

File No SAPLC/9

11 October 2005

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

**FULL PUBLIC REPORT**

**Polymer in RCP-49315**

This Self 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. The data supporting this assessment will be subject to audit by NICNAS.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at:

Library  
Australian Safety and Compensation Council  
25 Constitution Avenue  
CANBERRA ACT 2600  
AUSTRALIA

To arrange an appointment contact the Librarian on TEL + 61 2 6279 1162 or email [ascc.library@dewr.gov.au](mailto:ascc.library@dewr.gov.au)

This Full Public Report is available for viewing and downloading from the NICNAS website or available on request, free of charge, by contacting NICNAS. For requests and enquiries please contact the NICNAS Administration Coordinator at:

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:	<a href="http://www.nicnas.gov.au">www.nicnas.gov.au</a>

**Director  
NICNAS**

## **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
5. PROCESS AND RELEASE INFORMATION .....	4
5.1. Operation Description .....	4
6. EXPOSURE INFORMATION .....	5
6.1. Summary of Occupational Exposure .....	5
6.2. Summary of Public Exposure .....	6
6.3. Summary of Environmental Exposure .....	6
6.3.1. Environmental Release .....	6
6.3.2. Environmental Fate .....	7
7. PHYSICAL AND CHEMICAL PROPERTIES .....	7
7.1. Comments .....	7
8. HUMAN HEALTH IMPLICATIONS .....	7
8.1. Toxicology .....	7
8.2. Human Health Hazard Assessment .....	7
9. ENVIRONMENTAL HAZARDS .....	7
9.1. Ecotoxicology .....	7
9.2. Environmental Hazard Assessment .....	7
10. RISK ASSESSMENT .....	8
10.1. Environment .....	8
10.2. Occupational Health and Safety .....	8
10.3. Public Health .....	8
11. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS .....	8
11.1. Environmental Risk Assessment .....	8
11.2. Human Health Risk Assessment .....	9
11.2.1. Occupational health and safety .....	9
11.2.2. Public health .....	9
12. MATERIAL SAFETY DATA SHEET .....	9
12.1. Material Safety Data Sheet .....	9
13. RECOMMENDATIONS .....	9
13.1. Secondary Notification .....	10

## **FULL PUBLIC REPORT**

### **Polymer in RCP-49315**

#### **1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

DuPont (Australia) Ltd (ABN: 59 000 716 469)  
168 Walker Street  
NORTH SYDNEY  
N.S.W. 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, Manufacture/Import Volume, and Site of Manufacture/Reformulation

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

#### **2. IDENTITY OF CHEMICAL**

OTHER NAME(S)

Polymer in RC-49315

MARKETING NAME(S)

Polymer in RC-49315

CAS NUMBER

None allocated

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) >1000

#### **3. COMPOSITION**

PLC CRITERIA JUSTIFICATION

The notified polymer does not contain any moderate or high concern reactive functional groups

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</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

Australia as either a < 40% component in a finished paint or a <90% resin solution for local paint manufacture.

The imported paint product will be contained in a 1L; 0.95L, 3.78L or 4L steel can or resin solution in a steel 200L steel drum. The imported RC-49315 resin solution will be formulated in Australia into finished automotive spray paints. Both the paint and resin will be imported in LCL through the ports of Sydney or Melbourne and transported from the wharf in container, unpacked and stored in a local warehouse licensed to hold dangerous goods.

##### 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>	3-10	10-30	10-30	10-30	10-30

##### USE

The notified polymer will be used in automotive paints for professional use. 90% of the above volume will potentially be exported as finished product.

#### 5. PROCESS AND RELEASE INFORMATION

##### 5.1. Operation Description

###### Manufacturing

The notified polymer will either be imported as a component of finished paint manufactured overseas or as an ingredient for local manufacture. Local manufacture using RC49315 occurs at the DPC factory at 15-23 Melbourne Rd Riverstone NSW 2765.

RC-49315 is imported in 200 L steel drums 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, 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 automatic mixing tank using a trolley jack with tilt facility and loaded into a closed tank. Other ingredients are added to the batch and stirred mechanically. The tank solvent fume is exhausted to the atmosphere.

Once combined with other ingredients into the finished paint product, it will be automatically stirred till homogenous.

When the batch of paint is completed, quality assurance tests and approves the quality before, the paint is gravity fed to a semi automatic filling machine where it is filled into approved steel containers of 1L or 4L capacity then labelled according to the NOHSC code and packed for warehousing. The finished paint is either transported to the warehouse, or immediately containerised for distribution. Imported finished paint product, may also be stored in the warehouse.

Individual end user orders are re-aggregated paint into cartons with other paint types to be transported to the final destination; the spray painter/smash repairer. Product containing RC-49315 may be sold singly or packed in cardboard cartons, each carton holding four, 1L, 4 L or 5 L cans

#### End Use.

Spray-painters who are qualified, professional tradesmen mix the RC-49315 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**

Manufacturing workers may be exposed to the <80% solution of notified polymer through accidental leaks and spills or when opening containers, and during weighing and measuring RC-49315 for production. 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 solution of the notified polymer via the 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 by 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. The overall risk is exceedingly low.

Paint manufacturing workers will semi-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 spray painting personnel weigh or measure and mix the paint components containing RC49315 together with solvent and part "B" isocyanate into a spray gun pot. This operation occurs in an area with fume extraction that maintains solvent levels below the TWA and the explosive limit. The workers wear PPE of solvent resistant nitrile rubber gloves or similar.

The spray application of the paint occurs in a ventilated spray booth with water wall or filtration to capture over spray. Air supplied breathing apparatus is used in conjunction with product containing RC-49315 due to its requirement for isocyanate curing. The use of the paint containing the polymer should 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

from the isocyanate will negate any exposure to the polymer. PPE will be impermeable gloves (Butyl rubber) ANZS2161, Eye/Face protection goggles ANZS1336 and ANZS1337, supplied air respiratory protection ANZS1716 and ANZS1715 and clothing AS2919.

After spray application the dried paint containing the notified polymer has cured and the polymer RC-49315 is chemically reacted into a new species of ultra high molecular weight 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 used to clean the manufacturing equipment.

A solvent recycling company will dispose of the RC-49315 residue contained in the used wash solvent by complying with N.S.W. EPA protocol allowing no water-soluble fractions of polymer to remain in distillation residuals when disposed to landfill or use as a asphalt tackifier. It is assumed that 2.5% of the notified polymer remains in each 200 L imported drum. This is removed during drum recycling by solvent washing or incineration. The drum recycle wash solvent is treated to the same EPA protocol allowing no soluble fraction.

#### Local Spray painting

- Waste attached to disposed container

Approximately 5% of the notified polymer will be wasted annually in the residual paint in end-user containers. Traditionally, used paint cans have been crushed and sent to landfill. Alternately used steel paint cans may be recycled to new steel and incinerating residual paint.

- Residues from paint as sprayed

Over spray will be between 20% and 50%. A water curtain will capture it or spray booth/room filters and directed to landfill as dried insoluble polymer that has met EPA tests. Thus, in a worst case up to 50% of the notified polymer will be lost due to over spray

- 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 RCP 49315 resin released during Australian use is:

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

Only the 5%<sub>container</sub> remains as RC49315 all other residues have been catalysed and transformed by polyisocyanate into large molecules.

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 recondition 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 EPA protocol that polymerises the RC49315 residues with other polymers to such an extent as to eliminate any water-soluble fraction.

Residue from solvent reclamation of dirty solvents and paints are treated by the same EPA protocol to render the high polymer mass insoluble. The residues are also tested for water extractable fraction before being sent to landfill or being used as an asphalt tackifier.

Waste RC49315 from all sources released to the environment is expected to be less than 2 % of the import volume.

#### **6.3.2. Environmental Fate**

The notified polymer is expected to be hydrolytically stable in the environmental pH range and not readily biodegradable. Due to its hydrophobic nature, it is expected that the notified polymer will be stable in landfill and slowly degrade over a long period. If released the polymer will preferentially associate with sediments and organic phases of soil and sediments, and slowly degrade by biotic and abiotic processes 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 - 126°C
<b>Density</b>	1010 kg/m <sup>3</sup> (solution polymer)
<b>Water Solubility</b>	< 5 to 10% based on analogue
<b>Reactivity</b>	Stable under normal environmental conditions
<b>Flash Point</b>	22.8 – 37.8°C
<b>Auto ignition temperature</b>	407°C
<b>Flammability Limit LEL</b>	1.4
<b>Flammability Limit UEL</b>	7.6
<b>Degradation Products</b>	None under normal conditions of use. Will degrade into CO, CO <sub>2</sub> , H <sub>2</sub> O and carbon fragments in fire or heated above 407°C. Hydrolysis of the isocyanate cross-linked polymer is highly stable and will occur over long periods. Hydrolysis may occur slowly transforming into CO, CO <sub>2</sub> , H <sub>2</sub> O

#### **7.1. Comments**

The polymer is never isolated from solution and the above is for the 50% solution polymer.

## **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**

Poly non-ionic polymers with NAMW > 1,000 are of low concern to the aquatic department.

## **10. RISK ASSESSMENT**

### **10.1. Environment**

The polymer is imported as a component for paint. It is a polymer conforming to PLC criteria with NAMW >1,000 and expected to be soluble at <10%wt based on an analogue.

Polymer released into the environment would not be expected to rapidly degrade, instead associate with aquatic sediments and the organic fraction of the aquatic and soil partitions. The use pattern is highly diffuse within cities and towns.

No environmental release with aquatic exposure is anticipated during manufacture and end use of the notified polymer with controls mitigating release to the environment. It is envisaged that the 2% waste would be generated from the paint manufacturing process through equipment washout and a further 2% will remain attached to the containers used to import RC-49315 and will be removed by incineration or washout by drum reconditioning firms.

Solvent washout wastes are collected by licensed waste contractors and solvent reclaimed by distillation and polymer residue reduced to an insoluble polymer mass meeting NSW EPA criteria for water extractable fractions. The residual polymer mass is suitable as a rubberiser and tackifier in road base or can be land filled.

It is expected that the waste generated by Spray painter end users will be up to 65%, primarily as over spray) and will be catalysed, solidified and disposed to the solvent recycling firm and also treated to state EPA specifications. and disposed into road base or approved landfills. The solid wastes after treatment will not be mobile and will degrade slowly and not pose a significant risk to the environment.

Residuals of 5% of RC49315 remains attached to the container supplied to end-users. The container should be scraped clean before disposal. RC-49315 attached to the steel can will be destroyed in a steel furnace when the can is recycled as will any paint on the steel shell of a car. Greater than 95% waste RC-49315 will either be collected by controls, transformed or incinerated and made unavailable to the environment. The residual will preferably associate with sediments.

The environmental risk presented by the notified polymer is expected to be low, based on the 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 and low exposure as well as the engineering controls and personal protective equipment used by workers to protect from other hazardous ingredients resulting in a high level of protection from RC-49315. The notified polymer may be present in formulations containing other hazardous ingredients. Formulations classified as hazardous to health in accordance with the to the *NOHSC Approved Criteria for Classifying Hazardous Substances* workplace practices must use control procedures consistent with the provisions of the State and Territory hazardous Substances legislation.

### **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 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 or work practices 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.

- Personal protective equipment required during formulation are
  - Eye protection (safety glasses or goggles)
  - Impermeable gloves
  - Industrial clothing and footwear
  - Breathing Protection
- 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/release of the notified polymer should be handled by absorbing with sand and placing 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.