



FORMICA VINYL DOORS

Chemwatch Independent Material Safety Data Sheet
Issue Date: 28-Oct-2011
A317LP

CHEMWATCH 4758-41
Version No:2.0
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Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

FORMICA VINYL DOORS

PRODUCT USE

Used for the construction of furniture and cabinets for interior use.

SUPPLIER

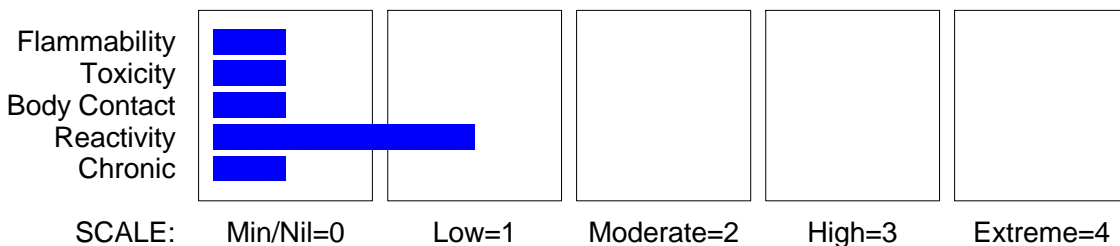
Company: The Laminex Group
Address:
90- 94 Tram Road
Doncaster
VIC, 3108
Australia
Telephone: +61 3 9848 4811
Emergency Tel:**1800 039 008**
Fax: +61 3 9840 6513
Website: www.thelaminexgroup.com.au

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

NON-HAZARDOUS SUBSTANCE. NON-DANGEROUS GOODS. According to NOHSC Criteria, and ADG Code.

CHEMWATCH HAZARD RATINGS



RISK

•None under normal operating conditions.

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.

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Section 2 - HAZARDS IDENTIFICATION

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	%
PVC veneer, containing polyvinyl chloride	9002-86-2	<10
adhered to reconstituted wood panel containing softwood particles		>60
bonded together with urea/ formaldehyde resin	9011-05-6	<10
melamine/ urea/ formaldehyde resin	25036-13-9	10-30
paper		<10
the encapsulated panel will contain traces of urea	57-13-6	
formaldehyde	50-00-0	
hexamethylene diisocyanate	822-06-0	
dust from sawing and forming operations will contain wood dust softwood	Not avail.	NotSpec
cured binder		NotSpec

Section 4 - FIRST AID MEASURES

SWALLOWED

- - 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.
 - Generally not applicable.

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, aerosols or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

NOTES TO PHYSICIAN

- Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- - Foam.
- Dry chemical powder.
- BCF (where regulations permit).

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Section 5 - FIRE FIGHTING MEASURES

- Carbon dioxide.
- Water spray or fog - Large fires only.

FIRE FIGHTING

- - Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use 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. Will burn if ignited.
- Combustion products include: carbon monoxide (CO), carbon dioxide (CO₂), and minor amounts of, hydrogen cyanide, other pyrolysis products typical of burning organic material.

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

MINOR 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.

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

- - Avoid generating and breathing dust
- Avoid contact with skin and eyes.
- Wear nominated personal protective equipment when handling.
- Use in a well-ventilated area.
- Use good occupational work practices.
- Observe manufacturer's storing and handling recommendations.

SUITABLE CONTAINER

- No restriction on the type of containers. Packing as recommended by manufacturer. Check all material is clearly labelled.

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Section 7 - HANDLING AND STORAGE

STORAGE INCOMPATIBILITY

- - Avoid reaction with oxidising agents.

STORAGE REQUIREMENTS

- Store away from incompatible materials.

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	formaldehyde (Formaldehyde (h))	1	1.2	2	2.5	Sen
Australia Exposure Standards	hexamethylene diisocyanate (Isocyanates, all (as- NCO))		0.02		0.07	Sen
Australia Exposure Standards	wood dust softwood (Wood dust (soft wood))		5		10	Sen

The following materials had no OELs on our records

- polyvinyl chloride: CAS:9002- 86- 2
- 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
- melamine/ urea/ formaldehyde resin: CAS:25036- 13- 9
- urea: CAS:57- 13- 6

EMERGENCY EXPOSURE LIMITS

Material	Revised	IDLH
formaldehyde	0	20

MATERIAL DATA

FORMALDEHYDE:

MELAMINE/ UREA/ FORMALDEHYDE RESIN:

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

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,

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Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

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).

FORMICA VINYL DOORS:

Not available

POLYVINYL CHLORIDE:

■ for vinyl chloride

NOTE: Detector tubes for vinyl chloride, measuring in excess of 1 ppm, are commercially available.

Acute inhalation causes central nervous system depression and death. Chronic inhalation produces cancers of the liver, kidney, skin, lungs and bones in animals. The recommended TLV-TWA should produce no detectable increase in the incidence of occupational cancers, specifically angiosarcoma of the liver. Nonetheless of practical significance is the potentiation of vinyl chloride induced hepatic angiosarcomas, hepatomas and lymphosarcomas by ethanol in laboratory animals and the identification of genetically susceptible individuals. Thus the degree of protection offered by the 5 ppm TLV among workers who consume alcohol or who have sensitive genotypes is unknown.

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

(i) demography, occupational and medical history and health advice

(ii) physical examination if indicated

(iii) records of personal exposure

Odour Safety Factor(OSF)

OSF=0.00033 (VINYL.CHLORIDE).

UREA:

■ For urea:

CEL TWA: 10 mg/m³ (compare WEEL-TWA)

Even if individuals inhaled 10 mg/m³ of urea through the whole workday, they would only inhale 100 mg/day.

This increment, even if totally absorbed, would be insignificant when compared to the 30 g/day normal excretion rate. The workplace environmental exposure limit (WEEL) established by the AIHA is protective against the effects of urea as a nuisance dust.

HEXAMETHYLENE DIISOCYANATE:

■ for hexamethylenediamine:

Saturated Vapour Concentration: 526 ppm (estimate) at 25 C.

Odour Threshold: 0.0032 mg/m³ (for the most sensitive individual) Hexamethylenediamine is moderately toxic following a single skin application, corrosive to the eye and skin and irritating to the upper respiratory tract. A 4-week inhalation study with rats established a no significant adverse effect level of 49 mg/m³. In a 7-week study the no-effect level was 12.8 mg/m³. Workers were reported to experience eye and upper respiratory tract irritation at concentrations of 7 ppm.

The TLV-TWA is thought to be protective against such effects.

for 1,6-hexamethylene diisocyanate (HDI):

The toxicological action of HDI is similar to that of toluene diisocyanate and the TLV-TWA is analogous. In light of reported asthmatic/ respiratory sensitisation-like responses in HDI exposed workers, individuals who may be hypersusceptible or otherwise unusually responsive may not be adequately protected at this limit.

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

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apply.

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

- - 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], [AS/NZS 1336 or national equivalent].

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.

OTHER

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

Avoid breathing dust when sawing or grinding.

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.

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When cutting wear approved dust respirator to avoid inhalation of wood dust created during the cutting process.

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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.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

PVC coated wood-based panel. Newly manufactured board or freshly cut surfaces may have a pine/wood odour

PHYSICAL PROPERTIES

Solid.

Does not mix with water.

State	Solid	Molecular Weight	Not Available
Melting Range (°C)	Not Available	Viscosity	Not Available
Boiling Range (°C)	Not Available	Solubility in water (g/L)	Immiscible
Flash Point (°C)	Not Available	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 Available	Specific Gravity (water=1)	Not Available
Lower Explosive Limit (%)	Not Available	Relative Vapour Density (air=1)	Not Available
Volatile Component (%vol)	Not Available	Evaporation Rate	Not Applicable

urea

log Kow (Prager 1995):

- 1.09

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

log Kow (Sangster 1997): formaldehyde	- 2.11
log Kow (Prager 1995):	0.35
log Kow (Sangster 1997):	0.35

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

- The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (eg. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

EYE

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

SKIN

- Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions.

INHALED

- The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
- Hazard relates to dust released by sawing, cutting, sanding, trimming or other finishing operations. New boards or freshly cut surfaces may have a pine/wood/solvent odour which will dissipate with ventilation. When cutting, wood dust will be created which is classified as a Hazardous Substance according to the criteria of NOHSC.
Atmosphere should be checked and if necessary suitable arrangements made to reduce the level of vapours in the breathing zone for persons working in the area.

CHRONIC HEALTH EFFECTS

- This manufactured article is considered to have low hazard potential if handling and personal protection recommendations are followed.
The sealer for the the final topcoat contains toluene diisocyanate, which is s skin sensitiser, but this is expected to be fully reacted. When cutting new sheets there is a miniscule possibility that free isocyanate may be available - care should be taken and correct safety procedures followed to minimise exposure.

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Section 11 - TOXICOLOGICAL INFORMATION

TOXICITY AND IRRITATION

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

MELAMINE/ UREA/ FORMALDEHYDE RESIN:

FORMALDEHYDE:

HEXAMETHYLENE DIISOCYANATE:

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.

WOOD DUST SOFTWOOD:

HEXAMETHYLENE DIISOCYANATE:

■ 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.

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

■ 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.

WOOD DUST SOFTWOOD:

POLYVINYL CHLORIDE:

■ No significant acute toxicological data identified in literature search.

WOOD DUST SOFTWOOD:

FORMALDEHYDE:

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

UREA:

FORMALDEHYDE:

HEXAMETHYLENE DIISOCYANATE:

POLYVINYL CHLORIDE:

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

UREA:

UREA/ FORMALDEHYDE RESIN:

■ 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.

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FORMICA VINYL DOORS:

- Not available. Refer to individual constituents.

POLYVINYL CHLORIDE:

- The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

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

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

MELAMINE/ UREA/ FORMALDEHYDE RESIN:

TOXICITY

Oral (rat) LD50: >5000 mg/kg

IRRITATION

Nil Reported [Manufacturer]

UREA:

TOXICITY

Oral (rat) LD50: 8471 mg/kg

Intraperitoneal (rat) LD50: >5000 mg/kg

Subcutaneous (rat) LD50: 8200 mg/kg

Intratracheal (rat) LD50: 567 mg/kg

Oral (mouse) LD50: 11000 mg/kg

Subcutaneous (mouse) LD50: 9200 mg/kg

Intravenous (mouse) LD50: 4600 mg/kg

Intraperitoneal (Mouse) LD: 6608 mg/kg

Intravenous (Rat) LD50: 5300 mg/kg

Intravenous (Rabbit) LD: 4800 mg/kg

Subcutaneous (Pig) LD: 14800 mg/kg

- 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.

For urea:

There is little data that relates urea to human health other than its use in dermatology and some more limited applications in clinical medicine. The use of urea (at 10% concentration or less) in ointments and creams to treat dry skin has been widespread, and long term follow-up studies have indicated that the substance is nonallergenic and virtually free from side effects. Among other clinical therapeutic uses, the treatment of inappropriate secretion of antidiuretic hormone (SIADH) should be noted, because its chronic form has involved long term oral administration of large amounts of urea. Most patients have tolerated urea well, although diarrhoea is sometimes reported after ingestion of 60-90 g/day. The possibility exists that infection of *H. pylori* in human stomach may aggravate local effects by urea because of ammonia generation. Acute toxicity: The acute toxicity by urea is well delineated by the oral route. Toxicity is low in mammals other than ruminants, especially cattle, and sheep, in which the rumen micro-organisms contain urease activity and metabolise urea to ammonia at a high rate. In mice and rats, urea is of low toxicity even by the subcutaneous and intravenous route.

Repeated dose toxicity: No well-conducted repeated dose toxicity studies on urea were located. Chronic toxicity and carcinogenicity screening studies in mice and rats fed with 4500, 9000 or 45000 ppm in diet (up to about 6750 mg/kg body weight/day for mice and about 2250 mg/kg body weight/day for rats) did not uncover any treatment-related toxic syndromes in the various organs studied. Neither was any weight depression noted at terminal necropsy for animals of either sex or species at any dose levels. Thus the NOAELs were about 6750 mg/kg body weight/day for mice and about 2250 mg/kg body weight/day for rats.

Repeated dose toxicity studies with rats by skin application over 4 weeks and 25 weeks were conducted using urea ointment at 10%, 20% and 40% concentrations, and no consistent treatment-related toxic effects were found. The ointments were applied on a 20 cm² area of the back skin; it is concluded that the repeated dose

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toxicity of urea by dermal route is low.

Reproductive/developmental toxicity: The studies cited under repeated dose toxicity did not indicate any toxic effects on the reproductive organs of mice and rats. No adequate teratogenicity/developmental toxicity studies of urea with mammals were located. According to one rat study, 50 g/kg body weight/day administered by gavage in two doses 12 hours apart for an average of 14 days did not cause outstanding (external) teratogenicity; the mean birthweight of the newborn was lower but the litter size greater. Injection of urea into the air sack of eggs shows that urea is toxic to the development of chick embryo.

No NOAEL can be given for the reproductive/developmental toxicity of urea because appropriate studies are lacking.

Genetic toxicity: Urea has been negative in several appropriately conducted bacterial mutagenicity tests. Urea caused DNA single strand breaks in mammalian cells in vitro and was clastogenic for mammalian cells in vitro and in vivo but only at concentrations much beyond the physiological range (about 50-100 higher concentrations than found in human blood). The mechanism of genotoxicity is probably non-specific (e.g. difference in osmotic pressure across the cell membrane).

Altered sleep time, change in motor activity, antipsychosis, dyspnea, methaemoglobinaemia, convulsions, lymphomas recorded.

Carcinogenic by RTECS criteria.

FORMALDEHYDE:

TOXICITY

Oral (woman) LDLo: 108 mg/kg

Oral (man) TDLo: 643 mg/kg

Oral (rat) LD50: 100 mg/kg

Inhalation (man) TCLo: 0.3 mg/m³

Inhalation (rat) LC50: 203 mg/m³

Dermal (rabbit) LD50: 270 mg/kg

■ The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause severe 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. Repeated exposures may produce severe ulceration.

Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen [National Toxicology Program: U.S. Dep. of Health & Human Services 2002].

IRRITATION

Skin (human): 0.15 mg/3d- I Mild

Skin (rabbit): 2 mg/24H SEVERE

Eye (human): 4 ppm/5m

Eye (rabbit): 0.75 mg/24H SEVERE

HEXAMETHYLENE DIISOCYANATE:

TOXICITY

Oral (rat) LD50: 738 mg/kg

Inhalation (rat) LC50: 60 mg/m³/4h

Oral (mouse) LD50: 350 mg/kg

Inhalation (mouse) LC50: 30 mg/m³

Intravenous (mouse) LD50: 5.6 mg/kg

Dermal (rabbit) LD50: 593 mg/kg

■ For 1,6-hexamethylene diisocyanate (HDI):

Exposures to HDI are often associated with exposures to its prepolymers, one of which is widely used as a hardener in automobile and airplane paints. Both the prepolymers and the native substance may cause asthma. HDI is corrosive to the skin and eye, and will sensitise the skin and airway. Most of the toxicity is in the upper airway (nose), although animal testing did not show that HDI caused cancer. In animal tests, HDI did not cause mutations, genetic damage, reduce fertility, or cause developmental toxicity.

Isocyanate vapours are irritating to the airways and can cause their inflammation, with wheezing, gasping, severe distress, even loss of consciousness and fluid in the lungs. Nervous system symptoms that may occur include headache, sleep disturbance, euphoria, inco-ordination, anxiety, depression and paranoia. Digestive effects include nausea and vomiting. Breathing difficulties may occur unpredictably after a period of tolerance and after skin contact. Allergic inflammation of the skin can occur, with rash, itching, blistering, and swelling of the hands and feet. Sensitive people can react to very low levels and should not be exposed to this material.

IRRITATION

Nil Reported

WOOD DUST SOFTWOOD:

WARNING: Inhalation of wood dust by workers in the furniture and cabinet making industry has been related to nasal cancer [I.L.O. Encyclopedia] Use control measures to limit all exposures.

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Section 11 - TOXICOLOGICAL INFORMATION

CARCINOGEN

Polyvinyl chloride	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	3
Formaldehyde	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	1

Section 12 - ECOLOGICAL INFORMATION

UREA/ FORMALDEHYDE RESIN:
MELAMINE/ UREA/ FORMALDEHYDE RESIN:
UREA:
FORMALDEHYDE:
HEXAMETHYLENE DIISOCYANATE:
WOOD DUST SOFTWOOD:
POLYVINYL CHLORIDE:

■ DO NOT discharge into sewer or waterways.

MELAMINE/ UREA/ FORMALDEHYDE RESIN:
FORMALDEHYDE:
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.

MELAMINE/ UREA/ FORMALDEHYDE RESIN:
UREA/ FORMALDEHYDE RESIN:

■ 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.

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Section 12 - ECOLOGICAL INFORMATION

POLYVINYL CHLORIDE:

UREA/ FORMALDEHYDE RESIN:

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.

MELAMINE/ UREA/ FORMALDEHYDE RESIN:

UREA:

■ For Urea: log Kow: -2.97 to -2.26; Henry's Law Constant: 4.4E-8 atm m³/mol. Urea is essentially non-volatile in solid form.

Atmospheric Fate: Urea will not evaporate from water to the atmosphere and is expected to be readily degraded by reactions with photochemically produced hydroxyl radicals; half-life is expected to be less than 1 day.

Degradation of urea to ammonia causes NH₃-emissions to the air.

Terrestrial Fate: The highest environmental exposure for urea is via fertilizer when 85 - 90% of urea is incorporated into the soil. Urea will hydrolyze into ammonium in a matter of days to several weeks. Urea is relatively leachable from the soil into surface water and groundwater especially if the soil surface is saturated with water.

Aquatic Fate: Urea is very soluble in water and may rapidly biodegrade to a moderate extent. Urea is not expected to evaporate significantly. Urea can be leached relatively easily into the surface water and the groundwater. Degradation products (e.g. nitrate, nitrite and ammonium) can be measured after urea has undergone biodegradation.

Ecotoxicity: Urea is not likely to undergo bioaccumulation and generally has low acute ecotoxicity to organisms. The degradation product of urea, ammonia, is known to be toxic to all vertebrates; however, in neutral and acidic conditions, ammonia exists in the form of the ammonium ion. Urea may directly influence eutrophication in the environment and there is a pollution risk to groundwater when urea is used as a fertilizer, and a deicing agent at airports. Ecosystems may be affected following long-term use of urea in the control of soil acidification and by ammonia emissions to air.

FORMALDEHYDE:

■ Harmful to aquatic organisms.

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

The material is classified as an ecotoxin* because the Fish LC₅₀ (96 hours) is less than or equal to 0.1 mg/l

* Classification of Substances as Ecotoxic (Dangerous to the Environment)

Appendix 8, Table 1

Compiler's Guide for the Preparation of International Chemical Safety Cards: 1993 Commission of the European Communities.

log Kow: 0-0.35

Half-life (hr) air: 19-50

Henry's atm m³/mol: 3.27E-07

BOD 5 if unstated: 0-1.1,60%

COD: 1.06,100%

ThOD: 1.068

HEXAMETHYLENE DIISOCYANATE:

■ Hydrolysis would represent the primary fate mechanism for the majority of the commercial isocyanate monomers, but, is tempered somewhat by the lack of water solubility. In the absence of hydrolysis, sorption to solids (e.g., sludge and sediments) will be the primary mechanism of removal. Biodegradation is minimal for most compounds and volatilisation is negligible. Atmospheric degradation is not expected with removal from air occurring by washout or dry deposition. Volatilisation from surface waters (e.g., lakes and rivers) is expected to take years. In wastewater treatment this process is not expected to be significant.

Review of the estimated properties of the isocyanates suggest that sorption is the primary removal mechanism in the ambient environment and in wastewater treatment in the absence of significant hydrolysis. Sorption to solids in wastewater treatment is considered strong to very strong for most compounds. Sorption to sediments and soils in the ambient environment is very strong in most instances. Migration to groundwater and surface waters is not expected due to sorption or hydrolysis.

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Hydrolysis of the $N=C=O$ will occur in less than hours in most instances and within minutes for more than 90% of the commercial isocyanates. However, the low to very low solubility of these substances will generally lessen the effectiveness of hydrolysis as a fate pathway. But hydrolysis should be considered one of the two major fate processes for the isocyanates.

Aerobic and/or anaerobic biodegradation of the isocyanates is not expected to occur at significant levels.

Most of the substances take several months to degrade.

Degradation of the hydrolysis products will occur at varying rates depending on the moiety formed.

for 1,6-hexamethylene diisocyanate (HDI):

The substance forms oily droplets in water and hydrolyses rapidly. The vapour pressure of HDI is 0.7 Pa/20 C.

A log Kow is not determinable due to the instability in water.

Based on its vapor pressure, HDI will exist entirely in the vapor phase in the atmosphere. Although the atmospheric hydrolysis of HDI with condensed water has not been investigated, wet deposition is probably not an important atmospheric removal process for HDI because of its reactivity with water. Because HDI exists as a vapor in the atmosphere, its removal from air by dry deposition is also likely to be negligible.

In air HDI is indirectly photodegradable with $t_{1/2} = 48.4$ h.

The aliphatic isocyanates do not absorb light in the near ultraviolet region therefore, direct photolysis

is not a probable atmospheric degradation mechanism for HDI. Under simulated atmospheric conditions, the reactions of the diamine hydrolysis products of TDI and MDI with photochemically generated hydroxyl radicals have been found to proceed more rapidly than those of the parent compounds, suggesting that there would be no atmospheric accumulation of these diamines even if they were significant hydrolysis products.

Although HDI is essentially insoluble in water, in the presence of excess water it can undergo competing two-phase reactions to form: (1) a complete hydrolysis product, hexamethylene diisocyanate (HDA); (2) di-, tri-, or tetra-ureaisocyanates; and/or (3) higher molecular weight polyureas. The complex hydrolysis reactions of isocyanates usually involve a mechanism in which an unstable carbamic acid intermediate is initially formed, with subsequent decomposition to the amine and release of carbon dioxide; further reaction of the amine with isocyanate may occur to yield polyurea compounds.

Hydrolysis of HDI was 90 % after a reaction period of 30 min in water at 20 C. Hydrolysis products are principally HDA and polyurea. Biodegradation tests on hexamethylene diamine (HAD) show the substance to be inherently biodegradable. Polyureas are more or less inert and, because of their molecular size, not bioavailable. The favourite compartment for HDA is water as suggested by the high water solubility. Mackay level I distribution for HDA is not applicable as this substance is protonated under environmental pH conditions. Due to the high solubility in water of HDA (800 g/l at 15.6 C) and its log Kow of 0.02 no bioaccumulation is expected.

Because of the rapid hydrolysis of HDI in water and the ease with which this substance is metabolised in higher trophic animals, it is not expected that HDI will bioconcentrate in aquatic organisms or bioaccumulate in the food chain.

Because of the rapid hydrolysis of HDI in water and moist soil or sediment, neither volatilisation from these media nor leaching from soil or sediment should be important partitioning processes. HDI would also not be expected to partition onto suspended solids and sediment in water. Henry's law constant(H) for HDI has been estimated to be 4.80×10^{-5} atm-m³/mol, which indicates a relatively slow rate of volatilisation from water

Ecotoxicity:
As the inherent property of HDI is to hydrolyse rapidly in an aquatic environment the ecotoxicological tests were conducted with the hydrolysis product(s) under defined conditions.

Fish LC0 (96 h): Brachydanio rerio ≥ 82.8 mg/l

Daphnia magna EC0 (48 h): ≥ 89.1 mg/l

Algal EC50 (72 h): Scenedesmus subspicatus > 77.4 mg/l; NOEC 11.7 mg/l

I.

WOOD DUST SOFTWOOD:

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
polyvinyl chloride	LOW	No Data Available	LOW	HIGH
urea/ formaldehyde resin	LOW	No Data Available	LOW	HIGH

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Section 12 - ECOLOGICAL INFORMATION

melamine/ urea/ formaldehyde resin	No Data Available	No Data Available		
urea	LOW	No Data Available	LOW	HIGH
formaldehyde	LOW	LOW	LOW	HIGH
hexamethylene diisocyanate	LOW	No Data Available	LOW	MED
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 Authority for disposal.
- Bury or incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

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

Vicir S700 (CAS: 9002-86-2) is found on the following regulatory lists;

"Australia Inventory of Chemical Substances (AICS)", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs"

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"

melamine/ urea/ formaldehyde resin (CAS: 25036-13-9) is found on the following regulatory lists;

"Australia Inventory of Chemical Substances (AICS)"

urea (CAS: 57-13-6) is found on the following regulatory lists;

"Australia High Volume Industrial Chemical List (HVICL)", "Australia Inventory of Chemical Substances (AICS)", "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", "International Fragrance Association (IFRA) Survey: Transparency List"

formaldehyde (CAS: 50-00-0,8005-38-7,8006-07-3,8013-13-6,112068-71-0) is found on the following regulatory lists;

"Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (Domestic water supply - disinfection by-products)", "Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (Domestic water supply quality)", "Australia - Queensland Hazardous Materials and Prescribed Quantities for Major Hazard Facilities", "Australia Dangerous Goods Code (ADG Code) - Goods Too Dangerous To Be Transported", "Australia Exposure Standards", "Australia Exposure Standards Currently Under Review", "Australia Hazardous Substances", "Australia High Volume Industrial Chemical List (HVICL)", "Australia Illicit Drug Precursors/Reagents - Category II", "Australia Inventory of Chemical Substances (AICS)", "Australia National Pollutant Inventory", "Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) -

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Section 15 - REGULATORY INFORMATION

Appendix C", "Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix F (Part 3)", "Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 2", "Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs", "International Chemical Secretariat (ChemSec) SIN List (*Substitute It Now!)", "International Council of Chemical Associations (ICCA) - High Production Volume List", "WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have not been established"

hexamethylene diisocyanate (CAS: 822-06-0) is found on the following regulatory lists;

"Australia Hazardous Substances", "Australia Inventory of Chemical Substances (AICS)", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "International Council of Chemical Associations (ICCA) - High Production Volume List"

No data for Formica Vinyl Doors (CW: 4758-41)

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
formaldehyde	50- 00- 0, 8005- 38- 7, 8006- 07- 3, 8013- 13- 6, 112068- 71- 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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Issue Date: 28-Oct-2011

Print Date: 22-Nov-2011

This is the end of the MSDS.