

CADMIUM SULPHIDE (ORANGE)

GHS Safety Data Sheet

Version No:2.0

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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

CADMIUM SULPHIDE

OTHER NAMES

Cd-S, "cadmium sulphide", "Aurora Yellow", ,
 , "Cadmium orange",
 "Ferro lemon yellow", "Ferro orange yellow"

PROPER SHIPPING NAME

CADMIUM COMPOUND

PRODUCT USE

Pigments, inks, pyrotechnics, phosphors, ceramic glazes, fluorescent screens, scintillation counters, rectifiers, transistors (n-type semiconductor), photovoltaic cells, solar cells, photoconductor in xerography, catalyst in the decomposition of hydrogen sulfide.

SUPPLIER

Company: S D FINE- CHEM LIMITED

Address:

315- 317, T.V. INDUSTRIAL ESTATE,

248, WORLI,

MUMBAI- 400030.INDIA.

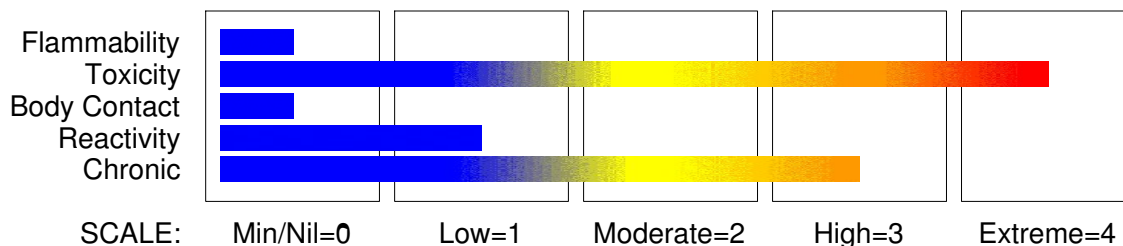
technical@sdfine.com

Telephone: 91- 22- 24959898

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HAZARD RATINGS



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Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Acute Toxicity (Dermal) Category 4
Acute Toxicity (Inhalation) Category 2
Acute Toxicity (Oral) Category 3
Carcinogen Category 1B
Chronic Aquatic Hazard Category 1
Organ Damage Category 1
Reproductive Toxicity Category 1B



EMERGENCY OVERVIEW

HAZARD

DANGER

Determined by using GHS criteria:

H330 H301 H312 H350 H360 H360 H372 H410

Fatal if inhaled

Toxic if swallowed

Harmful in contact with skin

May cause CANCER

May damage fertility

May damage the unborn child

Causes damage to organs through prolonged or repeated exposure.

Very toxic to aquatic life with long lasting effects

Harmful to life in the soil

PRECAUTIONARY STATEMENTS

Prevention

Wear respiratory protection.

Wear protective gloves/clothing

Obtain special instructions before use.

Do not breathe dust/fume/gas/mist/vapours/spray.

Use only outdoors or in a well ventilated area.

Wash hands thoroughly after handling.

Do not eat, drink or smoke when using this product.

Use personal protective equipment as required.

Do not handle until all safety precautions have been read and understood.

Response

If exposed or concerned: Get medical attention advice.

Wash contaminated clothing before reuse.

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Section 2 - HAZARDS IDENTIFICATION

IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.

Keep container tightly closed.

Specific treatment: refer to Label or MSDS.

IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

Get medical advice/attention if you feel unwell.

IF ON SKIN: Gently wash with plenty of soap and water.

Immediately call a POISON CENTER or doctor/physician.

Call a POISON CENTER or doctor/physician if you feel unwell.

Storage

Store locked up.

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
cadmium sulfide	1306-23-6	>98

Section 4 - FIRST AID MEASURES

SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.

· IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.

· For advice, contact a Poisons Information Centre or a doctor.

Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

· Induce vomiting with fingers down the back of the of the throat, ONLY IF CONSCIOUS.

· Lean patient forward or place on left side (head-down position if possible) to maintain open airway and prevent aspiration.

NOTE: Wear a protective glove when inducing vomiting by mechanical means.

· In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.

· If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided. Further action will be the responsibility of the medical specialist.

· If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.

EYE

If this product comes in contact with the eyes:

· Wash out immediately with fresh 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.

· If pain persists or recurs seek medical attention.

· Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

If skin contact occurs:

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Section 4 - FIRST AID MEASURES

- 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 breathing passages.
- Ask patient to rinse mouth with water but to not drink water.
- Seek immediate medical attention.

NOTES TO PHYSICIAN

- High acute exposure, to cadmium, produces delayed pulmonary oedema progressing to interstitial fibrosis.
- For acute inhalations, initial presentation simulates metal fume fever (fever, headache, dyspnoea, pleuritic chest pain, conjunctivitis, rhinitis, sore throat, cough) developing 4-12 hours post-exposure. Respiratory failure may ensue in 3-10 days.
- For acute oral exposures, gastroenteritis results with sudden onset of vomiting, diarrhoea and abdominal pain.
- If vomiting is not prominent, use Ipecac/lavage/catharsis in usual manner.
- CaNa₂EDTA is the chelator of choice for acute cadmium exposure. British Anti-Lewisite increases nephrotoxicity and therefore is not indicated [Ellenhorn and Barceloux: Medical Toxicology]

COMMENTS on HUMAN TOXICITY:

- Between 10 and 50% of inhaled cadmium is adsorbed, the adsorption being greater for smaller particles and fumes; absorption through skin is negligible.
- The half-life of cadmium in the human body is thought to be about around 30 years and it has no known biological function.

Blood and urine cadmium concentrations may be determined.

Normal concentrations

Blood <27 nmol/l (<3ug/l), non- smokers <54 nmol/l (<6 ug/l), smokers
Urine <18 nmol/l (<2 ug/l), non- smokers 0.4-1.3 nmol/mmol creatinine <45 nmol/l (<5 ug/l), smokers 10- 35 nmol/mmol creatinine

Hazardous concentrations

>180 nmol/l (>20 ug/l)
>180 nmol/l (>20 ug/l) >4- 13 nmol/mmol creatinine

BIOLOGICAL EXPOSURE INDEX (BEI)

These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

Determinant	Sampling time	Index	Comments
Cadmium in urine	Not critical	5 ug/g creatinine	B
Cadmium in blood	Not critical	5 ug/L	B

B: Background levels occur in specimens collected from subjects NOT exposed.

For exposures involving sulfides and hydrogen sulfide (including gastric acid decomposition products of alkaline sulfides):

- Hydrogen sulfide anion produces its major toxic effect through inhibition of cytochrome oxidases.
- Symptoms include profuse salivation, nausea, vomiting and diarrhea. Central nervous effects may include giddiness, headache, vertigo, amnesia, confusion and unconsciousness. Tachypnoea, palpitations, tachycardia, arrhythmia, sweating, weakness and muscle cramps may also indicate overexposure.

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Section 4 - FIRST AID MEASURES

Treatment involves:

- If respirations are depressed, application of artificial respiration, administration of oxygen (continue after spontaneous breathing is established).
 - For severe poisonings administer amyl nitrite and sodium nitrite (as for cyanide poisoning) but omit sodium thiosulfate injection.
 - Atropine sulfate (0.6 mg intramuscularly) may contribute symptomatic relief.
 - Conjunctivitis may be relieved by installation of 1 drop of olive-oil in each eye and sometimes by 3 drops of epinephrine solution (1:1000) at frequent intervals. Occasionally local anesthetics and hot and cold compresses are necessary to control pain.
 - Antibiotics at first hint of pulmonary infection.
- [Gosselin etal, Clinical Toxicology of Commercial Products].

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

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

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- 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

- Non combustible.
- Not considered to be a significant fire risk.
- Expansion or decomposition on heating may lead to violent rupture of containers.
- Decomposes on heating and may produce toxic fumes of carbon monoxide (CO).
- May emit acrid smoke.

FIRE INCOMPATIBILITY

Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Personal Protective Equipment

Breathing apparatus.
Gas tight chemical resistant suit.
Limit exposure duration to 1 BA set 30 mins.

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Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- Clean up waste regularly and abnormal spills immediately.
- Avoid breathing dust and contact with skin and eyes.
- Wear protective clothing, gloves, safety glasses and dust respirator.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up or sweep up. NOTE: Vacuum cleaner must be fitted with an exhaust micro filter (HEPA type) (consider explosion-proof machines designed to be grounded during storage and use).
- Dampen with water to prevent dusting before sweeping.
- Place in suitable containers for disposal.

MAJOR SPILLS

Pollutant . 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.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



X



X



+



X



X



+

+: May be stored together

O: May be stored together with specific precautions

X: Must not be stored together

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

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

Avoid generating and breathing dust.

- 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.

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Section 7 - HANDLING AND STORAGE

- 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

Packaging as recommended by manufacturer.

- Check that containers are clearly labelled.

Glass container.

Plastic drum.

Polyethylene or polypropylene container.

Metal can.

Metal drum.

STORAGE INCOMPATIBILITY

Avoid storage with oxidisers and acids.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

- cadmium sulfide:

CAS:1306- 23- 6 CAS:106496- 20- 2

MATERIAL DATA

The adopted TLVs were recommended to prevent proteinuria, pulmonary oedema and emphysema. Evidence for added risk of carcinoma of the lung and prostate has been reported amongst smelter workers but exposure to other toxic fumes, gases and dusts is a confounding factor. Most of the data on cadmium levels responsible for these observed effects indicated exposures above the former TLV ceiling of 0.1 mg/m³ for cadmium fume. It is anticipated that the total dust recommendation will prevent the development of preclinical kidney dysfunction and that the respirable fraction recommendation will protect the lower respiratory tract from the accumulation of cadmium burden that might directly act on the lung as a carcinogen. It is also expected that the recommendations will protect workers from metal fume fever. The concentration of respirable dust for application of this limit is to be determined from the fraction that penetrates a

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

separator whose size collection efficiency is described by a cumulative log normal function with a median aerodynamic volume of $4.0 \mu\text{m}$ (+-) $0.3 \mu\text{m}$ and with a geometric standard deviation of $1.5 \mu\text{m}$ (+-) $0.1 \mu\text{m}$, i.e. less than $5 \mu\text{m}$. Some jurisdictions require that health surveillance be conducted on occupationally exposed workers.

Such surveillance should emphasise

- demography, occupational and medical history
- health advice, including counselling on additional cadmium burden from smoking
- physical examination with emphasis on the respiratory system
- completion of a standardised respiratory questionnaire
- standardised respiratory function tests such as FEV1, FVC and FEV1/FVC
- urinary cadmium and beta2-microglobulin
- records of personal exposure.

Inhaled cadmium sulfide is bioavailable in the lungs although only to a small extent. Locally highly carcinogenic soluble compounds are produced as a consequence

MAK IIIA2: Substances shown to be clearly carcinogenic only in animal studies but under conditions indicative of carcinogenic potential in the workplace.

PERSONAL PROTECTION



EYE

- 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

Wear chemical protective gloves. eg. PVC gloves with barrier cream

Wear safety footwear.

OTHER

- Overalls.
- Eyewash unit.

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*	-

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

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

General exhaust is adequate under normal operating conditions. Local exhaust ventilation may be required in specific circumstances. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. 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:

solvent, vapours, degreasing etc., evaporating from tank (in still air).

aerosols, fumes from pouring operations,

intermittent container filling, low speed

conveyer transfers, welding, spray drift,

plating acid fumes, pickling (released at low velocity into zone of active generation)

direct spray, spray painting in shallow booths,

drum filling, conveyer loading, crusher dusts,

gas discharge (active generation into zone of rapid air motion)

grinding, abrasive blasting, tumbling, high

speed wheel generated dusts (released at high

initial velocity into zone of very high rapid air motion).

Air Speed:

0.25- 0.5 m/s (50- 100 f/min)

0.5- 1 m/s (100- 200 f/min.)

1- 2.5 m/s (200- 500 f/min.)

2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range

1: Room air currents minimal or favourable to capture

2: Contaminants of low toxicity or of nuisance value only.

3: Intermittent, low production.

4: Large hood or large air mass in motion

Upper end of the range

1: Disturbing room air currents

2: Contaminants of high toxicity

3: High production, heavy use

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 m/s (200-400 f/min) for extraction of solvents generated in a tank 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.

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Yellow or yellow/ brown powder; does not mix with cold water.
Forms colloids in hot water. Soluble in acids and ammonia.

PHYSICAL PROPERTIES

Solid.

Does not mix with water.

Sinks in water.

Molecular Weight: 144.46

Melting Range (°C): 1750 (100 atm)

Solubility in water (g/L): Immiscible

pH (1% solution): Not applicable

Volatile Component (%vol): Negligible

Relative Vapour Density (air=1): Not applicable

Lower Explosive Limit (%): Not available

Autoignition Temp (°C): Not available

State: Divided solid

Boiling Range (°C): Not applicable

Specific Gravity (water=1): 4.82

pH (as supplied): Not applicable

Vapour Pressure (kPa): Negligible

Evaporation Rate: Not applicable

Flash Point (°C): None

Upper Explosive Limit (%): Not available

Decomposition Temp (°C): Not available

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

Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.

Ingestion of cadmium salts produces prompt vomiting and are not retained. For this reason exposure by this route tends to be less harmful than exposure by inhalation. Although as little as 10-20 mg of soluble cadmium has produced severe toxic syndrome following ingestion, lethal doses probably comprise several hundred milligram by the oral route. Ingestion may cause excessive salivation, nausea, persistent vomiting, diarrhoea and abdominal pain.

Ingestion of sulfide salts may result in their decomposition by stomach gastric acid to hydrogen sulfide with systemic poisoning. Symptoms may include headache, respiratory depression, cyanosis, fall of blood pressure, loss of consciousness, tremors and convulsions.

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Section 11 - TOXICOLOGICAL INFORMATION

EYE

Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

SKIN

Skin contact with the material may be harmful; systemic effects may result following absorption.

The material is not thought to be a skin irritant (i.e. is unlikely to produce irritant dermatitis as described in EC Directives using animal models). Temporary discomfort, however, may result from prolonged dermal exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

Open cuts, abraded or irritated skin should not be exposed to this material.

Toxic effects may result from skin absorption.

INHALED

The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation, of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress. Reactions may not occur on exposure but response may be delayed with symptoms only appearing many hours later.

BE AWARE: Repeated minor exposures with only mild symptoms may have a serious cumulative poisoning effect.

If any of these symptoms are noticed, CEASE work immediately and seek medical attention or call a doctor.

Cadmium is absorbed more efficiently from the respiratory tract than from the gastrointestinal tract. Three clinical stages are recognised in dog. An acute pulmonary oedema (within 24 hours), proliferative interstitial pneumonitis (3rd-10th day) and permanent lung damage (consisting of perivascular and peribronchial fibrosis) have been identified - a similar sequence (though not permanent damage) is inferred from human autopsy material. The inhalation of 40 mg of cadmium with pulmonary retention of 4 mg is estimated to be fatal in man. Following absorption, organs accumulate low molecular weight proteins (metallothioneins - MTNs) which avidly bind metals such as cadmium, zinc and mercury. Single intravenous doses of cadmium-MTN complex produce necrosis and sloughing of renal tubular cells in rabbits. Renal (kidney) injury is also common amongst workers in cadmium industries exposed both acutely and chronically. Acute massive exposures may result in acute renal necrosis whereas prolonged low level exposures commonly produce renal tubular dysfunction characterised by low grade proteinuria (protein in the urine).

CHRONIC HEALTH EFFECTS

On the basis, primarily, of animal experiments, the material may be regarded as carcinogenic to humans. There is sufficient evidence to provide a strong presumption that human exposure to the material may result in cancer on the basis of:

- appropriate long-term animal studies
- other relevant information.

There is sufficient evidence to provide a strong presumption that human exposure to the material may result in impaired fertility on the basis of: - clear evidence in animal studies of impaired fertility in the absence of toxic effects, or evidence of impaired fertility occurring at around the same dose levels as other toxic effects but which is not a secondary non-specific consequence of other toxic effects.

There is sufficient evidence to provide a strong presumption that human exposure to the material may result in developmental toxicity, generally on the basis of:

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Section 11 - TOXICOLOGICAL INFORMATION

- clear results in appropriate animal studies where effects have been observed in the absence of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not secondary non-specific consequences of the other toxic effects. Principal routes of exposure are by accidental skin and eye contact and inhalation of generated dusts.

In chronic cadmium poisoning, bone softening (osteomalacia), radiological decreases in bone density, high levels of calcium in the urine (hyper- calcinuria) and renal stones reflect disturbance in calcium metabolism. Although this disturbance may reflect cadmium induced renal tubular damage there is evidence in rats that direct action on the bone may produce metabolic breakdown of collagen (the main structural protein in bone). Animals sometimes exhibit significant hypertension after chronic exposure to cadmium in drinking water. Epidemiological studies suggest a relationship between airborne cadmium and human cardiovascular disease though this is still equivocal. From a diagnostic point of view the formation of a yellow ring as part of the tooth structure in chronically exposed humans may be significant. Heavy smoking has been reported to considerably increase tissue calcium levels and would appear to increase the risk of cumulative toxic effects. Repeated or prolonged exposure may result in a loss of smell, ulceration of the nose, pulmonary emphysema and mild anaemia. Occupational exposure to cadmium (in the form of the oxide) may increase the risk of prostate, respiratory and genito-urinary cancers in humans. In one follow-up study of an investigation of cadmium-nickel workers and cadmium -copper alloy factory workers, additional cases of nasopharyngeal, colorectal, prostatic and lung-cancer were reported. In a further study of cadmium smelter workers a significant trend was noted for cumulative cadmium exposures and lung cancer mortality. This relationship has not been seen in other follow-up studies. Male rats continuously exposed to cadmium chloride aerosols developed dose-related increases in adenocarcinomas, epidermoid (squamous cell) carcinomas and mucoepidermoid carcinomas of the lung. When introduced through intratracheal instillation, cadmium chloride induced invasive prostatic carcinomas in the rat.

TOXICITY AND IRRITATION

TOXICITY

Oral (rat) LD50: 7080 mg/kg

WARNING: This substance has been classified by the IARC as Group 2A: Probably Carcinogenic to Humans.

IRRITATION

Nil Reported

Section 12 - ECOLOGICAL INFORMATION

Marine Pollutant:Not Determined

Significant compartments for soluble cadmium salts are likely to be soil and water. Cadmium(II) adsorbs to sediments. Once in an aquatic environment cadmium is highly mobile ; its dissolved species are highly labile and are first to be released, for example, when salinity is increased in estuaries. In fresh water, cadmium toxicity is influenced by water hardness (the harder the water, the lower the toxicity). Cadmium can bioaccumulate and bioconcentrate in the food chain. Biomagnification in terrestrial food chains is not expected.

Drinking Water Standards:

5 ug/l (UK max.)

3 ug/l (WHO guideline)

Soil Guidelines: Dutch Criteria:

0.8 mg/kg (target)

12 mg/kg (intervention)

Air Quality Standards:

<1-5 ng/m³ (rural areas)

10-20 ng/m³ (urban and industrial areas) (WHO Guidelines)

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Section 12 - ECOLOGICAL INFORMATION

The importance of cadmium in environmental disease is illustrated in the outbreak of itai-itai disease caused by the contamination of rice paddies in Japan by smelter waste. Cadmium toxicity affected the skeletal system of inhabitants of the region resulting in severe bony deformities and chronic renal disease. Although cadmium exposure has been implicated in the pathogenesis of the syndrome, vitamin D deficiencies and other nutritional deficiencies are also thought to be implicated. ("Itai-itai" translates to "ouch-ouch" reflecting the accompanying bone pain). Sewage sludge and phosphate fertilisers are often contaminated with cadmium which then concentrates in plants grown on contaminated soils. Compared with other heavy metals cadmium is mobile in the aqueous environment and may exist as the hydrated ion, as complexes with carbonate, chloride or sulfate or with humic acids. Cadmium thus tends to move in the environment and is widely distributed. It is taken up by organisms and is bioaccumulated. Bioconcentration in the aquatic environment is greatest in invertebrates such as mollusks and crustaceans, followed by fish and plants. However, under reducing conditions, cadmium forms the insoluble sulfide and precipitates in the sediment. The biological production of sulfide also promotes the formation of cadmium sulfide. Cadmium is one of the most readily absorbed metals in plants grown on contaminated soils and the potential for bioaccumulation is substantial. Zinc and calcium are also thought to bioaccumulate with cadmium with a resultant protective action against its toxic effects.

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible. Special hazard may exist - specialist advice may be required.
- Consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Bury or incinerate residue at an approved site.
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
- Puncture containers to prevent re-use and bury at an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION



Labels Required: TOXIC
HAZCHEM: 2X

UNDG:

Dangerous Goods Class: 6.1
UN Number: 2570
Shipping Name: CADMIUM COMPOUND

Subrisk: None
Packing Group: III

Air Transport IATA:

ICAO/IATA Class: 6.1
UN/ID Number: 2570
ERG Code: 6L

ICAO/IATA Subrisk: None
Packing Group: III

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Section 14 - TRANSPORTATION INFORMATION

Shipping name:CADMIUM COMPOUND

Maritime Transport IMDG:

IMDG Class:	6.1	IMDG Subrisk:	None
UN Number:	2570	Packing Group:	III
EMS Number:	F- A, S- A	Marine Pollutant:	Not Determined

Shipping name:CADMIUM COMPOUND

Section 15 - REGULATORY INFORMATION

REGULATIONS

cadmium sulfide (CAS: 1306-23-6) is found on the following regulatory lists;
Great Lakes Binational Toxics Strategy Substances (U.S. and Canada) - Level II Substances
United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances - Table II

No data available for cadmium sulfide as CAS: 106496-20-2.

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
cadmium sulfide	1306- 23- 6, 106496- 20- 2

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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