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

FULL PUBLIC REPORT

HC-18-1755 Acrylic Resin

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (the Act) and Regulations. This legislation is an Act of the Commonwealth of Australia. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Department of Health and Ageing, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Department of the Environment and Heritage.

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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. HUMAN HEALTH IMPLICATIONS | 5 |
| 7.1. Toxicology | 5 |
| 7.2. Occupational Health | 5 |
| 7.3. Public Health | 6 |
| 8. ENVIRONMENTAL IMPLICATIONS..... | 6 |
| 8.1. Ecotoxicology | 6 |
| 8.2. Environmental Contamination..... | 6 |
| 9. RISK ASSESSMENT..... | 6 |
| 9.1. Environment | 6 |
| 9.2. Occupational Health and Safety..... | 7 |
| 9.3. Public Health | 7 |
| 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

HC-18-1755 Acrylic Resin

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

PPG Industries Australia Pty Ltd of McNaughton Road, Clayton, VIC 3168

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

- Chemical Name,
- Molecular and Structural Formula,
- Means of Identification,
- Molecular weight details,
- Charge Density,
- Polymer Constituents, Residual monomers and Impurities,
- Reactive Functional Groups,
- Manufacture/Import Volume,
- Site of Manufacture/Reformulation,
- Purity

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

OTHER NAME(S)

None.

MARKETING NAME(S)

HC-18-1755 Acrylic Resin

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

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

Charge Density

The notified polymer has low charge density.

| | |
|--------------------|--|
| Elemental Criteria | The notified polymer contains only approved elements. |
| Degradability | The notified polymer is not biodegradable. |
| Water Absorbing | The notified polymer is not a water-absorbing polymer. |
| Residual Monomers | All residual monomers are below the relevant cut-off. |
| Hazard Category | The notified polymer is not classified as a hazardous 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> | 10-30 | 30-100 | 30-100 | 30-100 | 30-100 |

USE

Component of automotive refinish coating.

A polymer solution containing the notified polymer will be imported in 200 L steel drums. After formulation, the final painting products are packaged in tinplate paint cans of 1 and 5 L capacity.

6. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|--|--|
| Appearance at 20°C and 101.3 kPa | The polymer solution is a colourless, viscous liquid. |
| Melting Point/Glass Transition Temp | Not applicable. |
| Density | 1149 kg/m ³ |
| Water Solubility | The notified polymer is never isolated from the base solution. The notified polymer contains a high level of hydrophobic aromatic and aliphatic components suggesting low water solubility. |
| Particle Size | Not applicable as it exists as a solution. |
| Degradation Products | Stable under normal use. |
| Loss of monomers, other reactants, additives impurities | Stable under normal use. |
| Hydrolysis as a Function of pH | The notified polymer contains ester linkages that can 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 will be immobile in the environment due to its low expected water solubility. |
| Dissociation Constant | The notified polymer contains some free carboxylic acid functionality and is expected to have typical acidic characteristics. |

7. HUMAN HEALTH IMPLICATIONS

7.1 Toxicology

9.2.1. Toxicological Investigations

No toxicological data were submitted.

9.2.2. 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 (hour/day)</i> | <i>Frequency (day/year)</i> |
|--|--|---|---------------------------------|
| (a) PPG Laboratory Development | | | |
| Manufacture and testing of Polymer | 3 | 8 | 10 |
| Manufacture and testing of paint | 3 | 8 | 20 |
| (b) PPG paint manufacture | | | |
| Paint make-up | 3 | 8 | 30 |
| QC testing | 3 | 8 | 30 |
| Filling into drums | 3 | 8 | 30 |
| (c) Paint application by end user | | | |
| Activation and thinning of paint. | 6000 | 4 | 220 |
| Paint application and cleaning of spray equipment. | 6000 | 4 | 220 |
| (d) PPG warehouse staff | | | |
| Handling incoming resin containers | 10 | 1 | 4 |
| Picking finished product containers from warehouse, palletising and loading to transport vehicles. | 25 | 1 | 50 |
| (e) Transport vehicle drivers | | | |
| Loading & unloading resin containers | 8 | 1 | 4 |
| Loading and unloading finished product containers | 500 | 1 | 200 |
| (f) Distributors' warehouse staff | | | |
| Handling incoming finished product containers | 200 | 1 | 100 |
| Picking finished product containers from warehouse, palletising and loading to transport vehicles. | 200 | 1 | 200 |

7.2.2 Exposure Assessment

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

Dermal, ocular and inhalation exposure to the notified polymer may occur during 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

The notified polymer is intended only for use in industry, and will not be available to the public. Members of the public may come into contact with painted automotive surface containing the notified polymer in a cured inert matrix.

7.3.2 Exposure Assessment

Negligible public exposure to the notified polymer is expected.

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 formulation, the notifier estimates that up to 650 kg per annum of waste containing the notified polymer will be generated from cleaning up minor spills and cleaning out manufacturing and formulation equipment. The notifier further estimates that up to 35 tonnes per annum of the notified polymer from the collection of overspray will be disposed of during coating use and up to 650 kg of the notified polymer will be disposed of in empty product containers.

The notified polymer in waste from spills and equipment cleaning and drum disposal will be collected and treated by a distillation process whereby, the solvent is reclaimed and the remaining solid containing the notified polymer will be disposed of in landfill. The notified polymer in overspray will also be disposed of to landfill. The notifier indicates that incineration of waste may also occur.

The majority of the notified polymer will be applied to vehicles. At the end of their useful life it will either be disposed of to landfill or recycled.

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 is expected to 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 undergo the solvent reclamation process described above and the resulting solid residue disposed of in landfill. Incineration of waste may also occur and would result in the production of water vapour and oxides of carbon.

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 reacted 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 metal panels and car

bodies coated with the polymer are likely to be either recycled for steel reclamation or be placed into landfill at the end of their useful life. When recycled the polymer would be destroyed in furnaces and converted to water vapour and oxides of carbon.

The notified polymer is not likely to present a hazard to the environment when it is 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,1999), workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

9.3 Public health

The notified polymer is intended for use by professional spray painters in automotive coating only, and will not be sold to the public. 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 Negligible 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.

Disposal

- The notified polymer should be disposed of by landfill. Liquid wastes should either be incinerated or evaporated to dryness and the resulting solid residue disposed of in landfill.

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 by an authorised landfill agent.

Transport and Packaging

- The polymer itself is not a dangerous good. However, the final formulated products shall be transported and stored according to the statutory requirements for 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.