

MDF Bonder Adhesive

Chemwatch Material Safety Data Sheet
Issue Date: 14-Jul-2013
A317LP

Hazard Alert Code: MODERATE

CHEMWATCH 21-9640
Version No:3.1.1.1
Page 1 of 19

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

MDF Bonder Adhesive

SYNONYMS

Cyanoacrylate

PRODUCT USE

Used according to manufacturer's directions.
Instant glue for mitred joints.

SUPPLIER

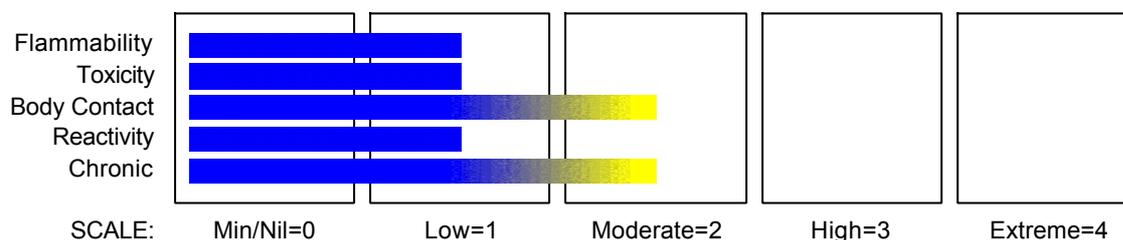
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Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE

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

CHEMWATCH HAZARD RATINGS



RISK

SAFETY

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 2 of 19

Section 2 - HAZARDS IDENTIFICATION

- Irritating to eyes, respiratory system and skin.
 - May cause SENSITISATION by inhalation and skin contact.
 - Harmful to aquatic organisms, may cause long- term adverse effects in the aquatic environment.
 - Inhalation may produce health damage*.
 - Cumulative effects may result following exposure*.
 - Limited evidence of a carcinogenic effect*.
* (limited evidence).
- Do not breathe gas/fumes/vapour/spray.
 - Avoid contact with skin.
 - Avoid contact with eyes.
 - Wear suitable protective clothing.
 - Wear suitable gloves.
 - Wear eye/face protection.
 - Use only in well ventilated areas.
 - Keep container in a well ventilated place.
 - To clean the floor and all objects contaminated by this material, use water and detergent.
 - Keep container tightly closed.
 - Keep away from food, drink and animal feeding stuffs.
 - In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre.
 - If swallowed, IMMEDIATELY contact Doctor or Poisons Information Centre. (show this container or label).
 - In case of accident by inhalation: remove casualty to fresh air and keep at rest.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
ethyl cyanoacrylate	7085-85-0	85-90
methyl methacrylate homopolymer	9011-14-7	10-15
hydroquinone	123-31-9	0.1-0.5

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.
- For material bonded in the mouth seek medical/dental attention.
- If lips are accidentally stuck together apply lots of warm water and encourage maximum wetting and pressure from saliva inside the mouth.
- Peel or roll lips apart.
- Do NOT attempt to pull the lips with direct opposing action.
- It is almost impossible to swallow cyanoacrylates. The adhesive solidifies and adheres in the mouth. Saliva will lip the adhesion in one or two days.

EYE

- Eyelid Adhesion

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 3 of 19

Section 4 - FIRST AID MEASURES

-
- Wash thoroughly with water and apply moist pad; maintain in position.
 - DO NOT force separation.
 - Transport to hospital, or doctor without delay.
 - Minor eye contamination should be treated by copious washing with water or 1% sodium carbonate solution.
 - The eye will generally open without further action, typically in one to two days. there should be no residual damage.
 - Adhesive introduced
 - Removal of contact lenses after eye injury should only be undertaken by skilled personnel.

Adhesive in the Eye:

- Adhesive will attach itself to eye proteins and will disassociate from these over intermittent periods, usually within several hours.
- This will result in weeping until clearance of the protein complex.
- It is important to understand that disassociation will normally occur within a matter of hours even with gross contamination.

SKIN

■ Cyanoacrylate adhesives is a very fast setting and strong. they bond human tissues including skin in seconds. Experience shows that accidents involving cyanoacrylates are best handled by passive, non-surgical first aid.

Skin Contact:

- Remove excessive adhesive.
- Soak in warm water - the adhesive should loosen from the skin in several hours. Dried adhesive does not present a health hazard.
- Contact with clothes, fabric, rags or tissues may generate heat, and strong irritating odours; skin burns may also ensue.

Skin Adhesion:

- IMMEDIATELY immerse affected areas in warm soapy water.
- DO NOT force bonded surfaces apart.
- Use a gentle rolling action to peel surfaces apart if possible. It may be necessary to use a blunt edge such as a spatula or spoon handle. Do NOT attempt to pull the surfaces apart with a direct opposing action.
- Remove any cured material with warm, soapy water.
- Seek medical attention without delay.
- A solvent such as acetone may be used (with care!) to separate bonded skin surfaces. NEVER use solvent near eyes, mouth, cuts, or abrasions.

INHALED

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

It should never be necessary to use surgical means to separate tissues which become accidentally bonded. The action of physiological fluids or warm soapy water will cause this adhesive to eventually fail.

Treat symptomatically.

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 4 of 19

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- Water spray or fog.
- Alcohol stable foam.
- Dry chemical powder.
- Carbon dioxide.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- 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.

FIRE/EXPLOSION HAZARD

- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
- May emit acrid smoke.
- Mists containing combustible materials may be explosive.

Combustion products include: carbon dioxide (CO₂), aldehydes, nitrogen oxides (NO_x), other pyrolysis products typical of burning organic material.

May emit poisonous fumes.

May emit corrosive fumes.

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

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

MAJOR SPILLS

Moderate hazard.

- Clear area of personnel and move upwind.

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 5 of 19

Section 6 - ACCIDENTAL RELEASE MEASURES

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- If contamination of drains or waterways occurs, advise emergency services.

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

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- DO NOT allow clothing wet with material to stay in contact with skin.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storage and handling recommendations contained within this MSDS.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

SUITABLE CONTAINER

- Metal can or drum
- Packaging as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

STORAGE INCOMPATIBILITY

For cyanoacrylates:

- Avoid contact with acids, bases, amines.
- Avoid contact with clothes, fabric, rags (especially cotton and wool) rubber or paper; contact may cause polymerisation.
- Cyanoacrylate adhesives undergo anionic polymerization in the presence of a weak base, such as water, and are stabilized through the addition of a weak acid. The stabiliser is usually in the form of a weak acidic gas such as SO₂, NO, or BF₃. An essential function of the stabiliser is to prevent polymerisation in the container, which is usually made of polyethylene. If too little stabiliser is added, the product will be prone to premature polymerization and if too much is added it will be less active and function less

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 6 of 19

Section 7 - HANDLING AND STORAGE

effectively as an adhesive.

- When the adhesive contacts a slightly alkaline surface, trace amounts of adsorbed water or hydroxide ions (OH-) that are present on the substrate's surface neutralise the acidic stabilizer in the adhesive, resulting in rapid polymerisation.
- Unmodified cyanoacrylate adhesives do not polymerise readily on acidic surfaces such as wood or dichromated metals.
- Cyanoacrylate adhesives (or super-glues) do not wet or adhere well to polyolefins. The surface tension of the adhesive is much higher than that of the substrate. However, polyolefins can be primed for adhesion with cyanoacrylates by certain chemical compounds normally considered to be activators for cyanoacrylate polymerisation.
- Free radical stabilisers such as hydroquinone are added to improve storage stability.
- Segregate from alcohol, water.
- Avoid reaction with oxidising agents.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storage and handling recommendations contained within this MSDS.

SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+: *May be stored together*

O: *May be stored together with specific preventions*

X: *Must not be stored together*

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

- ethyl cyanoacrylate: CAS:7085- 85- 0
- methyl methacrylate homopolymer: CAS:9011- 14- 7 CAS:39379- 18- 5

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
hydroquinone 2662	50	

MATERIAL DATA

HYDROQUINONE:

MDF BONDER ADHESIVE:

The recommended TLV-TWA for hydroquinone takes into account the toxicology of hydroquinone and experience of industrial exposures to benzenediols. Exposure at or below the limit is thought to minimise the risk to

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet
Issue Date: 14-Jul-2013
A317LP

CHEMWATCH 21-9640
Version No:3.1.1.1
Page 7 of 19

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

workers of eye injury, dermatitis and central nervous system effects. A short-term duration exposure value has not been recommended, because no quantitative data as to the levels of hydroquinone which produce eye irritation or more serious corneal changes has been identified.

ETHYL CYANOACRYLATE:

METHYL METHACRYLATE HOMOPOLYMER:

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.

ETHYL CYANOACRYLATE:

Odour Threshold: 1-3 ppm

METHYL METHACRYLATE HOMOPOLYMER:

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.

PERSONAL PROTECTION



continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 8 of 19

Section 8 - EXPOSURE CONTROLS / 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 lenses 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, e.g. PVC.
- Wear safety footwear or safety gumboots, e.g. 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.
- The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and

has to be observed when making a final choice.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:

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

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly.

Application of a non-perfumed moisturiser is recommended.

- Polyethylene gloves.

OTHER

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

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 9 of 19

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

RESPIRATOR

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

■ Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content. The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.

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

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

Provide adequate ventilation in warehouse or closed storage area.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Clear liquid with a sharp irritating odour; not miscible with water.

PHYSICAL PROPERTIES

Liquid.

Does not mix with water.

Sinks in water.

State	Liquid	Molecular Weight	Not Applicable
Melting Range (°C)	Not Available	Viscosity	Not Available
Boiling Range (°C)	>100	Solubility in water (g/L)	Immiscible
Flash Point (°C)	>81	pH (1% solution)	Not Available
Decomposition Temp (°C)	Not Available	pH (as supplied)	Not Available
Autoignition Temp (°C)	Not Applicable	Vapour Pressure (kPa)	Negligible
Upper Explosive Limit (%)	Not Applicable	Specific Gravity (water=1)	1.1
Lower Explosive Limit (%)	Not Applicable	Relative Vapour Density (air=1)	Not Available
Volatile Component (%vol)	Not Available	Evaporation Rate	Not Available

continued...

MDF Bonder Adhesive

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

Hazard Alert Code: MODERATE

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 10 of 19

Section 10 - STABILITY AND REACTIVITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Although ingestion is not thought to produce harmful effects (as classified under EC Directives), the material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. 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. Uncured cyanoacrylates are difficult to swallow as saliva cures the surface of the adhesive with negligible bonding. The cured material is considered to be non-hazardous.

EYE

■ This material can cause eye irritation and damage in some persons. Exposure to cyanoacrylate vapours can cause discomfort and tears, nasal discharge, and blurred vision. The eyelids may be glued shut. Double vision and corneal scratching may occur.

SKIN

■ This material can cause inflammation of the skin on contact in some persons. The material may accentuate any pre-existing dermatitis condition. Small n-alkyl cyanoacrylates cause burns and irritation on skin contact. Exposure to their vapours can cause irritation, but usually only in dry conditions. Open cuts, abraded or irritated skin should not be exposed to this material. Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. In low humidity, cyanoacrylate vapours are irritating to the respiratory system and eyes. High concentrations may cause inflammation of the lungs and other complications. They are much less dangerous in high humidity.

CHRONIC HEALTH EFFECTS

■ Long-term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population. Skin contact with the material is more likely to cause a sensitisation reaction in some persons compared to

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 11 of 19

Section 11 - TOXICOLOGICAL INFORMATION

the general population.

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

Dermatitis may result from prolonged exposures. On repeated and prolonged exposure by skin contact or inhalation, a small proportion of individuals develop allergic sensitivities.

There is some evidence that inhaling this product is more likely to cause a sensitisation reaction in some persons compared to the general population.

Chronic exposure to cyanides and certain nitriles may result in interference to iodine uptake by thyroid gland and its consequent enlargement. This occurs following metabolic conversion of the cyanide moiety to thiocyanate. Thyroid insufficiency may also occur as a result of metabolic conversion of cyanides to the corresponding thiocyanate. Exposure to small amounts of cyanide compounds over long periods are reported to cause loss of appetite, headache, weakness, nausea, dizziness, abdominal pain, changes in taste and smell, muscle cramps, weight loss, flushing of the face, persistent runny nose and irritation of the upper respiratory tract and eyes. These symptoms are not specific to cyanide exposure and therefore the existence of a chronic cyanide toxicity remains speculative. Repeated minor contact with cyanides produce a characteristic rash with itching, papules (small, superficial raised spots on the skin) and possible sensitisation. Concerns have been expressed that low-level, long term exposures may result in damage to the nerves of the eye.

TOXICITY AND IRRITATION

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

HYDROQUINONE:

MDF BONDER ADHESIVE:

■ The following information refers to contact allergens as a group and may not be specific to this product. 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.

HYDROQUINONE:

METHYL METHACRYLATE HOMOPOLYMER:

■ 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.

ETHYL CYANOACRYLATE:

MDF BONDER ADHESIVE:

■ For methyl cyanoacrylate (MCA) and ethyl cyanoacrylate (ECA)
Studies show that the key toxicological features of MCA and ECA are as a result of local activity at the site of contact. Liquid MCA and ECA may cause eye and skin irritation on repeated exposure but inconclusive evidence of skin sensitization and asthma causing effect. ECA and MCA does not cause genetic toxicity but presents similar health effect predicted to be due to its similar dose-response relationship, close structural similarities, similar physicochemical properties and toxicological profiles.
■ 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

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 12 of 19

Section 11 - TOXICOLOGICAL INFORMATION

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.

MDF BONDER ADHESIVE:

TOXICITY

Oral (Rat) LD50:>5000 mg/kg

Dermal (None) LD50:>2000 mg/kg

■ 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.

IRRITATION

ETHYL CYANOACRYLATE:

TOXICITY

Oral (rat) LD50:>5000 mg/kg

Oral (rat) LD50:0.18 ml/kg * [Manufacturer]

Dermal (rabbit) LD50:>2000 mg/kg

Dermal (Rabbit) LD50:0.22 ml/kg *

* [AIHAAP]

IRRITATION

Nil Reported

METHYL METHACRYLATE HOMOPOLYMER:

■ No significant acute toxicological data identified in literature search.

HYDROQUINONE:

TOXICITY

Oral (human) LDLo:29 mg/kg

Oral (human) TDLo:170 mg/kg

Oral (rat) LD50:320 mg/kg

■ 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.

Hydroquinone is rapidly and extensively absorbed from the gut and lungs of animals. Absorption via the skin is slow but may be accelerated with vehicles such as alcohols. Hydroquinone distributes rapidly and widely among tissues. It is metabolized to 1,4-benzoquinone and other oxidised products, and is detoxified by conjugation to monoglucuronide, monosulfate, and mercapturic derivatives. The excretion of hydroquinone and its metabolites is rapid, and occurs primarily via the urine.

Hydroquinone exhibits moderate acute oral toxicity for animals. Limited data suggest that powdered hydroquinone causes transient eye irritation and corneal opacity in dogs and guinea-pigs; in rabbits powdered hydroquinone induced slight irritation of the eye. Hydroquinone may be a skin sensitiser in animals. The ability to induce sensitization has been found to vary from "weak" to "strong" depending on the test procedure and vehicle used.

Repeated oral dosing caused tremors and reduced activity (≥64 mg/kg), reduced body weight gain (≥200 mg/kg), convulsions (≥400 mg/kg), and nephropathy in F-344 rats (≥100 mg/kg). No adverse effects on the kidneys were reported in Sprague-Dawley rats treated for the same length of time with the same dose levels. Effects

IRRITATION

Skin (human):2% - Mild

Skin (human):5% - SEVERE

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 13 of 19

Section 11 - TOXICOLOGICAL INFORMATION

in mice include tremors and convulsions (400 mg/kg), increased liver weight (≥ 25 mg/kg), and irritation of the forestomach (≥ 200 mg/kg). A functional observational battery and neuropathological examinations of rats failed to give any evidence of persistent or structural neurotoxicity after repeated dosing for 90 days. A NOEL for all effects was 20 mg/kg per day.

Fourteen days of repeated dermal dosing caused reduced body weights of male rats at the 3840 mg/kg dose level (6% relative to the controls), but the body weights of female rats at this dose level and of mice at 4800 mg/kg were comparable to controls. There were no clinical signs of toxicity in either species. Prolonged dermal dosing over 13 weeks with 2.0, 3.5, or 5.0% hydroquinone in an oil-in-water emulsion cream resulted in minimal to minor dermal irritation, but no overt toxicity. No adverse effects or compound-related effects occurred in organ weight, clinical pathology, or histopathology. A NOEL was not determined because of the dermal irritation in all treated groups, but the NOAEL was the highest dose level of 5% hydroquinone (74 mg/kg in males and 110 mg/kg in females) based on the lack of systemic effects.

Reproductive effects: A two-generation reproduction study was conducted in rats. The NOAEL for reproductive effects through two generations was 150 mg/kg per day (the highest dose tested).

Genetic toxicity: Numerous genotoxicity studies of hydroquinone have been conducted. Hydroquinone is not mutagenic in the Salmonella/microsome test. Other data indicate that hydroquinone induces structural chromosome aberrations and c-mitotic effects in vivo in mouse bone-marrow cells following ip injection. In vitro studies with various cell lines showed that hydroquinone was capable of inducing gene mutations, structural chromosome aberrations, sister-chromatid exchange, and DNA damage. Hydroquinone produces adducts with DNA in vitro, but recent in vivo studies were unable to produce DNA adducts. While several experiments with hydroquinone have shown mutagenic effects; the relevance of these results to human risk is uncertain. The majority of positive mutagenicity studies use routes of exposure (parenteral or in vitro) which are not relevant to human exposures. A dominant lethal assay in rats was negative.

Carcinogenicity: Sprague-Dawley rats treated for two-years with hydroquinone in the diet showed "atrophy of the liver cord cells, lymphoid tissue of the spleen, adipose tissue, and striated muscle together with superficial ulceration and hemorrhage of the stomach mucosa" but no carcinogenesis. Two-year studies performed by the NTP reported that hydroquinone exposure was associated with some evidence of carcinogenicity in F-344 rats and B6C3F1 mice. In the NTP study, renal tubular cell adenomas occurred in male rats and mononuclear cell leukemia in female rats, and hepatocellular neoplasms, mainly adenomas, in female mice. The NTP concluded that these data indicated "some evidence of carcinogenic activity" in male and female rats and in female mice. In another study using F-344 rats and B6C3F1 mice, renal tubular cell adenomas were also noted in male rats; hepatocellular adenomas and renal cell hyperplasia were noted in male mice; and hyperplasia of the forestomach was noted in both male and female mice fed 0.8% hydroquinone diets for two years. The evidence provided by cancer bioassay studies is considered limited A.U.S.E.P.A. review of the NTP bioassay found the bioassay results provide limited evidence of carcinogenicity in animals.

Mechanisms: Covalent binding and oxidative stress are mechanisms postulated to be associated with hydroquinone-induced toxicity. Oxidised hydroquinone metabolites may covalently bind cellular macromolecules or alkylate low molecular weight nucleophiles (e.g., glutathione (GSH)) resulting in enzyme inhibition, alterations in nucleic acids and oxidative stress; however, redox cycling is not likely to contribute significantly to oxidative stress. The reaction of hydroquinone metabolites with GSH results in the formation of conjugates which can be further processed to cysteine conjugates which are postulated to cause kidney toxicity. Cell proliferation associated nephrotoxicity in a sensitive strain and species of animal (male F344 rat) has been postulated to be involved in the production of renal tumors in rats.

Interaction with Phenols:

A number of studies reporting interactive effects between hydroquinone and other phenolic compounds. Coadministration of hydroquinone and phenol (75 mg/kg), when given by intraperitoneal injection twice per day, produced a synergistic decrease in bone marrow cellularity in B6C3F1 mice that was similar to that induced by benzene. This compound treatment was significantly more myelotoxic than that observed when either hydroquinone or phenol was administered separately. Associated in vitro studies suggested that this interactive effect was due to a phenol-induced stimulation of the myeloperoxidase-mediated conversion of hydroquinone to 1,4-benzoquinone in the bone marrow.

Subsequent studies have indicated that interactions between hydroquinone and other phenolic compounds can result in a variety of cytotoxic, immunotoxic and genotoxic effects.

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MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 14 of 19

Section 11 - TOXICOLOGICAL INFORMATION

CARCINOGEN

methyl methacrylate homopolymer	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	3	Not classifiable as to its carcinogenicity to humans
hydroquinone	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	3	Not classifiable as to its carcinogenicity to humans

SKIN

methyl methacrylate homopolymer	GESAMP/EHS Composite List - GESAMP Hazard Profiles	D1: skin irritation/corrosion	0
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Section 12 - ECOLOGICAL INFORMATION

METHYL METHACRYLATE HOMOPOLYMER:

ETHYL CYANOACRYLATE:

DO NOT discharge into sewer or waterways.

ETHYL CYANOACRYLATE:

Substances containing unsaturated carbons are ubiquitous in indoor environments. They result from many sources (see below). Most are reactive with environmental ozone and many produce stable products which are thought to adversely affect human health. The potential for surfaces in an enclosed space to facilitate reactions should be considered.

Source of unsaturated substances	Unsaturated substances (Reactive Emissions)	Major Stable Products produced following reaction with ozone.
Occupants (exhaled breath, ski oils, personal care products)	Isoprene, nitric oxide, squalene, unsaturated sterols, oleic acid and other unsaturated fatty acids, unsaturated oxidation products	Methacrolein, methyl vinyl ketone, nitrogen dioxide, acetone, 6MHQ, geranyl acetone, 4OPA, formaldehyde, nonanol, decanal, 9- oxo- nonanoic acid, azelaic acid, nonanoic acid.
Soft woods, wood flooring, including cypress, cedar and silver fir boards, houseplants	Isoprene, limonene, alpha-pinene, other terpenes and sesquiterpenes	Formaldehyde, 4- AMC, pinoaldehyde, pinic acid, pinonic acid, formic acid, methacrolein, methyl vinyl ketone, SOAs including ultrafine particles
Carpets and carpet backing	4- Phenylcyclohexene, 4-vinylcyclohexene, styrene, 2-ethylhexyl acrylate, unsaturated fatty acids and esters	Formaldehyde, acetaldehyde, benzaldehyde, hexanal, nonanal, 2- nonenal

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 15 of 19

Section 12 - ECOLOGICAL INFORMATION

Linoleum and paints/polishes containing linseed oil	Linoleic acid, linolenic acid	Propanal, hexanal, nonanal, 2-heptenal, 2- nonenal, 2- decenal, 1- pentene- 3- one, propionic acid, n- butyric acid
Latex paint Certain cleaning products, polishes, waxes, air fresheners	Residual monomers Limonene, alpha- pinene, terpinolene, alpha- terpineol, linalool, linalyl acetate and other terpenoids, longifolene and other sesquiterpenes	Formaldehyde Formaldehyde, acetaldehyde, glycoaldehyde, formic acid, acetic acid, hydrogen and organic peroxides, acetone, benzaldehyde, 4- hydroxy- 4- methyl- 5- hexen- 1- al, 5- ethenyl- dihydro- 5- methyl- 2(3H)- furanone, 4- AMC, SOAs including ultrafine particles
Natural rubber adhesive	Isoprene, terpenes	Formaldehyde, methacrolein, methyl vinyl ketone
Photocopier toner, printed paper, styrene polymers Environmental tobacco smoke	Styrene Styrene, acrolein, nicotine	Formaldehyde, benzaldehyde
Soiled clothing, fabrics, bedding	Squalene, unsaturated sterols, oleic acid and other saturated fatty acids	Formaldehyde, benzaldehyde, hexanal, glyoxal, N- methylformamide, nicotinaldehyde, cotinine
Soiled particle filters	Unsaturated fatty acids from plant waxes, leaf litter, and other vegetative debris; soot; diesel particles	Acetone, geranyl acetone, 6MHO, 4OPA, formaldehyde, nonanal, decanal, 9- oxo- nonanoic acid, azelaic acid, nonanoic acid
Ventilation ducts and duct liners	Unsaturated fatty acids and esters, unsaturated oils, neoprene	Formaldehyde, nonanal, and other aldehydes; azelaic acid; nonanoic acid; 9- oxo- nonanoic acid and other oxo- acids; compounds with mixed functional groups (=O, - OH, and - COOH)
" Urban grime"	Polycyclic aromatic hydrocarbons	C5 to C10 aldehydes Oxidized polycyclic aromatic hydrocarbons
Perfumes, colognes, essential oils (e.g. lavender, eucalyptus, tea tree)	Limonene, alpha- pinene, linalool, linalyl acetate, terpinene- 4- ol, gamma- terpinene	Formaldehyde, 4- AMC, acetone, 4- hydroxy- 4- methyl- 5- hexen- 1- al, 5- ethenyl- dihydro- 5- methyl- 2(3H) furanone, SOAs including ultrafine particles
Overall home emissions	Limonene, alpha- pinene, styrene	Formaldehyde, 4- AMC, pinonaldehyde, acetone, pinic acid, pinonic acid, formic acid, benzaldehyde, SOAs including ultrafine particles

Abbreviations: 4-AMC, 4-acetyl-1-methylcyclohexene; 6MHQ, 6-methyl-5-heptene-2-one, 4OPA, 4-oxopentanal, SOA, Secondary Organic Aerosols
Reference: Charles J Weschler; Environmental Health Perspectives, Vol 114, October 2006.

METHYL METHACRYLATE HOMOPOLYMER:

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 16 of 19

Section 12 - ECOLOGICAL INFORMATION

Marine Pollutant	Yes
Hazardous Air Pollutant:	Yes
Fish LC50 (96hr.) (mg/l):	159- 277
Daphnia magna EC50 (48hr.) (mg/l):	37- 120
BOD5:	0.14
Half- life Soil - High (hours):	672
Half- life Soil - Low (hours):	168
Half- life Air - High (hours):	9.7
Half- life Air - Low (hours):	1.1
Half- life Surface water - High (hours):	672
Half- life Surface water - Low (hours):	168
Half- life Ground water - High (hours):	1344
Half- life Ground water - Low (hours):	336
Aqueous biodegradation - Aerobic - High (hours):	672
Aqueous biodegradation - Aerobic - Low (hours):	168
Aqueous biodegradation - Anaerobic - High (hours):	2688
Aqueous biodegradation - Anaerobic - Low (hours):	672
Photooxidation half- life air - High (hours):	9.7
Photooxidation half- life air - Low (hours):	1.1
First order hydrolysis half- life (hours):	4 YRS
Base rate constant [MOH]- HR]- 1:	200M- 1 hr-

HYDROQUINONE:

Marine Pollutant Yes

Very toxic to aquatic organisms.

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.

Hydroquinone, a byproduct of several microorganisms and marine species, is found in several foods and beverages. Hydroquinone can undergo biodegradation and photodegradation.

Degradation: Hydroquinone is degraded through biotic and abiotic processes that are affected by pH, temperature, presence/absence of oxygen, and acclimation of the microorganisms involved. Since the microorganisms responsible in degrading hydroquinone are widely distributed in sludges, soil, sediment, and compost, it is expected to undergo biodegradation.

Photolysis: Hydroquinone can rapidly undergo photodegradation.

Distribution between environmental compartments and occurrence in the environment: When released to the environment, Hydroquinone will likely to be distributed in the water compartment but not in the atmosphere for it is non-volatile. When released in soil, hydroquinone will most likely be degraded by soil microorganisms.

Effects on the Environment: Aquatic effect - Toxicity conducted on Pimephales promelas, Daphnia magna, and Salt water shrimp show that Hydroquinone is acutely toxic to aquatic organisms.

Fish LC50 (96 h): Pimephales promelas 0.044 mg/l

Daphnia magna LC50 (48 h): 0.096 mg/l (interpolated results from several researchers)

Salt water shrimp (Crangon septemspinosa) LC50 (84 h):0.833 mg/l

Algal EC50 (3 d): S. capricornutum 0.355 mg/l.

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.

Koc: 9-50

ThOD: 1.89

BCF: 40-65

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 17 of 19

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
ethyl cyanoacrylate	LOW	No Data Available	LOW	HIGH
methyl methacrylate homopolymer	LOW	LOW	LOW	HIGH
hydroquinone	LOW	No Data Available	LOW	MED

Section 13 - DISPOSAL CONSIDERATIONS

- Containers may still present a chemical hazard/ danger when empty.
- Return to supplier for reuse/ recycling if possible.

Otherwise:

- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.

- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

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

- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste 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, IATA, IMDG

continued...

MDF Bonder Adhesive

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

Hazard Alert Code: MODERATE

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 18 of 19

Section 15 - REGULATORY INFORMATION

Indications of Danger:

Xn Harmful

POISONS SCHEDULE

S5

REGULATIONS

Regulations for ingredients

ethyl cyanoacrylate (CAS: 7085-85-0) is found on the following regulatory lists;

"Australia Hazardous Substances Information System - Consolidated Lists", "Australia Inventory of Chemical Substances (AICS)", "Australia National Pollutant Inventory", "Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix E (Part 2)", "Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5", "Sigma-AldrichTransport Information"

methyl methacrylate homopolymer (CAS: 9011-14-7, 39379-18-5) is found on the following regulatory lists;

"Australia Inventory of Chemical Substances (AICS)", "Australia National Pollutant Inventory", "FisherTransport Information", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "IMO IBC Code Chapter 17: Summary of minimum requirements", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs", "Sigma-AldrichTransport Information"

hydroquinone (CAS: 123-31-9) is found on the following regulatory lists;

"Australia - South Australia Controlled Substances (Poisons) Regulations - Schedule E: Schedule 2 poisons authorised to be sold by holder of a medicine sellers licence", "Australia Exposure Standards", "Australia FAISD Handbook - First Aid Instructions, Warning Statements, and General Safety Precautions", "Australia Hazardous Substances Information System - Consolidated Lists", "Australia Inventory of Chemical Substances (AICS)", "Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix E (Part 2)", "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 4", "Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5", "Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6", "FisherTransport Information", "GESAMP/EHS Composite List - GESAMP Hazard Profiles", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs", "International Fragrance Association (IFRA) Survey: Transparency List", "IOFI Global Reference List of Chemically Defined Substances", "OECD List of High Production Volume (HPV) Chemicals", "Sigma-AldrichTransport Information", "United Nations Consolidated List of Products Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved by Governments"

No data for MDF Bonder Adhesive (CW: 21-9640)

Section 16 - OTHER INFORMATION

INGREDIENTS WITH MULTIPLE CAS NUMBERS

Ingredient Name	CAS
methyl methacrylate homopolymer	9011-14-7, 39379-18-5

continued...

MDF Bonder Adhesive

Hazard Alert Code: MODERATE

Chemwatch Material Safety Data Sheet

Issue Date: 14-Jul-2013

A317LP

CHEMWATCH 21-9640

Version No:3.1.1.1

Page 19 of 19

Section 16 - OTHER INFORMATION

■ 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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This is the end of the MSDS.