

Flue dust, zinc-refining

Crude zinc calcine; Zinc rich flue dust

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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 : Flue dust, zinc-refining

CAS No : 69012-63-1
EC No : 273-760-6
Annex VI Index No : None.
Product Code(s) : Zinc rich flue dust
AZR Grade: Crude zinc calcine

1.2 Relevant identified uses of the substance or mixture and uses advised against

: Raw material for production of zinc metal.
Restricted to professional users. Refer also to restrictions found in REACH Annex XVII items 23, 28, 30, and 63.

1.3 Details of the supplier of the safety data sheet:

American Zinc Recycling

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

Email: info@azr.com

Website: <http://azr.com/american-zinc>

Telephone : 001-724-773-2223

1.4 Emergency Telephone Number

: 001-703-527-3887 (Chemtrec - U.S.)

SECTION 2. HAZARDS IDENTIFICATION

Most Important Hazard

Yellow green to reddish brown solid (powder or granules). Odourless.

Most important hazards:

Causes skin irritation. Causes serious eye damage. Continuous long-term exposure above the permissible exposure limits are suspected to cause genetic defects, sterility, cancer, and/or organ damage. Contains a small amount of lead and lead compounds that can be toxic at elevated exposure levels. Occupational exposure to the substance or mixture may cause adverse effects. For further information, please refer to section 11 of the SDS.

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

2.1 Classification of the substance or mixture

This substance is classified as hazardous according to Regulation (EC) No. 1272/2008. Classification:

Skin corrosion/irritation - Category 2; H315
Serious eye damage/eye irritation - Category 1; H318
Germ cell mutagenicity - Category 2; H341
Reproductive toxicity - Category 1A; H360Df
Carcinogenicity - Category 1B; H350
Specific target organ toxicity, repeated exposure - Category 1; H372
Chronic aquatic hazard - Category 3; H412

2.2 Label elements

Hazard pictogram(s)



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Signal word:

Danger

Hazard statements:

H315 - Causes skin irritation.

H318 - Causes serious eye damage.

H341 - Suspected of causing genetic defects.

H350 - May cause cancer.

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

H372 - Causes damage to organs through prolonged or repeated exposure if swallowed.

H412 - Harmful 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. Mild respiratory irritant. May cause gastrointestinal irritation. Iron particles in the eye may leave a "rust ring" or brownish stain on the cornea.

PBT assessment:

This information is not available.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Chemical nature: Calcined zinc oxide enriched flue dust (Inorganic substances in powdered form).

The following substances shall be indicated according to legislation:

Chemical name	CAS #	EC No.	Annex VI Index No	Concentration
Flue dust, zinc-refining	69012-63-1	273-760-6	None.	100%
Flue dust constituents:				
Zinc	7440-66-6	231-175-3	030-001-01-9	60.0 - 70.0
Iron	7439-89-6	231-096-4	None.	2.0 - 6.0
Calcium	7440-70-2	231-179-5	020-001-00-X	1.0 - 2.0
Potassium	7440-09-7	231-119-8	019-001-00-2	0.06 - 0.8
Silicon dioxide	7631-86-9	231-545-4	None.	0.13 - 2
Sulphur	7704-34-9	231-722-6	016-094-00-1	0.1 - 1.1
Fluorine	7782-41-4	231-954-8	009-001-00-0	3.0 - 5.5
Cadmium	7440-43-9	231-152-8	048-002-00-0	0.0 - 0.06
Magnesium	7439-95-4	231-104-6	012-002-00-9	0.4 - 1.0
Manganese	7439-96-5	231-105-1	None.	0.3 - 0.7

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Carbon	7440-44-0	231-153-3	None.	0.02 - 0.23
Chlorine	7782-50-5	231-959-5	017-001-00-7	0.05 - 0.66
Lead	7439-92-1	231-100-4	082-001-00-6	0.04 - 0.7
Aluminium oxide	1344-28-1	215-691-6	None.	0.1 - 0.5
Copper	7440-50-8	231-159-6	None.	0.05 - 0.08
Chromium	7440-47-3	231-157-5	None.	0.07 - 0.14

3.2 Mixtures

Not applicable

SECTION 4. FIRST-AID MEASURES

4.1 Description of first aid measures

- Ingestion* : Do NOT induce vomiting. Rinse mouth. Never give anything by mouth to an unconscious person. IF exposed or concerned: Get medical advice/attention.
- Inhalation* : If inhaled, move to fresh air. If breathing is difficult, give oxygen by qualified medical personnel only. If breathing stops, provide artificial respiration. IF exposed or concerned: Get medical attention/advice.
- Skin contact* : Remove/Take off immediately all contaminated clothing. Wash off immediately with soap and plenty of water.
IF exposed or concerned: Get medical attention/advice.
- Eye contact* : 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.

4.2 Most important symptoms and effects, both acute and delayed

- : Causes skin irritation. Symptoms include redness, swelling and sloughing of skin cells (flaking). Causes serious eye damage. Contact may cause redness, swelling and a painful sensation. 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. Symptoms may include spontaneous abortion, pre-term delivery, stillbirths, alterations in sperm, decreased male fertility, and effects on neurological development including decreased intelligence, shortened attention span, and slowed reaction times. Causes damage to organs through prolonged or repeated exposure if swallowed. Contains lead and lead compounds. Prolonged overexposure may 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. Additional symptoms may include a blue "lead line" on the gums and an accumulation of lead in the blood resulting in shock, coma and death. Mild respiratory irritant. May cause coughing and breathing difficulties. 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. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Iron particles in the eye may leave a "rust ring" or brownish stain on the cornea.

4.3 Indication of any immediate medical attention and special treatment needed

- : Provide general supportive measures and treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

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Unsuitable extinguishing media

- : None known.

5.2 Special hazards arising from the substance or mixture

- : Not considered flammable. The pressure in sealed containers can increase under the influence of heat.
In the event of fire the following can be released: Metal oxides.

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. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Dike for water control.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

- : Wear suitable protective equipment. Keep people away from and upwind of spill/leak. Restrict access to area until completion of clean-up.

6.2 Environmental precautions

- : Do not allow material to enter ground water system. 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. Sweep up and shovel into suitable containers for disposal. Avoid dust formation. Contact the proper local authorities. Clean contaminated floors and objects thoroughly while observing environmental regulations.

6.4 Reference to other sections

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

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

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

7.2 Conditions for safe storage, including any incompatibilities

- : Store in a cool, well-ventilated area. Keep away from heat. 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

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SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control Parameters

Exposure Limits:				
Chemical Name	Exposure Limits	Type	Notes	
Cadmium	0.05 mg/m ³ (TWA)	France (OEL)	Carcinogen Mutagen Reproductive toxicity	
	0.02 mg/m ³ (Total dust); 0.002 mg/m ³ (respirable dust) (TWA)	Sweden (OEL)	Carcinogen	
	0.015 mg/m ³ (inhalable); 0.004 mg/m ³ (respirable dust) (TWA)	Switzerland (OEL)	Skin notation Carcinogen Mutagen Reproductive toxicant	
	0.025 mg/m ³ (TWA)	The United Kingdom (WELs)	Carcinogen	
Calcium	None known.	European Union (OEL)	None.	
Flue dust, zinc-refining	None known.	European Union (OEL)	None.	
Fluorine	1 ppm (1.58 mg/m ³) (TWA) 2 ppm (3.16 mg/m ³) (STEL)	European Union (OEL)	None.	
	1 ppm (1.58 mg/m ³) (TWA) 2 ppm (3.16 mg/m ³) (STEL)	France (OEL)	None.	
	1 ppm (1.6 mg/m ³) (exposure factor 2) (TWA)	Germany (OEL)	None.	
	0.1 ppm (0.2 mg/m ³) (TWA) 2 ppm (3.16 mg/m ³) (STEL)	Sweden (OEL)	None.	
	0.1 ppm (0.15 mg/m ³) (TWA) 0.2 ppm (0.3 mg/m ³) (STEL)	Switzerland (OEL)	None.	
	1 ppm (1.6 mg/m ³) (TWA) 1 ppm (1.6 mg/m ³) (STEL)	The United Kingdom (WELs)	None.	
	Iron	6.0 mg/m ³ (TWA)	Bulgaria (OEL)	None.
		6 mg/m ³ (total aerosol) (TWA)	Slovak Republic (OEL)	None.
Potassium	None known.	European Union (OEL)	None.	
Silicon dioxide	4 mg/m ³ (inhalable) (TWA)	Germany (OEL)	None.	
	4 mg/m ³ (inhalable); 0.3 mg/m ³ (respirable dust) (TWA)	Switzerland (OEL)	None.	
	6 mg/m ³ (inhalable); 2.4 mg/m ³ (respirable dust) (TWA)	The United Kingdom (WELs)	None.	

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Sulphur	6 mg/m ³ (TWA)	Latvia (OEL)	None.
	6 mg/m ³ (TWA)	Lithuania (OEL)	None.
	15 mg/m ³ (STEL)	Rumania (OEL)	None.
Zinc	5 mg/m ³ (fumes); 10 mg/m ³ (dust) (TWA)	France (OEL)	Zinc oxide
	5 mg/m ³ (total dust) (TWA)	Sweden (OEL)	Zinc oxide
	3 mg/m ³ (fumes) (TWA)	Switzerland (OEL)	Zinc oxide
Carbon	10 mg/m ³ (inhalable); 4 mg/m ³ (respirable dust) (TWA)	The United Kingdom (WELs)	None.
Magnesium	None known.	European Union (OEL)	None.
Manganese	1 mg/m ³ (fumes) (TWA)	France (OEL)	None.
	0.2 mg/m ³ (inhalable); 0.02 mg/m ³ (respirable dust) (exposure factor 8) (TWA)	Germany (OEL)	None.
	0.2 mg/m ³ (total dust); 0.1 mg/m ³ (respirable dust) (TWA)	Sweden (OEL)	None.
	0.5 mg/m ³ (inhalable) (TWA)	Switzerland (OEL)	None.
	0.5 mg/m ³ (TWA)	The United Kingdom (WELs)	None.
Chlorine	0.5 ppm (1.5 mg/m ³) (STEL)	European Union (OEL)	None.
	0.5 ppm (1.5 mg/m ³) (STEL)	France (OEL)	None.
	0.5 ppm (1.5 mg/m ³) (exposure factor 1) (TWA)	Germany (OEL)	None.
	0.5 ppm (1.5 mg/m ³) (STEL)	Sweden (OEL)	None.
	0.5 ppm (1.5 mg/m ³) (TWA) 0.5 ppm (1.5 mg/m ³) (STEL)	Switzerland (OEL)	None.
	0.5 ppm (1.5 mg/m ³) (STEL)	The United Kingdom (WELs)	None.
Lead	0.15 mg/m ³ (TWA)	European Union (OEL)	None.
	0.1 mg/m ³ (TWA)	France (OEL)	Carcinogen Reproductive toxicity
	0.1 mg/m ³ (inhalable dust); 0.05 mg/m ³ (respirable dust) (TWA)	Sweden (OEL)	Reproductive toxicity
	0.1 mg/m ³ (inhalable) (TWA) 0.8 mg/m ³ (inhalable) (STEL)	Switzerland (OEL)	Carcinogen Reproductive toxicant
	0.15 mg/m ³ (TWA)	The United Kingdom (WELs)	None.
Aluminium oxide	10 mg/m ³ (TWA)	France (OEL)	None.
	1.25 mg/m ³ (respirable dust); 10 mg/m ³ (inhalable) (exposure factor 2) (TWA)	Germany (OEL)	(General dust limit)

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	10 mg/m ³ (TWA)	Spain (OEL)	None.
	3 mg/m ³ (TWA) 24 mg/m ³ (fumes) (STEL)	Switzerland (OEL)	None.
	10 mg/m ³ (inhalable); 4 mg/m ³ (respirable dust) (TWA)	The United Kingdom (WELs)	None.
Copper	0.2 mg/m ³ (fumes); 1 mg/m ³ (dust) (TWA) 2 mg/m ³ (dust) (STEL)	France (OEL)	None.
	1 mg/m ³ (total dust); 0.2 mg/m ³ (respirable dust) (TWA)	Sweden (OEL)	None.
	0.1 mg/m ³ MAK (inhalable); 0.2 mg/m ³ STEL (inhalable)	Switzerland (OEL)	N/Av
	0.2 mg/m ³ (fumes); 1 mg/m ³ (dust) (TWA) 2 mg/m ³ (dust) (STEL)	The United Kingdom (WELs)	None.
Chromium	2 mg/m ³ (TWA)	France (OEL)	None.
	2 mg/m ³ (exposure factor 1) (TWA)	Germany (OEL)	None.
	0.5 mg/m ³ (total dust) (TWA)	Sweden (OEL)	None.
	0.5 mg/m ³ (inhalable) (TWA)	Switzerland (OEL)	None.
	0.5 mg/m ³ (TWA)	The United Kingdom (WELs)	None.

Biological Exposure Indices:

France. Biological indicators of exposure (IBE) (National Institute for Research and Security (INRS, ND 2065)

Lead (CAS # 7439-92-1)

400 µg/L, Parameter: Lead (men), Specimen: Blood

300 µg/L, Parameter: Lead (women), Specimen: Blood

Cadmium (CAS # 7440-43-9)

0.005 mg/g Creatinine, Parameter: Cadmium (Background noise on non-exposed subjects), Specimen: Urine

0.005 mg/L, Parameter: Cadmium (Background noise on non-exposed subjects), Specimen: Blood

chromium (CAS # 7440-47-3)

0.01 mg/g Creatinine, Parameter: Total chromium (augmented during shift (soluble aerosol)), Specimen: Urine

0.03 mg/g Creatinine, Parameter: Total chromium (soluble aerosol), Specimen: Urine

Germany. TRGS 903, BAT List (Biological Limit Values)

Lead (CAS # 7439-92-1)

300 µg/L, Parameter: Lead (women less than 45 years old), Specimen: Blood

400 µg/L, Parameter: Lead (women 45 years and older), Specimen: Blood

Switzerland. BAT-Werte (Biological Limit Values in the Workplace as per SUVA)

Lead (CAS # 7439-92-1)

400 µg/L, Parameter: Lead (men and women over 45 years old), Specimen: Blood

100 µg/L, Parameter: Lead (women less than 45 years old), Specimen: Blood

Manganese (CAS # 7439-96-5)

20 µg/L, Parameter: Manganese, Specimen: Blood

Cadmium (CAS # 7440-43-9)

5 µg/g Creatinine, Parameter: Cadmium, Specimen: Urine

Derived No Effect Level (DNEL):

No information available.

Predicted No Effect Concentration (PNEC):

No information available.

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8.2 Exposure controls

Ventilation and engineering measures

- : Use 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.
The local exhaust ventilation system should be high efficiency (84%).
Recommended cyclone/filter (for minimizing dust emissions) efficiency:
70-90% (cyclones);
50-80% (dust filters);
85-95% (double stage, cassette filters)
Process enclosure should be considered, especially in potentially 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

- : Respirator must be worn if exposed to dust. 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.
Recommended Filter type:
dust filter-half mask P1 (efficiency 75%)
dust filter-half mask P2 (efficiency 90%)
dust filter-half mask P3 (efficiency 95%)
dust filter-full mask P1 (efficiency 75%)
dust filter-full mask P2 (efficiency 90%)
dust filter-full mask P3 (efficiency 97.5%).

Skin protection

- : Wear protective gloves/clothing. The selected protective gloves have to satisfy the specifications of EU Directive 89/689/EEC and the standard EN 374 derived from it. The suitability for a specific workplace should be discussed with the producers of the protective gloves. Gloves are recommended to be $\geq 90\%$ efficient.
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Eye / face protection

- : Chemical goggles must be worn to prevent dusts from entering the eyes.

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

- : Avoid contact with skin, eyes and clothing. Do not breathe dust or fume. 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** : Solid (powder/granular); yellow green to reddish brown.
- Odour** : Odourless
- Odour threshold** : None.
- pH** : No information available.
- Flash point** : None.
- Flashpoint (Method)** : Not applicable.
- Lower flammable limit (% by vol.)** : None.
- Upper flammable limit (% by vol.)** : None.
- Flammability (solid, gas)** : The product is not flammable.

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Auto-ignition temperature

: None.

Decomposition temperature

: No information available.

Oxidizing properties

: None known.

Explosive properties

: Not explosive

Initial boiling point and boiling range

: > 1000°C

Melting/Freezing point

: > 1000°C

Relative density

: 4.83

Solubility in water

: Insoluble

Other solubility(ies)

: No information available.

Vapour pressure

: No information available.

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

: Direct sources of heat. Incompatible products Do not use in areas without adequate ventilation.

10.5 Incompatible materials

: Acids; Halogenated compounds; Nitrogen compounds; Oxidizing agents.

10.6 Hazardous decomposition products

: In the event of fire the following can be released: Metal oxides.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on Toxicological effects:

Acute toxicity

: According to the classification criteria of the European Union, this product is not considered as being an acutely toxic chemical. Based on available data, the classification criteria are not met.

Skin corrosion/Irritation

: This substance is classified as hazardous according to Regulation (EC) No. 1272/2008.
Classification:
Skin corrosion/irritation - Category 2. Causes skin irritation.

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Serious eye damage/irritation

- : This substance is classified as hazardous according to Regulation (EC) No. 1272/2008.
Classification:
Serious eye damage/eye 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.
Based on available data, the classification criteria are not met.

Germ cell mutagenicity

- : This substance is classified as hazardous according to Regulation (EC) No. 1272/2008.
Classification:
Germ cell mutagenicity - Category 2. Suspected of causing genetic defects.
Contains: Cadmium. Cadmium may cause irreversible effects in non-reproductive (somatic) cells, based on animal data.

Carcinogenicity

- : This substance is classified as hazardous according to 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: Cadmium. Cadmium and cadmium compounds (as respirable dust/aerosols) have proven so far to be unmistakably carcinogenic in animal experimentation only; namely under conditions which are comparable to those for possible exposure of a human being at the workplace, or from which such comparability can be deduced.

Reproductive toxicity

- : This substance is classified as hazardous according to Regulation (EC) No. 1272/2008.
Classification:
Reproductive toxicant - Category 1A. May damage the unborn child. Suspected of damaging fertility. Symptoms may include spontaneous abortion, pre-term delivery, stillbirths, alterations in sperm, decreased male fertility, and effects on neurological development including decreased intelligence, shortened attention span, and slowed reaction times.
Contains: lead compounds. Lead compounds are known to cause certain reproductive effects in both males and females. Lead compounds are known to cause embryotoxicity.

STOT-single exposure

- : According to the classification criteria of the European Union, this product is not expected to cause target organ toxicity through a single exposure. Based on available data, the classification criteria are not met.

STOT-repeated exposure

- : This substance is classified as hazardous according to Regulation (EC) No. 1272/2008.
Classification:
Specific target organ toxicity, repeated exposure - Category 1. Causes damage to organs through prolonged or repeated exposure if swallowed.
Contains lead and lead compounds. Prolonged overexposure may 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. Additional symptoms may include a blue "lead line" on the gums and an accumulation of lead in the blood resulting in shock, coma and death.

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

- : See below for toxicological data on the substance.

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<u>Chemical name</u>	<u>LC₅₀ (4hr)</u>	<u>LD₅₀</u>	
	<u>inh, rat</u>	<u>(Oral, rat)</u>	<u>(Rabbit, dermal)</u>
Flue dust, zinc-refining	> 5.371 mg/L	> 2000 mg/kg	> 2000 mg/kg
Flue dust constituents:			
Zinc	> 5.4 mg/L (dust) (No mortality)	> 2000 mg/kg (No mortality)	No information available.
Iron	No information available.	30,000 mg/kg	No information available.
Calcium	No information available.	> 2000 mg/kg (Read-across)	> 2500 mg/kg (Read-across)
Potassium	No information available.	No information available.	No information available.
Silicon dioxide	No information available.	> 3160 mg/kg	> 5000 mg/kg
Sulphur	> 9.23 mg/L	> 8437 mg/kg	> 2000 mg/kg (No mortality)
Fluorine	93 ppm	No information available.	No information available.
Cadmium	0.01 - 0.0125 mg/L (Cadmium oxide; fumes)	2330 mg/kg	No information available.
Magnesium	No information available.	> 2000 mg/kg (No mortality) (Read-across)	No information available.
Manganese	> 5.14 mg/L (dust) (No mortality)	> 2000 mg/kg (No mortality)	No information available.
Carbon	> 64.4 mg/L (dust)	> 2000 mg/kg (No mortality)	No information available.
Chlorine	147 ppm	No information available.	No information available.
Lead	> 5.05 mg/L (dust) (No mortality) (Read-across)	> 2000 mg/kg (No mortality) (Read-across)	> 2000 mg/kg (No mortality) (Read-across)
Aluminium oxide	> 2.3 mg/L (dust) (No mortality)	> 2000 mg/kg (No mortality)	No information available.
Copper	> 5.11 mg/L (dust) (No mortality)	> 2500 mg/kg	> 2000 mg/kg
Chromium	> 5.41 mg/L (dust) (No mortality)	> 3400 mg/kg (No mortality)	No information available.

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

Effects of acute exposure : *Inhalation:* May cause irritation of the mucous membranes. Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough. 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: Causes skin irritation. Symptoms include redness, swelling and sloughing of skin cells (flaking).

Eye contact: Causes serious eye damage. Contact may cause redness, swelling and a painful sensation. May cause irreversible eye damage.

Ingestion: Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

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. 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.

Flue dust, zinc-refining

Crude zinc calcine; Zinc rich flue dust

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SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity : Harmful to aquatic life with long lasting effects. The product should not be allowed to enter drains, water courses or the soil.

The following tables list individual ingredient ecotoxicity data for fish, daphnia and algae.

Ecotoxicity data:

Ingredients	CAS No	Toxicity to Fish		
		LC50 / 96h	NOEC / 21 day	M Factor
Flue dust, zinc-refining	69012-63-1	> 100 mg/L (Zebra fish)	No information available.	None.
Zinc	7440-66-6	No information available.	No information available.	None.
Iron	7439-89-6	> 10 000 mg/L (Zebra fish)	No information available.	None.
Calcium	7440-70-2	No information available.	No information available.	None.
Potassium	7440-09-7	No information available.	No information available.	None.
Silicon dioxide	7631-86-9	No information available.	No information available.	None.
Sulphur	7704-34-9	No information available.	No information available.	None.
Fluorine	7782-41-4	No information available.	No information available.	None.
Cadmium	7440-43-9	4.48 mg/L (Channel catfish)	0.0013 mg/L/27 days (Coho salmon)	10
Magnesium	7439-95-4	541 mg/L (Fathead minnow) (Read-across)	No information available.	None.
Manganese	7439-96-5	28 mg/L (Fathead minnow)	No information available.	None.
Carbon	7440-44-0	> 100 mg/L (Zebra fish)	No information available.	None.
Chlorine	7782-50-5	0.05 mg/L (Fathead minnow)	No information available.	10
Lead	7439-92-1	1.17 mg/L (Rainbow trout)	No information available.	None.
Aluminium oxide	1344-28-1	> 100 mg/L (Brown trout)	No information available.	None.
Copper	7440-50-8	No information available.	No information available.	None.
Chromium	7440-47-3	33 - 71.9 mg/L (Guppy)	No information available.	None.

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<u>Ingredients</u>	CAS No	Toxicity to Daphnia		
		EC50 / 48h	NOEC / 21 day	M Factor
Flue dust, zinc-refining	69012-63-1	> 100 mg/L (Daphnia magna)	No information available.	None.
Zinc	7440-66-6	0.07 mg/L (Daphnia magna)	0.12 mg/L/29-day	10
Iron	7439-89-6	> 100 mg/L (Daphnia magna)	5.9 mg/L	None.
Calcium	7440-70-2	No information available.	No information available.	None.
Potassium	7440-09-7	No information available.	No information available.	None.
Silicon dioxide	7631-86-9	No information available.	No information available.	None.
Sulphur	7704-34-9	No information available.	No information available.	None.
Fluorine	7782-41-4	No information available.	No information available.	None.
Cadmium	7440-43-9	0.042 mg/L Daphnia pulex (Water flea)	0.0063 mg/L/28-day Mysidopsis bahia (water flea)	10
Magnesium	7439-95-4	140 mg/L (Daphnia magna) (Read-across)	No information available.	None.
Manganese	7439-96-5	40 mg/L (Daphnia magna)	No information available.	None.
Carbon	7440-44-0	> 100 mg/L (Daphnia magna)	No information available.	None.
Chlorine	7782-50-5	0.085 mg/L (Daphnia magna)	No information available.	10
Lead	7439-92-1	0.45 mg/L (Daphnia magna)	No information available.	None.
Aluminium oxide	1344-28-1	> 100 mg/L (Daphnia magna)	No information available.	None.
Copper	7440-50-8	No information available.	No information available.	None.
Chromium	7440-47-3	No information available.	No information available.	None.

Flue dust, zinc-refining

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<u>Ingredients</u>	CAS No	Toxicity to Algae		
		EC50 / 96h or 72h	NOEC / 96h or 72h	M Factor
Flue dust, zinc-refining	69012-63-1	12.3 mg/L/72hr	No information available.	None.
Zinc	7440-66-6	0.15 mg/L/72hr (Green algae)	0.05 mg/L/72hr	1
Iron	7439-89-6	No information available.	No information available.	None.
Calcium	7440-70-2	No information available.	No information available.	None.
Potassium	7440-09-7	No information available.	No information available.	None.
Silicon dioxide	7631-86-9	No information available.	No information available.	None.
Sulphur	7704-34-9	No information available.	No information available.	None.
Fluorine	7782-41-4	No information available.	No information available.	None.
Cadmium	7440-43-9	0.07 mg/L/72hr (Green algae)	No information available.	10
Magnesium	7439-95-4	> 12 mg/L/72hr (Green algae) (Read-across)	≥ 12 mg/L/72hr (Read-across)	None.
Manganese	7439-96-5	4.5 mg/L/72hr (Green algae)	2.5 mg/L/72hr	None.
Carbon	7440-44-0	> 100 mg/L/72hr (Green algae)	≥ 100 mg/L/72hr	None.
Chlorine	7782-50-5	No information available.	No information available.	None.
Lead	7439-92-1	2.66 mg/L/96hr (Green algae)	No information available.	None.
Aluminium oxide	1344-28-1	> 100 mg/L/72hr (Green algae) (Read-across)	No information available.	None.
Copper	7440-50-8	No information available.	No information available.	None.
Chromium	7440-47-3	No information available.	No information available.	None.

12.2 Persistence and degradability

- : Biodegradation is not applicable to metals/inorganic substances.

12.3 Bioaccumulation potential

- : Zinc is a natural, essential element, which is needed for the optimal growth and development of all living organisms, including man. All living organisms have homeostasis mechanisms that actively regulate zinc uptake and absorption/excretion from the body; due to this regulation, zinc and zinc compounds do not bioaccumulate or biomagnify.

Components

Partition coefficient n-octanol/water (log K_{ow})

Bioconcentration factor (BCF)

Manganese (CAS 7439-96-5)	No information available.	220 (Bluegill sunfish)
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12.4 Mobility in soil

- : For metals, the transport and distribution over the different environmental compartments e. g. the water (dissolved fraction, fraction bound to suspended matter), soil (fraction bound or complexed to the soil particles, fraction in the soil pore water...) is described and quantified by the metal partition coefficients between these different fractions. In the CSR, a solids-water partitioning coefficient of 158.5 l/kg (log value 2.2) was applied for zinc in soils (CSR zinc 2010).

12.5 Results of PBT and vPvB assessment

- : This information is not available.

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.

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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.
- 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	None	Not regulated	Not regulated	None	
EU ADR/RID Classification Code	Not applicable.				
EU ADR / RID Hazard Identification Number	Not applicable.				
ADR/RID Additional information	Not classified as dangerous for conveyance in the meaning of the regulations for the transport of dangerous goods by road and rail.				
IMDG	None	Not regulated.	Not regulated	None	
IMDG Additional information	None.				
ICAO/IATA	None	Not regulated.	Not regulated	None	
ICAO/IATA Additional information	None.				

- 14.5 Environmental hazards** : Although this product does not meet the criteria for an environmentally hazardous mixture, according to the IMDG Code, this product does contain substances toxic for the environment. Harmful to aquatic life with long lasting effects. 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.

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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 substances and 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 28. cadmium (CAS # 7440-43-9)

See Item 30. Lead (CAS # 7439-92-1)

Lead (CAS # 7439-92-1) See Item 63.

cadmium (CAS # 7440-43-9) See Item 23.

Authorisations

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

cadmium (CAS # 7440-43-9)

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

Chlorine (CAS # 7782-50-5)

Fluorine (CAS # 7782-41-4)

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

Flue dust, zinc-refining (CAS # 69012-63-1)

Zinc (CAS # 7440-66-6)

Iron (CAS # 7439-89-6)

Chlorine (CAS # 7782-50-5)

Lead (CAS # 7439-92-1)

Calcium (CAS # 7440-70-2)

Potassium (CAS # 7440-09-7)

Magnesium (CAS # 7439-95-4)

Manganese (CAS # 7439-96-5)

sulfur (CAS # 7704-34-9)

Fluorine (CAS # 7782-41-4)

cadmium (CAS # 7440-43-9)

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

Flue dust, zinc-refining (CAS # 69012-63-1)

Chlorine (CAS # 7782-50-5)

Lead (CAS # 7439-92-1)

Potassium (CAS # 7440-09-7)

Manganese (CAS # 7439-96-5)

Fluorine (CAS # 7782-41-4)

cadmium (CAS # 7440-43-9)

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 been carried out for this substance. Refer to the Chemical Safety Report (CSR) for Flue dust, zinc-refining, 2010, for detailed information on the results of the Chemical Safety Assessment.

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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
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
NOEC: No observable effect concentration
OECD: Organisation for Economic Co-operation and Development
OEL: National occupational exposure limits
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
WHO: World Health Organization
- 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.
- Preparation Date (dd/mm/yyyy)** : 10/11/2010
- Reviewed Date SDS (dd/mm/yyyy)** : 28/09/2017
- Revision No.** : 2
- Revision Information** : All (format change)
- H-Phrases (Full text)** : H315 - Causes skin irritation.
H318 - Causes serious eye damage.
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.
H372 - Causes damage to organs (a,b,c) through prolonged or repeated exposure.
H412 - Harmful to aquatic life with long lasting effects.

Other special considerations for handling

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Other special considerations for handling

- : Provide adequate information, instruction and training for operators.
- List of uses for which a Generic Exposure Scenario (GES) is provided as an annex:
 - GES Recycling Calcine 0: Industrial treatment of secondary zinc bearing material in the production of the Intermediate Recycling Calcine (273-760-6) through pyrometallurgical processes
 - GES Recycling Calcine -2: Industrial use of the Intermediate Recycling Calcine (273-760-6) in the ultimate manufacturing of Zinc or Zinc compounds by several metallurgical processes

<p>Prepared for: American Zinc Recycling 4955 Steubenville Pike, Suite 405 Pittsburgh, Pennsylvania, USA, 15205 Telephone: +1 (724) 773-2223 Website: http://azr.com/american-zinc Direct all enquiries to: American Zinc Recycling.</p>	 <p>Delivering a Sustainable Future</p>
<p>Prepared by: ICC The Compliance Center Inc. http://www.thecompliancecenter.com</p>	

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