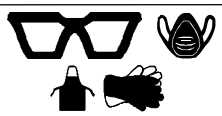
# Agrium Material Safety Data Sheet

| NFPA Classification | DOT / TDG Pictograms | WHMIS Classification | HMIS | | PROTECTIVE CLOTHING |
|---|---|---|---|---|---|
| Health 1, Flammability 0, Reactivity 0, Specific Hazard |  |  | Health<br>Flammability<br>Reactivity<br>PPE | 1<br>0<br>0<br>F |  |

## *Section I. Chemical Product and Company Identification*

**PRODUCT NAME/ TRADE NAME** **Ultra Yield Zinc Oxy Sulfate - EZ 20**

| | | | |
|---|---|---|---|
| **SYNONYM** | Sulfated zinc oxide | **MSDS NUMBER:** | **14265** |
| **CHEMICAL NAME** | Zinc sulfate, basic | **REVISION NUMBER** | 1.3 |
| **CHEMICAL FAMILY** | Metal salt. | **MSDS prepared by the Environment, Health and Safety Department on:** | **February 16, 2007** |
| **CHEMICAL FORMULA** | $Zn_4O_3(SO_4)$ | **24 HR EMERGENCY TELEPHONE NUMBER:** | |
| **MATERIAL USES** | Agricultural use: Fertilizer ingredient. | **Transportation Emergency: 1 (800) 792-8311**<br>**Medical Emergency: 1 (888) 670-8123** | |

**MANUFACTURER**

Agrium
North American Wholesale
13131 Lake Fraser Drive, S.E.
Calgary, Alberta, Canada, T2J 7E8

Agrium U.S. Inc.
Suite 1700, 4582 South Ulster St.
Denver, Colorado, U.S.A., 80237

**SUPPLIER**

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## *Section II. Hazardous Ingredients*

| | | Exposure Limits (ACGIH) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **NAME** | **CAS #** | **TLV-TWA mg/m³** | **TLV-TWA ppm** | **STEL mg/m³** | **STEL ppm** | **CEIL mg/m³** | **CEIL ppm** | **% by Weight** |
| Zinc sulfate | 7733-02-0 | N/A | | | | | | 11-16 as Zn |
| Zinc oxide | 1414-13-2 | 2 (R) | | 10 (R) | | | | 4-9 as Zn |
| Zinc oxide sulfate | 59766-35-7 | ---- | | | | | | 5-10 as Zn |
| Ferrous sulfate | 7720-78-7 | 1 | | | | | | 1-3 as Fe |
| Iron oxide | 1309-37-1 | 5 (R) | | | | | | 3-7 as Fe |

**ACGIH TLV notations:**

**---- No assigned TLV**
**(C) - Ceiling - the concentration not to be exceeded at any time**
**(I) - measured as the Inhalable fraction of the aerosol**
**(R) - measured as the Respirable fraction of the aerosol**
**(T) - measured as the Thoracic fraction of the aerosol**

**TOXICOLOGICAL DATA ON INGREDIENTS**

**Zinc sulfate:**
Rat oral (LD50), Acute: 1710 mg/kg RTECS
Aquatic Toxicity: 0.3 mg/l as Zn/120 hr/stickleback/lethal
4.6 ppm/96 hr/rainbow trout/LC 50/fresh water

**Zinc oxide:**
Mouse oral (LD50), Acute: 7950 mg/kg Mouse, RTECS.

**Ferrous sulfate:**

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Rat oral (LD50), Acute: 319-533 mg/kg, RTECS.

**Iron oxide:**
Rat oral (LDLo), Acute: 250 mg/kg, RTECS.

## *Section III. Hazards Identification.*

| | |
|---|---|
| **POTENTIAL ACUTE HEALTH EFFECTS** | Zinc and iron are essential dietary elements, and are generally not extremely toxic. However, some characteristics of certain zinc compounds can affect humans severely. Zinc salts produce effects ranging from a burning pain in the mouth and throat caused by zinc sulfate, to intense chest and stomach pain, violent vomiting, diarrhea, shock, and possible death on massive ingestion. May cause severe eye irritation. Corrosive to eyes and skin. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing.<br><br>Fumes generated from high temperatures such as from welding and cutting on metals contaminated with this product may result in formation of zinc oxide fumes at levels above the occupational exposure limit, which can cause "metal fume fever", a flu-like condition involving fever, chills, sweats, nausea, vomiting, muscular aches and pains and breathing disturbance. Symptoms may appear a few hours after exposure and subside within 24-48 hours with no permanent effect.<br><br>Iron oxide and iron salts may be expected to be irritating to the eyes and respiratory tract due to mechanical action. |
| **POTENTIAL CHRONIC HEALTH EFFECTS** | Not considered to be a human carcinogen, teratogen or mutagen by ACGIH, IARC, or NTP.<br><br>Repeated skin exposure may produce local skin damage or dermatitis. Exposure to excessive quantities of iron oxide over many years may lead to siderosis, an accumulation of iron particles in the lung which may lead to chronic inflammation. |

## *Section IV. First Aid Measures*

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| **EYE CONTACT** | Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Use warm water if available. Obtain medical attention if irritation persists. |
| **MINOR SKIN CONTACT** | May cause skin irritation. Wash contaminated skin with soap and water. Cover dry or irritated skin with a good quality skin lotion. If irritation persists, seek medical attention. Wash contaminated clothing before reusing. |
| **EXTENSIVE SKIN CONTACT** | No additional information. |
| **MINOR INHALATION** | Allow to rest in a well ventilated area. Seek medical attention, if not feeling well. Inhalation of dust may produce irritation to the respiratory tract, characterized by burning, sneezing and coughing. |
| **SEVERE INHALATION** | In emergency situations, use respiratory protection to evacuate the person to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the person is not breathing, perform artificial respiration. Seek medical attention. |
| **SLIGHT INGESTION** | Do not induce vomiting. May cause digestive tract irritation, with accompanying nausea, vomiting and diarrhea. If spontaneous vomiting does occur, lower the head so that the vomit will not reenter the mouth and throat.<br><br>If tolerated, give no more than 1 cup of milk or water for adults or 1/2 cup for children to rinse the mouth and throat, dilute the stomach contents, and minimize irritation. Obtain medical attention. |
| **EXTENSIVE INGESTION** | No additional information. |

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## *Section V. Fire and Explosion Data*

| | |
|---|---|
| **THE PRODUCT IS** | Non-flammable. |
| **AUTO-IGNITION TEMPERATURE** | Not applicable. |
| **FLASH POINT** | Not applicable. |
| **FLAMMABILITY LIMITS** | Not applicable. |
| **PRODUCTS OF COMBUSTION** | Not applicable. |
| **FIRE HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES** | Non-flammable. Decomposes to produce toxic gases ($NO_2$, $SO_2$). |
| **EXPLOSION HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES** | This substance is non-explosive. |
| **FIRE FIGHTING MEDIA AND INSTRUCTIONS** | Non-flammable. |
| **SPECIAL REMARKS ON FIRE HAZARDS** | No additional information. |
| **SPECIAL REMARKS ON EXPLOSION HAZARDS** | No additional information. |

## *Section VI. Accidental Release Measures*

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| **SMALL SPILL** | Use appropriate tools or equipment to place the spilled solid in a suitable container for recycle or disposal. Cleanup personnel should be protected against dust inhalation and dermal contact. Consult your environmental advisor regarding disposal alternatives. |
| **LARGE SPILL** | Stop spill if possible to do so without risk. Keep spills from entering sewers, wells, watercourses, etc. Water spill: Neutralize with agricultural lime, crushed limestone or sodium bicarbonate. Add soda ash. Adjust pH to neutral (pH= 7). Use mechanical dredges or lifts to remove immobilized precipitates. Recover and place in suitable containers for recycle, reuse, or disposal. Ensure disposal conforms with local regulations. |

## *Section VII. Handling and Storage*

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| **PRECAUTIONS** | Do not ingest or breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately. |
| **STORAGE** | Keep container tightly closed. Keep in a cool, well-ventilated place. Keep away from food, drink and animal feeds. Keep away from combustible materials. Keep away from incompatible materials. Keep out of reach of children. |

## *Section VIII. Exposure Controls/Personal Protection*

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| **ENGINEERING CONTROLS** | Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, use adequate local exhaust or general ventilation to keep exposure to airborne contaminants below the exposure limits. |
| **PERSONAL PROTECTION** | The selection of personal protective equipment varies, depending upon conditions of use. Wear appropriate respiratory protection for dust/mist when ventilation is inadequate. A filtering facepiece dust mask is recommended for most applications if respiratory protection is needed. Where skin and eye contact may occur as a result of brief periodic exposures, wear long sleeved clothing, coveralls, chemical resistant gloves, and safety glasses with side shields. |
| **PERSONAL PROTECTION IN CASE OF LARGE RELEASE** | |

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| | |
|---|---|
| | Where skin and eye contact may occur as a result of prolonged or repeated exposures, wear long sleeved clothing, impervious coveralls or apron, rubber gloves, and safety glasses with side shields. Use a dust and mist respirator if concentrations may exceed the exposure limit. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. For U.S. work sites where respiratory protection is required, ensure that a respiratory protection meeting 29 CFR 1910.134 is in place. |
| **EXPOSURE LIMITS** | Iron salts, soluble:<br>ACGIH TLV-TWA: 1 mg/m$^3$ as Fe<br>MI OSHA PEL: 1 mg/m$^3$ as Fe<br>Iron oxide:<br>ACGIH TLV-TWA: 5 mg/m$^3$ as Fe (respirable fraction)<br><br>Zinc oxide:<br>ACGIH TLV-TWA 2 mg/m$^3$ as respirable dust<br>Fed OSHA Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 15 mg/m$^3$ as total dust, 5 mg/m$^3$ as respirable dust, and 5 mg/m$^3$ as fume.<br>MI OSHA Permissible Exposure Limit: 8-hr Time Weighted Avg: 10 mg/m$^3$ as total dust, 5 mg/m$^3$ as respirable dust, and 5 mg/m$^3$ as fume.<br><br>MI and Fed OSHA Permissible Exposure Limit: 15 mg/m$^3$ (as Particulates Not Otherwise Regulated)<br><br>Federal, State, and Provincial exposure limits may vary. Consult local officials for acceptable exposure limits in your jurisdiction. |

## *Section IX. Physical and Chemical Properties*

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|---|---|---|---|
| **PHYSICAL STATE AND APPEARANCE** | Granular solid. | | |
| **MOLECULAR WEIGHT** | Not available | **COLOR** | Grey. |
| **pH (10% SOLN/WATER)** | 5.0 - 6.0 | **ODOR** | Not available. |
| **BOILING POINT** | Decomposes | **ODOR THRESHOLD** | Not available. |
| **MELTING POINT** | Not available | **TASTE** | Not available. |
| **CRITICAL TEMPERATURE** | Not applicable | **VOLATILITY** | Not available. |
| **SPECIFIC GRAVITY g/cc** | Not available | **SOLUBILITY** | Slightly soluble in cold or hot water. |
| **BULK DENSITY kg/m$^3$ ; lbs/ft$^3$** | Not available | **DISPERSION PROPERTIES** | See solubility. |
| **VAPOR PRESSURE** | Not applicable. | **WATER/OIL DIST. COEFF.** | Not available. |
| **VAPOR DENSITY** | Not applicable | | |

## *Section X. Stability and Reactivity Data*

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|---|---|
| **STABILITY** | The product is stable. |
| **INSTABILITY TEMPERATURE** | Not applicable |
| **CONDITIONS OF INSTABILITY** | No additional information. |
| **INCOMPATABILITY WITH VARIOUS SUBSTANCES** | No information is available in our database regarding the reactivity of this material. |
| **CORROSIVITY** | No specific information is available in our database regarding the corrosivity of this substance. |
| **SPECIAL REMARKS ON REACTIVITY** | No additional information. |
| **SPECIAL REMARKS ON CORROSIVITY** | Contact your sales representative or a metallurgical specialist to ensure compatability with your equipment. |

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## *Section XI. Toxicological Information*

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| **SIGNIFICANT ROUTES OF EXPOSURE** | Ingestion. Inhalation. |
| **TOXICITY TO ANIMALS** | See Section II. |
| **SPECIAL REMARKS ON TOXICITY TO ANIMALS** | Low toxicity for humans or animals under normal conditions of use. May be harmful to livestock and wildlife if ingested. Clean up all spilled material, especially where bulk fertilizer loading of equipment occurs to prevent animal exposure.<br><br>Aquatic/Marine Toxicity: Will disperse with current. Release to watercourses may cause effects down stream from the point of release. Harmful to fish and other water organisms. U.S. D.O.T.: This material is NOT listed as a Marine pollutant. |
| **OTHER EFFECTS ON HUMANS** | No additional information is available in our database regarding other toxic effects of this material. |
| **SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS** | Animal embryotoxic. Effects are seen at maternally toxic doses. The significance of these findings to humans is unknown. |
| **SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS** | No additional information. |

## *Section XII. Ecological Information*

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| **ECOTOXICITY** | Very low toxicity. The product itself and its products of degradation are not harmful under normal conditions of use.<br><br>Aquatic/Marine Toxicity: Harmful to fish and other water organisms. Zinc poisoning causes inflamed gills in fish. Will disperse with current. Release to watercourses may cause effects down stream from the point of release. |
| **BOD and COD** | Not available. |
| **PRODUCTS OF DEGRADATION** | Some metallic oxides. Inorganic mineral salts and oxides. |
| **TOXICITY OF THE PRODUCTS OF DEGRADATION** | The products of degradation are less toxic than the product itself. |
| **SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION** | No additional information. |

## *Section XIII. Disposal Considerations*

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| **WASTE DISPOSAL OR RECYCLING** | Recover and place material in a suitable container for intended use or disposal. Ensure disposal is in compliance with government requirements and local regulations. |

## *Section XIV. Transport Information*

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|---|---|
| **DOT / TDG CLASSIFICATION** | Not controlled under DOT (US) or TDG (Canada). |
| **PIN and Shipping Name** | Not applicable. |
| **SPECIAL PROVISIONS FOR TRANSPORT** | No additional remark. |
| **DOT (U.S.A) (Pictograms)** |  |

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## *Section XV. Other Regulatory Information and Pictograms*

**OTHER REGULATIONS**

Federal Secondary Drinking Water Standards: EPA 5mg/L Zinc
Clean Water Act Requirements:
Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.
Toxic pollutant designated pursuant to section 307(a)(1) of the Clean Water Act and is subject to effluent limitations. (Zinc and compounds). For total recoverable zinc the criterion to protect freshwater aquatic life is 47 ng/l as a 24 hr average at a hardnesses of 50, 100, and 200 mg/l as CaCO3. The concentration of total recoverable zinc should not exceed 180, 320, 570 ug/l at any time. For total recoverable zinc the criterion to protect saltwater aquatic life is 58 ug/l as a 24 hr average and the concentration should not exceed 170 ug/l at any time. (Soluble zinc salts)

CERCLA Reportable Quantities:
Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 1,000 lb or 454 kg. The toll free telephone number of the NRC is (800) 424-8802; In the Washington metropolitan area (202) 426-2675. The rule for determining when notification is required is stated in 40 CFR 302.6 (section IV. D.3.b).

This product contains the following chemicals subject to the reporting requirements of SARA Section 313 and 40 CFR 372:
Zinc compounds, chemical category code N982, 20% of total product weight is Zn.

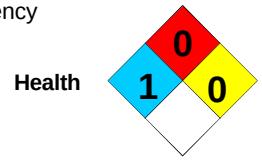
TSCA (Toxic Substance Control Act): This product is listed on the TSCA Inventory.
CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and is acceptable for use under the provisions of CEPA.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by the Controlled Products Regulations.

**OTHER CLASSIFICATIONS**

| | |
|---|---|
| **HCS (U.S.A.)** | HCS CLASS: Irritating substance. |
| **DSCL (EEC)** | Not available. |

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

Hazards presented under acute emergency conditions only:




**TDG (Pictograms - Canada)**

**DSCL (Europe) (Pictograms)**

Not Available
No Disponible
Pas Disponible

**ADR (Europe) (Pictograms)**

Not Available
No Disponible
Pas Disponible

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## *Section XVI. Other Information*

**REFERENCES**

-Transportation of Dangerous Goods Act and Clear Language Regulations, current revision.
-Canada Gazette Part II, Vol. 122, No. 2 Registration SOR/88-64 31 December, 1987 Hazardous Products Act "Ingredient Disclosure List".
-Domestic Substances List, Canadian Environmental Protection Act.
-29 CFR Part 1910
-33 CFR Parts 151, 153, 154, 156
-40 CFR Parts 1-799
-46 CFR Part 153
-49 CFR Parts 1-199
-American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances, 2006.
-NFPA 704, National Fire Codes Online, National Fire Protection Association, current edition at time of MSDS preparation.
-Corrosion Data Survey, Sixth Edition, 1985, National Association of Corrosion Engineers
-TOMES® System: Heitland G & Hurlbut KM (Eds) (electronic version): MICROMEDEX, Greenwood Village, Colorado, USA. Available at: http://csi.micromedex.com (2007). The TOMES® System includes MEDITEXT® Medical Management; HAZARDTEXT® Hazard Management; INFOTEXT® Documents; ERG2000 Emergency Response Guidebook Documents; REPROTEXT®: Heitland G & Hurlbut KM (Eds); CHRIS Hazardous Chemical Data: U.S. Department of Transportation, U.S. Coast Guard, Washington, D.C. (2007); HSDB: Hazardous Substances Data Bank. National Library of Medicine, Bethesda, Maryland (2007); IRIS: Integrated Risk Information System. U.S. Environmental Protection Agency, Washington, D.C. (2007); NIOSH: Pocket Guide to Chemical Hazards. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2007); OHM/TADS: Oil and Hazardous Materials Technical Assistance Data System. U.S. Environmental Protection Agency, Washington, D.C. (2007); REPROTOX®: Scialli A.R. Georgetown University Medical Center and Reproductive Toxicology Center, Columbia Hospital for Women Medical Center, Washington, D.C. (2007); RTECS®: Registry of Toxic Effects of Chemical Substances. National Institute for Occupational Safety and Health, Cincinnati, Ohio (2007); and SHEPARDS: Shepard T.H.: Shepard's Catalog of Teratogenic Agents (2007).
-The Fertilizer Institute Product Testing Program Results, March 2003
-Michigan Office of Regulatory Reform R325.51108

**OTHER SPECIAL CONSIDERATIONS**

Changes to Sections 2, 3, 4, and 15 in this revision.

**FOR FURTHER SAFETY, HEALTH, OR ENVIRONMENTAL INFORMATION ON THIS PRODUCT, CONTACT**

**AGRIUM**
**Wholesale Environment, Health and Safety**
**Telephone (780) 998-6906 or Fax (780) 998-6677**

**NOTICE TO READER**