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**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME
(NICNAS)**

FULL PUBLIC REPORT

Polymer in Polyurethane Dispersion 65422

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**Director
NICNAS**

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FULL PUBLIC REPORT**Polymer in Polyurethane Dispersion 65422****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Dow Chemical (Australia) Ltd (ABN 72 000 264 979) of 541-583 Kororoit Creek Road Altona VIC 3018.

NOTIFICATION CATEGORY

Self Assessment: Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

- Chemical identity
- Polymer constituents
- Import volume

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

No variation to the schedule of data requirements is claimed.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

No previous permits or certificates

NOTIFICATION IN OTHER COUNTRIES

United States – PMN has been filed and has been assigned PMN # P04-665. Commercialization of this substance is scheduled for October 2004.

Canada – Substance will be notified to Canada as a Polymer of Low Concern (PLC) in August 2004.

2. IDENTITY OF CHEMICAL

MARKETING NAME(S) POLYMER IN POLYURETHANE DISPERSION 65422

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</i>
Meets Molecular Weight Requirements	Yes
Meets Functional Group Equivalent Weight (FGEW) Requirements	Not applicable
Low Charge Density	Yes
Approved Elements Only	Yes
No Substantial Degradability	Yes
Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

4. INTRODUCTION AND USE INFORMATION

MAXIMUM INTRODUCTION VOLUME OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	<30	<30	<60	<60	<60

USE

The notified polymer is a component of formulated surface coatings and adhesives.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The notified polymer will not be manufactured in Australia. Product will be imported in container loads in either totes (300 gallon), drums (55 gallon) or both. On delivery to the wharf, product is transferred to customer warehouses in all main capital cities where totes or drums are removed from containers and stored awaiting use.

Typical local processing operations involve three major stages: Bulk Storage, Mixing, and application (includes probable end use).

1. Product Use: The new polymer will not be manufactured in Australia. A dispersion of the notified polymer in water will be supplied to formulators and processed into an adhesive compound. A typical end use is carpet backing adhesive. The process consists of the following steps:

- a) The notified polymer is pumped from a storage tank (or drums) to a large mixing tank.
- b) A batch of thickeners, fillers and the notified substance are mixed and the resulting product is stored in an intermediate day tank.

These steps are performed in closed systems with little opportunity for operator exposure.

- c) In the case of carpet manufacture, the mixture containing less than 50% of the notified substance is pumped from the day tank and a thin coating applied to the carpet backing in a continuous process.

- d) The coating is cured in place as the carpet passes through a heated oven.

The work area and equipment is located in a well-ventilated area. Fumes from the oven are ducted away from the work area. When cured the notified substance is a rubber-like solid and not expected to present any human contact hazards.

2. Residual Product

- a) Bulk Storage: It is estimated that approximately 1% of dispersion product remains in the containers of which about 60% would be the notified polymer. Based on an annual import volume of 50t (5 year maximum) of new polymer, the maximum residual left in the containers after bulk storage would be 300 kg / yr.

- b) Mixing: We estimate that approximately 1% of blended product remains in the mixer of which about 25% would be the notified polymer. Based on an annual import volume of 50t (5 year maximum) of new polymer, the maximum residual left in the mixer after blending would be approx 125 kg / yr.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

Minimal to no environmental exposure is anticipated. It is estimated that 99% of raw material will be converted to useful products. It is recommended that any waste amounts of dispersion product containing the polymer of interest are sent to a licensed, permitted, recycler, reclaimer, incinerator, or

other thermal destruction device. Finished carpet backing products containing the polymer will 'cure' to form an inert solid bound to the carpet substrate.

Below is an estimate of environmental exposure resulting from each of the processing steps noted above.

1. Bulk Storage: Based on an annual import volume of 50 t (5 year maximum) of new polymer, the maximum residual left in the containers after bulk storage would be 300 kg/yr

2. Mixing: Based on an annual import volume of 50 t (5 year maximum) of new polymer, the maximum residual left in the mixer after blending would be 125 kg/yr.

These estimates are based on manufacturing experience with similar polymer substances. Where thermal destruction facilities are available it is expected that 0.01% of the waste polymer would remain for release to land or air.

Finished products containing the notified chemical

1. Packaging: Based on the import volume of 50 t/y, the estimated maximum residual after use of products would be 300 kg/yr.

2. Application: the polymer will be incorporated into finished articles (e.g. carpet backing material, attached to the carpet substrate).

Additional End Use Information: Once the finished adhesive product is 'cured', it then becomes a solid material that is bonded to a given substrate. At this point the notified polymer substance is an inert solid and poses little potential for exposure risk to the environment or the public at large.

A maximum annual estimate of total residual polymer from processing operations and after use of products would be 725 kg/yr or 1.45% of the total imported volume.

Disposal of polyurethane dispersions is generally by evaporation and/or curing to a solid and then to a permitted landfill. Disposal, including the choosing of sites for disposal is a customer responsibility.

3. Disposal of Finished Product

In the case of carpet, the product is disposed of by consumers in approved landfill at the end of its useful life.

6.2. Summary of Occupational Exposure

There is limited opportunity for human contact. The imported polyurethane dispersion product (containing the polymer) would be compounded along with filler materials and other additives at the formulator site to produce the finished carpet backings. Activities associated with this process could include handling of bulk dispersion, mixer charging, and application of the carpet backing formulation. Chemical goggles, body-covering clothing and gloves are standard protective equipment. No new or additional safety practices are anticipated to be needed at the formulator site in order to handle the polymer substance. Finished products pose no significant hazards to human health.

Conclusions:

Dermal and ocular exposure can occur during certain formulation processes. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

General ventilation is typically adequate for most conditions. Additional controls and / or personal protection equipment (PPE) may be necessary if mists are generated during processing.

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

Workers involved in the handling of products containing the new substance will be provided with product MSDS and appropriate container labels.

To date, there have been no reported incidents of work related injuries or diseases associated with the use of this polymer substance or products containing this substance.

6.3. Summary of Public Exposure

The notified polymer will not be available to the public. Members of the public may come into contact with finished products containing the cured polymer.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	White solid, imported as dispersion in water.
Melting Point/Glass Transition Temp	No Data
Density	> 1.00
Water Solubility	Dispersion as sold is dilutable; polymer component is insoluble
Dissociation Constant	No ionisable functionalities are present.
Particle Size	Polymer as delivered is in a liquid dispersion.
Reactivity	Stable under recommended storage conditions.
Degradation Products	The polymer component is not expected to biodegrade.

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

Data from similar polymers has been extrapolated for purposes of estimating the potential for oral and dermal toxicity, eye irritation, and sensitization potential as described below.

8.1.1 Discussion of Observed Effects

Comparison of the structure of the notified polymer with other similar polymers indicates that single dose oral toxicity of this polymer is probably very low. The oral LD₅₀ for rats is expected to be > 2000 mg/kg. Brief contact with skin may cause slight skin irritation with local redness. Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD₅₀ for skin absorption in rats is expected to be >2000 mg/kg. May cause moderate eye irritation, but corneal injury to eyes is unlikely. These effects are attributed to the surfactant in the product rather than the polymer itself. No adverse effects are anticipated from a single exposure to vapours. No adverse human health effects have been reported.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

No toxicological data were submitted.

9.1.1 Discussion of Observed Effects

The notified polymer is not expected to be toxic to aquatic or terrestrial life. Because of the high molecular weight, no bioconcentration of this polymer is expected. The polymer will remain in the soil or sink and remain in the sediment of an aquatic environment. The polymer is water insoluble, inert and not expected to biodegrade. No adverse environmental effects have been reported.

No residual amines are anticipated. The polymer is considered stable under normal conditions. It is not a cationic polymer or a polymer that is expected to become cationic in the aquatic environment. It is not a polymer that is designed to (or can be expected to) degrade, decompose, or depolymerize.

9.2. Environmental Hazard Assessment

The notified polymer is not expected to be hazardous to aquatic or terrestrial organisms.

10. RISK ASSESSMENT**10.1. Environment**

Accidental spills aside, the polymer will not be released to the environment. Carpeting or other materials manufactured using the polymer may ultimately be disposed of in a landfill where they are not expected to degrade or become mobile. The risk to the environment presented by the notified polymer is considered low. The notified polymer is not cationic, nor is it expected to become cationic in the aquatic compartment.

The notified polymer is not expected to be toxic to aquatic or terrestrial life. Because of the high molecular weight, no bioconcentration of this polymer is expected. The polymer will remain in the soil or sink and remain in the sediment of an aquatic environment. The polymer is water insoluble, inert and not expected to biodegrade. No adverse environmental effects have been reported.

10.2. Occupational health and safety

The OHS risk presented by the notified polymer is expected to be low. The notified polymer may be present in formulations containing hazardous ingredients. If these formulations are classified as hazardous to health in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

10.3. Public health

The notified polymer will not be available to the public. Members of the public may make dermal contact with products containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is bound within a matrix/chemically stable/resistant to degradation and unlikely to be bioavailable.

11. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS**11.2. Environmental risk assessment**

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

11.3. Human health risk assessment**11.3.1. Occupational health and safety**

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

11.3.2. Public health

There is Negligible Concern to public health when used to produce the components /materials described.

12. MATERIAL SAFETY DATA SHEET**12.1. Material Safety Data Sheet**

The notifier has provided MSDS in accordance with the schedule item B 12 of the *Industrial Chemicals (Notification & assessment) Act*. The accuracy of the information on the MSDS remains the responsibility of the applicant.

13. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- The following personal protective equipment is recommended in accordance with good occupational health and safety practice
 - Chemical goggles, clean, body-covering clothing, and chemical gloves resistant to this material
 - In misty atmospheres, use an approved particulate respirator (not anticipated to be necessary for the carpet backing application).
- No specific engineering controls, work practices or additional personal protective equipment are required for the safe use of the notified polymer itself, however, these should be selected on the basis of all ingredients in the formulation.
 - Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.
- A copy of the MSDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Environment

- No bioconcentration of the polymer is expected because of its high molecular weight and the polymer is not expected to biodegrade.

Disposal

- It is recommended that any waste amounts of dispersion product containing the polymer substance are sent to a licensed, permitted, recycler, reclaimer, incinerator, or other thermal destruction device

Storage

- The following precautions should be taken by distributors and product end-users regarding storage of the notified polymer / dispersion product:
 - Store between 40-110F (4-43C). Avoid Freezing.

Emergency procedures

- Spills/release of the notified polymer / dispersion should be handled by
 - Isolate area. Keep unnecessary and unprotected personnel from entering area. Spilled material may cause a slipping hazard. Use appropriate safety equipment.
 - Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.
 - Contain spilled material if possible. Absorb with material such as clay or sand. Wash the spill site with large quantities of water.

13.1. Secondary notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under subsection 64(1) of the Act; if
 - the notified polymer is introduced in a chemical form that does not meet the PLC criteria.

or

- (2) Under subsection 64(2) of the Act:

- if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.