ZINC SULPHATE HEPTAHYDRATE
Safety Data Sheet- MSDS

Update version -IV-

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

ZINC SULPHATE HEPTAHYDRATE

OTHER NAMES

ZnSO4.7H2O, "white vitriol", Bonazen, "zinc vitriol", "sulfuric acid, zinc salt dried", "zinc sulfate (CAS RN: 7733-02-0)", "sulphuric acid, zinc salt (1:1), monohydrate ZnSO4.H2O", "zinc sulfate heptahydrate (CAS RN: 7446-20-0)", "zinc sulfate hexahydrate (CAS RN:", 13986-24-8),

PROPER SHIPPING NAME

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (contains zinc sulfate heptahydrate)

PRODUCT USE

As a mordant in calico-printing; preserving wood and skins; bleaching paper; manufacture of lithopone and other zinc salts; clarifying glue; electrodepositing zinc; chemical reagent. Used in medicine as an astringent solution and in eye-drops Intermediate

SUPPLIER

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Section 2 - HAZARDS IDENTIFICATION

GHS Classification
Acute Toxicity Category 3
Chronic Aquatic Hazard Category 1 Serious Eye Damage Category

EMERGENCY OVERVIEW
HAZARD
DANGER

Determined by using GHS criteria

H301	Toxic if swallowed.
H318	Causes serious eye damage.
H410	Very toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS

Prevention

Code	Phrase
P264	Wash ... thoroughly after handling.
P270	Do not eat, drink or smoke when using this product

P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection

Response Code

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P305+P351+P338 IF IN EYES Rinse cautiously with water for several minutes. Remove
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses If Present and easy to do continue rising.
P310 Immediately call a POISON CENTER or doctor/physician
P330 Collect spillage
P391

Storage

Code	Phrase
P405	Store locked up.

Disposal

Code	**Phrase**
P501	Dispose of contents/container to …

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME zinc sulphate heptahydrate >99 % CAS 7446-20-0

Section 4 - FIRST AID MEASURES

SWALLOWED

- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
- For advice, contact a Poisons Information Centre or a doctor.
- Urgent hospital treatment is likely to be needed.
- In the meantime, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.

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.

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 dust is inhaled, remove from contaminated area.
- Encourage patient to blow nose to ensure clear passage of breathing.
- If irritation or discomfort persists seek medical attention.

NOTES TO PHYSICIAN

For poisons (where specific treatment regime is absent):

Basic Treatment

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 L/min.
- Monitor and treat, where necessary, for pulmonary oedema.
- Absorption of zinc compounds occurs in the small intestine.
- The metal is heavily protein bound.
- Elimination results primarily from faucal excretion.
- The usual measures for decontamination (Ipecac Syrup, lavage, charcoal or cathartics) may be administered, although patients usually have sufficient vomiting not to require them.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves in the event of a fire.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use fire fighting procedures suitable for surrounding area.

FIRE/EXPLOSION HAZARD

- Noncombustible.
- Not considered a significant fire risk, however containers may burn.

Decomposition may produce toxic fumes of: sulfur oxides (Sox), sulfur dioxide (SO2), metal oxides.

FIRE INCOMPATIBILITY

- None known

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact with the substance, by using protective equipment. Environmental hazard - contain spillage.

MAJOR SPILLS

- Environmental hazard - contain spillage. 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.

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

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.

PACKAGING MATERIAL INCOMPATIBILITIES

Chemical Name
Container Type

" Acetal (Delrinr)" , Aluminum, " Buna N (Nitrile)" , " Carbon Steel" , " Carpenter 20" , " Cast iron" , " Ceramic Al203" , Copper, " Natural rubber" , Polypropylene, Polyuethene

SUITABLE CONTAINER

- Glass container is suitable for laboratory quantities.
- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY

- WARNING: Avoid or control reaction with peroxides. All transition metal peroxides should be considered as potentially explosive. For example transition metal complexes of alkyl hydroperoxides may decompose explosively.
- The pi-complexes formed between chromium(0), vanadium(0) and other transition metals (haloarene-metal complexes) and mono-or poly-fluorobenzene show extreme sensitivity to heat and are explosive.

  - Avoid reaction with borohydrides or cyanoborohydrides
  - Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.
  - These trifluorides are hypergolic oxidisers. They 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.

When heated over 680 C, zinc sulfate decomposes into sulfur dioxide gas and zinc oxide fume, both of which are hazardous.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry area protected from environmental extremes.
  Store away from incompatible materials and foodstuff containers

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records
zinc sulfate heptahydrate CAS:7446- 20- 0 CAS:7446- 19- 7 CAS:7733- 02- 0 CAS:13986-24-8

MATERIAL DATA

ZINC SULFATE HEPTAHYDRATE:

■ 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).

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.

PERSONAL PROTECTION

RESPIRATOR

•Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

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], [AS/NZS 1336 or national equivalent].

HANDS/FEET

■ The selection of the suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application. The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice. Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.

- polychloroprene
- nitrile rubber
- butyl rubber
- fluor caoutchouc

OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.

ENGINEERING CONTROLS

■ Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

White free-flowing crystals or white powder. Soluble in water. No odor. Solubility in water is 50-65% at 20 C. Solutions hydrolyze and are acidic. Practically insoluble in alcohol.
The monohydrate does not cake as does the heptahydrate, hence is more convenient for use.

PHYSICAL PROPERTIES

Solid.
Mixes with water

State	Divided solid	Molecular Weight	287.54
Melting Range (°C)	100 (.7H2O)	Viscosity	Not Applicable
Boiling Range (°C)	>500 decomposes	Solubility in water (g/L)	Miscible
Flash Point (°C)	Not applicable	pH (1% solution)	4.0- 5.2 (5%).
Decomposition Temp (°C)	>500	pH (as supplied)	Not applicable
Autoignition Temp (°C)	Not applicable	Vapour Pressure (kPa)	Negligible
Upper Explosive Limit (%)	Not applicable	Specific Gravity (water=1)	3.35
Lower Explosive Limit (%)	Not applicable	Relative Vapour Density	Not applicable.
Volatile Component (%vol)	Negligible	(air=1) Evaporation Rate	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.

For incompatible materials - refer to Section 7 - Handling and Storage

Section 11 - TOXICOLOGICAL INFORMATION

Health hazard summary table:

Acute toxicity	Acute Tox. (oral) 3
Skin corrosion/irritation	Not applicable
Serious eye damage/irritation	Eye Dam. 1
Respiratory or skin sensitization	Not applicable
Germ cell mutagenicity	Not applicable
Carcinogenicity	Not applicable
Reproductive toxicity	Not applicable
STOT- single exposure	Not applicable
STOT- repeated exposure	Not applicable
Aspiration hazard	Not applicable

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
■ Limited evidence exists that this substance may cause irreversible mutations (though not lethal) even following a single exposure.
■ Sulfates are not well absorbed orally, but can cause diarrhoea.
■ Soluble zinc salts produce irritation and corrosion of the alimentary tract with pain, and vomiting.
Death can occur due to insufficiency of food intake due to severe narrowing of the oesophagus and pylorus.

EYE

■ If applied to the eyes, this material causes severe eye damage.

SKIN

■ There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ Solution of material in moisture on the skin, or perspiration, may increase irritant effects.
■ Entry into the blood-stream, though, 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.

INHALED

■ There is some evidence to suggest that the material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.
■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled. If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.
■ Limited evidence exists that this substance may cause irreversible mutations (though not lethal) even following a single exposure.

CHRONIC HEALTH EFFECTS

■ There is some evidence from animal testing that exposure to this material may result in toxic effects to the unborn baby. Based on laboratory and animal testing, exposure to the material may result in irreversible effects and mutations in humans.
Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung. Prime symptom is breathlessness; lung shadows show on X-ray.
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 quickly if operations occur in enclosed or poorly ventilated areas.

TOXICITY AND IRRITATION

■ Limited evidence of a carcinogenic effect*.
NOTE: Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA.

Section 12 - ECOLOGICAL INFORMATION

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. This material and its container must be disposed of as hazardous waste.
Avoid release to the environment.
Refer to special instructions/ safety data sheets.

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
zinc sulfate heptahydrate	HIGH	No Data Available	LOW	HIGH

Section 13 - DISPOSAL CONSIDERATIONS

• Containers may still present a chemical hazard/ danger when empty.
• Return to supplier for reuse/ recycling, if
Possible, Otherwise,
• If container cannot be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorized landfill.
• Where possible retain label warnings and MSDS and observe all notices pertaining to the product.
Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must

refer to laws operating in their area.
A Hierarchy of Controls seems to be common - the user should investigate:
• Reduction.
• DO NOT allow wash water from cleaning or process equipment to enter drains.
• It may be necessary to collect all wash water for treatment before disposal.
• In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
• Where in doubt contact the responsible authority.
• Recycle wherever possible or consult manufacturer for recycling options.
• Consult State Land Waste Management Authority for disposal.
• Bury residue in an authorized landfill.
• Recycle containers if possible, or dispose of in an authorized landfill.

Section 14 - TRANSPORTATION INFORMATION

Labels Required: MISCELLANEOUS

HAZCHEM:
2Z

Land Transport

UNDG: Class or division:	9	Subsidiary risk:	None
UN No.:	3077	UN packing group:	III

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

Air Transport IATA:

ICAO/IATA Class:	9	ICAO/IATA Sub risk:	None
UN/ID Number:	3077	Packing Group:	III
Special provisions:	A97		

Shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (contains zinc sulphate heptahydrate)

Maritime Transport IMDG:

IMDG Class:	9	IMDG Sub risk:	None
UN Number:	3077	Packing Group:	III
EMS Number:	F- A, S- F	Special provisions:	274 335
Limited Quantities:	5 kg	Marine Pollutant:	Yes

Shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (contains zinc sulphate heptahydrate)

Section 15 - REGULATORY INFORMATION

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
zinc sulphate heptahydrate	7446-20-0,7446-19-7,7733-02-0,13986-24-8

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

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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