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

**FULL PUBLIC REPORT**

**Notified Polymer in RC-49912**

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**Director  
NICNAS**

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## FULL PUBLIC REPORT

### Notified Polymer in RC-49912

#### 1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

DuPont (Australia) Ltd (ABN: 59 000 716 469)

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 include the following or any inference of the following:

Chemical Name

Other Names

Molecular Formula

Structural Formula

CAS Number

Polymer Constituents

Use

Volume of import

Molecular weight

Quantity of finished product using notified chemical

Detailed technical function of notified chemical

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

Nil

NOTIFICATION IN OTHER COUNTRIES

Nil

#### 2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

RC-49912

#### 3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</i>
Meets Molecular Weight Requirements	Yes
Meets Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
No Substantial Degradability	Yes
Not Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Not a Hazardous 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 resin manufacturing of RC-49912 will occur in the USA or Europe and it will be imported into Australia as either a < 50% component in a finished paint or a resin solution for paint manufacture.

The paint product will be imported as either finished paint contained in steel cans or resin solution mixed in solvent contained in a steel drum. The imported RC-49912 resin solution will be formulated in Australia into finished automotive spray paints. The paint and resin will be imported in LCL through the port of Sydney, transported from the wharf in the container 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>	<10	<50	<50	<100	<100

##### USE

The notified chemical will be used as a polymer in automotive paints for professional use.

#### 5. PROCESS AND RELEASE INFORMATION

##### 5.1. Operation Description

###### Paint Manufacturing

The majority of the notified polymer will be imported as a component of a pre prepared paint synthesized by DuPont overseas. RC-49912 will be imported to be used in the manufacturing of paint at the DPC Sydney factory or as a component of finished products ready for use in the automotive refinish trade.

For local paint manufacturing RC-49912 will be imported in 200L 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 local paint manufacture, the notified polymer will be semi-manually weighed and transferred to a mechanically stirred, enclosed, mixer 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 is gravity fed to the filling station where it will be semi automatically filled into steel containers of 1L or 4L capacity labelled and packed for warehouse storage of container distribution.

Once finished, a 200-500ml sample of paint is taken and tested. Once approved by QA, the paint is gravity fed and filled into 1L or 4L mild steel approved cans and labelled with NOHSC compliant labels. The finished paint is transported to the warehouse, or immediately containerised for distribution or export.

RC-49912 will also be imported as a component of DuPont pre prepared paint in a 1L or 4L steel cans packed in boxes within a mixed FCL sea freight container. The container will be transported from the wharf to warehouse site for storage and relabelling with NOHSC compliant labels. 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.

At the warehouse individual orders are re-aggregated into cartons with other paint types to be transported to the final destination; the spray painter/smash repairer.

###### End Use.

Spray-painters who are qualified, professional tradesmen, mix the paint containing RC-49912 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 a solution of the notified polymer at <50% when opening containers, and during weighing and measuring. Dermal exposure is expected to be the major route of exposure, however ocular exposure may occur due to accidental splashing and secondary transfer from gloved hands. Workers may also be exposed to the solution of the notified polymer via the dermal, ocular and inhalation routes during spraying.

The finished paint product is sprayed in a spray-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 spray painting 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 (transformed) into an inert matrix and is unavailable for release and 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.

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-49912 due to the necessity of isocyanate curing.

Before the paint can be sprayed it must first be prepared by measuring and mixing the components which is carried out using either flame proof balances or calibrated mixing cylinders in an area with fume extraction so that solvent concentrations remain below the AELs. While measuring the paint components the workers wear industrial clothing of cotton suit, butyl rubber gloves and face shield or goggles.

The spray use of the paint containing the polymer is expected to be in accordance with the NOHSC National Guidance material for Spray Painting. 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, the notified polymer RC-49912 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 resin is to be used as a clear topcoat on motor vehicles. The fully cured finished topcoat will come in contact with the general public. However at that stage the polymer will be fully adhered to the vehicles outer surface forming a continuous molecule of infinite size and is consequently rendered non-hazardous.

### 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 2 tonnes 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-49912 residue contained in the used wash solvent by complying with NSW EPA protocol allowing no water-soluble fractions of polymer to remain in distillation residuals when disposed to landfill or use as an 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 to NSW EPA standards.

##### Local Spray painting

- Waste attached to disposed paint 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 scraped clean, 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 the spray painting process

Overspray that misses the item being sprayed will be between 20% and 50%. Either a water curtain or spray booth/room filters will capture overspray and it will be directed to solvent recycling waste or landfill as dried insoluble polymer that meets NSW State EPA tests for water extractable fractions. In a worst case up to 50% of the notified polymer will be lost due to overspray. Note: 50% overspray is a maximum amount; normally overspray would be less than 20% for an experienced tradesman.

- Residues of 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-49912 resin released during use applies to the volume of the RC-49912 used locally and will be:

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

Only the component labelled  $5\%_{\text{container}}$  will be available to be released to the environment as the polymer RC-49912 attached to the container (steel can) as sold to the end user. The remaining 60% of the resin released will have been mixed with polyisocyanate and thus RC-49912 will be consumed as it is transformed by polymerisation. These transformed polymers are extracted from waste solvent and residues in the process of solvent recycling. 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 NSW EPA protocol that eliminates any water-soluble fraction. Total waste from all sources released to the environment is expected to be approximately 5% or less of the total import volume of RC-49912.

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

### 6.3.2. Environmental Fate

The notified polymer meets the criteria for a polymer of low concern and is expected to be hydrolytically stable and not 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, releasing oxides of carbon and water vapour.

## 7. ESTABLISHMENT OF LOW PHYSICAL AND CHEMICAL HAZARD

Physico-chemical properties for the notified polymer are unknown. Those listed below are for the imported polymer solution: RC-49912

<b>Appearance at 20°C and 101.3 kPa</b>	Clear semi-viscous liquid
<b>Boiling Point</b>	125-140°C
<b>Density</b>	930 kg/m <sup>3</sup> (imported polymer solution)
<b>Water Solubility</b>	2.71 mg/L based on analogue being RC-49668. In spite of differences in structural formula, it is expected to have similar properties.
<b>Hydrolysis as a function of pH</b>	The polymer contains hydrolysable groups; however hydrolysis is unlikely in the environmental pH range of 4 to 9, due to the polymer's low water solubility.
<b>Dissociation Constant</b>	Anionic groups are present; these are expected to shown typical acidity.
<b>Reactivity</b>	Stable under normal environmental conditions.
<b>Flash Point</b>	25°C (imported polymer solution)
<b>Auto ignition temperature</b>	407-432°C
<b>Flammability Limit LEL</b>	1% (imported polymer solution)
<b>Flammability Limit UEL</b>	12.3% (imported polymer solution)
<b>Comments</b>	The polymer is never isolated from solution and the data above is for the solution polymer RC-49912. Water solubility testing has been undertaken for a close analogue polymer to RC-49912 having a NAMW >1,000 (RC-49668).

## 8. ESTABLISHMENT OF LOW HUMAN HAZARD

### 8.1. Toxicology

No toxicological data are available for the notified polymer and no data are required for a polymer of low concern.

## 9. ENVIRONMENTAL HAZARDS

### 9.1. Ecotoxicology

No ecotoxicological data were submitted as allowed for a PLC.

### 9.2. Environmental Hazard Assessment

The polymer is largely non-ionic with NAMW > 1,000 and should thus be of low concern. However, it contains minor quantities of carboxylic acid functionality and hence it may be moderately toxic to algae. The mode of toxic action is overchelation of nutrient elements needed by algae for growth. The highest toxicity is when the anionic group is on alternating carbons of the polymer backbone. This is unlikely to apply to the notified polymer. The toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups.

## **10. RISK ASSESSMENT**

### **10.1. Environment**

The notified polymer meets the PLC criteria and is, therefore, expected to be of low environmental hazard.

While potentially anionic, the polymer contains many hydrophobic functional groups and has NAMW >1,000. The polymer is not expected to be toxic to aquatic organisms up to the level of its solubility. Consequently, irrespective of the polymer's release pattern, it is unlikely to pose an unacceptable risk to the aquatic environment. If released it is expected to associate with sediments and the organic fraction of the soil. 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 a maximum of 1% waste of the imported RC-49912 may be released to the environment attached to the container.

All other wastes are collected by licensed waste contractors and will be either incinerated or reduced to an insoluble polymer mass meeting EPA criteria for no measurable water extractable fractions, then used as a rubberiser and tackifier in road base or landfilled.

It is expected that all of the waste generated from end users as over spray will be solidified and disposed of in approved landfills as inert solid waste by solvent recyclers to state EPA specifications into road base. 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 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 that is expected for polymers 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, resulting in a high level of protection from the notified polymer in RC-49912. 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 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 from RC-49912 to occupational health and safety under the conditions of the occupational settings described due to the high level of personal protective equipment used to protect workers against the isocyanate and solvents. Both these pose a greater risk than the notified polymer.



### 11.2.2. Public health

The notified polymer is intended for use by professional spray painters in auto repair workshops only and will not be sold to the public. Following application the polymer is trapped as an integral part of the paint film and will not be bioavailable. The risk to the public from contact with the polymer is considered low.

## 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 *ICNA Act*. 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 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.