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

**FULL PUBLIC REPORT**

**RC- 49227**

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**Director  
NICNAS**

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**FULL PUBLIC REPORT**

RC-49227

**1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

DuPont (Australia) Ltd, (ABN 59 000 716 469) of 168 Walker Street North Sydney NSW 2060.

## NOTIFICATION CATEGORY

Self Assessment: Polymer of Low Concern

## EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical Name, Other Names, CAS Number, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, Use Details and Manufacture/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)

None

## NOTIFICATION IN OTHER COUNTRIES

USA 2003

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

RC-49227, Polymer in Acrylic Resin for NGT Binder

## MOLECULAR WEIGHT (NAMW)

Number Average Molecular Weight (NAMW) &gt;1000

**3. COMPOSITION**

<i>Criterion</i>	<i>Criterion met</i>
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
Stable Under Normal Conditions of Use	Yes
Not Water Absorbing	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

**4. INTRODUCTION AND USE INFORMATION**

## MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

The notified polymer will be imported as either finished paint contained in a 3.78 L or 4 L steel can or resin solution mixed solvents in a steel 200 L steel drum to be formulated in Australia into finished automotive spray paints.

## 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	<30	<30	<30

## USE

The notified polymer will be used as a polymer in automotive paints.

## 5. PROCESS AND RELEASE INFORMATION

### 5.1. Operation Description

#### Paint Manufacturing

The majority of the notified polymer will be imported as a component of RC-49227, which is used in the manufacturing paint at the DPC factory at 15-23 Melbourne Rd Riverstone NSW 2765.

RC-49227 is imported in 200 L steel drums inside containers and transported to the manufacturing site for storage, mixing and transformation into finished paint. All storage warehouses are approved for storage of bulk Class-3 flammable goods, and are located in bunded areas with layout and storage according to AS1940.

During formulation, the notified polymer will be semi-manually weighed and then transferred to an mechanically stirred, enclosed, mixing tank using a trolley jack with tilt facility. Other ingredients are added to the batch slowly and stirred mechanically. The tank fume is exhausted to the atmosphere. Once combined with other ingredients into the finished paint product, it will be semi automatically filled into steel containers, of 4 L or 1 L capacity. When formulating the final product, RC-49227 is mixed with other components in a gravity fed mixer.

Once finished paint is tested and approved by QA, the paint is gravity fed and filled into 4 L and 5 L open-head mild steel approved cans and labelled with NOHSC compliant labels. The finished paint is transported to the warehouse, or immediately containerised for distribution. Imported finished paint product may also be stored in the same warehouse.

Individual orders are re-aggregated into cartons with other paint types to be transported to the final destination; the spray painter/smash repairer. Product containing RC-49227 may be sold singly or packed in cardboard cartons, each carton holding four 3.785 L, 4 L or 5 L cans.

#### End Use.

Spray-painters who are qualified, professional tradesmen mix the paint containing RC-49227 as a component (part A) to be mixed with isocyanate catalyst (part B) according to the product recipe using a balance or measuring cylinder and mixing jar. After mixing, the paint is loaded into a spray gun and sprayed out onto the vehicle placed in a spray booth constructed and used to AS 4114.

After the refinishing is complete the spray gun and lines are emptied and any residual paint placed into a "paint waste" drum for recycling. The spray gun is then cleaned at an earthed recycled solvent wash station ready for the next use.

## 6. EXPOSURE INFORMATION

### 6.1. Summary of Occupational Exposure

Workers may be exposed to < 70 % solution of notified polymer when opening containers, and during weighing and measuring RC-49227. Dermal exposure is expected to be the major route of exposure, however ocular exposure may occur from accidental splashing and secondary transfer from gloved hands. Workers may also be exposed to the solution of the notified polymer via dermal, ocular and inhalation routes during manufacturing of paint and spraying of the finished product. The product is sprayed in a booth with an exhaust/filter system, and workers wear a supplied air respirator or mask

fitted with an organic vapour cartridge, face-shield, gloves and protective suit conforming to AS and NZ standards as specified in the MSDS. Workers may be exposed to a dilute solution of the polymer via the dermal and ocular routes while cleaning and rinsing spray equipment using recirculated solvent.

After application and once dried, the paint containing the notified polymer is cured into an inert matrix and is therefore unavailable for exposure

Transport and warehousing workers may come into dermal and ocular contact with the notified polymer through accidental leaks and spillages of the drums and containers.

Paint manufacturing workers will manually weigh and transfer the polymer solution to the mixing vats. Workers will wear impermeable gloves, eye protection and impermeable trousers or suits when required. Exposure from the notified polymer to these workers can occur by either dermal or ocular routes, however significant exposure will be limited by the workplace practices, personal protective equipment and plant design used.

Throughout end use, spray painters may come into contact with the notified polymer through dermal, inhalation and ocular routes. The likelihood of exposure, however, will be minimal as application is done in a ventilated spray booth. Air supplied breathing apparatus is used in conjunction with the application of product containing RC-49227 due to the necessity of isocyanate curing.

The use of the paint containing the notified polymer expected to be in accordance with the NOHSC National Guidance material for Spray Painting (NOHSC, 1999). The level of protection from exposure afforded by the standard control measures to protect against the isocyanate will minimise any exposure from the notified polymer. PPE used will be impermeable gloves (butyl rubber) in accordance with ANZS2161, eye/face protection goggles in accordance with ANZS1336 and ANZS1337, supplied air respiratory protection in accordance with ANZS1716 and ANZS1715 and clothing in accordance with AS2919.

When the paint containing the notified polymer has dried and cured and the notified polymer RC-49227 will have chemically reacted, creating a new species as a paint film, which is unavailable for exposure to humans or the environment.

## 6.2. Summary of Public Exposure

The notified polymer will not be available to the public and will be sold to smash repair businesses for use by technically qualified spray painters. Members of the public will not come into contact with the notified polymer until it has completely reacted, cross-linked and transformed into a fully integrated constituent of a non-reactive paint film covering the surface of the vehicle.

## 6.3. Summary of Environmental Exposure

### 6.3.1. Environmental Release

#### Local Manufacturing Process

During paint manufacture, there is potential for small releases through spills, which will be contained within bunded areas and collected for disposal. In the event of a wash out of the mixer, the maximum loss will be 2 % (up to 400 kg per annum) of the notified polymer dissolved in the wash out solvent. The solvent recycling company will dispose of the RC-49227 contained in the used wash solvent in accordance with NSW EPA protocol. It is assumed that 2 % of the notified polymer remains in each 200 L imported drum. This is removed during drum recycling by washing or incineration. Drum washings are treated by distillation.

#### Local Spray painting

- Waste attached to disposed container

be wasted annually in the residual paint in end-user containers. Traditionally, used paint cans have been crushed and sent to landfill. However due to a Coating Care program being extended by the Packaging Covenant to steel cans used by industry this residue may also be incinerated in a steel furnace.

- Residues from paint as sprayed

Over-spray will be between 20 % and 50 %. A water curtain will capture it or it will be captured by

spray booth/room filters and directed to landfill as dried insoluble polymer that has met NSW state EPA tests for water extra able fractions. In a worst case situation up to 50 % of the notified polymer will be lost due to over spray. Note: 50 % over spray is a maximum amount; normally over spray would be less than 20 % for an experienced tradesman.

- Residues from paint in mixing container

Residual paint remaining in the mixing container is washed out with a solvent wash. This accounts for approximately 5 % of the imported polymer.

- Residues from Cleaning Spray Equipment

After refinishing is complete the spray gun and lines will be emptied and any residual paint will be placed into a waste paint drum for recycling. The spray gun and lines are then washed with recycled solvent with the resultant effluent going to solvent recovery. Approximately 5 % of the imported notified polymer would be lost in this way.

Hence the Maximum total amount of RC-49917 resin released during use is:

$$5\%_{\text{container}} + 50\%_{\text{over-spray}} + 5\%_{\text{mixing}} + 5\%_{\text{cleaning}} = 65\% \text{ used in Australian consumed products.}$$

Release to the environment during shipping, transport and warehousing will only occur through accidental spills or leaks of the drums or steel packaged containers.

During formulation and packaging, spills are expected to be minimal. When spills occur, they will be contained by bunding, collected with absorbent material and sent to a licensed off site waste disposal centre. Empty drums from import will be sent to drum reconditioning firms where any residuals are removed by flushing or burning so that the drum is clean for reuse. Any unburnt waste from drum cleaning is treated by a N.S.W EPA protocol that eliminates any water-soluble fraction. Total waste from all sources that may escape untreated to the environment is expected to be  $\leq 2\%$  of the total import volume.

### 6.3.2. Environmental Fate

The notified polymer is expected to be hydrolytically stable and to not be readily biodegradable. Due to its hydrophobic nature, it is expected that the notified polymer will be stable in landfill and if released will associate with sediments and organic phases of soil and sediments, and slowly degrade to simple carbon compounds. During automobile recycling, the polymer will be destroyed in the steel furnace.

## 7. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance at 20°C and 101.3 kPa</b>	Semi-viscous liquid
<b>Melting Point/Glass Transition Temp</b>	125-190°C
<b>Density</b>	1.02 kg/m <sup>3</sup>
<b>Water Solubility</b>	Low
<b>Reactivity</b>	Stable under normal environmental conditions
<b>Degradation Products</b>	None under normal conditions of use
<b>Flash Point</b>	37.8-60.6°C
<b>Auto ignition Temperature</b>	407-479°C
<b>Flammability Limit LEL</b>	0.9
<b>Flammability Limit UEL</b>	7.6

### 7.1. Comments

The polymer is never isolated from solution and the data above is for the solution polymer RC-49227. While water solubility testing has not been undertaken the polymer has a NAMW > 1,000 with hydrophobic structure. The solubility is not determined for this polymer and would be expected to have solubility < 1ppm. When cross-linked the paint film will be insoluble.

## **8. HUMAN HEALTH IMPLICATIONS**

### **8.1. Toxicology**

No toxicological data were submitted.

### **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.

### **9.2. Environmental Hazard Assessment**

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

## **10. RISK ASSESSMENT**

### **10.1. Environment**

The polymer is composed of hydrophobic monomers with NAMW > 1,000 and if released would be expected to associate with sediments and the organic fraction of the soil partition. The use pattern is highly diffuse within cities and towns.

No aquatic exposure is anticipated during manufacture and end use of the notified polymer. It is envisaged that the 2 % waste would be generated from the paint manufacturing process. These wastes would be collected by licensed waste contractors and be either incinerated or reduced to an insoluble polymer mass meeting EPA criteria that may be used as a rubberiser and tackifier in road base.

It is expected that practically all of the waste generated from end users (50 % as over spray) will be solidified and disposed of in approved landfills as inert solid waste by solvent recyclers to state EPA specifications. In landfill, the solid wastes will not be mobile and will degrade slowly and not pose a significant risk to the environment.

The environmental risk presented by the notified polymer is expected to be low, based on low hazard and aquatic exposure.

### **10.2. Occupational Health and Safety**

The OHS risk presented by the notified polymer is expected to be low, based on low hazard that is required of a polymer meeting the criteria of polymers of low concern. Combined with low exposure and the use of engineering controls and personal protective equipment, workers will be well protected from all hazardous ingredients including isocyanates and resulting in a high level of protection from the notified polymer RC-49227. The notified polymer may be present in formulations containing other hazardous ingredients. If these formulations are classified as hazardous to health in accordance with the to the NOHSC Approved Criteria for Classifying Hazardous Substances workplace practices and control procedures consistent with the provisions of the State and Territory hazardous substances legislation must be in operation.

### **10.3. Public Health**

The notified polymer will not be sold to the public, being used by professional spray painters in a controlled industrial setting. Once the polymer is applied and cured it will be contained in an inert matrix, and hence will not be bio-available. Risk to the public is considered low.

## **11. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS**

### 11.1. Environmental Risk Assessment

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

### 11.2. Human Health Risk Assessment

#### 11.2.1. Occupational health and safety

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

#### 11.2.2. Public health

There is Negligible Concern to public health when used in the proposed manner.

## 12. MATERIAL SAFETY DATA SHEET

### 12.1. Material Safety Data Sheet

The notifier has provided a material safety data sheet (MSDS) as part of the notification statement. The accuracy of the information on the MSDS remains the responsibility of the applicant.

## 13. 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

- The following control measures should be implemented by the notifier to minimise environmental exposure during formulation of the notified polymer:
  - Bunding
- The following control measures should be implemented by end users (spray painters) to minimise environmental exposure during use of the notified polymer:
  - Exhaust ventilation with filter

#### Disposal

- The notified polymer should be disposed of to landfill or incinerated.
- Empty containers should be sent to local recycling or waste disposal facilities.

#### Emergency procedures

- Spills of the notified polymer should be handled by absorbing with sand and put into suitable container for disposal. Contaminated containers can be re-used after cleaning.

**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.

**14. BIBLIOGRAPHY**

National Occupational Health and Safety Commission NOHSC (1999) National Guidance Material for Spray Painting. Australian Government Publishing Service, Canberra.