

LAMINEX FSC TIMBER VENEER

Chemwatch Independent Material Safety Data Sheet

Issue Date: 28-Oct-2011

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Section 2 - HAZARDS IDENTIFICATION

Dust generated from shaping, cutting and sawing operations carried out on this product will contain cured binder/wood particles and may contain wood dust without binder.

Wood dust is a hazardous substance according to the NOHSC criteria.

and "may cause Sensitisation by inhalation and skin contact" (R42/43) and "may cause cancer by inhalation" (R49)

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
wood particles		>86
urea/ formaldehyde resin	9011-05-6	1-12
paraffin wax	8002-74-2	0-2
stain		<5
residual bonding reactants not more than formaldehyde.	50-00-0	0.01^
dust from sawing and forming operations will contain wood dust softwood	Not avail.	NotSpec
cured binder		NotSpec

Section 4 - FIRST AID MEASURES

SWALLOWED

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

- Immediately give a glass of water.

- First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

EYE

■ If this product comes in contact with eyes:

- Wash out immediately with water.

- If irritation continues, seek medical attention.

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

SKIN

■ Brush off dust.

In the event of abrasion or irritation of the skin seek medical attention.

INHALED

■ - If dust is inhaled, remove from contaminated area.

- Encourage patient to blow nose to ensure clear passage of breathing.

- If irritation or discomfort persists seek medical attention.

NOTES TO PHYSICIAN

■ Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

■ - Water spray or fog.

- Foam.

- Dry chemical powder.

- BCF (where regulations permit).

- Carbon dioxide.

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Section 5 - FIRE FIGHTING MEASURES

FIRE FIGHTING

- - Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use water delivered as a fine spray to control fire and cool adjacent 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

- Combustible.
- Wood products do not normally constitute an explosion hazard.
- Mechanical or abrasive activities which produce wood dust, as a by-product, may present a severe explosion hazard if a dust cloud contacts an ignition source.
- Hot humid conditions may result in spontaneous combustion of accumulated wood dust.
- Partially burned or scorched wood dust can explode if dispersed in air.
- Wet dusts may ignite spontaneously.
- Solid fuels, such as wood, when subjected to a sufficient heat flux, will degrade, gasify and release vapours. There is little or no oxidation involved in this gasification process and thus it is endothermic. This process is referred to as forced pyrolysis but is sometimes referred to, wrongly, as smoldering combustion. This type of combustion, once initiated, can continue in a low-oxygen environment, even when the fire is in a closed compartment with low oxygen content.
- An airborne concentration of 40 grams of dust per cubic meter of air is frequently used as the lower explosive limit (L.E.L) of wood dusts.
- Thermal oxidative decomposition may produce vapours and gases including carbon monoxide, aldehydes (including formaldehyde), organic acids, cyanides, polycyclic aromatics, and other volatile organic fragments.

FIRE INCOMPATIBILITY

Avoid contamination/mixing of dust with oxidising agents as fire may result.

HAZCHEM

None

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Refer to major spills.

MAJOR SPILLS

- - 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.

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

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- No special handling procedures required.

SUITABLE CONTAINER

- - Generally not applicable.

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Section 7 - HANDLING AND STORAGE

STORAGE INCOMPATIBILITY

- - Keep dry.

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	Notes
Australia Exposure Standards	paraffin wax (Paraffin wax (fume))		2			
Australia Exposure Standards	formaldehyde. (Formaldehyde (h))	1	1.2	2	2.5	Sen
Australia Exposure Standards	wood dust softwood (Wood dust (soft wood))		5		10	Sen

The following materials had no OELs on our records

- urea/ formaldehyde resin: CAS:9011- 05- 6 CAS:39327- 95- 2 CAS:56779- 89- 6 CAS:57608- 68- 1 CAS:57657- 45- 1 CAS:57762- 61- 5 CAS:60267- 46- 1 CAS:60831- 80- 3

MATERIAL DATA

PARAFFIN WAX:

WOOD DUST SOFTWOOD:

■ It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace.

At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience). Airborne concentrations must be maintained as low as is practically possible and occupational exposure must be kept to a minimum.

NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.

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- None assigned. Refer to individual constituents.

UREA/ FORMALDEHYDE RESIN:

- for formaldehyde:

Odour Threshold Value for formaldehyde: 0.98 ppm (recognition)

NOTE: Detector tubes for formaldehyde, measuring in excess of 0.2 ppm are available commercially.

Formaldehyde vapour exposure:

Primary irritation is dependent on duration of exposure and individual susceptibility.

The following are typical symptoms encountered at various exposure levels.

0.1 ppm - Lower level of mucous eye, nose and throat irritation

0.8 ppm - Typical threshold of perception

1-2 ppm - Typical threshold of irritation

2-3 ppm - Irritation of eyes, nose and throat

4-5 ppm - Increased irritation, tearing, headache, pungent odour

10-20 ppm - Profuse tearing, severe burning, coughing

50 ppm - Serious bronchial and alveolar damage

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100 ppm - Formaldehyde induced chemical pneumonia and death

Despite the intent of the TLV Ceiling recommendation it is believed that 0.3 ppm will not protect that portion of the workforce (up to 20%) reported to be responsive to low ambient concentrations. Because of the dose-related carcinogenic activity for rat and mouse inhalation of formaldehyde, the report of macromolecular adducts in the upper and lower respiratory tracts of nonhuman primates following inhalation of formaldehyde, the human case reports of upper respiratory tract malignant melanoma associated with formaldehyde inhalation and the suggestive epidemiologic data on human cancer risk, the TLV Committee recommends that workplace formaldehyde air concentrations be reduced to the lowest possible levels that can be achieved using engineering controls.

Odour Safety Factor(OSF)

OSF=0.36 (FORMALDEHYDE).

PARAFFIN WAX:

■ Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:

- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

for mineral oils (excluding metal working fluids), pure, highly and severely refined:

Human exposure to oil mist alone has not been demonstrated to cause health effects except at levels above 5 mg/m³ (this applies to particulates sampled by a method that does not collect vapour). It is not advisable to apply this standard to oils containing unknown concentrations and types of additive.

WOOD DUST SOFTWOOD:

■ 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

EYE

- No special equipment for minor exposure i.e. when handling small quantities.
- OTHERWISE:
- Safety glasses with side shields.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent].

HANDS/FEET

- - Protective gloves eg. Leather gloves or gloves with Leather facing.
- Safety footwear.

OTHER

- No special equipment needed when handling small quantities.

OTHERWISE:

- Overalls.
- Barrier cream.
- Eyewash unit.

RESPIRATOR

- Type BAX-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

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

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

The basic types of engineering controls are:

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

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.

Employers may need to use multiple types of controls to prevent employee overexposure.

- 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.

Dust and vapour extraction system is recommended for static full time exposures.

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Solid, flat medium density fibreboard sheet, manufactured as pressed boards ranging in thickness from 5 mm to 40 mm. Manufactured from wood fibre bound with a small amount of urea formaldehyde resin.

New board has a slight odour of formaldehyde (with concentrations up to 0.5 ppm), which dissipates on ageing.

PHYSICAL PROPERTIES

Does not mix with water.

Floats on water.

State	Manufactured	Molecular Weight	Not Applicable
Melting Range (°C)	Not Applicable	Viscosity	Not Applicable
Boiling Range (°C)	Not Applicable	Solubility in water (g/L)	Immiscible
Flash Point (°C)	Not Applicable	pH (1% solution)	Not Applicable
Decomposition Temp (°C)	Not Available	pH (as supplied)	Not Applicable
Autoignition Temp (°C)	Not Available	Vapour Pressure (kPa)	Not Applicable
Upper Explosive Limit (%)	Not Applicable	Specific Gravity (water=1)	0.70 - 0.75
Lower Explosive Limit (%)	Not Applicable	Relative Vapour Density (air=1)	Not Applicable
Volatile Component (%vol)	Not Applicable	Evaporation Rate	Not Applicable

Section 10 - STABILITY AND REACTIVITY

CONDITIONS CONTRIBUTING TO INSTABILITY

■ Product is considered stable and 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

■ Overexposure is unlikely in this form.

The dust may be discomforting and abrasive if swallowed.

EYE

■ Not normally a hazard due to physical form of product.

The dust may be discomforting.

SKIN

■ Not normally a hazard due to physical form of product.

The material may be mildly discomforting and abrasive to the skin.

Sharp edges may abrade the skin

INHALED

■ Not normally a hazard due to physical form of product.

Generated dust may be discomforting to the upper respiratory tract.

Formaldehyde vapour is irritating to the upper respiratory tract.

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Section 11 - TOXICOLOGICAL INFORMATION

CHRONIC HEALTH EFFECTS

■ - Hazard relates to dust released by sawing, cutting, sanding, trimming or other finishing operations. The material will emit small amounts of formaldehyde which is irritating to the mucous membranes. Wood dust may cause skin and respiratory sensitisation.

TOXICITY AND IRRITATION

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

WOOD DUST SOFTWOOD:

UREA/ FORMALDEHYDE RESIN:

■ 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.

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■ Not available. Refer to individual constituents.

UREA/ FORMALDEHYDE RESIN:

TOXICITY

Oral (rat) LD50: 8394 mg/kg

Inhalation (rat) LC50: >167 mg/m³/4h

Dermal (rat) LD50: >2100 mg/kg

Oral (mouse) LD50: 6361 mg/kg

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

Somnolence, impaired liver function tests, changes in leucocyte (WBC) count recorded.

IRRITATION

Skin (rabbit): 500 mg/24h- SEVERE

Eye (rabbit): 0.1 ul/24h - SEVERE

PARAFFIN WAX:

TOXICITY

IRRITATION

Skin (rabbit): 500 mg/24 hr- Mild

Eye (rabbit): 100 mg/24 hr- Mild

■ The materials included in the Lubricating Base Oils category are related from both process and physical-chemical perspectives;

The potential toxicity of a specific distillate base oil is inversely related to the severity or extent of processing the oil has undergone, since:

- The adverse effects of these materials are associated with undesirable components, and
- The levels of the undesirable components are inversely related to the degree of processing;
- Distillate base oils receiving the same degree or extent of processing will have similar toxicities;
- The potential toxicity of residual base oils is independent of the degree of processing the oil receives.
- The reproductive and developmental toxicity of the distillate base oils is inversely related to the degree of processing.

Unrefined & mildly refined distillate base oils contain the highest levels of undesirable components, have the largest variation of hydrocarbon molecules and have shown the highest potential carcinogenic and mutagenic activities. Highly and severely refined distillate base oils are produced from unrefined and mildly refined oils by removing or transforming undesirable components. In comparison to unrefined and mildly refined base oils, the highly and severely refined distillate base oils have a smaller range of hydrocarbon molecules and have demonstrated very low mammalian toxicity. Mutagenicity and carcinogenicity testing of residual oils has been negative, supporting the belief that these materials lack biologically active components or the components are largely non-bioavailable due to their molecular size.

Toxicity testing has consistently shown that lubricating base oils have low acute toxicities. Numerous tests

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Section 11 - TOXICOLOGICAL INFORMATION

have shown that a lubricating base oil's mutagenic and carcinogenic potential correlates with its 3-7 ring polycyclic aromatic compound (PAC) content, and the level of DMSO extractables (e.g. IP346 assay), both characteristics that are directly related to the degree/conditions of processing.

Highly and Severely Refined Distillate Base Oils

Acute toxicity: Multiple studies of the acute toxicity of highly & severely refined base oils have been reported. Irrespective of the crude source or the method or extent of processing, the oral LD50s have been observed to be >5 g/kg (bw) and the dermal LD50s have ranged from >2 to >5g/kg (bw). The LC50 for inhalation toxicity ranged from 2.18 mg/l to > 4 mg/l.

When tested for skin and eye irritation, the materials have been reported as "non-irritating" to "moderately irritating"

Testing in guinea pigs for sensitization has been negative

Repeat dose toxicity: . Several studies have been conducted with these oils. The weight of evidence from all available data on highly & severely refined base oils support the presumption that a distillate base oil's toxicity is inversely related to the degree of processing it receives. Adverse effects have been reported with even the most severely refined white oils - these appear to depend on animal species and/ or the peculiarities of the study.

- The granulomatous lesions induced by the oral administration of white oils are essentially foreign body responses. The lesions occur only in rats, of which the Fischer 344 strain is particularly sensitive,

- The testicular effects seen in rabbits after dermal administration of a highly to severely refined base oil were unique to a single study and may have been related to stress induced by skin irritation, and

- The accumulation of foamy macrophages in the alveolar spaces of rats exposed repeatedly via inhalation to high levels of highly to severely refined base oils is not unique to these oils, but would be seen after exposure to many water insoluble materials.

Reproductive and developmental toxicity: A highly refined base oil was used as the vehicle control in a one-generation reproduction study. The study was conducted according to the OECD Test Guideline 421. There was no effect on fertility and mating indices in either males or females. At necropsy, there were no consistent findings and organ weights and histopathology were considered normal by the study's authors.

A single generation study in which a white mineral oil (a food/ drug grade severely refined base oil) was used as a vehicle control is reported. Two separate groups of pregnant rats were administered 5 ml/kg (bw)/day of the base oil via gavage, on days 6 through 19 of gestation. In one of the two base oil dose groups, three malformed fetuses were found among three litters. The study authors considered these malformations to be minor and within the normal ranges for the strain of rat.

Genotoxicity:

In vitro (mutagenicity): Several studies have reported the results of testing different base oils for mutagenicity using a modified Ames assay. Base oils with no or low concentrations of 3-7 ring PACs had low mutagenicity indices.

In vivo (chromosomal aberrations): A total of seven base stocks were tested in male and female Sprague-Dawley rats using a bone marrow cytogenetics assay. The test materials were administered via gavage at dose levels ranging from 500 to 5000 mg/kg (bw). Dosing occurred for either a single day or for five consecutive days. None of the base oils produced a significant increase in aberrant cells.

Carcinogenicity: Highly & severely refined base oils are not carcinogens, when given either orally or dermally.

"hydrocarbon wax" describes a group of solid C20 to C36 paraffinic hydrocarbons which are not absorbed in the gastro-intestinal tract and in small quantity will pass through undigested.

Tumorigenic in rats

WOOD DUST SOFTWOOD:

■ 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.

No significant acute toxicological data identified in literature search.

WARNING: This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS.

WARNING: Inhalation of wood dust by workers in the furniture and cabinet making industry has been related to

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Section 11 - TOXICOLOGICAL INFORMATION

nasal cancer [I.L.O. Encyclopedia] Use control measures to limit all exposures.

Section 12 - ECOLOGICAL INFORMATION

PARAFFIN WAX:

WOOD DUST SOFTWOOD:

UREA/ FORMALDEHYDE RESIN:

■ DO NOT discharge into sewer or waterways.

UREA/ FORMALDEHYDE RESIN:

■ For Formaldehyde:

Environmental Fate: Formaldehyde is common in the environment as a contaminant of smoke and as photochemical smog. Concentrated solutions containing formaldehyde are unstable and oxidize slowly. In the presence of air and moisture, polymerization takes place readily in concentrated solutions at room temperature to form paraformaldehyde.

Atmospheric Fate: In the atmosphere, formaldehyde both photolysis and reacts with reactive free radicals (primarily hydroxyl radicals). Reaction with nitrate radicals, insignificant during the day, may be an important removal process at night. Air Quality Standards : <0.1 mg/m³ as a 30 min. average, indoor air, non-industrial buildings (WHO guideline).

Aquatic Fate: Due to its solubility, formaldehyde will efficiently transfer to rain and surface water and will biodegrade to low concentrations within days. Adsorption to sediment and volatilization are not expected to be significant routes of biodegradation.

Drinking Water Standard: Formaldehyde: 900 ug/L. (WHO guideline).

Terrestrial Fate: In soil, aqueous solutions of formaldehyde leach through the soil; at high concentrations adsorption to clay minerals may occur. Although biodegradable under both aerobic and anaerobic conditions the fate of formaldehyde in soil is unclear.

Ecotoxicity: Formaldehyde does not bioconcentrate in the food chain.

Urea-formaldehyde (UF) resins cannot be made free of residual formaldehyde. Under ambient conditions and during curing, uncured resins can release free formaldehyde, at rates gradually decreasing over time (Formaldehyde Institute, 1984). In pressed wood products, under high load conditions, even traces of residual, unreacted formaldehyde from the UF resin can result in measurable off-gassing, causing discernible formaldehyde levels in indoor air. High temperatures and humidity, which hydrolyze formaldehyde, promote the release; they can triple or quadruple the rate of release.

Urea also strongly affects the release rate because of an equilibrium reaction in which hydrolysed formaldehyde is consumed, yielding monomethylol urea. Building materials, such as composition boards (e.g., particleboard), which consist of UF resins, can emit formaldehyde for several years after manufacture.

Slowly, but not readily biodegradable.

TOC - removal 28 days; 61% BOD₂₈; 0.62 mg/mg substance.

Nitrification 28 days; 0.45 mg NO₃-N/mg substance.

PARAFFIN WAX:

■ for lubricating oil base stocks:

Vapor Pressure Vapor pressures of lubricating base oils are reported to be negligible. In one study, the experimentally measured vapour pressure of a solvent-dewaxed heavy paraffinic distillate base oil was 1.7 x 10⁻⁴ Pa . Since base oils are mixtures of C₁₅ to C₅₀ paraffinic, naphthenic, and aromatic hydrocarbon isomers, representative components of those structures were selected to calculate a range of vapor pressures. The estimated vapor pressure values for these selected components of base oils ranged from 4.5 x 10⁻¹ Pa to 2 x 10⁻¹³Pa. Based on Dalton's Law the expected total vapour pressure for base oils would fall well below minimum levels (10⁻⁵ Pa) of recommended experimental procedures.

Partition Coefficient (log K_{ow}): In mixtures such as the base oils, the percent distribution of the hydrocarbon groups (i.e., paraffins, naphthenes, and aromatics) and the carbon chain lengths determines in-part the partitioning characteristics of the mixture. Generally, hydrocarbon chains with fewer carbon atoms tend to have lower partition coefficients than those with higher carbon numbers .However, due to their complex composition, unequivocal determination of the log K_{ow} of these hydrocarbon mixtures cannot be made. Rather, partition coefficients of selected C₁₅ chain-length hydrocarbon structures representing paraffinic, naphthenic, and aromatic constituents in base oil lubricants were modelled . Results showed typical log K_{ow}

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Section 12 - ECOLOGICAL INFORMATION

values from 4.9 to 7.7, which were consistent with values of >4 for lubricating oil basestocks

Water Solubility: When released to water, base oils will float and spread at a rate that is viscosity dependent. While water solubility of base oils is typically very low, individual hydrocarbons exhibit a wide range of solubility depending on molecular weight and degree of unsaturation. Decreasing molecular weight (i.e., carbon number) and increasing levels of unsaturation increases the water solubility of these materials. As noted for partition coefficient, the water solubility of lubricating base oils cannot be determined due to their complex mixture characteristics. Therefore, the water solubility of individual C15 hydrocarbons representing the different groups making up base oils (i.e., linear and branched paraffins, naphthenes, and aromatics) was modelled. Based on water solubility modelling of those groups, aqueous solubilities are typically much less than 1 ppm. (0.003-0.63 mg/l)

Environmental Fate:

Photodegradation: Chemicals having potential to photolyse have UV/visible absorption maxima in the range of 290 to 800 nm. Some chemicals have absorption maxima significantly below 290 nm and consequently cannot undergo direct photolysis in sunlight (e.g. chemicals such as alkanes, alkenes, alkynes, saturated alcohols, and saturated acids). Most hydrocarbon constituents of the materials in this category are not expected to photolyse since they do not show absorbance within the 290-800 nm range. However, photodegradation of polyaromatic hydrocarbons (PAHs) can occur and may be a significant degradation pathway for these constituents of lubricating base oils. The degree and rate at which PAHs may photodegrade depend upon whether conditions allow penetration of light with sufficient energy to effect a change. For example, polycyclic aromatic compounds (PAC) compounds bound to sediments may persist due to a lack of sufficient light penetration

Atmospheric gas-phase reactions can occur between organic chemicals and reactive molecules such as photochemically produced hydroxyl radicals, ozone and nitrogen oxides. Atmospheric oxidation as a result of radical attack is not direct photochemical degradation, but indirect degradation. In general, lubricating base oils have low vapour pressures and volatilisation is not expected to be a significant removal mechanism for the majority of the hydrocarbon components. However, some components (e.g., C15 branched paraffins and naphthenes) appear to have the potential to volatilise. Atmospheric half-lives of 0.10 to 0.66 days have been calculated for representative C15 hydrocarbon components of lubricating base oils

Stability in Water: Chemicals that have a potential to hydrolyze include alkyl halides, amides, carbamates, carboxylic acid esters and lactones, epoxides, phosphate esters, and sulfonic acid esters. Because lubricating base oils do not contain significant levels of these functional groups, materials in the lubricating base oils category are not subject to hydrolysis

Chemical Transport and Distribution in the Environment : Based on the physical-chemical characteristics of component hydrocarbons in lubricating base oils, the lower molecular weight components are expected to have the highest vapour pressures and water solubilities, and the lowest partition coefficients. These factors enhance the potential for widespread distribution in the environment. To gain an understanding of the potential transport and distribution of lubricating base oil components, the EQC (Equilibrium Criterion) model was used to characterize the environmental distribution of different C15 compounds representing different structures found in lube oils (e.g., paraffins, naphthenes, and aromatics). The modelling found partitioning to soil or air is the ultimate fate of these C15 compounds. Aromatic compounds partition principally to soil. Linear paraffins partition mostly to soil, while branching appears to allow greater distribution to air. Naphthenes distribute to both soil and air, with increasing proportions in soil for components with the greater number of ring structures. Because the modelling does not take into account degradation factors, levels modelled in the atmosphere are likely overstated in light of the tendency for indirect photodegradation to occur.

Biodegradation: The extent of biodegradation measured for a particular lubricating oil basestock is dependent not only on the procedure used but also on how the sample is presented in the biodegradation test. Lubricant base oils typically are not readily biodegradable in standard 28-day tests. However, since the oils consist primarily of hydrocarbons that are ultimately assimilated by microorganisms, and therefore inherently biodegradable. Twenty-eight biodegradability studies have been reported for a variety of lubricating base oils. Based on the results of ultimate biodegradability tests using modified Sturm and manometric respirometry testing the base oils are expected to be, for the most part, inherently biodegradable. Biodegradation rates found using the modified Sturm procedure ranged from 1.5 to 29%. Results from the manometric respirometry tests on similar materials showed biodegradation rates from 31 to 50%. Biodegradation rates measured in 21-day CEC tests for similar materials ranged from 13 to 79%.

Ecotoxicity:

Numerous acute studies covering fish, invertebrates, and algae have been conducted to assess the ecotoxicity of various lubricating base oils. None of these studies have shown evidence of acute toxicity to aquatic organisms. Eight, 7-day exposure studies using rainbow trout failed to demonstrate toxicity when tested up to

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Section 12 - ECOLOGICAL INFORMATION

the maximum concentration of 1000 mg/L applied as dispersions. Three, 96-hour tests with rainbow trout also failed to show any toxic effects when tested up to 1000 mg/L applied as dispersions. Similarly, three 96-hour tests with fathead minnows at a maximum test concentration of 100 mg/L water accommodated fractions (WAF) showed no adverse effects. Two species of aquatic invertebrates (*Daphnia magna* and *Gammarus* sp.) were exposed to WAF solutions up to 10,000 mg/L for 48 and 96-hours, respectively, with no adverse effects being observed. Four-day exposures of the freshwater green alga (*Scenedesmus subspicatus*) to 500 mg/L WAF solutions failed to show adverse effects on growth rate and algal cell densities in four studies

Multiple chronic ecotoxicity studies have shown no adverse effects to daphnid survival or reproduction. In 10 of 11 chronic studies, daphnids were exposed for 21 days to WAF preparations of lubricating base oils with no ill effects on survival or reproduction at the maximum concentration of 1000 mg/L. One test detected a reduction in reproduction at 1000 mg/L. Additional data support findings of no chronic toxicity to aquatic invertebrates and fish. No observed effect levels ranged from 550 to 5,000 mg/L when tested as either dispersions or WAFs.

The data described above are supported by studies on a homologous series of alkanes. The author concluded that the water solubility of carbon chains .C10 is too limited to elicit acute toxicity. This also was shown for alkylbenzene compounds having carbon numbers .C15. Since base oils consist of carbon compounds of C15 to C50, component hydrocarbons that are of acute toxicological concern are, for the most part, absent in these materials. Similarly, due to their low solubility, the alkylated two to three ring polyaromatic components in base oils are not expected to cause acute or chronic toxicity. This lack of toxicity is borne out in the results of the reported studies.

The effects of crude and refined oils on organisms found in fresh and sea water ha been extensively reviewed. sea water. Where spillages occur the non-mobile species suffer the greatest mortality, whereas fish species can often escape from the affected region. The extent of the initial mortality depends on the chemical nature of the oil, the location, and the physical conditions, particularly the temperature and wind velocity. Most affected freshwater and marine communities recover from the effects of an oil spill within a year. The occurrence of biogenic hydrocarbons in the world's oceans is well recorded. They have the characteristic isoprenoid structure, and measurements made in water columns indicate a background concentration of 1.0 to 10 ul/l. The higher molecular weight materials are dispersed as particles, with the highest concentrations of about 20 ul/l occurring in the top 3 mm layer of water.

A wide variation in the response of organisms to oil exposures has been noted. The larvae of fish and crustaceans appear to be most susceptible to the water-soluble fraction of crude oil. Exposures of plankton and algae have indicated that certain species of diatoms and green algae are inhibited, whereas microflagellates are not.

For the most part, molluscs and most intertidal worm species appear to be tolerant of oil contamination.

WOOD DUST SOFTWOOD:

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
urea/ formaldehyde resin	LOW	No Data Available	LOW	HIGH
paraffin wax	No Data Available	No Data Available		
wood dust softwood	No Data Available	No Data Available		

Section 13 - DISPOSAL CONSIDERATIONS

- - 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.

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Section 14 - TRANSPORTATION INFORMATION

HAZCHEM:

None (ADG7)

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: ADG7, UN, IATA, IMDG

Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE None

REGULATIONS

Regulations for ingredients

urea/ formaldehyde resin (CAS: 9011-05-6,39327-95-2,56779-89-6,57608-68-1,57657-45-1,57762-61-5,60267-46-1,60831-80-3) is found on the following regulatory lists;

"Australia Inventory of Chemical Substances (AICS)", "GESAMP/EHS Composite List - GESAMP Hazard Profiles"

PARAFFIN WAX 58 FRJ (CAS: 8002-74-2,12704-91-5,105054-93-1,105845-08-7,115251-23-5,115251-24-6,12704-92-6,12795-75-4,160936-34-5,37220-23-8,37339-80-3,39355-22-1,39373-78-9,51331-35-2,54692-42-1,57572-43-7,57608-84-1,58057-11-7,64742-43-4,64742-51-4,68607-08-9,68649-50-3,70431-26-4,72993-88-5,72993-89-6,72993-90-9,8035-62-9,8044-02-8,8044-79-9,9083-41-4) is found on the following regulatory lists;

"Australia Exposure Standards", "Australia Hazardous Substances", "Australia High Volume Industrial Chemical List (HVICL)", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances"

No data for Laminex FSC Timber Veneer (CW: 6636-06)

No data for wood dust softwood (CAS: , Not avail)

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
urea/ formaldehyde resin	9011- 05- 6, 39327- 95- 2, 56779- 89- 6, 57608- 68- 1, 57657- 45- 1, 57762- 61- 5, 60267- 46- 1, 60831- 80- 3
paraffin wax	8002- 74- 2, 12704- 91- 5, 105054- 93- 1, 105845- 08- 7, 115251- 23- 5, 115251- 24- 6, 12704- 92- 6, 12795- 75- 4, 160936- 34- 5, 37220- 23- 8, 37339- 80- 3, 39355- 22- 1, 39373- 78- 9, 51331- 35- 2, 54692- 42- 1, 57572- 43- 7, 57608- 84- 1, 58057- 11- 7, 64742- 43- 4, 64742- 51- 4, 68607- 08- 9, 68649- 50- 3, 70431- 26- 4, 72993- 88- 5, 72993- 89- 6, 72993- 90- 9, 8035- 62- 9, 8044- 02- 8, 8044- 79- 9, 9083- 41- 4

■ 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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Section 16 - OTHER INFORMATION

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This is the end of the MSDS.