

Lead Concentrate

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

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SAFETY DATA SHEET

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006, as amended.

SECTION 1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

- 1.1 Product identifier** : **Lead Concentrate**
Product Code(s) : No information available.
- 1.2 Relevant identified uses of the substance or mixture and uses advised against**
: Raw material used for the production of lead.
Use pattern: professional use
Restricted to professional users.
- 1.3 Details of the supplier of the safety data sheet:**
American Zinc Recycling
4955 Steubenville Pike, Suite 405
Pittsburgh, Pennsylvania, USA
15205
Telephone : +1 (724) 773 2223
- 1.4 Emergency Telephone Number**
: +1 (703) 527-3887 (Chemtrec)

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

White / grey powder. Odourless.

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 mixture is classified as hazardous in accordance with Regulation (EC) No 1272/2008. Classification:

Acute toxicity - Category 4; H302
Acute toxicity - Category 4; H332
Eye damage/irritation - Category 1; H318
Germ cell mutagenicity - Category 2; H341
Carcinogenicity - Category 1B; H350
Reproductive toxicity - Category 1A; H360Df
Specific target organ toxicity, single exposure - Category 3; H335
Specific target organ toxicity, repeated exposure - Category 2; H373
Acute aquatic toxicity - Category 1; H400
Chronic aquatic toxicity - Category 1; H410

2.2 Label elements

Hazard pictogram(s)



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Hazardous components which must be listed on the label:

Zinc sulphate (anhydrous); Lead dichloride; Zinc chloride; Cadmium oxide

Signal word:

DANGER!

Restricted to professional users.

Hazard statements:

H302 + H332 - Harmful if swallowed or if inhaled.

H318 - Causes serious eye damage.

H335 - May cause respiratory irritation.

H341 - Suspected of causing genetic defects.

H350 - May cause cancer.

H360Df - May damage the unborn child. Suspected of damaging fertility.

H373 - May cause damage to organs through prolonged or repeated exposure.

H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements:

P201 - Obtain special instructions before use.

P260 - Do not breathe dust or fumes.

P280 - Wear protective gloves/clothing and eye/face protection.

P308 + P313 - IF exposed or concerned: Get medical advice/attention.

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 - Immediately call a POISON CENTER or doctor/physician.

P501 - Dispose of contents/container in accordance with local regulation.

2.3 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.

PBT assessment:

This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable

3.2 Mixtures

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:

Chemical name	CAS #	EC No.	Concentration	CLP Classification
Zinc sulphate (anhydrous)	7733-02-0	231-793-3	12.0 - 20.0	*Acute Tox. 4; H302 Eye Dam. 1; H318 Aquatic Acute 1; H400 Aquatic Chronic 1; H410
Lead dichloride	7758-95-4	231-845-5	12.0 - 20.0	*Acute Tox. 4; H302 *Acute Tox. 4; H332 Repr. 1A; H360Df STOT RE 2; H373 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 (listed under 'Lead compounds')
Zinc chloride	7646-85-7	231-592-0	10.0 - 15.0	*Acute Tox. 4; H302 Skin Corr. 1B; H314 Aquatic Acute 1; H400 Aquatic Chronic 1; H410

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Zinc oxide	1314-13-2	215-222-5	3.0 - 5.0	Aquatic Acute 1; H400 Aquatic Chronic 1; H410
Cadmium oxide	1306-19-0	215-146-2	0.5 - 5.0	*Acute Tox. 2; H330 Muta. 2; H341 Carc. 1B; H350 Repr. 2; H361fd STOT RE 1; H372 Aquatic Acute 1; H400 Aquatic Chronic 1; H410
Lead sulphate	7446-14-2	231-198-9	3.0 - 5.0	*Acute Tox. 4; H302 *Acute Tox. 4; H332 Repr. 1A; H360Df Aquatic Acute 1; H400 Aquatic Chronic 1; H410 (listed under 'Lead compounds')
Potassium fluoride	7789-23-3	232-151-5	1.0 - 3.0	*Acute Tox. 3; H301 *Acute Tox. 3; H311 *Acute Tox. 3; H331
Sodium fluoride	7681-49-4	231-667-8	0.5 - 1.5	*Acute Tox. 3; H301 Skin Irrit. 2; H315 Eye Irrit. 2; H319 EUH032
Cupric oxide	1317-38-0	215-269-1	0.1 - 0.5	Aquatic Acute 1; H400 Aquatic Chronic 1; H410 (self classified)
Lead fluoride	7783-46-2	231-998-8	0.2 - 0.5	*Acute Tox. 4; H302 *Acute Tox. 4; H332 Repr. 1A; H360Df STOT RE 2; H373 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 (listed under 'Lead compounds')

*The above CLP Acute toxicity Classifications for the following chemicals are 'Minimum Classifications': Zinc sulphate (anhydrous); Lead dichloride; Zinc chloride; Cadmium oxide; Lead sulphate; Potassium fluoride; Sodium fluoride; Lead fluoride.

For the full text of the H phrases not mentioned in this Section or in Section 2, see Section 16.

SECTION 4. FIRST-AID MEASURES

4.1 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.

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4.2 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 the unborn child. Suspected of damaging fertility. Effects of excessive exposures may include: Deformity; Delayed development; Functional disorders in fetus; Sterility; Reduced fertility; Menstruation disorders. May cause 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.

4.3 Indication of any immediate medical attention and special treatment needed

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

SECTION 5. FIRE-FIGHTING MEASURES

5.1 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.

5.2 Special hazards arising from the substance or mixture

- : The product itself does not burn. 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.

5.3 Advice 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.

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SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 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.

6.2 Environmental precautions

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

6.3 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. Contact the proper local authorities.

6.4 Reference to other sections

- : Refer to protective measures listed in sections 7 and 8. Refer to Section 13 for disposal of contaminated material.

SECTION 7. HANDLING AND STORAGE

7.1 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.

7.2 Conditions for safe storage, including any incompatibilities

- : 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.

7.3 Specific end use(s)

- : Raw material used for the production of lead.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control Parameters

<u>Exposure Limits:</u>			
<u>Chemical Name</u>	<u>Exposure Limits</u>	<u>Type</u>	<u>Notes</u>
Cadmium oxide	0.02 mg/m ³ (TWA)	Finland (OEL)	Cadmium and cadmium compounds Potential for cutaneous absorption
	0.05 mg/m ³ (STEL)	France (OEL)	C1B, M2, R2
	0.05 mg/m ³ (Ceiling Limit Value)	Hungary (OEL)	None.
	0.01 mg/m ³ (dust and fume); 0.002 mg/m ³ (respirable dust) (TWA)	Poland (OEL)	(as Cd)
	0.01 mg/m ³ (inhalable); 0.002 mg/m ³ (respirable dust) (TWA)	Spain (OEL)	None.
	0.025 mg/m ³ (TWA) 0.05 mg/m ³ (STEL)	The United Kingdom (WELs)	(fumes) Carcinogen

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Cupric oxide	0.1 mg/m ³ (fumes); 1 mg/m ³ (TWA)	Finland (OEL)	(as Cu)
	0.2 mg/m ³ (fumes); 1 mg/m ³ (dust) (TWA)	France (OEL)	(as Cu)
	1 mg/m ³ ; 0.1 mg/m ³ (fumes) (TWA) 4 mg/m ³ ; 0.1 mg/m ³ (fumes) (STEL)	Hungary (OEL)	(as Cu)
	0.2 mg/m ³ (TWA)	Poland (OEL)	(as Cu)
	0.2 mg/m ³ (fumes); 1 mg/m ³ (Dust and mist) (STEL)	Spain (OEL)	(as Cu)
	0.2 mg/m ³ (fumes); 1 mg/m ³ (Dust and mist) (TWA)	The United Kingdom (WELs)	(as Cu)
Lead dichloride	0.15 mg/m ³ (TWA)	European Union (OEL)	Inorganic lead and its compounds
	0.1 mg/m ³ (TWA)	France (OEL)	lead and lead compounds
	0.15 mg/m ³ (TWA)	Hungary (OEL)	lead and lead compounds
	0.05 mg/m ³ (TWA)	Poland (OEL)	lead and lead compounds
	0.15 mg/m ³ (TWA)	Spain (OEL)	inorganic Lead compounds
	0.15 mg/m ³ (TWA)	The United Kingdom (WELs)	Lead other than lead alkyls
Lead sulphate	0.15 mg/m ³ (TWA)	European Union (OEL)	Inorganic lead and its compounds
	0.1 mg/m ³ (TWA)	France (OEL)	lead and lead compounds
	0.15 mg/m ³ (TWA)	Hungary (OEL)	lead and lead compounds
	0.05 mg/m ³ (TWA)	Poland (OEL)	lead and lead compounds
	0.15 mg/m ³ (TWA)	Spain (OEL)	inorganic Lead compounds
	0.15 mg/m ³ (TWA)	The United Kingdom (WELs)	Lead other than lead alkyls
Potassium fluoride	2.5 mg/m ³ (TWA)	European Union (OEL)	(as 'Fluoride, inorganic')
	2.5 mg/m ³ (TWA)	Finland (OEL)	(as 'Fluoride, inorganic')
	2.5 mg/m ³ (TWA)	France (OEL)	(as 'Fluoride, inorganic')
	1 mg/m ³ (respirable) (exposure factor 4) (TWA)	Germany (OEL)	(as 'Fluoride')
	2.5 mg/m ³ (TWA) 10 mg/m ³ (STEL)	Hungary (OEL)	(as 'Fluoride')
	2 mg/m ³ (TWA) 3 mg/m ³ (STEL)	Poland (OEL)	(as 'Fluoride')
	2.5 mg/m ³ (TWA)	Spain (OEL)	(as 'Fluoride, inorganic')
	2.5 mg/m ³ (TWA)	The United Kingdom (WELs)	(as 'Fluoride, inorganic')

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Sodium fluoride	2.5 mg/m ³ (TWA)	European Union (OEL)	(as 'Fluoride, inorganic')
	2.5 mg/m ³ (TWA)	Finland (OEL)	(as 'Fluoride, inorganic')
	2 mg/m ³ (TWA)	France (OEL)	(as F)
	1 mg/m ³ (respirable) (exposure factor 4) (TWA)	Germany (OEL)	(as 'Fluoride')
	2.5 mg/m ³ (TWA) 10 mg/m ³ (STEL)	Hungary (OEL)	
	2 mg/m ³ (TWA) 3mg/m ³ (STEL)	Poland (OEL)	(as 'Fluoride')
	2.5 mg/m ³ (TWA)	Spain (OEL)	(as 'Fluoride, inorganic')
	2.5 mg/m ³ (TWA)	The United Kingdom (WELs)	(as 'Fluoride, inorganic')
Zinc chloride	1 mg/m ³ (TWA)	Finland (OEL)	(fumes)
	1 mg/m ³ (TWA)	France (OEL)	(fumes)
	1 mg/m ³ (TWA) 2 mg/m ³ (STEL)	Poland (OEL)	None.
	1 mg/m ³ (TWA) 2 mg/m ³ (STEL)	Spain (OEL)	(fumes)
	1 mg/m ³ (TWA) 2 mg/m ³ (STEL)	The United Kingdom (WELs)	(fumes)
Zinc oxide	2 mg/m ³ (TWA) 10 mg/m ³ (STEL)	Finland (OEL)	(fumes)
	5 mg/m ³ (fumes); 10 mg/m ³ (dust) (TWA)	France (OEL)	None.
	5 mg/m ³ (TWA) 20 mg/m ³ (STEL)	Hungary (OEL)	(respirable dust)
	5 mg/m ³ (TWA) 10 mg/m ³ (STEL)	Poland (OEL)	(fumes)
	2 mg/m ³ (TWA) 10 mg/m ³ (STEL)	Spain (OEL)	(respirable dust)
Zinc sulphate (anhydrous)	None known.	European Union (OEL)	None.
Lead fluoride	0.15 mg/m ³ (TWA)	European Union (OEL)	Inorganic lead and its compounds
	0.1 mg/m ³ (TWA)	France (OEL)	lead and lead compounds
	0.15 mg/m ³ (TWA)	Hungary (OEL)	lead and lead compounds
	0.05 mg/m ³ (TWA)	Poland (OEL)	lead and lead compounds
	0.15 mg/m ³ (TWA)	Spain (OEL)	inorganic Lead compounds
	0.15 mg/m ³ (TWA)	The United Kingdom (WELs)	Lead other than lead alkyls

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8.2 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. Process enclosure should be considered, especially in dusty units. Dust levels should be measured in the workplace air (static or individual), according to National regulations. In case of insufficient ventilation wear suitable respiratory equipment.

Respiratory protection

- : Use a full-face respirator if dust levels exceed exposure limits. The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used.

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. The selected protective gloves have to satisfy the specifications of EU Directive 89/689/EEC and the standard EN 374 derived from it.

Eye / face protection

- : Wear eye/face protection. Use of a full-face respirator will provide suitable protection. See also EN 166.

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

9.1 Information on basic physical and chemical properties

- Appearance** : White / grey powder.
- Odour** : Odourless.
- Odour threshold** : No information available.
- pH** : 6 - 6.5 (as aqueous solution)
- Flash point** : Not applicable.
- Flashpoint (Method)** : Not applicable.
- Lower flammable limit (% by vol.)** : Not applicable.
- Upper flammable limit (% by vol.)** : Not applicable.
- Flammability (solid, gas)** : The product is not flammable.
- Auto-ignition temperature** : No information available.
- Decomposition temperature** : No information available.
- Oxidizing properties** : None known.
- Explosive properties** : Not explosive
- Initial boiling point and boiling range** : > 732°C (1350°F) (based on ingredients)
- Melting/Freezing point** : No information available.
- Relative density** : 3 - 3.5
- Solubility in water** : 50% soluble in water
- Other solubility(ies)** : No information available.
- Vapour pressure** : No information available.

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- Vapour density** : No information available.
Partition coefficient: n-octanol/water
: No information available.
Viscosity : Not applicable.
Evaporation rate (BuAe = 1)
: No information available.

9.2 Other Information

- Volatiles (% by weight)** : No information available.
Volatile organic Compounds (VOC's)
: No information available.
Other physical/chemical comments
: No additional information.

SECTION 10. STABILITY AND REACTIVITY

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

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological effects:

- Acute toxicity** : This mixture is classified as hazardous in accordance with Regulation (EC) No 1272/2008.
Classification:
Acute toxicity - Category 4. Harmful if swallowed or if inhaled.
- Skin corrosion/Irritation** : According to the classification criteria of the European Union, this product is not considered as being a skin corrosive or irritant.
- Serious eye damage/irritation**
: This mixture is classified as hazardous in accordance with Regulation (EC) No 1272/2008.
Classification:
Eye damage/irritation - Category 1. Causes serious eye damage.
- Respiratory or skin sensitisation**
: According to the classification criteria of the European Union, this product is not considered as being an allergic respiratory sensitiser.
According to the classification criteria of the European Union, this product is not considered as being an allergic skin sensitiser.
- Germ cell mutagenicity** : This mixture is classified as hazardous in accordance with Regulation (EC) No 1272/2008.
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 mixture is classified as hazardous in accordance with Regulation (EC) No 1272/2008.
Classification:
Carcinogenicity - Category 1B. May cause cancer. Symptoms may include persistent coughing, shortness of breath, coughing up blood and wheezing.
Contains: lead compounds; Cadmium compounds.
- Reproductive toxicity** : This mixture is classified as hazardous in accordance with Regulation (EC) No 1272/2008.
Classification:
Reproductive toxicant: Category 1A. May damage the unborn child. Suspected of damaging fertility. 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.
- STOT-single exposure** : This mixture is classified as hazardous in accordance with Regulation (EC) No 1272/2008.
Classification:
Specific target organ toxicity, single exposure - Category 3. May cause respiratory irritation.
- STOT-repeated exposure** : This mixture is classified as hazardous in accordance with Regulation (EC) No 1272/2008.
Classification:
Specific target organ toxicity, repeated exposure - Category 2. May cause 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.
- Aspiration hazard** : According to the classification criteria of the European Union, this product is not considered as being an aspiration hazard to humans.
- 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 dermal = 90 383 mg/kg
ATE inhalation (dust/mist) = 2.26 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 sulphate (anhydrous)	No information available.	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	No information available.	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	No information available.
Lead sulphate	> 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	No information available.	69 - 223 mg/kg	> 2000 mg/kg
Cupric oxide	No information available.	> 2000 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)

Routes of exposure : Eye contact; Skin contact; Skin Absorption; Inhalation; Ingestion

Effects of acute exposure : *Inhalation:* Harmful 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. 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.

Skin contact: Direct skin contact may result in little or no irritation. Can be absorbed through skin.

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

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.

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.

Other important hazards : None known or reported by the manufacturer.

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SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity : 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.

Ecotoxicity data:

<u>Ingredients</u>	CAS No	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
Zinc sulphate (anhydrous)	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)	No information available.	None.
Cadmium oxide	1306-19-0	4.48 mg/L (Channel catfish) (Read-across)	0.0013 mg/L (Rainbow trout) (Read-across)	10
Lead sulphate	7446-14-2	0.75 mg/L Cynoglossus joyneri (Red Tongue Sole) (dissolved lead)	No information available.	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.
Cupric oxide	1317-38-0	0.81 mg/L (common carp)	No information available.	1
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

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<u>Ingredients</u>	CAS No	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
Zinc sulphate (anhydrous)	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)	No information available.	10
Cadmium oxide	1306-19-0	0.042 mg/L Daphnia pulex (Water flea) (Read-across)	No information available.	10
Lead sulphate	7446-14-2	0.392 mg/L (Daphnia magna) (dissolved lead)	No information available.	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.
Cupric oxide	1317-38-0	0.026 mg/L (Daphnia magna) (dissolved copper)	No information available.	10
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

<u>Ingredients</u>	CAS No	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
Zinc sulphate (anhydrous)	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)	No information available.	10
Cadmium oxide	1306-19-0	0.09 mg/L/72hr (Green algae)	No information available.	10
Lead sulphate	7446-14-2	No information available.	No information available.	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)	No information available.	None.
Cupric oxide	1317-38-0	No information available.	No information available.	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

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12.2 Persistence and degradability

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

12.3 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 sulphate (anhydrous) (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)	No information available.
Potassium fluoride (CAS 7789-23-3)	0.77 (estimated)	No information available.
Sodium fluoride (CAS 7681-49-4)	No information available.	2.3

12.4 Mobility in soil : No data is available on the product itself.

12.5 Results of PBT and vPvB assessment

: This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT).

12.6 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

13.1 Waste Treatment Methods:

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 of in accordance with the European Directives on waste and hazardous waste. Waste must be classified and labelled prior to recycling or disposal. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Waste codes should be assigned by the user based on the application for which the product was used.

SECTION 14. TRANSPORTATION INFORMATION

<i>Regulatory Information</i>	14.1 UN Number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing Group	<i>Label</i>
ADR/RID	UN3077	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Lead chloride; Zinc oxide)	9	III	 
EU ADR/RID Classification Code	M7 - Pollutant to the aquatic environment, solid				
EU ADR / RID Hazard Identification Number	90 - environmentally hazardous substance; miscellaneous dangerous substances				





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ADR/RID 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.				

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

14.6 Special precautions for user

: Avoid and control operations which create dust. Avoid release to the environment.

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

: This information is not available.

SECTION 15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

: Classification according to Regulation (EC) No. 1272/2008 on the classification of hazardous mixtures.

Restrictions on use

Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use, as amended:

Restricted to professional users. See Item 30.

Authorisations

Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorisation, as amended:

Cadmium oxide (CAS # 1306-19-0)

Directive 2012/18/EU (Seveso III) on the control of major-accident hazards involving dangerous substances:

E1 Hazardous to the Aquatic Environment in Category Acute 1 or Chronic 1

Directive 98/24/EC on the protection of the health and safety of workers from risks related to chemical agents at work:

Zinc sulphate (anhydrous) (CAS # 7733-02-0)

Lead dichloride (CAS # 7758-95-4)

Zinc chloride (CAS # 7646-85-7)

Zinc oxide (CAS # 1314-13-2)

Cadmium oxide (CAS # 1306-19-0)

Lead sulphate (CAS # 7446-14-2)

Potassium fluoride (CAS # 7789-23-3)

Sodium fluoride (CAS # 7681-49-4)

Cupric oxide (CAS # 1317-38-0)

Lead fluoride (CAS # 7783-46-2)

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Directive 94/33/EC on the protection of young people at work:

Lead dichloride (CAS # 7758-95-4)
Zinc chloride (CAS # 7646-85-7)
Cadmium oxide (CAS # 1306-19-0)
Lead sulphate (CAS # 7446-14-2)
Potassium fluoride (CAS # 7789-23-3)
Sodium fluoride (CAS # 7681-49-4)
Lead fluoride (CAS # 7783-46-2)

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006, as amended [including Regulation (EU) 2015/830].

Follow national regulation for work with chemical agents.

German legislation on water endangering substances VwVwS - Water contaminating class (Germany): 3 (self classified)

15.2 Chemical safety assessment

: A chemical safety assessment has not been carried out by the Manufacturer of this product.

SECTION 16. OTHER INFORMATION

Legend

: ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
CAS: Chemical Abstract Services
CLP: Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
EC: European Community
EC50: Effective Concentration 50%
ECHA: European Chemicals Agency
EEC: European Economic Community
EINECS: European Inventory of Existing Commercial chemical Substances
EN: European Standard
EU: European Union
HSDB: Hazardous Substances Data Bank
IATA: International Air Transport Association
IBC: Intermediate Bulk Container
ICAO: International Civil Aviation Organisation
IMDG: International Maritime Dangerous Goods
Inh: Inhalation
LC: Lethal Concentration
LD: Lethal Dose
OEL: National occupational exposure limits
NOEC: No observable effect concentration
OECD: Organisation for Economic Co-operation and Development
PEL: Permissible exposure limit
QSAR: Quantitative structure-activity relationship
RID: Regulations concerning the International Carriage of Dangerous Goods by Rail
RTECS: Registry of Toxic Effects of Chemical Substances
SCBA: Self-Contained Breathing Apparatus
SDS: Safety Data Sheet
STEL: Short Term Exposure Limit
TWA: Time Weighted Average
WEL: Workplace Exposure Limit

Information Source

: 1. Material Safety Data Sheet from manufacturer.
2. Canadian Centre for Occupational Health and Safety, CCIInfoWeb Databases, 2017 (Chempendium, RTECs, HSDB, INCHEM).
3. European Chemicals Agency, Classification Legislation, 2017.
4. OECD - The Global Portal to Information on Chemical Substances - eChemPortal, 2017.

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- H-Phrases (Full text)** :
- EUH032 - Contact with acids liberates very toxic gas.
 - H301 - Toxic if swallowed.
 - H302 - Harmful if swallowed.
 - H311 - Toxic in contact with skin.
 - H314 - Causes severe skin burns and eye damage.
 - H315 - Causes skin irritation.
 - H318 - Causes serious eye damage.
 - H319 - Causes serious eye irritation.
 - H330 - Fatal if inhaled.
 - H331 - Toxic if inhaled.
 - H332 - Harmful if inhaled.
 - H335 - May cause respiratory irritation.
 - H341 - Suspected of causing genetic defects <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
 - H350 - May cause cancer <state route of exposure if it is conclusively proven that no other routes of exposure cause the hazard>.
 - H360Df - May damage the unborn child. Suspected of damaging fertility.
 - H361fd - Suspected of damaging fertility. Suspected of damaging the unborn child.
 - H372 - Causes damage to organs (a,b,c) through prolonged or repeated exposure.
 - H373 - May cause damage to organs (a,b,c) through prolonged or repeated exposure.
 - H400 - Very toxic to aquatic life.
 - H410 - Very toxic to aquatic life with long lasting effects.

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>	
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