

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 2.0

Chemwatch 21-9309

Issue Date: 13-Nov-2009

CD 2009/3

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

307 Activated Fountain Drier

PROPER SHIPPING NAME

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(contains cobalt(II) sulfate)

PRODUCT USE

■ Used according to manufacturer's directions. The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing. Before starting consider control of exposure by mechanical ventilation. Printing industry use only.

SUPPLIER

Company: Hurst Australia Pty Ltd

Address:

10 Bellona Avenue

Regents Park

NSW, 2143

AUS

Telephone: +61 2 9644 6888

Emergency Tel: +61 2 9644 6888

Fax: +61 2 9644 6534

Email: info@hurst.com.au

HAZARD RATINGS

	Min	Max
Flammability:	0	■
Toxicity:	2	■
Body Contact:	2	■
Reactivity:	1	■
Chronic:	3	■

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4



Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

HAZARDOUS SUBSTANCE. DANGEROUS GOODS. According to the Criteria of NOHSC, and the ADG Code.

POISONS SCHEDULE

S5

RISK

- Harmful by inhalation in contact with skin and if swallowed.
- Contact with water liberates toxic gas.
- May cause SENSITISATION by inhalation and skin contact.
- May cause CANCER by inhalation.
- Toxic to aquatic organisms may cause long-term adverse effects in the aquatic environment.
- Harmful: possible risk of irreversible effects through inhalation in contact with skin and if swallowed.
- Cumulative effects may result following exposure*.
- May produce discomfort of the respiratory system*.
- Vapours potentially cause drowsiness and dizziness*.

* (limited evidence).

SAFETY

- Keep locked up.
- Do not breathe gas/ fumes/ vapour/ spray.
- In case of insufficient ventilation wear suitable respiratory equipment.
- Use only in well ventilated areas.
- Keep container in a well ventilated place.
- Avoid exposure - obtain special instructions before use.
- To clean the floor and all objects contaminated by this material use water.
- Keep container tightly closed.
- This material and its container must be disposed of in a safe way.
- Keep away from food drink and animal feeding stuffs.
- Use appropriate container to avoid environment

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CD 2009/3

contamination.

■ Avoid release to the environment. Refer to special instructions/ safety data sheets.

■ This material and its container must be disposed of as hazardous waste.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
methanol	67-56-1	<10
cobalt(II) sulfate	10124-43-3	<10
water	7732-18-5	>60

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

INHALED

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

NOTES TO PHYSICIAN

- Treat symptomatically.
- For acute and short term repeated exposures to methanol:
- Toxicity results from accumulation of formaldehyde/formic acid.
 - Clinical signs are usually limited to CNS, eyes and GI tract. Severe metabolic acidosis may produce dyspnea and profound systemic effects which may become intractable. All symptomatic patients should have arterial pH measured. Evaluate airway, breathing and circulation.
 - Stabilise obtunded patients by giving naloxone, glucose and thiamine.
 - Decontaminate with Ipecac or lavage for patients presenting 2 hours post-ingestion. Charcoal does not absorb well; the usefulness of cathartic is not established.
 - Forced diuresis is not effective; haemodialysis is recommended where peak methanol levels exceed 50 mg/dL (this correlates

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 2.0

Chemwatch 21-9309

Issue Date: 13-Nov-2009

CD 2009/3

- with serum bicarbonate levels below 18 mEq/L).
- Ethanol, maintained at levels between 100 and 150 mg/dL, inhibits formation of toxic metabolites and may be indicated when peak methanol levels exceed 20 mg/dL. An intravenous solution of ethanol in D5W is optimal.
 - Folate, as leucovorin, may increase the oxidative removal of formic acid. 4-methylpyrazole may be an effective adjunct in the treatment. 8-Phenytoin may be preferable to diazepam for controlling seizure.

[Ellenhorn Barceloux: Medical Toxicology]

BIOLOGICAL EXPOSURE INDEX - BEI

Determinant	Index	Sampling Time	Comment
1. Methanol in urine	15 mg/l	End of shift	B, NS
2. Formic acid in urine	80 mg/gm creatinine	Before the shift at end of workweek	B, NS

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

NS: Non-specific determinant - observed following exposure to other materials.

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 for fire only.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use fire fighting procedures suitable for surrounding area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

FIRE/EXPLOSION HAZARD

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

Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.

FIRE INCOMPATIBILITY

- None known.

HAZCHEM

*3Z

Personal Protective Equipment

Gas tight chemical resistant suit.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- Environmental hazard - contain spillage.
- 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.

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.

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
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Revision No: 2.0

Chemwatch 21-9309

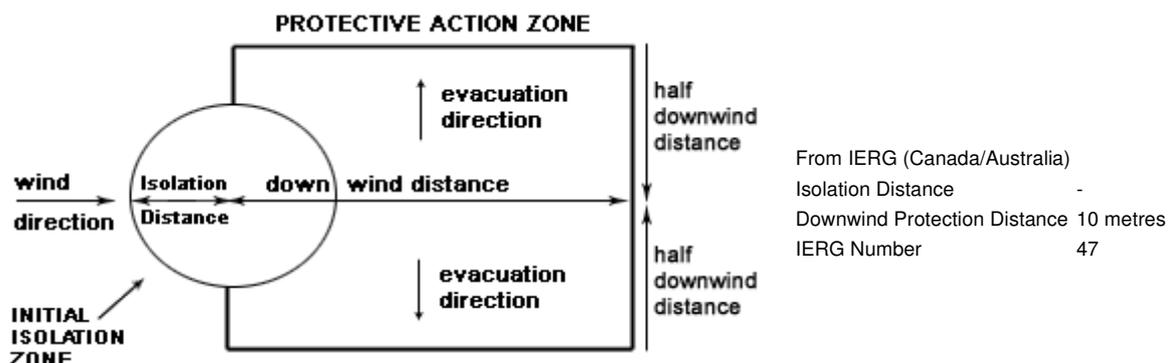
Issue Date: 13-Nov-2009

CD 2009/3

- 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.

Environmental hazard - contain spillage.

PROTECTIVE ACTIONS FOR SPILL



FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills". LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.
- 5 Guide 171 is taken from the US DOT emergency response guide book.
- 6 IERG information is derived from CANUTEC - Transport Canada.

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

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Contains low boiling substance:

Storage in sealed containers may result in pressure buildup causing violent rupture of containers not rated appropriately.

- Check for bulging containers.
- Vent periodically
- Always release caps or seals slowly to ensure slow dissipation of vapours
- DO NOT allow clothing wet with material to stay in contact with skin
- 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.

SUITABLE CONTAINER

-
- Polyethylene or polypropylene container.

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 2.0

Chemwatch 21-9309

Issue Date: 13-Nov-2009

CD 2009/3

- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY

-
- Avoid reaction with oxidising agents
strong acids.
strong alkalis.
Avoid reaction with.
amines.

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.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



X: Must not be stored together

O: May be stored together with specific precautions

+: May be stored together

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC	Notes
Australia Exposure Standards	methanol (Methyl alcohol)	200	262	250	328				Sk

The following materials had no OELs on our records

- cobalt(II) sulfate: CAS:10124-43-3 CAS:60459-08-7 CAS:10026-24-1
- water: CAS:7732-18-5

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
methanol		6,000

MATERIAL DATA

307 ACTIVATED FOUNTAIN DRIER:

■ In view of the serious effects seen in experimental animals after a relatively short exposure period at 0.1 mg/m³ the recommended TLV-TWA is thought to reduce the significant risk of material impairment of health posed by respiratory disease and pulmonary sensitization which have been shown to occur at higher levels of exposure. The value does not apply generally to cobalt compounds.

A significant increase in the risk of lung cancer was reported among workers involved in cobalt production (with concomitant exposure to nickel and arsenic) and hard-metal workers with documented exposure to cobalt-containing dusts. A significant increase in lung cancer risk has been observed in workers whose exposure began more than 20 years previously. A number of single cases of malignant tumours, mostly sarcomas, have been reported at the site, following implant of cobalt-containing orthopedic implants.

Epidemiological studies do not support a link between cobalt and abnormal growths (neoplasms) in humans.

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For methanol:

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 2.0

Chemwatch 21-9309

Issue Date: 13-Nov-2009

CD 2009/3

Odour Threshold Value: 4.2-5960 ppm (detection), 53.0-8940 ppm (recognition)

NOTE: Detector tubes for methanol, measuring in excess of 50 ppm, are commercially available.

Exposure at or below the recommended TLV-TWA is thought to substantially reduce the significant risk of headache, blurred vision and other ocular and systemic effects.

Odour Safety Factor (OSF)

OSF=2 (METHANOL).

METHANOL:

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NOTE: Detector tubes for methanol, measuring in excess of 50 ppm, are commercially available.

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OSF=2 (METHANOL).

COBALT(II) SULFATE:

■ Epidemiological studies do not support a link between cobalt and abnormal growths (neoplasms) in humans.

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WATER:

■ No exposure limits set by NOHSC or ACGIH.

PERSONAL PROTECTION



EYE

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

HANDS/FEET

-
- Wear chemical protective gloves, eg. PVC.
- Wear safety footwear or safety gumboots, eg. Rubber

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.
- Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.

Suitability and durability of glove type is dependent on usage. Factors such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity,

are important in the selection of gloves.

OTHER

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

RESPIRATOR

- Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 2.0

Chemwatch 21-9309

Issue Date: 13-Nov-2009

CD 2009/3

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	AX-AUS P	-
1000	50	-	AX-AUS P
5000	50	Airline *	-
5000	100	-	AX-2 P
10000	100	-	AX-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 site specific CHEMWATCH data (if available), or 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 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:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air).	0.25-0.5 m/s (50-100 f/min.)

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)	0.5-1 m/s (100-200 f/min.)
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direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min.)
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grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)
--	------------------------------

Within each range the appropriate value depends on:

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

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 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

Pink to red viscous liquid with a characteristic odour; miscible with water.

PHYSICAL PROPERTIES

Liquid.

Mixes with water.

Contact with water liberates toxic gas.

Molecular Weight: Not Available	Boiling Range (°C): 105 (initial)	Melting Range (°C): Not Available
Specific Gravity (water=1): 1.0	Solubility in water (g/L): Miscible	pH (as supplied): Not Available
pH (1% solution): Not Available	Vapour Pressure (kPa): Not Available	Volatile Component (%vol): Not Available
Evaporation Rate: <1 BuAC = 1	Relative Vapour Density (air=1): >1	Flash Point (°C): Not Available
Lower Explosive Limit (%): Not Available	Upper Explosive Limit (%): Not Available	Autoignition Temp (°C): Not Available
Decomposition Temp (°C): Not Available	State: Liquid	Viscosity: Not Available

Material

Value

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 2.0

Chemwatch 21-9309

Issue Date: 13-Nov-2009

CD 2009/3

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Section 10 - CHEMICAL STABILITY

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

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.

In toxic doses soluble cobalt salts produce stomach pain and vomiting, flushing of the face and ears, rash, ringing in the ears, nervous deafness and reduced blood flow to the extremities.

EYE

■ 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

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

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

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

■ Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful. Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by sleepiness, reduced alertness, loss of reflexes, lack of co-ordination, and vertigo.

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.

Cobalt poisoning can cause inflammation of the terminal airways (bronchioles), and cause lethargy and death within hours.

Minor but regular methanol exposures may effect the central nervous system, optic nerves and retinae. Symptoms may be delayed, with headache, fatigue, nausea, blurring of vision and double vision. Continued or severe exposures may cause damage to optic nerves, which may become severe with permanent visual impairment even blindness resulting.

WARNING: Methanol is only slowly eliminated from the body and should be regarded as a cumulative poison which cannot be made non-harmful [CCINFO].

The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing.

Before starting consider control of exposure by mechanical ventilation.

CHRONIC HEALTH EFFECTS

■ On the basis of epidemiological data, it has been concluded that prolonged inhalation of the material, in an occupational setting, may produce cancer in humans.

Inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.

Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to the general population.

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Inhalation of cobalt powder can induce asthma, chest tightness and chronic inflammation of the bronchi. Chronic exposure to cobalt causes increase in blood haemoglobin, increased production of cells in the blood marrow and thyroid gland, discharge from around the heart and damage to the alpha cells of the pancreas. Long-term administration has caused goitre (overactivity of the thyroid) and reduced thyroid activity. Allergic inflammation of the skin may appear following exposure to cobalt, usually exhibited as red patches. Injection of cobalt can cause cancer at the site of entry.

Long-term exposure to methanol vapour, at concentrations exceeding 3000 ppm, may produce cumulative effects characterised by gastrointestinal disturbances (nausea, vomiting), headache, ringing in the ears, insomnia, trembling, unsteady gait, vertigo, conjunctivitis and clouded or double vision. Liver and/or kidney injury may also result. Some individuals show severe eye damage following prolonged exposure to 800 ppm of the vapour.

TOXICITY AND IRRITATION

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

■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger

307 ACTIVATED FOUNTAIN DRIER

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CD 2009/3

sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.

Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Allergy causing activity is due to interactions with proteins.

Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema. Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure.

METHANOL:

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

TOXICITY

Oral (human) LDLo: 143 mg/kg
Oral (man) LDLo: 6422 mg/kg
Oral (man) TDLo: 3429 mg/kg
Oral (rat) LD50: 5628 mg/kg
Inhalation (human) TClO: 86000 mg/m³
Inhalation (human) TClO: 300 ppm
Inhalation (rat) LC50: 64000 ppm/4h
Dermal (rabbit) LD50: 15800 mg/kg

IRRITATION

Skin (rabbit): 20 mg/24 h-Moderate
Eye (rabbit): 40 mg-Moderate
Eye (rabbit): 100 mg/24h-Moderate

■ The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

COBALT(II) SULFATE:

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

Oral (rat) LD50: 424 mg/kg Nil Reported

■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.

Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Allergy causing activity is due to interactions with proteins.

Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema.

Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure.

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

WATER:

■ No significant acute toxicological data identified in literature search.

CARCINOGEN

Cobalt and cobalt compounds (NB: International Agency for Research on Cancer (IARC) - Agents Reviewed Group 2B
Evaluated as a group) by the IARC Monographs

SKIN

methanol Australia Exposure Standards - Skin Notes Sk

Section 12 - ECOLOGICAL INFORMATION

Refer to data for ingredients, which follows:

307 ACTIVATED FOUNTAIN DRIER:

COBALT(II) SULFATE:

■ 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.

307 ACTIVATED FOUNTAIN DRIER:

COBALT(II) SULFATE:

■ for cobalt compounds:

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 2.0

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Issue Date: 13-Nov-2009

CD 2009/3

Environmental Fate:

Cobalt strongly binds to humic substances naturally present in aquatic environments. Humic acids can be modified by UV light and bacterial decomposition, which may change their binding characteristics over time. The lability of the complexes is strongly influenced by pH, the nature of the humic material, and the metal-to-humic substance ratio. The lability of cobalt-humate complexes decreases in time ("aging effect"). The "aging effect" indicates that after a period of time (~12 hours), complexes that were initially formed are transformed into stronger ones from which the metal ion is less readily dislodged.

Between 45 and 100% of dissolved cobalt was found to occur in very strong complexes. The distribution coefficient of cobalt may vary considerably in the same sediment in response to conditions affecting the pH, redox conditions, ionic strength, and amount of dissolved organic matter. Uptake of ^{60}Co from the water by sediment increased rapidly as the pH was increased from 5 to 7-7.5 and then slightly decrease. Therefore, pH would be an important factor affecting the migration of cobalt in surface water. Uptake was little affected by changes in liquid-to-solids ratio and ionic strength. ^{60}Co is more mobile in anaerobic marine aquatic environments than in freshwater aerobic ones. In seawater sediment systems under anaerobic conditions ^{60}Co was 250 times more mobile than ^{60}Co in freshwater sediment systems under aerobic conditions. Under anaerobic conditions, 30% of the ^{60}Co added to a sediment-freshwater system was "exchangeable" and therefore potentially mobile, while under aerobic conditions, 98% of the ^{60}Co was permanently fixed. Most of the mobile ^{60}Co produced under anaerobic conditions in seawater consisted of nonionic cobalt associated with low molecular weight organic substances that were stable to changes in pH; the exchangeable ^{60}Co appeared to be mostly ionic.

The mobility of cobalt in soil is inversely related to how strongly it is adsorbed by soil constituents. Cobalt may be retained by mineral oxides such as iron and manganese oxide, crystalline materials such as aluminosilicate and goethite, and natural organic substances in soil. Sorption of cobalt to soil occurs rapidly (within 1-2 hours). Soil-derived oxide materials were found to adsorb greater amounts of cobalt than other materials examined, although substantial amounts were also adsorbed by organic materials.

Clay minerals sorbed relatively smaller amounts of cobalt. In addition, little cobalt was desorbed from soil oxides while substantial amounts desorbed from humic acids and montmorillonite. In clay soil, adsorption may be due to ion exchange at the cationic sites on clay with either simple ionic cobalt or hydrolysed ionic species such as CoOH^+ . Adsorption of cobalt onto iron and manganese increases with pH. In addition, as pH increases, insoluble hydroxides or carbonates may form, which would also reduce cobalt mobility. Conversely, sorption onto mobile colloids would enhance its mobility. In most soils, cobalt is more mobile than lead, chromium (II), zinc, and nickel, but less mobile than cadmium. In several studies, the K_d of cobalt in a variety of soils ranged from 0.2 to 3,800. The soil properties showing the highest correlation with K_d were exchangeable calcium, pH, water content, and cation exchange capacity. Organic complexing agents such as ethylenediaminetetraacetic acid (EDTA), which are used for decontamination operations at nuclear facilities, greatly enhance the mobility of cobalt in soil. Other organic complexing agents, such as those obtained from plant decay, may also increase cobalt mobility in soil. However, both types of complexes decrease cobalt uptake by plants. Addition of sewage sludge to soil also increases the mobility of cobalt, perhaps due to organic complexation of cobalt.

Cobalt may be taken up from soil by plants. Surface deposition of cobalt on leaves of plants from airborne particles may also occur. Elevated levels of cobalt have been found in the roots of sugar beets and potato tubers in soils with high cobalt concentrations (e.g., fly ash-amended soil) due to absorption of cobalt from soil. However, the translocation of cobalt from roots to above-ground parts of plants is not significant in most soils, as indicated by the lack of cobalt in seeds of barley, oats, and wheat grown in high-cobalt soil. However, in highly acidic soil (pH as low as 3.3), significantly higher than normal concentrations of cobalt were found in rye grass foliage, oats, and barley. For example, cobalt concentrations in rye grass grown in unlimed soil (pH<5.0) was 19.7 mg/kg compared with 1.1 mg/kg in rye grass grown in limed soil (pH>5.0). Soil and plant samples taken in the 30-km zone around Chernobyl indicated that ^{60}Co was not accumulated by plants and mushrooms. Studies investigating the uptake of ^{60}Co by tomato plants watered with ^{60}Co contaminated water showed that tomato plants absorbed <2% of the activity available from the soil.

^{60}Co is taken up by phytoplankton and unicellular algae (*Senenastrum capricornutum*) with concentration factors (dry weight) ranging from 15,000 to 40,000 and 2,300 to 18,000, respectively. Elimination experiments with the algae indicate a two component biological half-life, 1 hour and 11 days, respectively, and suggest that the cobalt might be absorbed not only on the surface, but also intracellularly. Since these organisms are at the bottom of the food chain, they could play an important role in the trophic transfer of ^{60}Co released into waterways by nuclear facilities. However, cobalt levels generally diminish with increasing trophic levels in a food chain. The low levels of cobalt in fish may also reflect cobalt's strong binding to particles and sediment. The bioaccumulation factors (dry weight basis) for cobalt in marine and freshwater fish are ~100-4,000 and <10-1,000, respectively; accumulation in the muscle of marine fish is 5- 500.

Cobalt largely accumulates in the viscera and on the skin, as opposed to the edible parts of the fish. In carp, accumulation from water accounted for 75% of ^{60}Co accumulated from both water and food; accumulation from water and food was additive. Depuration half-lives were 53 and 87 days for fish contaminated from food and water, respectively. In the case of an accidental release of ^{60}Co into waterways, the implication is that effects would manifest themselves rapidly since the primary route of exposure is from water rather than food. Uptake of ^{60}Co was very low in whitefish, with concentrations being highest in kidney and undetectable in muscle. Similarly, while accumulation of ^{60}Co by carp from food was dependent on food type, the transfer factor was very low, approximately 0.01, and no long-term bioaccumulation of the radionuclide occurred.

Concentration factors have also been reported for various other aquatic organisms. Freshwater mollusks have concentration factors of 100-14,000 (~1-300 in soft tissue). Much of the cobalt taken up by mollusks and crustaceae from water or sediment is adsorbed to the shell or exoskeleton; very little cobalt is generally accumulated in the edible parts. A concentration factor for ^{60}Co of 265 mL/g (wet weight) was determined for *Daphnia magna* in laboratory studies. The rapid decrease in radioactivity during the depuration phase indicated that adsorption to the surface was the major contamination process. However, the digestive glands of crustaceans, which are sometimes eaten by humans, may accumulate high levels of ^{60}Co . The shell accounted for more than half of the body burden. Among the soft tissue, the gills and viscera had the highest concentrations factors and the muscle had the lowest.

In mussels, higher absorption efficiencies and lower efflux rates were obtained for cobalamins than for inorganic cobalt, suggesting that it is a more bioavailable form of cobalt.

Vitamin B12, which contains cobalt, is synthesized by 58 species of seven genera of bacteria as well as blue-green algae and actinomycetes (mold-like bacteria). Consequently, vitamin B12 levels in marine water range from very low levels in some open ocean water to much higher levels in some coastal waters. Freshwater environments have comparable levels of vitamin B12. The high level of cobalamins in coastal water appears to be related to the occurrence of macrophytes in these areas with their high concentrations of vitamin B12. Cobalamins are released into the water when the organisms die.

Some female birds sequester metals into their eggs under certain conditions, a phenomenon that may jeopardize the developing embryos.

307 ACTIVATED FOUNTAIN DRIER:

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 2.0

Chemwatch 21-9309

Issue Date: 13-Nov-2009

CD 2009/3

COBALT(II) SULFATE:

METHANOL:

- DO NOT discharge into sewer or waterways.

307 ACTIVATED FOUNTAIN DRIER:

METHANOL:

- For methanol:

log Kow : -0.82- -0.66

Half-life (hr) air : 427

Half-life (hr) H₂O surface water : 5.3-64

Henry's atm m³/mol: 1.35E-04

BOD 5 0.76-1.12

COD : 1.05-1.50, 99%

ThOD : 1.5

BCF : 0.2-10

Environmental Fate

TERRESTRIAL FATE: An estimated Koc value of 1 indicates that methanol is expected to have very high mobility in soil. Volatilisation of methanol from moist soil surfaces is expected to be an important fate process given a Henry's Law constant of 4.55x10⁻⁶ atm-cu m/mole. The potential for volatilisation of methanol from dry soil surfaces may exist based upon a vapor pressure of 127 mm Hg. Biodegradation is expected to be an important fate process for methanol based on half-lives of 1 and 3.2 days measured in a sandy silt loam and sandy loam from Texas and Mississippi, respectively.

AQUATIC FATE: The estimated Koc indicates that methanol is not expected to adsorb to suspended solids and sediment. Volatilization from water surfaces is expected based upon a Henry's Law constant Using this Henry's Law constant estimated volatilisation half-lives for a model river and model lake are 3 and 35 days, respectively. A BCF of less than 10 measured in fish, suggests bioconcentration in aquatic organisms is low. Hydrolysis and photolysis in sunlit surface waters is not expected to be an important environmental fate process for methanol since this compound lacks functional groups that hydrolyse or absorb light under environmentally relevant conditions. Methanol has been shown to undergo rapid biodegradation in a variety of screening studies using sewage seed and activated sludge inoculum, which suggests that biodegradation will occur in aquatic environments.

ATMOSPHERIC FATE: According to a model of gas/particle partitioning of semivolatile organic compounds in the atmosphere and vapour pressure, methanol is expected to exist solely as a vapor in the ambient atmosphere. Vapour-phase methanol is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals(SRC); the half-life for this reaction in air is estimated to be 17 days, calculated from its rate constant of 9.4x10⁻¹³ cu cm/molecule-sec at 25 deg C

Ecotoxicity:

Fish LC50 (96 h) fathead minnow (*Pimephales promelus*) 29000 mg/l; rainbow trout (*Oncorhynchus mykiss*) 19000 mg/l; bluegill (*Lepomis macrochirus*) 15400 mg/l

Fish LC50 (7 d): guppy 10860 mg/l (14 d): 11.5 mg/l (semistatic)

Daphnia pulex LC50 (18 h): 19500 mg/l

Brine shrimp (*Artemia salina*) LC50 24 h): 1101.46-1578.84 mg/l (static)

Brown shrimp (*Crangon crangon*) LC50 (96 h): 1340 mg/l (semistatic)

Mussel (*Mytilus edulis*) LC50 (96 h): 15900 mg/l

Marine bacterium (*Photobacterium phosphoreum*) LC50 (4 h): 7690 mg/l

Protozoa (*Tetrahymena pyriformis*) LC50 (48 h) 18756 mg/l.

307 ACTIVATED FOUNTAIN DRIER:

Marine Pollutant:

Not Determined

- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

METHANOL:

COBALT(II) SULFATE:

- Hazardous Air Pollutant:

Yes

- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

- Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air. Once released to surface waters and moist soils their fate depends on solubility and dissociation in water. Environmental processes (such as oxidation and the presence of acids or bases) may transform insoluble metals to more soluble ionic forms. Microbiological processes may also transform insoluble metals to more soluble forms. Such ionic species may bind to dissolved ligands or sorb to solid particles in aquatic or aqueous media. A significant proportion of dissolved/ sorbed metals will end up in sediments through the settling of suspended particles. The remaining metal ions can then be taken up by aquatic organisms.

When released to dry soil most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/ or surface water ecosystems when soaked by rain or melt ice. Environmental processes may also be important in changing solubilities.

Even though many metals show few toxic effects at physiological pHs, transformation may introduce new or magnified effects.

A metal ion is considered infinitely persistent because it cannot degrade further.

The current state of science does not allow for an unambiguous interpretation of various measures of bioaccumulation.

The counter-ion may also create health and environmental concerns once isolated from the metal. Under normal physiological conditions the counter-ion may be essentially insoluble and may not be bioavailable.

Environmental processes may enhance bioavailability.

- Data from tap water studies with human volunteers indicate that sulfates produce a laxative effect at concentrations of 1000 - 1200 mg/litre, but no increase in diarrhoea, dehydration or weight loss. The presence of sulfate in drinking-water can also result in a noticeable taste; the lowest taste threshold concentration for sulfate is approximately 250 mg/litre as the sodium salt. Sulfate may also contribute to the corrosion of distribution systems. No health-based guideline value for sulfate in drinking water is proposed. However, there is an increasing likelihood of complaints arising from a noticeable taste as concentrations in water increase above 500 mg/litre.

Sulfates are removed from the air by both dry and wet deposition processes. Wet deposition processes including rain-out (a process that occurs within the clouds) and washout (removal by precipitation below the clouds) contribute to the removal of sulfate from the atmosphere.

In soil, the inorganic sulfates can adsorb to soil particles or leach into surface water and groundwater. Sulfates can be taken up by plants and be incorporated into the parenchyma of the plant.

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 2.0

Chemwatch 21-9309

Issue Date: 13-Nov-2009

CD 2009/3

Sulfate in water can also be reduced by sulfate bacteria (Thiobacilli) which use them as a source of energy.

WATER:

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
307 Activated Fountain Drier		No data		
methanol	LOW	No data	LOW	HIGH
cobalt(II) sulfate		No data	LOW	
water	LOW	No data	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 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.
- Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
- A Hierarchy of Controls seems to be common - the user should investigate:
- Reduction,
 - Reuse
 - Recycling
 - Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

- 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 authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION



- Environmentally Hazardous Substances meeting the descriptions of UN 3077 or UN 3082 are not subject to this Code when transported by road or rail in;
 - (a) packagings;
 - (b) IBCs; or
 - (c) any other receptacle not exceeding 500 kg(L).
 - Australian Special Provisions (SP AU01) - ADG Code 7th Ed.

Labels Required: MISCELLANEOUS

HAZCHEM: ●3Z (ADG7)

ADG7:

Class or division:	9	Subsidiary risk:	None
UN No.:	3082	UN packing group:	III
Special provisions:	179, 274, 331, 335	Packing Instructions:	None

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 2.0

Chemwatch 21-9309

Issue Date: 13-Nov-2009

CD 2009/3

Notes:	None	Limited quantities:	5 L
Portable tanks and bulk containers - Instructions:	T4	Portable tanks and bulk containers - Special provisions:	TP1, TP29
Packagings and IBCs - Packing instruction:	P001, IBC03, LP01	Packagings and IBCs - Special packing provisions:	PP1

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(contains cobalt(II) sulfate)
Land Transport UNDG:

Class or division:	9	Subsidiary risk:	None
UN No.:	3082	UN packing group:	III

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(contains cobalt(II) sulfate)

Air Transport IATA:

ICAO/IATA Class:	9	ICAO/IATA Subrisk:	☐
UN/ID Number:	3082	Packing Group:	III
Special provisions:	A97		

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. *(CONTAINS COBALD(II) SULFATE)

Maritime Transport IMDG:

IMDG Class:	9	IMDG Subrisk:	None
UN Number:	3082	Packing Group:	III
EMS Number:	F-A,S-F	Special provisions:	274 909 944
Limited Quantities:	5 L	Marine Pollutant:	Not Determined

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.(contains cobalt(II) sulfate)

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE

S5

REGULATIONS

Regulations for ingredients

methanol (CAS: 67-56-1) is found on the following regulatory lists;

"Australia - New South Wales Hazardous Substances Prohibited for Specific Uses", "Australia Exposure Standards", "Australia Hazardous Substances", "Australia High Volume Industrial Chemical List (HVICL)", "Australia Inventory of Chemical Substances (AICS)", "Australia National Pollutant Inventory", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix E (Part 2)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix F (Part 3)", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 5", "Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 6", "GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals"

cobalt(II) sulfate (CAS: 10124-43-3, 60459-08-7, 10026-24-1) is found on the following regulatory lists;

"Australia Hazardous Substances", "Australia Inventory of Chemical Substances (AICS)", "International Chemical Secretariat (ChemSec) REACH SIN* List (*Substitute It Now!) 1.0", "International Council of Chemical Associations (ICCA) - High Production Volume List", "OECD Representative List of High Production Volume (HPV) Chemicals"

water (CAS: 7732-18-5) is found on the following regulatory lists;

"Australia Inventory of Chemical Substances (AICS)", "GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships", "IMO IBC Code Chapter 18: List of products to which the Code does not apply", "OECD Representative List of High Production Volume (HPV) Chemicals"

No data for 307 Activated Fountain Drier (CW: 21-9309)

Section 16 - OTHER INFORMATION

Ingredients with multiple CAS Nos

Ingredient Name	CAS
cobalt(II) sulfate	10124-43-3, 60459-08-7, 10026-24-1

REPRODUCTIVE HEALTH GUIDELINES

Ingredient	ORG	UF	Endpoint	CR	Adeq TLV
methanol	262 mg/m3	NA	NA	NA	Yes

■ These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as

307 ACTIVATED FOUNTAIN DRIER

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 2.0

Chemwatch 21-9309

Issue Date: 13-Nov-2009

CD 2009/3

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).

EXPOSURE STANDARD FOR MIXTURES

■ "Worst Case" computer-aided prediction of spray/ mist or fume/ dust components and concentration: ■ Composite Exposure Standard for Mixture (TWA) :100 mg/m³.

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

www.chemwatch.net/references.

■ 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. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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