ZINC WIRE DIA 2MM >_99.5%

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
ZINC WIRE DIA 2MM >_99.5%

OTHER NAMES

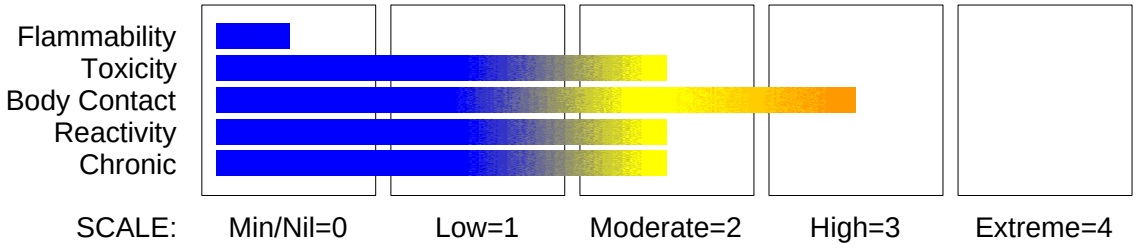
Zn, "zinc pellets", "zinc powder AnalaR"

PROPER SHIPPING NAME
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
(contains zinc)

PRODUCT USE
Used in galvanising sheet iron; as an ingredient of alloys such as brass, bronze, German silver, and special alloys for die-casting; as a protective coating for other metals to prevent corrosion.
For electrical apparatus, especially dry cell batteries, household utensils, castings, printing plates, building materials, automotive equipment; as a reducing agent in organic chemistry; as a reagent in analytical chemistry; for deoxidising bronze; extracting gold by the cyanide process; cable wrappings.

SUPPLIER
Company: S D FINE- CHEM LIMITED
Address:
315- 317, T.V. INDUSTRIAL ESTATE,
248, WORLI,
MUMBAI- 400030.INDIA.
technical@sdfine.com
Telephone: 91- 22- 24959898
Telephone: 91- 22- 24959899
Fax: 91- 22- 24937232

HAZARD RATINGS



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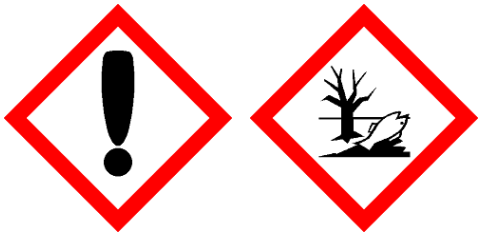
Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Acute Toxicity (Dermal) Category 4
Chronic Aquatic Hazard Category 1
Respiratory Irritation Category 3
Skin Corrosion/Irritation Category 3



EMERGENCY OVERVIEW

HAZARD

WARNING
Determined by using GHS criteria:
H335 H312 H316 H410
May cause respiratory irritation
Harmful in contact with skin
Causes mild skin irritation
Very toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS

Prevention

Wear protective gloves/clothing

Response

IF ON SKIN: Gently wash with plenty of soap and water.
If skin irritation occurs, seek medical advice/attention.
Wash contaminated clothing before reuse.
Specific treatment: refer to Label or MSDS.
Call a POISON CENTER or doctor/physician if you feel unwell.

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
zinc	7440-66-6	> 98.5
some grades can contain		
lead	7439-92-1	
aluminium	7429-90-5	
trace elements unspecified		< 0.1

continued...

Section 4 - FIRST AID MEASURES

SWALLOWED

· Immediately give a glass of water.
· First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

EYE

If this product comes in contact with the eyes:
· Immediately hold eyelids apart and flush the eye continuously with running water.
· Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
· Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
· Transport to hospital or doctor without delay.
· Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:
· Immediately remove all contaminated clothing, including footwear.
· Flush skin and hair with running water (and soap if available).
· Seek medical attention in event of irritation.

INHALED

· If fumes or combustion products are inhaled remove from contaminated area.
· Lay patient down. Keep warm and rested.
· Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
· Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
· Transport to hospital, or doctor.

NOTES TO PHYSICIAN

Copper, magnesium, aluminium, antimony, iron, manganese, nickel, zinc (and their compounds) in welding, brazing, galvanising or smelting operations all give rise to thermally produced particulates of smaller dimension than may be produced if the metals are divided mechanically. Where insufficient ventilation or respiratory protection is available these particulates may produce "metal fume fever" in workers from an acute or long term exposure.
· Onset occurs in 4-6 hours generally on the evening following exposure. Tolerance develops in workers but may be lost over the weekend. (Monday Morning Fever)
· Pulmonary function tests may indicate reduced lung volumes, small airway obstruction and decreased carbon monoxide diffusing capacity but these abnormalities resolve after several months.
· Although mildly elevated urinary levels of heavy metal may occur they do not correlate with clinical effects.
· The general approach to treatment is recognition of the disease, supportive care and prevention of exposure.
· Seriously symptomatic patients should receive chest x-rays, have arterial blood gases determined and be observed for the development of tracheobronchitis and pulmonary edema. [Ellenhorn and Barceloux: Medical Toxicology].
· Absorption of zinc compounds occurs in the small intestine.
· The metal is heavily protein bound.
· Elimination results primarily from faecal excretion.
· The usual measures for decontamination (Ipecac Syrup, lavage, charcoal or cathartics) may be administered, although patients usually have sufficient vomiting not to require

continued...

them.
· CaNa2EDTA has been used successfully to normalise zinc levels and is the agent of choice.
[Ellenhorn and Barceloux: Medical Toxicology].

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
Metal dust fires need to be smothered with sand, inert dry powders.
DO NOT USE WATER, CO2 or FOAM.
· Use DRY sand, graphite powder, dry sodium chloride based extinguishers, G-1 or Met L-X to smother fire.
· Confining or smothering material is preferable to applying water as chemical reaction may produce flammable and explosive hydrogen gas.
· Chemical reaction with CO2 may produce flammable and explosive methane.
· If impossible to extinguish, withdraw, protect surroundings and allow fire to burn itself out.
DO NOT use halogenated fire extinguishing agents.

FIRE FIGHTING
· Alert Fire Brigade and tell them location and nature of hazard.
· Wear breathing apparatus plus protective gloves for fire only.
· Prevent, by any means available, spillage from entering drains or water courses.
· Use fire fighting procedures suitable for surrounding area.
· DO NOT approach containers suspected to be hot.
· Cool fire exposed containers with water spray from a protected location.
· If safe to do so, remove containers from path of fire.
· Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD
· Zinc dust clouds are potentially explosive.
· Electric sparks may ignite the dust cloud even in atmospheres containing low oxygen (10%).
· In air the dust may be ignited in contact with hot surfaces or flame where temperatures exceed 600 deg C.
· Metal powders, while generally regarded as non-combustible, may burn when metal is finely divided and energy input is high.
· May react explosively with water.
· May be ignited by friction, heat, sparks or flame.
· Metal dust fires are slow moving but intense and difficult to extinguish.
· Will burn with intense heat.
· DO NOT disturb burning dust. Explosion may result if dust is stirred into a cloud, by providing oxygen to a large surface of hot metal.
· Containers may explode on heating.
· Dusts or fumes may form explosive mixtures with air.
· May REIGNITE after fire is extinguished.
· Gases generated in fire may be poisonous, corrosive or irritating.
· DO NOT use water or foam as generation of explosive hydrogen may result.
Decomposition may produce toxic fumes of: metal oxides.

FIRE INCOMPATIBILITY
Reacts with acids producing flammable / explosive hydrogen (H2) gas.
None known.

continued...

Personal Protective Equipment
Gas tight chemical resistant suit.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS
Environmental hazard - contain spillage.
- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable labelled container for waste disposal.

MAJOR SPILLS
Moderate hazard.
· CAUTION: Advise personnel in area.
· Alert Emergency Services and tell them location and nature of hazard.
· Control personal contact by wearing protective clothing.
· Prevent, by any means available, spillage from entering drains or water courses.
· Recover product wherever possible.
· IF DRY: Use dry clean up procedures and avoid generating dust. Collect residues and place in sealed plastic bags or other containers for disposal. IF WET: Vacuum/shovel up and place in labelled containers for disposal.
· ALWAYS: Wash area down with large amounts of water and prevent runoff into drains.
· If contamination of drains or waterways occurs, advise Emergency Services.
Environmental hazard - contain spillage.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:
zinc 250 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:
zinc 50 mg/m³

other than mild, transient adverse effects without perceiving a clearly defined odour is:
zinc 30 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:
zinc 10 mg/m³

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
R50	>= 0.25%	Corrosive (C)	>= 5.0%
R51	>= 2.5%		
else	>= 10%		

where percentage is percentage of ingredient found in the mixture

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

continued...

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

· Avoid all personal contact, including inhalation.
· Wear protective clothing when risk of exposure occurs.
· Use in a well-ventilated area.
· Prevent concentration in hollows and sumps.
· DO NOT enter confined spaces until atmosphere has been checked.
· DO NOT allow material to contact humans, exposed food or food utensils.
· Avoid contact with incompatible materials.
· When handling, DO NOT eat, drink or smoke.
· Keep containers securely sealed when not in use.
· Avoid physical damage to containers.
· Always wash hands with soap and water after handling.
· Work clothes should be laundered separately. Launder contaminated clothing before re -use.
· Use good occupational work practice.
· Observe manufacturer's storing and handling recommendations.
· Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

SUITABLE CONTAINER

CARE: Packing of high density product in light weight metal or plastic packages may result in container collapse with product release.
Heavy gauge metal packages / Heavy gauge metal drums.
· Polyethylene or polypropylene container.
· Check all containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY

· Some metals can react exothermically with oxidising acids to form noxious gases.
· Very reactive metals have been known to react with halogenated hydrocarbons, sometimes forming explosive compounds (for example, copper dissolves when heated in carbon tetrachloride).
· Many metals in elemental form react exothermically with compounds have active hydrogen atoms such as acids and water to form flammable hydrogen gas and caustic products.
· Elemental metals may react with azo/diazo compounds to form explosive products.
· Some elemental metals form explosive products with halogenated hydrocarbons.
Reacts with acids producing flammable / explosive hydrogen (H2) gas.
Many metals may incandesce, react violently, ignite or react explosively upon addition of concentrated nitric acid.
Reacts violently with caustic soda, other alkalies - generating heat, highly flammable hydrogen gas. If alkali is dry, heat generated may ignite hydrogen - if alkali is in solution may cause violent foaming.
Metals and their oxides or salts may react violently with chlorine trifluoride. Chlorine trifluoride is a hypergolic oxidiser. It ignites on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition. The state of subdivision may affect the results.
Segregate from inorganic metal nitrates/ chlorates and inorganic nitrates, eg. ammonium, barium, sodium, potassium nitrates, hydroxylamine nitrate.
Segregate from mineral and organic acids, also chlorides, fluorides.
Segregate from halogenated hydrocarbon solvents, nitrobenzene.
Zinc will reduce acidic arsenic solutions releasing highly toxic arsine gas.
Zinc reduces acidic antimony solutions releasing highly toxic stibine gas.
Reacts with halogens in the presence of water vapour.
Avoid reaction with halogenated hydrocarbon solvents.

continued...

STORAGE REQUIREMENTS

Observe manufacturer's storing and handling recommendations.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS

+	X	+	X	0	+

+: May be stored together
O: May be stored together with specific preventions
X: Must not be stored together

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

- zinc: CAS:7440- 66- 6
- lead: CAS:7439- 92- 1
- aluminium: CAS:7429- 90- 5

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
lead	100	

MATERIAL DATA

It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace.
At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience). Airborne concentrations must be maintained as low as is practically possible and occupational exposure must be kept to a minimum.
NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.
Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no -observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five -category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.
OSHA (USA) concluded that exposure to sensory irritants can:
· cause inflammation

continued...

· cause increased susceptibility to other irritants and infectious agents
· lead to permanent injury or dysfunction
· permit greater absorption of hazardous substances and
· acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

INGREDIENT DATA

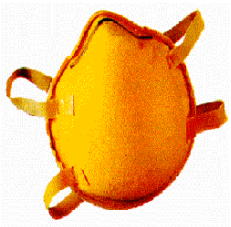
LEAD:

Not available

ALUMINIUM:

Twenty seven year experience with aluminium oxide dust (particle size 96% 1,2 um) without adverse effects either systemically or on the lung, and at a calculated concentration equivalent to 2 mg/m3 over an 8-hour shift has lead to the current recommendation of the TLV-TWA.
The limit should also apply to aluminium pyro powders whose toxicity is reportedly greater than aluminium dusts and should be protective against lung changes.

PERSONAL PROTECTION



EYE

· Safety glasses with side shields.
· Chemical goggles.
· Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

HANDS/FEET

Suitability and durability of glove type is dependent on usage. Factors such as:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity,
are important in the selection of gloves.
Wear chemical protective gloves, eg. PVC.
Wear safety footwear or safety gumboots, eg. Rubber.

OTHER

· Overalls.
· P.V.C. apron.
· Barrier cream.
· Skin cleansing cream.
· Eye wash unit.

continued...

RESPIRATOR

Protection Factor	Half- Face Respirator	Full- Face Respirator	Powered Air Respirator
10 x ES	P1 Air- line*	- -	PAPR- P1 -
50 x ES	Air- line**	P2	PAPR- P2
100 x ES	-	P3	-
		Air- line*	-
100+ x ES	-	Air- line**	PAPR- P3

* - Negative pressure demand ** - Continuous flow.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.
For further information consult your
Occupational Health and Safety Advisor.

ENGINEERING CONTROLS

Metal dusts must be collected at the source of generation as they are potentially explosive.
· Vacuum cleaners, of flame-proof design, should be used to minimise dust accumulation.
· Metal spraying and blasting should, where possible, be conducted in separate rooms. This minimises the risk of supplying oxygen, in the form of metal oxides, to potentially reactive finely divided metals such as aluminium, zinc, magnesium or titanium.
· Work-shops designed for metal spraying should possess smooth walls and a minimum of obstructions, such as ledges, on which dust accumulation is possible.
· Wet scrubbers are preferable to dry dust collectors.
· Bag or filter-type collectors should be sited outside the workrooms and be fitted with explosion relief doors.
· Cyclones should be protected against entry of moisture as reactive metal dusts are capable of spontaneous combustion in humid or partially wetted states.
· Local exhaust systems must be designed to provide a minimum capture velocity at the fume source, away from the worker, of 0.5 metre/sec.
Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
welding, brazing fumes (released at relatively low velocity into moderately still air)	0.5- 1.0 m/s (100- 200 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only.	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2.5

continued...

m/s (200-500 f/min.) for extraction of gases discharged 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Bluish-white to grey lustrous metal, in solid form. Insoluble in water.
Soluble in acids and alkalies.
Available in a range of purity grades and physical form.
Note: Hazard may vary depending upon physical form. Zinc dust/ zinc powder, depending on particle size may be pyrophoric or non-pyrophoric and are then classified as Dangerous Goods and have separate entries.

PHYSICAL PROPERTIES

Solid.
Does not mix with water.
Sinks in water.

Molecular Weight: 65.37
Melting Range (°C): 419
Solubility in water (g/L): Immiscible
pH (1% solution): Not applicable
Volatile Component (%vol): Nil
Relative Vapour Density (air=1): > 1
Lower Explosive Limit (%): Not applicable.
Autoignition Temp (°C): Not available.
State: Divided solid

Boiling Range (°C): 907
Specific Gravity (water=1): 7.13- 7.14
pH (as supplied): Not applicable
Vapour Pressure (kPa): 0.133 @ 487 C.
Evaporation Rate: Non Volatile
Flash Point (°C): Non Flammable
Upper Explosive Limit (%): Not applicable.
Decomposition Temp (°C): > 800 fumes
Viscosity: Not Applicable

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

Soluble zinc salts produces irritation and corrosion of the alimentary tract (in a manner similar to copper salts) with pain, vomiting, etc. Delayed deaths have been ascribed to inanition (weakness and extreme weight loss resulting from prolonged and severe food insufficiency) following severe strictures of the oesophagus, and pylorus.
The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g liver, kidney) damage is evident.
Present definitions of harmful or toxic substances are generally based on doses producing

continued...

mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

EYE
It has either been demonstrated or it is expected that when the material is applied to the eye(s) of animals, it produces severe ocular lesions which are present twenty-four hours or more after instillation.

SKIN
Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
The material may produce mild skin irritation; limited evidence or practical experience suggests, that the material either:
· produces mild inflammation of the skin in a substantial number of individuals following direct contact, and/or
· produces significant, but mild, inflammation when applied to the healthy intact skin of animals (for up to four hours), such inflammation being present twenty-four hours or more after the end of the exposure period.
Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (non allergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.
Skin contact with the material may be harmful; systemic effects may result following absorption.

INHALED
Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual.
Limited evidence or practical experience suggests that the material may produce irritation of the respiratory system, in a significant number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.
Inhalation of freshly formed zinc oxide particles sized below 1.5 microns and generally between 0.02 to 0.05 microns may result in "metal fume fever", with symptoms resembling influenza. Symptoms may be delayed for up to 12 hours and begin with the sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalised feeling of malaise. Mild to severe headache, nausea, occasional vomiting, fever or chills, exaggerated mental activity, profuse sweating, diarrhoea, excessive urination and prostration may also occur. Tolerance to the fumes develops rapidly, but is quickly lost. All symptoms usually subside within 24-36 hours following removal from exposure. Leucocytosis, a transient increase in white blood cell counts, is reported as a common finding in metal fume fever but is not known to be common amongst welders. Severe over-exposure to zinc oxide, following inhalation of fumes or finely divided dusts may result in bronchitis or pneumonia; a bluish skin tint may be present.
Welding or flame cutting of metals with zinc or zinc dust coatings may result in inhalation of zinc oxide fume; high concentrations of zinc oxide fume may result in "metal fume fever"; also known as "brass chills", an industrial disease of short duration. [I.L.O] Symptoms include malaise, fever, weakness, nausea and may appear

continued...

quickly if operations occur in enclosed or poorly ventilated areas.

CHRONIC HEALTH EFFECTS
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
Metallic dusts generated by the industrial process give rise to a number of potential health problems. The larger particles, above 5 micron, are nose and throat irritants. Smaller particles however, may cause lung deterioration. Particles of less than 1.5 micron can be trapped in the lungs and, dependent on the nature of the particle, may give rise to further serious health consequences.

TOXICITY AND IRRITATION
unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.
The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

LEAD:
unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (woman) TDLo: 450 mg/kg/6 years	Nil Reported
Inhalation (human) TCLo: 0.01 mg/m³	

WARNING: Lead is a cumulative poison and has the potential to cause
abortion and intellectual impairment to unborn children of pregnant workers.

ALUMINIUM:
Not available. Refer to individual constituents.

Section 12 - ECOLOGICAL INFORMATION

Marine Pollutant:Not Determined
Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
DO NOT discharge into sewer or waterways.
The material is classified as an ecotoxin* because the Fish LC50 (96 hours) is less than or equal to 0.1 mg/l

* Classification of Substances as Ecotoxic (Dangerous to the Environment)
Appendix 8, Table 1
Compiler's Guide for the Preparation of International Chemical Safety Cards: 1993
Commission of the European Communities.
The product has no effect on the environment unless in finely divided form. In this form it can be harmful to aquatic life. Acute toxicity data in the form of 96 hour LC50s for Australian freshwater animals are:
fish - 0.14 to 38 mg Zn/L; and crustaceans - 0.43 to 32 mg Zn/L.
Refer to data for ingredients, which follows:

LEAD:
Hazardous Air Pollutant: Yes

continued...

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Bury residue in an authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

Labels Required: MISCELLANEOUS
HAZCHEM: 2X

UNDG:

Dangerous Goods Class:	4.3	Subrisk:	None
UN Number:	1436	Packing Group	II

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (contains zinc)

Air Transport IATA:

ICAO/IATA Class:	4.3	ICAO/IATA Subrisk:	None
UN/ID Number:	1436	Packing Group:	II
Special provisions:	A97		

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID N.O.S.

Maritime Transport IMDG:

IMDG Class:	4.3	IMDG Subrisk:	None
UN Number:	1436	Packing Group:	II
EMS Number:	F- A, S- F	Special provisions:	274 909 944
Marine Pollutant:	Not Determined		

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.

Section 15 - REGULATORY INFORMATION

REGULATIONS

zinc (CAS: 7440-66-6) is found on the following regulatory lists;
OECD Representative List of High Production Volume (HPV) Chemicals
WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have not been established

continued...

Section 16 - OTHER INFORMATION

REPRODUCTIVE HEALTH GUIDELINES

Ingredient	ORG	UF	Endpoint	CR	Adeq TLV
lead	0.01 mg/m3	1000	D	NA	-

These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as unequivocally safe limits. ORGS represent an 8-hour time -weighted average unless specified otherwise.
CR = Cancer Risk/10000; UF = Uncertainty factor:
TLV believed to be adequate to protect reproductive health:
LOD: Limit of detection
Toxic endpoints have also been identified as:
D = Developmental; R = Reproductive; TC = Transplacental carcinogen
Jankovic J., Drake F.: A Screening Method for Occupational Reproductive American Industrial Hygiene Association Journal 57: 641-649 (1996).

MSDS SECTION CHANGES

The following table displays the version number of and date on which each section was last changed.

Section Name	Version	Date	Section Name	Version	Date	Section Name	Version	Date
Advice to Doctor	5	9- Mar- 2007	Handling Procedure	4	30- May- 2006	Instability Condition	4	30- May- 2006
First Aid (eye)	4	30- May- 2006	Storage (storage incompatibility)	4	30- May- 2006	Acute Health (eye)	4	30- May- 2006
First Aid (inhaled)	4	30- May- 2006	Storage (storage requirement)	4	30- May- 2006	Acute Health (inhaled)	4	30- May- 2006
First Aid (skin)	4	30- May- 2006	Storage (suitable container)	4	30- May- 2006	Acute Health (skin)	5	9- Mar- 2007
First Aid (swallowed)	4	30- May- 2006	Exposure Standard	5	9- Mar- 2007	Acute Health (swallowed)	5	9- Mar- 2007
Fire Fighter (extinguishing media)	4	30- May- 2006	Personal Protection (eye)	4	30- May- 2006	Chronic Health	4	30- May- 2006
Fire Fighter (fire fighting)	4	30- May- 2006	Personal Protection (hands/feet)	4	30- May- 2006	Toxicity and Irritation (Other)	4	30- May- 2006
Fire Fighter (fire incompatibility)	4	30- May- 2006	Personal Protection (other)	4	30- May- 2006	Environmental	4	30- May- 2006
Fire Fighter (fire/explosion hazard)	5	9- Mar- 2007	Appearance	5	9- Mar- 2007	Disposal	5	9- Mar- 2007
Spills (major)	5	9- Mar- 2007	Physical Properties	4	30- May- 2006	Transport	4	30- May- 2006
Spills (minor)	4	30- May- 2006						

The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

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