

MERCURY (METAL)

GHS Safety Data Sheet

Version No : 4

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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

MERCURY

OTHER NAMES

Hg, hydrargyrum, "liquid silver", "quick silver", "colloidal mercury", "quicksilver mercury metal"

PROPER SHIPPING NAME

MERCURY

PRODUCT USE

Barometers; thermometers; hydrometers; pyrometers; mercury arc lamps; switches; manufacture of mirrors; amalgams, mercury boilers; gold and silver extraction; cathode in electrolysis.

SUPPLIER

Company: S D FINE- CHEM LIMITED

Address:

315- 317, T.V. INDUSTRIAL ESTATE,

248, WORLI,

MUMBAI- 400030.INDIA.

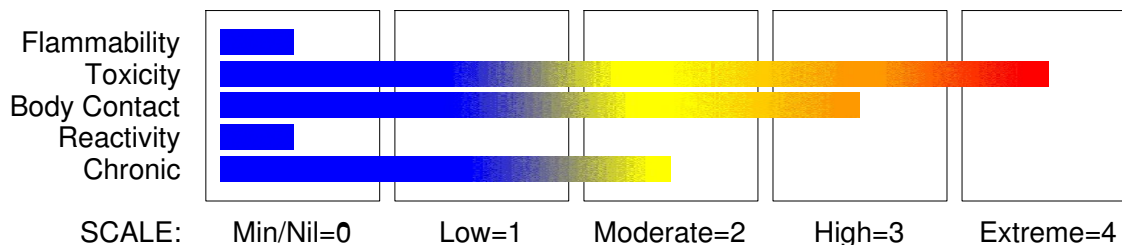
technical@sdfine.com

Telephone: 91- 22- 24959898

Telephone: 91- 22- 24959899

Fax: 91- 22- 24937232

HAZARD RATINGS



Section 2 - HAZARDS IDENTIFICATION

GHS Classification

Acute Toxicity (Dermal) Category 1

Acute Toxicity (Inhalation) Category 1

Acute Toxicity (Oral) Category 2

Chronic Aquatic Hazard Category 1

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Section 2 - HAZARDS IDENTIFICATION

Eye Irritation Category 2B
Metal Corrosion Category 1
Organ Damage Category 2
Reproductive Toxicity Category 2
Respiratory Irritation Category 3
Respiratory Sensitizer Category 1
Skin Corrosion/Irritation Category 3
Skin Sensitizer Category 1



EMERGENCY OVERVIEW

HAZARD

DANGER

Determined by using GHS criteria:

H335 H330 H310 H300 H316 H320 H334 H317 H361 H373 H290 H410

May cause respiratory irritation

Fatal if inhaled

Fatal in contact with skin

Fatal if swallowed

Causes mild skin irritation

Causes eye irritation

May cause allergic or asthmatic symptoms or breathing difficulties if inhaled

May cause allergic skin reaction

Suspected of damaging the unborn child

May cause damage to organs through prolonged or repeated exposure.

May be corrosive to metals

Very toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS

Prevention

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

Wash hands thoroughly after handling.

Contaminated clothing should not be allowed out of the workplace.

Wear protective gloves/clothing

Avoid breathing dust/fume/gas/mist/vapours/spray.

In case of inadequate ventilation wear respiratory protection.

Do not get in eyes, on skin or on clothing

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

Obtain special instructions before use.

Wear respiratory protection.

Use personal protective equipment as required.

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

Use only outdoors or in a well ventilated area.

Response

Wash contaminated clothing before reuse.

Keep container tightly closed.

If experiencing respiratory symptoms call a POISON CENTER or doctor/physician.

If skin irritation or rash occurs, seek medical advice/attention.

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Section 2 - HAZARDS IDENTIFICATION

If exposed or concerned: Get medical attention advice.
IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If skin irritation occurs, seek medical advice/attention.
If eye irritation persists, get medical advice/attention.
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
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.
Absorb spillage to prevent material damage.
Remove/Take off immediately all contaminated clothing
IF ON SKIN: Gently wash with plenty of soap and water.
Immediately call a POISON CENTER or doctor/physician.
Wash/Decontaminate removed clothing before reuse.

Storage

Store locked up.
Store in a corrosive resistant container with a resistant liner.

Disposal

Dispose of contents and container in accordance with relevant legislation.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
mercury (elemental)	7439-97-6	>98

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 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.
 - 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 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.

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,

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Section 4 - FIRST AID MEASURES

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 or hair contact occurs:

- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- Transport to hospital, or doctor.

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, without delay.

NOTES TO PHYSICIAN

- Moderate adsorption of inorganic mercury compounds through the gastro-intestinal tract (7-15%) is the principal cause of poisoning. These compounds are highly concentrated (as the mercuric (Hg (2+)) form) in the kidney; acute ingestion may lead to oliguric renal failure. Severe mucosal necrosis may also result from ingestion.
- Chronic effects range from proteinuria to nephrotic syndrome. Chronic presentation also involves dermatitis, gingivitis, stomatitis, tremor and neuropsychiatric symptoms of erethism.
- Absorbed inorganic mercury does not significantly cross the blood-brain barrier.
- Emesis and lavage should be initiated following acute ingestion.
- Activated charcoal interrupts absorption; cathartics should be administered when charcoal is given.
- The use of British Anti-Lewisite is indicated in severe inorganic poisoning. Newer derivatives of BAL (e.g. dimercaptosuccinic acid, [DMSA] and 2,3-dimercapto-1-propanesulfate [DMPS]) may prove more effective. [Ellenhorn and Barceloux: Medical Toxicology]

BIOLOGICAL EXPOSURE INDEX - BEI

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

Determinant	Index	Sampling Time	Comments
1. Total inorganic mercury in urine	35 ug/gm creatinine	Preshift	B
2. Total inorganic mercury in blood	15 ug/L	End of shift at end of workweek	B

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

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.
- Monitor and treat, where necessary, for shock.

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- Anticipate seizures.
- Where eyes have been exposed, flush immediately with water and continue to irrigate with normal saline during transport to hospital.
- DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.
- Skin burns should be covered with dry, sterile bandages, following decontamination.
- DO NOT attempt neutralisation as exothermic reaction may occur.

ADVANCED TREATMENT

- Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.
- Positive-pressure ventilation using a bag-valve mask might be of use.
- Monitor and treat, where necessary, for arrhythmias.
- Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.
- Drug therapy should be considered for pulmonary oedema.
- Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.
- Treat seizures with diazepam.
- Proparacaine hydrochloride should be used to assist eye irrigation.

EMERGENCY DEPARTMENT

- Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime.
- Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.
- Consider endoscopy to evaluate oral injury.
- Consult a toxicologist as necessary.

BRONSTEIN, A.C. and CURRANCE, P.L. EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994.

Within a group of workers there is a relatively good correlation between the level of exposure and the concentration of metal in the blood and urine. There is no specific antidote for chronic poisoning.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

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

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- 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.

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Section 5 - FIRE FIGHTING MEASURES

FIRE/EXPLOSION HAZARD

May emit corrosive fumes.

Personal Protective Equipment

Breathing apparatus.

Gas tight chemical resistant suit.

Limit exposure duration to 1 BA set 30 mins.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labelled container for waste disposal.

Use suction bottle to collect small amounts.

Calcium polysulfide with excess sulfur can be sprinkled into cracks or other inaccessible places to convert mercury globules into the sulfide.

Collect solid residues and place in tightly sealed, clean, dry containers.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

Avoid all personal contact and wear full protective equipment

Environmental hazard: contain spillage. Stop leak if safe to do so.

Clean up bulk spillage by mechanical means, suck up where practicable.

Calcium polysulfide with excess sulfur can be sprinkled into cracks or other inaccessible places to convert mercury globules into the sulfide.

(Proprietary products are available for this purpose)

Collect solid residues and place in clean, dry, sealable plastic drums.

Ensure that all residues are cleaned up.

Do NOT wash spill area after clean up. Vacuum up residues.

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:

mercury (elemental) 4.10 mg/m³

irreversible or other serious effects or symptoms which could impair an individual's ability to take

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Section 6 - ACCIDENTAL RELEASE MEASURES

protective action is:
mercury (elemental) 2.05 mg/m³

other than mild, transient adverse effects without perceiving a clearly defined odour is:
mercury (elemental) 0.1 mg/m³

The threshold concentration below which most people will experience no appreciable risk of health effects:
mercury (elemental) 0.025 mg/m³

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	$\geq 0.1\%$	Toxic (T)	$\geq 3.0\%$
R50	$\geq 0.25\%$	Corrosive (C)	$\geq 5.0\%$
R51	$\geq 2.5\%$		
else	$\geq 10\%$		

where percentage is percentage of ingredient found in the mixture

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



X X + X X +

+: May be stored together

O: May be stored together with specific preventions

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

DO NOT use aluminium, galvanised or tin-plated containers.

- Avoid all personal contact, including inhalation.
 - Wear protective clothing when risk of exposure occurs.
 - Use in a well-ventilated area.
 - Avoid contact with moisture.
 - 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.
- DO NOT allow clothing wet with material to stay in contact with skin.

SUITABLE CONTAINER

- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polyliner drum.

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Section 7 - HANDLING AND STORAGE

- Packing as recommended by manufacturer.
 - Check all containers are clearly labelled and free from leaks.
- For low viscosity materials
- Drums and jerricans must be of the non-removable head type.
 - Where a can is to be used as an inner package, the can must have a screwed enclosure.
- For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):
- Removable head packaging;
 - Cans with friction closures and
 - low pressure tubes and cartridges may be used.
-
- Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.
- Mercury dissolves aluminium, aluminium alloys.
- Packages for Air freight must be to IATA Packing Instruction 803, and manufactured articles containing mercury to Packing Instruction 805; i.e. Packing group I requirements.

STORAGE INCOMPATIBILITY

Dangerous goods of other classes.
Segregate from ammonia, amines, acetylene as explosive salts may form.

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

EMERGENCY EXPOSURE LIMITS

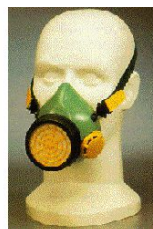
Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
mercury (elemental)	2	

MATERIAL DATA

Metallic mercury may also be absorbed via the skin.

NOTE: Detector tubes for mercury vapour, measuring in excess of 0.1 mg/m3, are commercially available.

PERSONAL PROTECTION



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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes
- 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

Elbow length PVC gloves.

NOTE: The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

PVC boots. Beware of transferring mercury on soles of footwear.

OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

Shower before changing to street clothing.

Separate work and street clothing.

Work with mercury in areas where spills can readily be cleaned up.

RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half- face Respirator	Full- Face Respirator
1000	10	HG- AUS P	-
1000	50	-	HG- AUS P
5000	50	Airline *	-
5000	100	-	HG- 2 P
10000	100	-	HG- 3 P
	100+		Airline**

* - Continuous Flow

** - Continuous-flow or positive pressure demand.

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

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

adequate protection.

An approved self contained breathing apparatus (SCBA) may be required in some situations.

Provide adequate ventilation in warehouse or closed storage area. 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.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Silvery, odourless, poisonous liquid heavy metal; sinks in water.

Has naturally occurring isotopes ranging in mass number from 189-206.

When pure, mercury does not tarnish on exposure to air, but when heated slowly it oxidises to mercury oxide (HgO). Forms explosive compounds with ammonia, amines and acetylene. Forms alloys with most metals except iron.

Rapidly corrodes aluminium and alloys. Insoluble in water.

Reacts with nitric acid and hot, concentrated sulphuric acid.

Extremely high surface tension gives mercury unique rheological properties.

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Passes readily into vapour at room temperature and when heated.

PHYSICAL PROPERTIES

Liquid.

Does not mix with water.

Sinks in water.

Corrosive.

Toxic or noxious vapours/gas.

Molecular Weight: 200.59

Melting Range (°C): - 38.57

Solubility in water (g/L): Immiscible

pH (1% solution): Not applicable.

Volatile Component (%vol): Not available.

Relative Vapour Density (air=1): 7.0

Lower Explosive Limit (%): Not applicable

Autoignition Temp (°C): Not applicable

State: Liquid

Boiling Range (°C): 356.72

Specific Gravity (water=1): 13.534

pH (as supplied): Not applicable

Vapour Pressure (kPa): 0.00027 @ 25 C.

Evaporation Rate: Very Slow

Flash Point (°C): Non combustible

Upper Explosive Limit (%): Not applicable

Decomposition Temp (°C): Not available

Viscosity: 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

Severely toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 5 gram may be fatal or may produce serious damage to the health of the individual.

Symptoms of ingestion within the first few minutes may include pain, profuse vomiting and severe purging and the victim may die within a few hours from peripheral vascular collapse secondary to fluid and electrolyte loss. Primary gastroenteritis may subside spontaneously within a few days but severe haemorrhagic inflammation of the colon (colitis) has occurred as late as 9 days following ingestion. A second phase developing over 1-3 days is characterised by stomatitis (lesions of the mouth parts), membranous colitis and kidney damage (tubular nephritis). This second phase is associated with a slow and prolonged excretion of mercury by salivary glands, the gastrointestinal mucosa and kidneys. Death in this phase usually occurs as a result of kidney failure.

The alimentary effects of many mercury compounds are so rapid that the course and outlook is largely determined by events within the first 5-10 minutes. Acute systemic mercurialism may be lethal within a few minutes or death may be delayed for 5-12 days. The ionisable salts are corrosive and tissue damage occurs almost immediately in the mouth, throat and oesophagus.

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EYE

Limited evidence exists, or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals and/or is expected to produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/ulceration may occur.

Although the liquid 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

Limited evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant 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 (nonallergic). 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 produce severely toxic effects; systemic effects may result following absorption and these may be fatal.

The liquid may be miscible with fats or oils and may degrease the skin, producing a skin reaction described as non-allergic contact dermatitis. The material is unlikely to produce an irritant dermatitis as described in EC Directives .

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.

INHALED

Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system in a substantial number of individuals following inhalation. Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce severely toxic effects. Relatively small amounts absorbed from the lungs may prove fatal.

The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of vapours, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.

CHRONIC HEALTH EFFECTS

Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems.

Limited evidence shows that inhalation of the material is capable of inducing a sensitisation reaction in a significant number of individuals at a greater frequency than would be expected from the response of a normal population.

Pulmonary sensitisation, resulting in hyperactive airway dysfunction and pulmonary allergy may be accompanied by fatigue, malaise and aching. Significant symptoms of exposure may persist for extended periods, even after exposure ceases. Symptoms can be activated by a variety of nonspecific environmental stimuli such as automobile exhaust, perfumes and passive smoking.

There exists limited evidence that shows that skin contact with the material is capable either of inducing a sensitisation reaction in a significant number of individuals, and/or of producing positive response in experimental animals.

Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.

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Section 11 - TOXICOLOGICAL INFORMATION

Serious damage (clear functional disturbance or morphological change which may have toxicological significance) is likely to be caused by repeated or prolonged exposure. As a rule the material produces, or contains a substance which produces severe lesions. Such damage may become apparent following direct application in subchronic (90 day) toxicity studies or following sub-acute (28 day) or chronic (two-year) toxicity tests.

In animal tests all forms of mercury have been shown to be teratogenic with mercury ion easily crossing the placental barrier. Chronic exposures in workers may result in excessive salivation (ptyalism), anorexia, digestive disturbances, vague abdominal distress and mild diarrhoea. Renal involvement is rare. Chronic mercurialism manifests itself primarily in neurological effects with the central nervous system the principal target of damage. Tremors involving the hands and fingers and, less often, eyelids, cheeks, tongue and legs, are encountered. Motor control may be impaired resulting in slurred or scanning speech or ataxic gait. Visual and aural disturbance may occur. A common syndrome, described as "erethism," involves behavioral changes such as depression, despondency, and fearfulness. These are often accompanied by insomnia, headache and fatigue. Advanced cases exhibit memory loss, hallucinations and mental deterioration. Other symptoms may include a constant metallic taste and gingivitis of various grades leading to pyorrhea and the loosening of teeth. A dark blue line may occur along the gingival margins and a discolouration of the anterior lens surface (mercurialentis) is considered a useful diagnostic indicator of the chronic condition. Acrodynia ("pink disease") is an uncommon syndrome involving a change in colour of the of the extremities, apathy, anorexia, fever, kidney damage, perspiration, photophobia and insomnia and, most characteristically, pruritic (itchy) scaling of hands and feet.

Sensitisation may give severe responses to very low levels of exposure, in situations where exposure may occur.

Dentists with moderate long term mercury exposures show subtle behavioural changes, tiredness, short term memory loss and impaired nerve conduction.

Tremor is regarded as indicator of long term, low level exposures. Fine tremor of fingers, hands, arms, occasionally eyelids, lips and whole body.

[CHEMINFO 322]

TOXICITY AND IRRITATION

Nil reported

(Source: RTECS)

Animal studies have shown that mercury may be a reproductive effector.

Section 12 - ECOLOGICAL INFORMATION

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.

Prevent, by any means available, spillage from entering drains or water courses.

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.

Mercury may occur in the environment as free mercury, Hg(0), mercury ions in salts and complexes, Hg⁺ and (Hg²⁺)₂ and as organic mercury compounds. Each species has its own set of physical, chemical and toxicologic properties.

In natural systems a dynamic equilibrium between soil and water mercury occurs determined

continued...

MERCURY (METAL)

Section 12 - ECOLOGICAL INFORMATION

largely by the physicochemical and biological conditions which pertain. Mercury ion is transported to aquatic ecosystems via surface run-off and from the atmosphere. It is complexed or tightly bound to both inorganic and organic particles, particularly sediments with high sulfur content. Organic acids such as fulvic and humic acids are often associated with mercury not bound to particles. Methyl mercury is produced by sediment micro-organisms, nonbiologically in sediments and by certain species of fish. The methylation of mercury by micro-organisms is the detoxification response that allows the organism to dispose of the heavy metal ions as small organometallic complexes. Methylation occurs only within a narrow pH range in which the micro-organism might exist and the rate of synthesis depends on the redox potential, composition of the microbial population, availability of Hg^{2+} and temperature. Vitamin B12 derivatives are thought to be the methylating agents, because they are the only methyl carbanion- or methyl radical-donating coenzymes known. In addition it has been demonstrated that the livers of yellow-fin tuna and albacore produce methyl mercury results in its desorption at relatively high rates thus little methyl mercury is found in sediments. Demethylation by sediment micro-organisms also occurs at a rapid rate compared with methylation. The best conversion rate for inorganic mercury to methyl mercury under ideal conditions is less than 1.5% per month. Methyl mercury released into surface waters may also undergo photodecomposition into mercury.

Methyl mercury can be bioaccumulated by planktonic algae and fish. In fish, the rate of absorption of methyl mercury is faster than that of inorganic mercury and the clearance rate is slower resulting in high concentrations of methyl mercury in muscle tissue. The ratio of organic mercury to total mercury is generally high in fish compared with other aquatic organisms. Selenium which is also present in seawater and other seafoods readily complexes with methyl mercury and is thought to have a protective effect against the toxic action of methyl mercury. The danger of methyl mercury poisoning has been illustrated in Minimata, Japan in the late 1950s following industrial release of mercury into the bay which subsequently resulted in at least 1200 cases of poisoning, some fatal.

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralise at an approved treatment plant. Treatment should involve : Neutralisation followed by: Burial in a licenced land-fill or Incineration in a licenced apparatus
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.
- Containers may still present a chemical hazard/ danger when empty.
- Return to supplier for reuse/ recycling if possible.

Otherwise:

- If container can not 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 authorised landfill.
- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

WASTE DISPOSAL PROCEDURES

- Wear nitrile rubber gloves, protective clothing and eye protection to control personal contact from mercury. A self contained breathing apparatus may be necessary. Use a suction pump and aspirator bottle equipped with a long capillary tube to collect any droplets and pools of mercury. Cover droplets in nonaccessible cracks with Merconvap. Place all recoverable quantities of a tightly stoppered bottle. Return to the manufacturer for recycling [Armour

MERCURY (METAL)

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Section 13 - DISPOSAL CONSIDERATIONS

1996].

SPILLAGE DISPOSAL

- Wear nitrile rubber gloves, protective clothing and eye protection to control personal contact from the mercury spill. A self contained breathing apparatus may be required depending on the size of the spill. Use a small aspirator with a capillary tube to collect droplets of mercury. Cover fine droplets of mercury with Merconvap. Place all recoverable quantities of mercury into a stoppered polyethylene bottle and return to the manufacturer or send for reclamation [Armour 1996].

Section 14 - TRANSPORTATION INFORMATION



Labels Required: CORROSIVE
HAZCHEM: 2Z

UNDG:

Dangerous Goods Class: 8
UN Number: 2809
Shipping Name: MERCURY

Subrisk: None
Packing Group: III

Air Transport IATA:

ICAO/IATA Class: 8
UN/ID Number: 2809
ERG Code: 8L
Shipping name: MERCURY

ICAO/IATA Subrisk: None
Packing Group: III

Maritime Transport IMDG:

IMDG Class: 8
UN Number: 2809
EMS Number: F- A, S- B
Shipping name: MERCURY

IMDG Subrisk: None
Packing Group: III

Section 15 - REGULATORY INFORMATION

REGULATIONS

mercury (elemental) (CAS: 7439-97-6) is found on the following regulatory lists;
Great Lakes Binational Toxics Strategy Substances (U.S. and Canada) - Level I Substances
International Agency for Research on Cancer (IARC) Carcinogens
United Nations List of Prior Informed Consent Chemicals
United Nations List of Prior Informed Consent Chemicals - French
United Nations List of Prior Informed Consent Chemicals - Spanish
WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water

continued...

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Section 15 - REGULATORY INFORMATION

No data available for mercury (elemental) as CAS: 8030-64-6, CAS: 92786-62-4, CAS: 92355-34-5, CAS: 123720-03-6, CAS: 51887-47-9, CAS: 149038-91-5.

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
mercury (elemental)	7439- 97- 6, 8030- 64- 6, 92786- 62- 4, 92355- 34- 5, 123720- 03- 6, 51887- 47- 9, 149038- 91- 5

REPRODUCTIVE HEALTH GUIDELINES

Established occupational exposure limits frequently do not take into consideration reproductive end points that are clearly below the thresholds for other toxic effects. Occupational reproductive guidelines (ORGs) have been suggested as an additional standard. These have been established after a literature search for the reproductive no-observed-adverse effect-level (NOAEL) and the lowest-observed-adverse-effect-level (LOAEL). In addition the US EPA's procedures for risk assessment for hazard identification and dose-response assessment as applied by NIOSH were used in the creation of such limits. Uncertainty factors (UFs) have also been incorporated.

Ingredient	ORG	UF	Endpoint	CR	Adeq TLV
mercury (elemental)	0.01 mg/m3	NA	NA	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).

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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