

CHH TIMBER CREOSOTE TREATED SOLID PINE

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 3

Chemwatch 25635

Issue Date: 6-Oct-2008

CD 2008/4

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

CHH TIMBER CREOSOTE TREATED SOLID PINE

SYNONYMS

"Rounds, Posts, Fencing Timber"

PRODUCT USE

Building of structures particularly below ground and for ground contact where termite, borer and rot resistance is required. Use of creosote treated pine is not recommended where there may be food or fodder contact; drinking water contact, except for incidental contact as for structures as bridges, docks. Also not recommended for regular contact with bare skin i.e.; seats, chairs; farm structures on which animals may chew, also brooding, farrowing, or small animal rearing structures. Sawing, machining and sanding produces dust which contains the preservative chemical.

SUPPLIER

Company: Carter Holt Harvey Wood Products Australia Group o

Address:

22 Prospect Street

Box Hill

VIC, 3128

AUS

Telephone: 1800 335 293

Fax: 1800 624 362

HAZARD RATINGS

	Min	Max	
Flammability:	1		
Toxicity:	0		
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. NON-DANGEROUS GOODS. According to the Criteria of NOHSC, and the ADG Code.

POISONS SCHEDULE

None

RISK

- » Irritating to eyes and skin.
- » May cause CANCER.

SAFETY

- » Keep locked up.
- » In case of insufficient ventilation wear suitable respiratory equipment.

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- » Harmful to aquatic organisms may cause long-term adverse effects in the aquatic environment.
- » Avoid exposure - obtain special instructions before use.
- » Cumulative effects may result following exposure*.
- » To clean the floor and all objects contaminated by this material use water and detergent.
- » May produce discomfort of the respiratory system*.
- » This material and its container must be disposed of in a safe way.
- » Possible respiratory and skin sensitiser*.
- » Keep away from food drink and animal feeding stuffs.
- * (limited evidence).
- » In case of contact with eyes rinse with plenty of water and contact Doctor or Poisons Information Centre.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
Pinus Radiata - Timber	None	80-92
impregnation residuals, as		
creosote, coal tar	8001-58-9	8-20
machining may produce		
wood dust	Not avail.	

Section 4 - FIRST AID MEASURES

SWALLOWED

- » Not normally a hazard due to physical form of product. For advice, contact a Poisons Information Centre or a doctor.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.

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 or hair contact occurs:
 - Flush skin and hair with running water (and soap if available).
 - Seek medical attention in event of irritation.

INHALED

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

- » Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- » There is no restriction on the type of extinguisher which may be used.

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CD 2008/4

- Use extinguishing media suitable for surrounding area.

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 course.

FIRE/EXPLOSION HAZARD

»

- Solid which exhibits difficult combustion or is difficult to ignite.
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
- Dry dust can also be charged electrostatically by turbulence, pneumatic transport, pouring, in exhaust ducts and during transport.
- Build-up of electrostatic charge may be prevented by bonding and grounding.
- Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.
- All movable parts coming in contact with this material should have a speed of less than 1-metre/sec.

Decomposes on heating and produces toxic fumes of:
carbon monoxide (CO) and phenolics.

FIRE INCOMPATIBILITY

»

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

HAZCHEM

None

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

Refer to major spills.

MAJOR SPILLS

»

- Wear physical protective gloves, eg. leather.
- Wear safety footwear.
- Clean up all spills immediately.
- Secure load if safe to do so.
- Bundle/collect recoverable product.
- Collect remaining material in containers with covers for disposal.

Clean up/sweep up area.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



X: Must not be stored together

O: May be stored together with specific preventions

+: May be stored together

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

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

» Wear protective clothing when risk of exposure occurs.

Avoid generating and breathing dust.

When handling, DO NOT eat, drink or smoke.

Always wash hands with soap and water after handling. Work clothes should be laundered separately.

Use good occupational work practice. Observe manufacturer's storing and handling recommendations.

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CD 2008/4

SUITABLE CONTAINER

» Not applicable.

STORAGE INCOMPATIBILITY

» None known.

STORAGE REQUIREMENTS

»

- Keep dry.
- Store under cover.
- Store in a well ventilated area.
- Store away from sources of heat or ignition.
- Observe manufacturer's storing and handling recommendations.

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
Australia Exposure Standards	creosote, coal tar (Coal tar pitch volatiles (as benzene solubles))		0.2					

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
creosote, coal tar	80	

MATERIAL DATA

» Not available. Refer to individual constituents.

INGREDIENT DATA

PINUS RADIATA - TIMBER:

wood dust (soft wood):

ES TWA*: 5 mg/m³, STEL: 10 mg/m³ [Sensitiser]

TLV TWA*: 5 mg/m³; STEL: 10 mg/m³

Inspirable dust concentrations in a worker's breathing zone should be collected and measured in accordance with AS3640.

CREOSOTE, COAL TAR:

» for coal tar creosotes:

Some jurisdictions require that health surveillance be conducted on workers occupationally exposed to creosote. Such surveillance should emphasise

(i) demography, occupational and medical history

(ii) health advice, including recognition of photosensitivity and skin changes

(iii) physical examination with emphasis on the neurological system and skin, noting any abnormal lesions, and evidence of skin sensitisation

(iv) records of personal exposure, including photosensitivity

Odour Safety Factor(OSF)

OSF=25 (PHENOL).

for coal tar pitch volatiles:

IDLH Level: 80 mg/m³

Exposure below the TLV-TWA should minimise the potential for an increase in the incidence of lung and other tumours. If the extractable fraction of total airborne particulate contains detectable quantities of benz[a]anthracene, benzo[b]fluoranthene, chrysene, anthracene, benz[a]pyrene, phenanthrene, acridine, and pyrene then the TLV for that material is 0.2 mg/m³. If none of these substances are detected then the airborne contamination is to be evaluated in terms of the TLV for asphalt fumes (5 mg/m³) or for "Particulates not otherwise classified, (PNOC)" (10 mg/m³).

Odour Safety Factor(OSF)

OSF=1.2E2 (coal tar pitch volatiles)

Odour Safety Factor(OSF)

OSF=0.042 (soft coal tar pitch).

None assigned. Refer to individual constituents.

WARNING: This substance is classified by the NOHSC as Category 2 Probable Human Carcinogen.

WOOD DUST:

» Wood dusts produce dermatitis and an increased risk of upper respiratory disease. Epidemiological studies in furniture workers show an increased risk of lung, tongue, pharynx and nasal cancer. An excess risk of leukaemia amongst millwrights probably is associated with exposure to various components used in wood preservation.

Impairment of nasal mucociliary function may occur below 5 mg/m³ and may be important in the development of nasal adenocarcinoma amongst furniture workers exposed to hardwoods.

Certain exotic hardwoods contain alkaloids which may produce headache, anorexia, nausea, bradycardia and dyspnoea.

The softwood TLV-TWA reflects the apparent low risk for upper respiratory tract involvement amongst workers in the building industry. A separate TLV-TWA, for hard woods, is based on impaired nasal mucociliary function reported to contribute to nasal adenocarcinoma and related hyperplasia found in furniture workers.

PERSONAL PROTECTION

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Hazard Alert Code:
HIGH

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Revision No: 3

Chemwatch 25635

Issue Date: 6-Oct-2008

CD 2008/4



EYE

» When sawing, machining or sanding use

- Safety glasses with side shields.
- 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

»

and

- PVC gloves

or

- Wear physical protective gloves, eg. leather.
- Wear safety footwear.
- Because of possible increased sunburn risk use a broad brim hat and consider using full length overalls with sleeves, as climate allows.
- Exposed skin areas should be protected with Sunblock cream with 15+PF (Protection Factor). For best protection, wash at 2 hour intervals and reapply Sunblock cream.

OTHER

» Overalls.

- Eyewash unit.

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	A-AUS P	-
1000	50	-	A-AUS P
5000	50	Airline *	-
5000	100	-	A-2 P
10000	100	-	A-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

» Use in a well-ventilated area.

- Hazard relates to dust released by sawing, cutting, sanding, trimming or other finishing operations.
- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.
- If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered. Such protection might consist of:
 - (a): particle dust respirators, if necessary, combined with an absorption cartridge;
 - (b): filter respirators with absorption cartridge or canister of the right type;
 - (c): fresh-air hoods or masks
- Build-up of electrostatic charge on the dust particle, may be prevented by bonding and grounding.
- Powder handling equipment such as dust collectors, dryers and mills may require additional protection measures such as explosion venting.

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to efficiently remove the contaminant.

Type of Contaminant:	Air Speed:
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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Revision No: 3

Chemwatch 25635

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grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very 2.5-10 m/s (500-2000 f/min.) high rapid air motion).

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 4-10 m/s (800-2000 f/min) for extraction of crusher dusts generated 2 metres 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

Dark grey coloured dressed pine timber. Mild creosote odour Being dry sections after vacuum / pressure creosote impregnation. THIS CHEMWATCH REPORT APPLIES TO THE TREATED TIMBER PRODUCT.

PHYSICAL PROPERTIES

Molecular Weight: Not applicable	Boiling Range (°C): Not applicable.
Melting Range (°C): Not applicable.	Specific Gravity (water=1): 0.4-0.75 approx
Solubility in water (g/L): Not Applicable	pH (as supplied): Not applicable
pH (1% solution): Not applicable	Vapour Pressure (kPa): Negligible
Volatile Component (%vol): 5-10 (water)	Evaporation Rate: Non Vol. @ 38C
Relative Vapour Density (air=1): Not applicable.	Flash Point (°C): Combustible
Lower Explosive Limit (%): Not available.	Upper Explosive Limit (%): Not available.
Autoignition Temp (°C): 265	Decomposition Temp (°C): Not available.
State: Manufactured	Viscosity: Not Applicable

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

» Product is considered stable and hazardous polymerisation will not occur.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

» Overexposure is unlikely in this form and quantity.
Considered an unlikely route of entry in commercial/industrial environments.

EYE

» The dust is mildly abrasive to the eyes.

SKIN

» The components of the material are capable of causing skin reactions which may lead to dermatitis and may cause in some cases, sensitisation photosensitisation i.e photosensitisation, with increased risk of sunburn, irritation, on exposure to sunlight. Sensitisation reactions may appear suddenly after repeated symptom free exposures.
Bare unprotected skin should not be exposed to this material.

The material may accentuate any pre-existing dermatitis condition.

INHALED

» Generated dust may be discomforting.
sawdust if inhaled.

Respiratory sensitisation may result in allergic/asthma like responses; from coughing and minor breathing difficulties to bronchitis with wheezing, gasping.

Inhalation hazard is increased at higher temperatures.

CHH TIMBER CREOSOTE TREATED SOLID PINE

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 3

Chemwatch 25635

Issue Date: 6-Oct-2008

CD 2008/4

CHRONIC HEALTH EFFECTS

»

- Hazard relates to dust released by sawing, cutting, sanding, trimming or other finishing operations.

Principal routes of exposure are usually by skin contact with the material and inhalation of generated dust i.e sawdust.

This material is a photosensitiser. Certain individuals working with this substance may show allergic reaction of the skin under sunlight. This results in sensitivity to sunburn (may be severe) unless protective covering and 15+PF sunscreen are used. Responses may vary from sunburn-like effects to swelling and blistering lesions.

TOXICITY AND IRRITATION

» Not available. Refer to individual constituents.

PINUS RADIATA - TIMBER:

» Not normally a hazard due to the physical form of product. The material is a physical irritant to the gastro-intestinal tract.

No data of toxicological significance identified in literature search.

CREOSOTE, COAL TAR:

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

TOXICITY	IRRITATION
Oral (rat) LD50: 725 mg/kg	Nil Reported
Oral (mouse) LD50: 433 mg/kg	

» The production of wood creosote, coal tar creosote, coal tar, coal tar pitch, and coal tar pitch volatiles, stems from the incomplete combustion or pyrolysis of carbon-containing materials. Creosotes, coal tar, coal tar pitch, and coal tar pitch volatiles are composed of many individual compounds of varying physical and chemical characteristics. In addition, the composition of each, although referred to by specific name (e.g., wood creosote or coal tar creosote) is not consistent. Coal tars are by-products of the carbonization of coal to produce coke or natural gas. Physically, they are usually viscous liquids or semisolids that are black or dark brown with a naphthalene-like odor. The coal tars are complex combinations of polycyclic aromatic hydrocarbons (PAHs), phenols, heterocyclic oxygen, sulfur, and nitrogen compounds. By comparison, coal tar creosotes are distillation products of coal tar. They have an oily liquid consistency and range in color from yellowish-dark green to brown. At least 75% of the coal tar creosote mixture is PAHs. Unlike the coal tars and coal tar creosotes, coal tar pitch is a residue produced during the distillation of coal tar. (Beech) wood creosote consists mainly of phenol, cresols, guaiacol, xylene, and creosol. Creosote bush resin consists of phenolic (e.g., flavonoids and nordihydroguaiaretic acid), neutral (e.g., waxes), basic (e.g., alkaloids), and acidic (e.g., phenolic acids) compounds. The phenolic portion comprises 83-91% of the total resin. Nordihydroguaiaretic acid accounts for 5-10% of the dry weight of the leaves.

It is likely that the toxicity of wood creosote, coal tar creosote, coal tar, coal tar pitch, and coal tar pitch volatiles is due largely to the major individual components, phenols, PAHs and others.

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

Somnolence, convulsions, respiratory depression, maternal effects, fetotoxicity, skin tumours recorded.

CARCINOGEN

creosote, coal tar	International Agency for Research on Cancer (IARC) Carcinogens	Group	2A
creosote, coal tar	Australia Exposure Standards - Carcinogens	Carcinogen Category	1

Section 12 - ECOLOGICAL INFORMATION

» DO NOT discharge into sewer or waterways.

Refer to data for ingredients, which follows:

PINUS RADIATA - TIMBER:

CREOSOTE, COAL TAR:

Marine Pollutant:	Not Determined
» Fish LC50 (96hr.) (mg/l):	4.42 (24hr)
» log Kow (Prager 1995):	1

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

» 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.

» for creosote:

As with other chemical mixtures, the fate and transport processes affecting creosote can be extremely complex. Creosote components may partition to the air, water, soil, or biota depending on their physical and chemical properties. Compounds initially released to the atmosphere may undergo atmospheric deposition and reach surface water directly or through runoff carrying soil-bound compounds. For coal tar creosote materials encountered in old production facilities or waste disposal sites, materials contained in the top several feet of soil will have become "weathered," with virtually all the phenolic and heterocyclic fractions having volatilized, oxidized, or biodegraded. The lighter fractions of the PAH materials will also have degraded. The remaining weathered creosote will show limited ability to move off-site.

Newly produced creosote, or materials from a spill or a more recent disposal site, may pose more serious toxicity concerns. A complicating factor in interpreting the available literature is that creosote alone may not be the only source of toxicity; such chemicals as pentachlorophenol (PCP) or heavy metals may be involved.

Transport and Partitioning: Coal tar creosote constituents released to surface waters will differentially partition to the water column or to sediments depending on their water solubility and sorptive properties. For example, PAHs, the major constituents of creosote, generally tend to sorb strongly to soil and sediment particulates, and often have low aqueous solubilities and mobility. Many

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Revision No: 3

Chemwatch 25635

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CD 2008/4

components in the PAH fraction, particularly the higher molecular weight (HMW) PAHs, will remain in a virtually stationary tar-like mass at the place where they were deposited. Nitrogenous bases present in creosote waste water (e.g., aniline, toluidines, and xylydines) are relatively soluble, mobile, and persistent in ground water. However, behavior at a given site is also dependent on site-specific characteristics.

In an investigation of the release of creosote from treated wood into fresh water and sea water, naphthalene, phenanthrene, acenaphthene, dibenzofuran, fluorene, and 2-methylnaphthalene were found to be the major components that migrated into water. The rate of migration was found to increase significantly with increasing temperature within the range of 20-40 C; slower migration occurred from aged than from freshly treated pilings. In a microcosm study of the leaching of PAHs from creosote-impregnated pilings into aquatic environments, the aqueous concentration of PAHs increased with the number of pilings used. These authors calculated a rate loss of creosote from the wood pilings into the water of approximately 50 ug/cm²/day (273 mg/piling/day). Creosote was observed to be removed from the water rapidly after 7 days, and was close to background concentrations (0.8-6.7 ug/L) by 84 days; losses were attributed to photolysis and microbial degradation, while sorption to sediment was not significant.

In an investigation of the volatilization of PAHs from creosote-treated wood, desorption of acenaphthene, fluorene, phenanthrene, anthracene, and fluoranthene was directly related to concentration and was greater at 30 C than at 4 C. The authors reported desorption half-lives of 0.7-31 years at 4 C and 0.3-1 year at 30 C for fluoranthene and acenaphthene, respectively.

While systemic uptake may be minimal, coal tar creosote components such as PAHs can adsorb to plant roots or surfaces. This seems a common way that vegetables or other produce for human consumption can pick up trace amounts of creosote materials.

Animals such as voles, crickets, snails, pill bugs, and worms have exhibited the capacity to assimilate radiolabeled creosote components in terrestrial microcosm studies. Creosote components were found to accumulate to the greatest extent in the vole, with bioconcentration factors (BCFs) of 12-31. The 14C mass balance content of the animals was 1.2% of applied acenaphthene and 0.8% of applied phenanthrene versus 4.3 and 2.7%, respectively, in soils. In addition, mussels taken from creosote-treated pilings have been found to contain significantly more benzo[a]pyrene, a creosote constituent, than those growing elsewhere. Accumulation of creosote-derived PAHs has been reported in benthic organisms. Fluoranthene, pyrene, benzo[a]pyrene, anthracene, chrysene, and phenanthrene were detected in higher concentrations in tissues of snails (*Thais haemastoma*) and oysters (*Crassostrea virginica*) taken from offshore sites near an onshore wood-treatment plant compared with those from control sites. Experimental and estimated log Kow values for many of the main constituents of coal tar are 1.2- 5.22. Based on these values, BCFs of 5-5,500 have been estimated and are consistent with reported experimental BCFs of 2-9,200 for fish and aquatic organisms, indicating that bioaccumulation may be important in the fate of some components of coal tar.

Air Among the more volatile constituents of creosote are the cresols in its phenolic fraction. These materials comprise only about 1% of the creosote by weight, but it is the cresol components that give creosote its distinctive odor and its resin-like properties. Although certain reaction pathways can lead to the rapid degradation of these cresols, appreciable transient build-ups of cresol vapors are possible. Degradation products include a variety of nitrocresols, aliphatic carbonyls, and ketoacids. These degradation products can become part of other atmospheric reactions in the air of typical urban areas. These transient cresol concentrations could amount to 10-13% of the toluene levels.

Water: Coal tar constituents present in surface waters may be degraded by direct and indirect photolysis. Estimated aqueous photolysis half-lives of 8.4, 71, and 21 hours have been reported for phenanthrene, naphthalene and fluoranthene, respectively. Other coal tar constituents which may undergo aqueous photolysis are acenaphthalene, anthracene, benzene, quinoline, phenol, cresol, and carbazide. In a microcosm study, PAHs leached from creosote-impregnated wood pilings were degraded in aquatic environments by photolysis and microbial degradation, while sorption to sediment was not significant. Photolysis in water is not expected to be a major route of the environmental fate of creosote constituents, particularly for the less soluble compounds. Coal tar creosote components are degraded in aquatic environments mainly by microfaunal metabolism. Microorganisms may act on the creosote-treated wood itself or on creosote components that have leached from the treated wood. Quinoline, the major tar base in creosote, has been reported to be degraded in surface water and ground water by bacteria of the genus *Pseudomonas*. Biotransformation of the phenolic components of creosote apparently also occurs under anaerobic conditions in contaminated ground water. Adaptation of soil microorganisms to PAH contaminants in ground water originating from creosote treatment plant wastes has also been reported.

So long as the ground water is not completely anoxic, numerous soil microorganisms can degrade creosote materials. Research suggests that up to 90% of the creosote degradation is associated with biologically mediated processes. Although this can lead to an appreciable reduction in the quantity of the creosote materials, it is the phenolic and lower molecular weight (LMW) PAHs that are degraded while the HMW PAHs that have been shown to resist biological attack may persist. In a study of biodegradation of creosote-contaminated ground water from the American Creosote Superfund Site, a toxic and teratogenic response of inland silverside (*Merida beryllina*) embryos to the biotreated water, at both 10 and 100% concentrations, was observed.

They attributed the response to the cumulative effects of carcinogenic HMW PAHs that remained after 14 days of incubation. The higher levels of biodegradation observed for the LMW PAHs was attributed to their greater aqueous solubility and consequent greater bioavailability.

In general, however, biodegradation under anoxic conditions appears to proceed very slowly. Even when supplied with ample quantities of such electron acceptors as nitrates, half-lives in excess of 20 days were observed in laboratory microcosms for the anoxic biodegradation of dimethylphenol components in creosote, and cresol components showed little indication of significant disappearance unless the experiments were continued in excess of 90 days.

Sediment and Soil Coal tar creosote components are slowly released from treated wood products by oil exudation, rainwater leaching, and by volatilisation of the lighter fractions. The major components of creosote were not detected in soil samples taken to a depth of 6 inches within 2-24 inches from treated poles, presumably as a result of biotransformation of mobilized components by soil microorganisms. Acclimation to creosote phenolic constituents by soil microorganisms has also been demonstrated.

Where the coal tar creosote is in well-oxygenated conditions, lignin degrading fungi like the white rot fungus *Phanerochaete sordida* can remove much of the PAH fraction.

» PAHs travel through the atmosphere as a gas or attached to dust particles. They are carried by air currents and deposited by dry or wet (rain, dew, etc) deposition. When deposited in water they sink to the bottom of lakes and rivers. Some will move through the soil to contaminate groundwater.

Polycyclic aromatic hydrocarbons (PAHs) are ubiquitous in the marine environment, occurring at their highest environmental concentrations around urban centres.

Two factors, lipid and organic carbon, control to a large extent the partitioning behaviour of PAHs in sediment, water and tissue; the more hydrophobic a compound, the greater the partitioning to non-aqueous phases. These two factors, along with the octanol-water partition coefficient, are the best predictors of this partitioning and can be used to determine PAH behaviour and its bioavailability in the environment.

The lipid (fat) phase, of all organisms, contains the highest levels of PAHs: organic carbon associated with sediment or dissolved in

CHH TIMBER CREOSOTE TREATED SOLID PINE

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 3

Chemwatch 25635

Issue Date: 6-Oct-2008

CD 2008/4

water has a great influence on bioavailability resulting from its ability to adsorb.

Accumulation of PAHs occurs in all marine organisms; however there is a wide range in tissue concentrations resulting from variable environmental concentrations, level and time of exposure, and species ability to metabolize these compounds. PAHs generally partition in lipid-rich tissues and their metabolites are found in most tissues. In fish, bile and liver accumulate the highest levels of parent PAH and metabolites. In invertebrates, the highest concentrations can be found in the internal organs, such as the liver and pancreas; tissue concentrations appear to follow seasonal cycles which may be related to variations in lipid content or spawning cycles.

The primary mode of toxicity for PAHs in soil dwelling terrestrial invertebrates is non-specific non-polar narcosis. The uptake of PAHs by earthworms occurs primarily by direct contact with the soluble phase of soil solution (interstitial pore-water).

Microbial degradation of PAHs is a key process in soils. Biodegradation of PAHs may take place over a period of weeks to months. Mixed microbial populations in sediment/water systems may degrade some PAHs, with degradation progressively decreasing with increasing molecular weight. The rate of degradation is dependent on nutrient content and the bacterial community in soil.

PAHs in soils undergo a weathering process such that the lighter chain fractions are removed (primarily by volatilisation). Heavier fractions bind to soil organic matter and remain behind in the top soil horizon. As the mixture of PAHs age, bioavailability changes as the fraction remaining bind more tightly.

In general the more soluble a PAH, the higher the uptake by plants while the reverse is true for uptake by earthworms and uptake in the gastrointestinal tract of animals.

» The material is classified as an ecotoxin* because the Daphnia EC50 (48 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.

WOOD DUST:

Section 13 - DISPOSAL CONSIDERATIONS

» Recycle wherever possible.

Consult manufacturer for recycling options.

Incinerate residue at an approved site or Bury residue in an authorised landfill.

Section 14 - TRANSPORTATION INFORMATION

HAZCHEM: None (ADG6)

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: UN, IATA, IMDG

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE

None

REGULATIONS

CHH Timber Creosote Treated Solid Pine (CAS: None):

No regulations applicable

creosote, coal tar (CAS: 8001- 58- 9) is found on the following regulatory lists;

Australia - New South Wales Hazardous Substances Requiring Health Surveillance

Australia - Tasmania Hazardous Substances Requiring Health Surveillance

Australia Hazardous Substances

Australia Hazardous Substances Requiring Health Surveillance

Australia Inventory of Chemical Substances (AICS)

Australia Occupational Health and Safety (Commonwealth Employment) (National Standards) Regulations 1994 - Hazardous Substances Requiring Health Surveillance

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) - Schedule 2

Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 6

Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 7

IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk

International Agency for Research on Cancer (IARC) Carcinogens

OECD Representative List of High Production Volume (HPV) Chemicals

creosote, coal tar (CAS: 61789- 28- 4) is found on the following regulatory lists;

Australia Hazardous Substances

Australia Inventory of Chemical Substances (AICS)

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) - Schedule 2

Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 6

Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 7

OECD Representative List of High Production Volume (HPV) Chemicals

creosote, coal tar (CAS: 65996- 91- 0) is found on the following regulatory lists;

Australia Hazardous Substances

Australia Inventory of Chemical Substances (AICS)

Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix E (Part 2)

CHH TIMBER CREOSOTE TREATED SOLID PINE

Hazard Alert Code:
HIGH

Chemwatch Material Safety Data Sheet (REVIEW)

Revision No: 3

Chemwatch 25635

Issue Date: 6-Oct-2008

CD 2008/4

Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 2
Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 6
Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 7
OECD Representative List of High Production Volume (HPV) Chemicals
No data available for wood dust as CAS: Not avail.

Section 16 - OTHER INFORMATION

Ingredients with multiple CAS Nos

Ingredient Name	CAS
creosote, coal tar	8001-58-9, 61789-28-4, 65996-91-0

» 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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