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

FULL PUBLIC REPORT

Polymer Latex TN1819

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| | |
|-----------------|------------------------------------------------------------|
| Street Address: | 334 - 336 Illawarra Road MARRICKVILLE NSW 2204, AUSTRALIA. |
| Postal Address: | GPO Box 58, SYDNEY NSW 2001, AUSTRALIA. |
| TEL: | + 61 2 8577 8800 |
| FAX | + 61 2 8577 8888. |
| Website: | www.nicnas.gov.au |

**Director
Chemicals Notification and Assessment**

TABLE OF CONTENTS

| | |
|-----------------------------------------------------------------------------------|---|
| FULL PUBLIC REPORT..... | 3 |
| 1. APPLICANT AND NOTIFICATION DETAILS..... | 3 |
| 2. IDENTITY OF CHEMICAL | 3 |
| 3. COMPOSITION..... | 3 |
| 4. INTRODUCTION AND USE INFORMATION..... | 4 |
| 6. PHYSICAL AND CHEMICAL PROPERTIES..... | 4 |
| 7.1 Toxicology..... | 4 |
| 7.2 Occupational Health | 5 |
| 7.2.1 Occupational Exposure | 5 |
| 7.2.2 Exposure Assessment | 5 |
| 7.3 Public Health | 5 |
| 7.3.1 Public Exposure | 5 |
| 7.3.2 Exposure Assessment | 5 |
| 8. ENVIRONMENTAL IMPLICATIONS | 6 |
| 8.1 Ecotoxicology..... | 6 |
| 8.2 Environmental Contamination | 6 |
| 8.2.1 Environmental Exposure..... | 6 |
| 8.2.2 Exposure Assessment | 6 |
| 9. RISK ASSESSMENT | 6 |
| 10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS..... | 7 |
| 10.2. Environmental risk assessment..... | 7 |
| 10.3. Human health risk assessment | 7 |
| 12. RECOMMENDATIONS..... | 7 |
| 12.1. Secondary notification | 8 |
| 13. BIBLIOGRAPHY | 8 |

FULL PUBLIC REPORT**Polymer Latex TN1819****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Dulux Australia of 1970 Princes Highway Clayton VIC 3168
 Nuplex Industries (Aust) Pty Ltd of 49-61 Stephen Road Botany NSW 2019

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

- Chemical Name,
- Molecular Formula,
- Structural Formula,
- Means of Identification,
- Number/Weight Average Molecular Weights,
- List of Polymer Constituents.

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)

None.

NOTIFICATION IN OTHER COUNTRIES

None.

2. IDENTITY OF CHEMICAL

CAS NUMBER

None allocated

MARKETING NAME(S)

Polymer Latex TN1819

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

| Functional Group | Category | Equivalent Weight (FGEW) |
|-----------------------|-------------|--------------------------|
| Carboxylic acid group | Low Concern | |

| | |
|--------------------|-------------------------------------------------------------------------------------|
| Charge Density | The notified polymer has low charge density. |
| Elemental Criteria | The notified polymer contains only approved elements. |
| Degradability | The notified polymer will only degrade with oxidising agents or under the UV light. |
| Water Absorbing | The notified polymer is present as a dispersion in water. |
| Residual Monomers | All residual monomers are below the relevant cut-off. |
| Hazard Category | The notified polymer is not classified as a hazardous/dangerous substance. |

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> | 50 | 50 | 50 | 50 | 50 |

USE

- The notified polymer is manufactured as a polymer dispersion (50% w/w in water) and will be used as a film forming polymer for architectural coatings by both professional painters and home handymen.
- The polymer dispersion will be transported in 200 L steel drums or 1100 L pallecons to the paint formulator. Once formulation is complete the final painting product is filled into epoxy lined tin plate cans of 500 ml, 1L, 4L 10L and 20L capacity.
- The application methods include brush, roller or spray.

6. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Appearance at 20°C and 101.3 kPa | The polymer dispersion is a white milky liquid. |
| Melting Point/Glass Transition Temp | Not applicable. |
| Density | 1070 kg/m ³ (polymer dispersion) |
| Water Solubility | Estimated to be < 1 mg/L The polymerisation process occurs in the aqueous phase. Once a critical molecular weight is reached the polymer becomes insoluble in water. Therefore, the notified polymer is not soluble but dispersible in water. |
| Particle Size | Not applicable as it exists as a dispersion in water. |
| Degradation Products | Not stated. |
| Loss of monomers, other reactants, additives impurities | Stable under normal ambient temperature. |
| Hydrolysis as a Function of pH | The notified polymer contains ester linkages that could be expected to undergo hydrolysis under extreme pH conditions. However, in the environmental pH range of 4 to 9, significant hydrolysis is unlikely to occur. |
| Partition Coefficient (n-octanol/water) | The expected low water solubility and likely hydrophobic nature of the notified polymer are indicative of partitioning into the octanol phase. |
| Adsorption/Desorption | The notified polymer is expected to have a high affinity for soil and sediment, and be immobile in the environment due to its low expected water solubility. |
| Dissociation Constant | The notified polymer contains some free carboxylic acid functionality and has typical characteristics of acidity. |

7. HUMAN HEALTH IMPLICATIONS

7.1 Toxicology

7.1.1 Toxicological Investigations

No toxicological data were submitted.

7.1.2 Human Health Hazard Assessment

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

7.2 Occupational Health

7.2.1 Occupational Exposure

| <i>Nature of Work</i> | <i>Number of Workers Exposed</i> | <i>Maximum Duration of Exposure</i> (hour/day) | <i>Frequency</i> (day/year) |
|------------------------------------------|--------------------------------------|--------------------------------------------------------|--------------------------------|
| (a) Manufacture | | | |
| Reactor Operators | 2 | 5 | 20 |
| Maintenance Personnel | 2 | 1-2 | 20 |
| Laboratory personnel | 2 | 2 | 20 |
| Storage and internal transport personnel | 2 | 2 | 20 |
| (b) Transport | | | |
| Delivery to Customer site | 2 | 20 | 40 |
| (c) Paint formulation | | | |
| Reformulation Operators | 10 | 1-2 | 20 |
| Maintenance personnel | 2 | 1-2 | 20 |
| Laboratory personnel | 5 | 1-2 | 20 |
| (d) Paint application | | | |
| Professional tradesmen and Home handymen | 10,000 | 8 | 240 |

7.2.2 Exposure Assessment

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

Dermal, ocular and inhalation exposure to the notified polymer may occur during manufacture, formulation and painting processes. Exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

After application and once dried, the paint containing the notified polymer is cured into an inert matrix and is hence unavailable to exposure.

7.3 Public Health

7.3.1 Public Exposure

Home renovators may apply the paint containing the notified polymer by brush or roll-on method. They are not expected to apply the paint frequently, however, limited PPE or control measures will be used at home. Members of the public may come into contact with the paint containing the notified polymer. Painted surface containing the notified polymer once dried will be present in a cured inert matrix.

7.3.2 Exposure Assessment

Public exposure to the notified polymer is expected to be moderate, for home renovators, and low for the other members of the public.

8. ENVIRONMENTAL IMPLICATIONS

8.1 Ecotoxicology

8.1.1 Ecotoxicological Investigations

No ecotoxicological data were submitted.

8.1.2 Environmental Hazard Assessment

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

8.2 Environmental Contamination

8.2.1 Environmental Exposure

During manufacture and formulation, approximately up to 500 kg per annum of waste containing the notified polymer will be generated from clean-up of minor spills and the manufacturing and formulation equipment. Further estimates up to 1.25 tonnes per annum of the notified polymer will be disposed of in empty product containers.

Most of the aqueous wastes derived from the cleaning of manufacture and formulation equipment will be reused in subsequent batches. The remainder, along with wastes from spills, will be passed through interceptor pits prior to release to sewer. The resulting solid wastes will be disposed of to landfill. Equipment used to apply the coating formulation, such as brushes and rollers (>90% of coatings expected to be applied in this manner) will be cleaned with water and these wastes (up to 5% of the manufacture volume or 2.5 tonnes per annum) will most likely be disposed of onto the ground or into the sewer. The notified polymer in other solid wastes such as masking tapes will also be disposed of to landfill.

Majority of the notified polymer applied to buildings will be disposed of to landfill on demolition.

8.2.2 Exposure Assessment

The notified polymer is expected to have low water solubility and will be immobile in both terrestrial and aquatic compartments. As a consequence, the notified polymer released to sewer or landfill is expected to rapidly associate with the soil matrix and sediments and slowly degrade through abiotic and biotic processes to water vapour and oxides of carbon. Liquid wastes resulting from the cleaning of formulation and application equipment will either be reused in subsequent formulations or treated prior to release to sewer with the resulting solid residue disposed of to landfill. In landfill the notified polymer will degrade via the processes described above.

The notified polymer is not expected to cross biological membranes due to its high molecular weight and low water solubility, and is therefore not expected to bioaccumulate (Connell 1989).

9. RISK ASSESSMENT

9.1. Environment

Most of the notified polymer will be interacted with other paint components to form a very high molecular weight and stable polymer matrix and as such, is expected to be immobile and pose little risk to the environment. As the coating degrades over time, any fragments, chips and flakes of the coating will be of little concern as they are expected to be inert.

The notified polymer is not likely to present a hazard to the environment when it is manufactured, formulated, stored, transported and used in the proposed manner.

9.2 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 [NOHSC:1008 (1999)] , workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

9.3 Public health

Paint products containing the notified polymer will be used by home handymen for architectural coatings. The health risk presented by the notified polymer is expected to be low due to its non-dangerous nature, and the intermittent use by the users. Following application, the notified polymer will become trapped within a matrix and will not be bioavailable. Therefore, the health risk to public from exposure to the notified polymer is considered low.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.2. Environmental risk assessment

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

10.3. Human health risk assessment

10.3.1. Occupational health and safety

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

10.3.2. Public health

There is Low Concern to public health based on its reported use pattern.

12. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- No specific engineering controls, work practices or 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

Disposal

- Wastes generated during industrial application should be disposed of through a licensed waste contractor.
- Wastes generated during domestic use should be disposed of according to the following instructions: "Do not pour leftover paint down the drain. Unwanted paint should be brushed out on newspaper, allowed to dry and then disposed of via domestic waste collections. Empty paint containers should be left open in a well ventilated area to dry out. When dry, recycle steel containers via steel can recycling programs. Disposal of empty paint containers via domestic recycling programs may differ between local authorities. Check with your local council first."

Storage

- On site facilities should be designed for storage of flammable liquids with bunding for spill containment and control of ignition sources.

Emergency procedures

- Spills/release of the notified polymer should be contained as described in the MSDS (ie. collect spilled material with an inert absorbent) and the resulting waste disposed of to an authorised landfill.

Transport and Packaging

- The polymer itself is not a dangerous good. However, the final formulated goods shall be transported and stored according to the statutory requirements applying to Class 3, Dangerous goods.

12.1. 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.

13. BIBLIOGRAPHY

Connell DW (1989) General characteristics of organic compounds which exhibit bioaccumulation. In: Connell DW ed. Bioaccumulation of xenobiotic compounds. Boca Raton, USA, CRC Press, pp 47-57.

NOHSC (1999) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1999)]. National Occupational Health and Safety Commission, Canberra, AusInfo.