This material is classified as hazardous under U.S. OSHA regulations (29CFR 1910.1200) (Hazcom 2012) and Canadian WHMIS regulations (Hazardous Products Regulations) (WHMIS 2015). Classification:
Specific target organ toxicity, single exposure - Category 3. May cause respiratory irritation.

Specific target organ toxicity, repeated exposure - Category 1. Causes damage to organs through prolonged or repeated exposure.
Contains: lead and lead compounds; Cadmium compounds.
Lead accumulates in body tissues and prolonged overexposure to even low levels may eventually result in lead toxicity syndrome which may result in permanent damage or death. Lead poisoning is characterized by a metallic taste in the mouth, loss of appetite, indigestion, nausea, vomiting, constipation, abdominal cramps, disturbance of rest and sleep, and weakness. Lead may damage kidney function, the blood forming system and the reproductive system.
Evidence from experimental animal systems indicates a potential neurotoxic hazard for cadmium. Heavy exposure to Cadmium has been associated with olfactory impairment. Studies performed on a limited number of occupationally-exposed subjects are suggestive of an effect of Cadmium on the peripheral and central nervous systems.

Medical conditions aggravated by overexposure

- : Pre-existing skin, eye, respiratory and central nervous system disorders.

Synergistic materials

- : None known or reported by the manufacturer.

Toxicological data

- : No data is available on the product itself. The calculated ATE values for this mixture are:
ATE oral = 669.2 mg/kg
ATE inhalation (dust/mist) = 2.33 mg/L/4H

See below for individual ingredient acute toxicity data.

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<u>Chemical name</u>	<u>LC₅₀ (4hr)</u> <u>inh, rat</u>	<u>LD₅₀</u>	
		<u>(Oral, rat)</u>	<u>(Rabbit, dermal)</u>
Zinc sulfate	N/Av	1710 mg/kg	> 2000 mg/kg (No mortality)
Lead dichloride	> 5.05 mg/L (dust) (No mortality)	> 1947 mg/kg (No mortality)	> 2000 mg/kg (No mortality)
Zinc chloride	N/Av	1100 mg/kg	> 2000 mg/kg (No mortality)
Zinc oxide	> 5.7 mg/L (dust) (No mortality)	> 5000 mg/kg	> 2000 mg/kg (No mortality)
Cadmium oxide	0.125 mg/L (dust) (mouse) 0.01 - 0.0125 mg/L (fumes) (rat)	72 mg/kg	N/Av
Lead sulfate	> 5.05 mg/L (dust) (No mortality)	> 2000 mg/kg (No mortality)	> 2000 mg/kg (No mortality)
Potassium fluoride	1 mg/L (dust)	148.5 mg/kg	> 2000 mg/kg (No mortality)
Sodium fluoride	N/Av	69 - 223 mg/kg	> 2000 mg/kg
Lead fluoride	> 5.05 mg/L (dust) (No mortality) The estimated human lethal dose is: 1.344 mg/L (Read-across) (lead conversion)	3031 mg/kg (rat) The estimated human lethal dose is: 714 mg/kg (Read-across)	> 2000 mg/kg (No mortality)

Other important toxicological hazards

: None known or reported by the manufacturer.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

: Very toxic to aquatic life with long lasting effects. The product should not be allowed to enter drains or water courses, or be deposited where it can affect ground or surface waters. The product contains the following substances which are hazardous for the environment: Zinc sulfate; Lead dichloride; Zinc chloride; Zinc oxide; Cadmium oxide; Lead sulfate; Lead fluoride.

See the following tables for individual ingredient ecotoxicity data.

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Ecotoxicity data:

<u>Ingredients</u>	CAS No	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
Zinc sulfate	7733-02-0	0.169 mg/L (dissolved zinc) (Rainbow trout)	0.025 mg/L/25 days (dissolved zinc)	1
Lead dichloride	7758-95-4	0.108 mg/L (Fathead minnow) (Read-across)	0.00565 mg/L Lepidomeda vittatus (Little Colorado spinedace) (Read-across)	10
Zinc chloride	7646-85-7	0.33 - 0.78 mg/L (Fathead minnow) (dissolved zinc)	0.039 - 0.974 mg/L (30 days) (Rainbow trout) (dissolved zinc)	1
Zinc oxide	1314-13-2	1.1 mg/L (Rainbow trout)	N/Av	None.
Cadmium oxide	1306-19-0	4.48 mg/L (Channel catfish (Read-across)	0.0013 mg/L (Rainbow trout) (Read-across)	10
Lead sulfate	7446-14-2	0.75 mg/L Cynoglossus joyneri (Red Tongue Sole) (dissolved lead)	N/Av	1
Potassium fluoride	7789-23-3	51 - 340 mg/L (Weight of Evidence)	4 mg/L (Rainbow trout)	None.
Sodium fluoride	7681-49-4	317 mg/L (Rainbow trout)	4 mg/L	None.
Lead fluoride	7783-46-2	0.108 mg/L (Fathead minnow) (dissolved lead) (Read-across)	0.00565 mg/L Lepidomeda vittatus (Little Colorado spinedace) (dissolved lead) (Read-across)	1

<u>Ingredients</u>	CAS No	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
Zinc sulfate	7733-02-0	0.131 mg/L (dissolved zinc) (Daphnia magna)	0.1 mg/L (dissolved zinc)	1
Lead dichloride	7758-95-4	0.0736 mg/L Ceriodaphnia (water flea) (Read-across)	0.0195 mg/L (Daphnia magna) (Read-across)	10
Zinc chloride	7646-85-7	0.67 mg/L (Daphnia magna) (dissolved zinc)	0.048 - 0.156 mg/L	1
Zinc oxide	1314-13-2	0.098 mg/L (Daphnia magna)	N/Av	10
Cadmium oxide	1306-19-0	0.042 mg/L Daphnia pulex (Water flea) (Read-across)	N/Av	10
Lead sulfate	7446-14-2	0.392 mg/L (Daphnia magna) (dissolved lead)	N/Av	1
Potassium fluoride	7789-23-3	97 mg/L (Daphnia magna)	3.7 - 14.1 mg/L	None.
Sodium fluoride	7681-49-4	97 - 270 mg/L (Daphnia magna)	3.7 mg/L	None.
Lead fluoride	7783-46-2	0.0736 mg/L Ceriodaphnia (water flea) (dissolved lead) (Read-across)	0.0195 mg/L (Daphnia magna) (dissolved lead) (Read-across)	10

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<u>Ingredients</u>	CAS No	<u>Toxicity to Algae</u>		
		<u>EC50 / 96h or 72h</u>	<u>NOEC / 96h or 72h</u>	<u>M Factor</u>
Zinc sulfate	7733-02-0	0.136 mg/L/72hr (dissolved zinc) (Green algae)	0.024 mg/L/72hr (dissolved zinc)	1
Lead dichloride	7758-95-4	0.084 mg/L/72hr (Green algae)	0.0227 mg/L/96hr (Skeletonema costatum) (Read-across)	10
Zinc chloride	7646-85-7	0.136 mg/L/72hr (Green algae) (dissolved zinc)	0.0049 - 0.124 mg/L/72hr	10
Zinc oxide	1314-13-2	0.044 mg/L/72hr (Green algae)	N/Av	10
Cadmium oxide	1306-19-0	0.09 mg/L/72hr (Green algae)	N/Av	10
Lead sulfate	7446-14-2	N/Av	N/Av	None.
Potassium fluoride	7789-23-3	43 - 122 mg/L/96hr (Green algae)	249 mg/L/96hr	None.
Sodium fluoride	7681-49-4	43 - 122 mg/L/96hr (Green algae)	N/Av	None.
Lead fluoride	7783-46-2	0.0231 mg/L/72hr (Green algae) (dissolved lead) (Read-across)	0.0227 mg/L/96hr (Skeletonema costatum) (dissolved lead) (Read-across)	10

Persistence and degradability

: No data is available on the product itself. Biodegradation is not applicable to inorganic substances.

Bioaccumulation potential

: No data is available on the product itself. See the following data for ingredient information.

<u>Components</u>	<u>Partition coefficient n-octanol/water (log Kow)</u>	<u>Bioconcentration factor (BCF)</u>
Zinc sulfate (CAS 7733-02-0)	- 0.07 (estimated)	28.3 - 96.05 (Zebra fish)
Zinc chloride (CAS 7646-85-7)	0.15 (estimated)	0.4 - 7.51 (Channa punctatus/spotted snakehead fish)
Zinc oxide (CAS 1314-13-2)	- 1.53 (estimated)	N/Av
Potassium fluoride (CAS 7789-23-3)	0.77 (estimated)	N/Av
Sodium fluoride (CAS 7681-49-4)	N/Av	2.3

Mobility in soil

: No data is available on the product itself.

Other Adverse Environmental effects

: No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

SECTION 13. DISPOSAL CONSIDERATIONS

Handling for Disposal

: Handle in accordance with good industrial hygiene and safety practice. Refer to protective measures listed in sections 7 and 8. Empty containers retain residue and can be dangerous.

Methods of Disposal

: Dispose in accordance with all applicable federal, state, provincial and local regulations.

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RCRA : If this product, as supplied, becomes a waste in the United States, it may meet the criteria of a hazardous waste as defined under RCRA, Title 40 CFR 261. It is the responsibility of the waste generator to determine the proper waste identification and disposal method. For disposal of unused or waste material, check with local, state and federal environmental agencies.

SECTION 14. TRANSPORTATION INFORMATION

Regulatory Information	UN Number	UN proper shipping name	Transport hazard class(es)	Packing Group	Label
49CFR/DOT	UN3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead chloride; Zinc oxide)	9	III	 
49CFR/DOT Additional information	May be shipped as Limited Quantity when transported in containers no larger than 5.0 kg; in packages not exceeding 30 kg gross mass. The 'Environmentally hazardous' mark must appear on packagings holding more than 5 kg of the material.				
TDG	UN3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead chloride; Zinc oxide)	9	III	 
TDG Additional information	May be shipped as Limited Quantity when transported in containers no larger than 5.0 kg; in packages not exceeding 30 kg gross mass. The 'Environmentally hazardous' mark must appear on packagings holding more than 5 kg of the material.				
ICAO/IATA	UN3077	Environmentally hazardous substance, solid, n.o.s. (Lead chloride; Zinc oxide)	9	III	 
ICAO/IATA Additional information	Refer to the appropriate Packing Instruction, prior to shipping this material. Review all State and Operator Variations, prior to shipping this material.				
IMDG	UN3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead chloride; Zinc oxide)	9	III	 
IMDG Additional information	May be shipped as Limited Quantity when transported in containers no larger than 5.0 kg; in packages not exceeding 30 kg gross mass. The 'Environmentally hazardous' mark must appear on packagings holding more than 5 kg of the material.				

Special precautions for user : Avoid and control operations which create dust. Avoid release to the environment.

Environmental hazards : This product meets the criteria for an environmentally hazardous material according to the IMDG Code. See ECOLOGICAL INFORMATION, Section 12.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

: This information is not available.

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SECTION 15 - REGULATORY INFORMATION

US Federal Information:

Components listed below are present on the following U.S. Federal chemical lists:

<u>Ingredients</u>	CAS #	TSCA Inventory	CERCLA Reportable Quantity(RQ) (40 CFR 117.302):	SARA TITLE III: Sec. 302, Extremely Hazardous Substance, 40 CFR 355:	SARA TITLE III: Sec. 313, 40 CFR 372, Specific Toxic Chemical	
					Toxic Chemical	de minimus Concentration
Zinc sulfate	7733-02-0	Yes	1000 lb/ 454 kg	None.	Yes	1%
Lead dichloride	7758-95-4	Yes	10 lb/ 4.54 kg	None.	Yes	0.1%
Zinc chloride	7646-85-7	Yes	1000 lb/ 454 kg	None.	Yes	1%
Zinc oxide	1314-13-2	Yes	None.	None.	Yes	1%
Cadmium oxide	1306-19-0	Yes	None.	100 lbs	Yes	0.1%
Lead sulfate	7446-14-2	Yes	10 lb/ 4.54 kg	None.	Yes	0.1%
Potassium fluoride	7789-23-3	Yes	None.	None.	No	N/Ap
Sodium fluoride	7681-49-4	Yes	1000 lb/ 454 kg	None.	No	N/Ap
Lead fluoride	7783-46-2	Yes	10 lb/ 4.54 kg	None.	Yes	0.1%

SARA TITLE III: Sec. 311 and 312, SDS Requirements, 40 CFR 370 Hazard Classes: Health hazards (Acute toxicity - Oral / Inhalation; Serious eye damage; Carcinogenicity; Reproductive toxicity; Germ cell mutagenicity; Specific target organ toxicity, single exposure; Specific target organ toxicity, repeated exposure). Under SARA Sections 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

US State Right to Know Laws:

The following chemicals are specifically listed by individual States:

<u>Ingredients</u>	CAS #	California Proposition 65		State "Right to Know" Lists					
		Listed	Type of Toxicity	CA	MA	MN	NJ	PA	RI
Zinc sulfate	7733-02-0	No	N/Ap	Yes	Yes	No	Yes	Yes	No
Lead dichloride	7758-95-4	Yes	Cancer; Developmental; male; female	Yes	Yes	No	Yes	Yes	No
Zinc chloride	7646-85-7	No	N/Ap	Yes	Yes	Yes	Yes	Yes	Yes
Zinc oxide	1314-13-2	No	N/Ap	Yes	Yes	Yes	Yes	Yes	Yes
Cadmium oxide	1306-19-0	Yes	Cancer; Developmental; male	Yes	Yes	Yes	Yes	Yes	Yes
Lead sulfate	7446-14-2	Yes	Cancer; Developmental; male; female	Yes	Yes	No	Yes	Yes	No
Potassium fluoride	7789-23-3	No	N/Ap	No	No	No	Yes	No	No
Sodium fluoride	7681-49-4	No	N/Ap	Yes	Yes	No	Yes	Yes	Yes
Lead fluoride	7783-46-2	Yes	Cancer; Developmental; male; female	Yes	Yes	No	Yes	Yes	No

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Canadian Information:

Canadian Environmental Protection Act (CEPA) information: All ingredients listed appear on the Domestic Substances List (DSL).

Canadian National Pollutant Release Inventory (NPRI): This product contains the following substances listed on the NPRI:
 lead compounds (Part 1, Group B Substance)
 Cadmium compounds (Part 1, Group B Substance)
 Sodium fluoride (Part 1, Group A Substance)

WHMIS information: Refer to Section 2 for a WHMIS Classification for this product.

International Information:

Components listed below are present on the following International Inventory list:

<u>Ingredients</u>	<u>CAS #</u>	<u>European EINECS</u>	<u>Australia AICS</u>	<u>Philippines PICCS</u>	<u>Japan ENCS</u>	<u>Korea KECI/KECL</u>	<u>China IECSC</u>	<u>New Zealand IOC</u>
Zinc sulfate	7733-02-0	231-793-3	Present	Present	(1)-542	KE-35582	Present	HSR003279
Lead dichloride	7758-95-4	231-845-5	Present	Present	(1)-252	KE-21901	Present	HSR005167
Zinc chloride	7646-85-7	231-592-0	Present	Present	(1)-264	KE-35535	Present	HSR001554
Zinc oxide	1314-13-2	215-222-5	Present	Present	(1)-561	KE-35565	Present	HSR003104
Cadmium oxide	1306-19-0	215-146-2	Present	Present	(1)-202	KE-04417	Present	HSR004390
Lead sulfate	7446-14-2	231-198-9	Present	Present	(1)-532; (1)-531; (1)-428	KE-21942	Present	HSR007365
Potassium fluoride	7789-23-3	232-151-5	Present	Present	(1)-322	KE-29114	Present	HSR006970
Sodium fluoride	7681-49-4	231-667-8	Present	Present	(1)-332; (1)-314	KE-31540	Present	HSR003112
Lead fluoride	7783-46-2	231-998-8	Present	Present	(1)-337	KE-21903	Present	HSR005168

SECTION 16. OTHER INFORMATION

Legend

- : ACGIH: American Conference of Governmental Industrial Hygienists
- CA: California
- CAS: Chemical Abstract Services
- CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act of 1980
- CFR: Code of Federal Regulations
- CSA: Canadian Standards Association
- DOT: Department of Transportation
- EC50: Effective Concentration 50%
- EINECS: European Inventory of Existing Commercial chemical Substances
- ENCS: Existing and New Chemical Substances
- EPA: Environmental Protection Agency
- HSDB: Hazardous Substances Data Bank
- IARC: International Agency for Research on Cancer
- IATA: International Air Transport Association
- IBC: Intermediate Bulk Container
- ICAO: International Civil Aviation Organisation
- IECSC: Inventory of Existing Chemical Substances
- IMDG: International Maritime Dangerous Goods
- Inh: Inhalation
- IOC: Inventory of Chemicals
- ISHL: Industrial Safety Health Law

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KECI: Korean Existing Chemicals Inventory
KECL: Korean Existing Chemicals List
LC: Lethal Concentration
LD: Lethal Dose
MA: Massachusetts
MN: Minnesota
N/Av: Not Applicable
N/Av: Not Available
NIOSH: National Institute of Occupational Safety and Health
NJ: New Jersey
NOEC: No observable effect concentration
NTP: National Toxicology Program
OECD: Organisation for Economic Co-operation and Development
OSHA: Occupational Safety and Health Administration
PA: Pennsylvania
PEL: Permissible exposure limit
PICCS: Philippine Inventory of Chemicals and Chemical Substances
QSAR: Quantitative structure-activity relationship
RCRA: Resource Conservation and Recovery Act
RI: Rhode Island
RTECS: Registry of Toxic Effects of Chemical Substances
SARA: Superfund Amendments and Reauthorization Act
SCBA: Self-Contained Breathing Apparatus
SDS: Safety Data Sheet
STEL: Short Term Exposure Limit
TDG: Canadian Transportation of Dangerous Goods Act & Regulations
TSCA: Toxic Substance Control Act
TWA: Time Weighted Average
WHMIS: Workplace Hazardous Materials Identification System

References

- : 1. ACGIH, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices for 2016.
- 2. International Agency for Research on Cancer Monographs, searched 2017.
- 3. Canadian Centre for Occupational Health and Safety, CCIInfoWeb databases, 2017 (Chempendium, HSDB and RTECs).
- 4. US EPA Title III List of Lists - March 2015 version.
- 6. California Proposition 65 List - January 27, 2017 version.
- 7. OECD - The Global Portal to Information on Chemical Substances - eChemPortal, 2017.

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Other special considerations for handling

: Provide adequate information, instruction and training for operators.

<p>Prepared for: American Zinc Recycling 4955 Steubenville Pike, Suite 405 Pittsburgh, Pennsylvania, USA, 15205 Telephone: (724) 773-2223 Website: http://azr.com/american-zinc Direct all enquiries to: American Zinc Recycling.</p>	
<p>Prepared by: ICC The Compliance Center Inc. Telephone: (888) 442-9628 (U.S.): (888) 977-4834 (Canada) http://www.thecompliancecenter.com</p>	

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