File No PLC/579

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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer in RC-29937

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Director
NICNAS

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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, Details of Notifications in Other Countries, 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 and Canada

2. IDENTITY OF CHEMICAL

OTHER NAME(S)
Polymer in RC-29937

MARKETING NAME(S)
Polymer in RC-29937

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

Criterion	*Criterion met (yes/no/not applicable)*
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 resin manufacturing of RCP-29937 will occur in the USA or Europe and will be imported into Australia as either a < 50% component in a finished paint or a resin solution for paint manufacture.

The imported paint product will be imported as either finished paint contained in a 3.78L steel can or resin solution mixed in solvent contained in a steel 200L steel drum. The imported RCP-29937 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 and transported from the wharf in container and stored in a local warehouse licensed to hold dangerous goods.

MAXIMUM INTRODUCTION VOLUME OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	3-10	30-100	30-100	30-100	30-100

USE
The notified polymer will be used 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 RCP-29937, which is used in the manufacturing paint at the DPC factory at 15-23 Melbourne Rd Riverstone NSW 2765.

RCP-29937 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 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 is gravity fed to the filling station where it will be semi automatically filled into steel containers, of 5L , 4L or 1 L capacity labelled and packed for warehouse storage of container distribution.

Once finished paint is tested and approved by QA, the paint is gravity fed and filled into 1L, 4L and 5L 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 or export.

Imported finished paint product, which has been manufactured overseas, may also be stored in the warehouse.

At the warehouse individual 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 RCP-29937 may be sold singly or packed in cardboard cartons, each carton holding four, 1L, 3.785 L, 4 L or 5 L cans.

End Use.
Spray-painters who are qualified, professional tradesmen mix the paint containing RCP-29937 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 the <80% solution of notified polymer 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 manufacturing of paint and spraying of the finished product.
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.

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 the plant design.

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 RCP-29937 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 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 RCP-29937 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 2000 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 RCP-29937 residue contained in the used wash solvent by complying with N.S.W. EPA protocol allowing no water-soluble fractions of polymer 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.

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

Over spray that misses the item being sprayed will be between 20% and 50%. Either a water curtain will capture over spray or spray booth/room filters and directed to solvent recycling waste or landfill as dried insoluble polymer that meets NSW state EPA tests for water extra able fractions. In a worst case up to 50% of the notified polymer will be lost due to over spray. 50% over spray is a maximum amount; normally over spray 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 recycle 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-29937 resin released during use applies to the volume of the RC29937 used locally and will be:

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

Only the component labelled $5\%_{container}$ will be available to be released to the environment as the polymer RC-29937 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-29937 will 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 N.S.W. EPA protocol that eliminates any water-soluble fraction. Total waste form all sources released to the environment is expected to be approximately < 0.5 % of the total import volume of RCP29937.

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 conforms to 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.

7. PHYSICAL AND CHEMICAL PROPERTIES

Physico-chemical properties for the notified polymer are unknown. Those listed below are for the imported polymer solution: RCP-29937

Appearance at 20ºC and 101.3 kPa	Semi-viscous liquid
Melting Point/Glass Transition Temp	118ºC ºC
Density	1010 kg/m^3
Water Solubility	< 0.47% based on analogue (DuPont)
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use. When exposed to high temperatures may produce CO_2, CO and H_2O.
Flash Point	48.8ºC
Auto ignition temperature	532.8ºC
Flammability Limit LEL	1.1
Flammability Limit UEL	7.5

7.1. Comments

The polymer is never isolated from solution and the data above is for the solution polymer RCP-29937. Water solubility testing has been undertaken for a close analogue polymer to RCP29937 having a NAMW >1,000.

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

Non-ionic polymers with NAMW > 1,000 are of low concern

10. RISK ASSESSMENT

10.1. Environment

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

The polymer is highly hydrophobic 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 a maximum of 0.5% waste of the imported RCP-29937 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 land filled.

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 environment 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 required of a 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 isocynates and resulting in a high level of protection from the notified polymer RCP-29937. 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 in the notification statement.

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 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 incineration..
- Empty containers should be sent to local recycling or waster disposal facilities

Emergency procedures

Spills/release of the notified polymer should be handled by absorbing with sand and placing in suitable containers 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.