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

**PUBLIC REPORT**

**Polymer in RC-49029**

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 Sustainability, Environment, Water, Population and Communities.

For the purposes of subsection 78(1) of the Act, this Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This Public Report is also 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:

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**Director  
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## SUMMARY

The following details will be published in the NICNAS *Chemical Gazette*:

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS SUBSTANCE	INTRODUCTION VOLUME	USE
LTD/1599	DuPont (Australia) Ltd	Polymer in RC-49029	ND*	≤ 8 tonnes per annum	Component of automotive refinish paint

\*ND = not determined

## CONCLUSIONS AND REGULATORY OBLIGATIONS

### **Hazard classification**

As no toxicity data were provided, the notified polymer cannot be classified according to the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

### **Human health risk assessment**

Under the conditions of the occupational settings described, the notified polymer is not considered to pose an unreasonable risk to the health of workers.

When used in the proposed manner, the notified polymer is not considered to pose an unreasonable risk to public health.

### **Environmental risk assessment**

On the basis of the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

### **Recommendations**

#### CONTROL MEASURES

##### Occupational Health and Safety

- Based on the information provided, no specific engineering controls 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.

- Spray applications should be carried out in accordance with the Safe Work Australia *National Guidance Material for Spray Painting* [NOHSC (1999)] or relevant State and Territory Codes of Practice.
- 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 *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)] 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 to landfill.

#### Emergency procedures

- Spills or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

### Regulatory Obligations

#### *Secondary Notification*

This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the chemical under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified chemical, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under Section 64(1) of the Act; if
  - the polymer has a number-average molecular weight of less than 1000;or
- (2) Under Section 64(2) of the Act; if
  - the function or use of the polymer has changed from a component of automotive paints, or is likely to change significantly;
  - the amount of polymer being introduced has increased from 8 tonnes per annum, or is likely to increase, significantly;
  - the polymer has begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the polymer on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

#### *Material Safety Data Sheet*

The MSDS of the notified polymer and products containing the notified chemical provided by the notifier were reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.

## **ASSESSMENT DETAILS**

This notification has been conducted under the cooperative arrangement with the United States Environmental Protection Agency (US EPA). Information pertaining to the assessment of the notified chemical by the US EPA was provided to NICNAS and, where appropriate, used in this assessment report. The other elements of the risk assessment, including the recommendations on safe use of the notified chemical, were carried out by NICNAS.

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

#### APPLICANT(S)

DuPont (Australia) Ltd (ABN 59 000 716 469)  
7 Eden Park Drive  
Macquarie Park NSW 2113

#### NOTIFICATION CATEGORY

Limited: Synthetic polymer with  $M_n \geq 1000$  Da.

#### EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: chemical name, CAS number, molecular and structural formulae, molecular weight, analytical data, degree of purity, polymer constituents, residual monomers, impurities, use details and import volume.

## VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: melting point, boiling point, vapour pressure, hydrolysis as a function of pH, partition coefficient, adsorption/desorption, dissociation constant, flash point, flammability, explosive properties and oxidising properties.

## PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

## NOTIFICATION IN OTHER COUNTRIES

USA (1996), Canada and Korea

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

RC-49029

## MOLECULAR WEIGHT

> 1,000 Da.

## ANALYTICAL DATA

Reference IR and GPC spectra were provided.

**3. COMPOSITION**

DEGREE OF PURITY > 90%

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS Below classification cut-offs

NON HAZARDOUS IMPURITIES/RESIDUAL MONOMERS (> 1% by weight) None

ADDITIVES/ADJUVANTS None

## LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

Not expected under normal conditions of use.

## DEGRADATION PRODUCTS

Not expected to occur under normal conditions of use.

**4. PHYSICAL AND CHEMICAL PROPERTIES**

APPEARANCE AT 20 °C AND 101.3 kPa: White solid

Property	Value	Data Source/Justification
Melting Point/Freezing Point	90.27°C	Calculated (EPIWIN)
Boiling Point	Not determined	Expected to decompose prior to boiling
Density	1,180 kg/m <sup>3</sup> at 20°C	Measured
Vapour Pressure	< 1.3 × 10 <sup>-9</sup> kPa	Estimated based on the NAMW > 1,000 Da (US EPA, 2007)
Water Extractability	0.73% at pH 2; 1.42% at pH 7; and 100% at pH 9 at 40°C	Measured
Hydrolysis as a Function of pH	Stable at pH 1.2, 4, 7 and 9 at 40°C.	The notified polymer contains hydrolysable functional groups. However, hydrolysis is not expected to be significant in the environmental pH range of 4-9.
Partition Coefficient (n-octanol/water)	Not determined	Partition coefficient for polymers having high molecular weight is difficult to measure. However, it is noted that the polymer has a

Adsorption/Desorption	Not determined	predominantly hydrophobic structure and is likely to partition from water to octanol.
Dissociation Constant	Not determined	The notified polymer is expected to adsorb to soil and sediment very strongly (US report).
Particle Size	Not determined	The notified polymer contains functionality that has potential to be ionised in the environmental pH range of 4-9.
Flash Point	Not determined	Not introduced in solid form.
Flammability	Not determined	Decomposes before boiling and hence cannot vapourise to form a flammable mixture in the air.
Autoignition Temperature	> 270°C	Decomposes before boiling and hence cannot vapourise to form a flammable mixture in the air.
Explosive Properties	Not expected to be explosive	MSDS for the product
Oxidising Properties	Not expected to be oxidising	The structural formula contains no explosives.
		Estimated based on chemical structure.

#### DISCUSSION OF PROPERTIES

For full details of tests on physical and chemical properties that were not fully described in the US report, refer to Appendix A.

#### Reactivity

Stable under normal conditions of use.

#### Dangerous Goods classification

Based on the submitted physico-chemical data in the above table, the notified polymer is not classified according to the Australian Dangerous Goods Code (NTC, 2007). However, the data above do not address all Dangerous Goods endpoints. Therefore, consideration of all endpoints should be undertaken before a final decision on the Dangerous Goods classification is made by the introducer of the polymer.

## 5. INTRODUCTION AND USE INFORMATION

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

The notified polymer will not be manufactured or reformulated within Australia. The notified polymer will be imported at a concentration of < 5% in finished car refinish paints.

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

Year	1	2	3	4	5
Tonnes	< 1	< 3	< 3	< 4	< 8

#### PORT OF ENTRY

Sydney, Melbourne and Brisbane.

#### TRANSPORTATION AND PACKAGING

Imported finished products containing the notified polymer will be packaged in 1, 2 and 4 L steel cans or plastic containers. Transportation of products containing the notified polymer throughout Australia will predominantly be by road.

#### USE

The notified polymer will be used as a component of automotive refinish paints.

#### OPERATION DESCRIPTION

The notified polymer will not be manufactured, reformulated or repackaged in Australia.

The automotive refinish paints containing the notified polymer (< 5%) will be transported to the customers (crash repair shops) in the original packaging. The automotive refinish paints will be decanted into the spray equipment and applied to the car. The majority of spray applications will occur in a spray booth. The level of ventilation present in the spray booth will vary between workshops. In smaller automotive refinish repair shops spray applications may occur outside of a spray booth.

Once spraying is completed or the paint has been exhausted, the equipment is drained and cleaned using solvents and rags.

## 6. HUMAN HEALTH IMPLICATIONS

### 6.1. Exposure Assessment

#### 6.1.1. Occupational Exposure

<i>Category of Worker</i>	<i>Exposure Duration (hours/day)</i>	<i>Exposure Frequency (days/year)</i>
Transport driver to warehouse	4	4
Warehouse - inbound	1.0	4
Warehouse - outbound	0.5	250
Transport driver warehouse to spray shop	4.0	250
Refinish shop store man inwards	0.1	40
Spray painter decanting paint to spray gun reservoir/pot	0.1	125
Spray painter spraying car	0.3	125
Spray painter cleaning gun and equipment	0.2	125

#### EXPOSURE DETAILS

Exposure of transport and storage workers is not expected except in the event of accidental spillage or breach of packaging.

#### *Spray Application of Paint*

Dermal and ocular exposure to the notified polymer (< 5%) may occur during weighing and transfer of the automotive refinish paint. Inhalation exposure is unlikely due to the low estimated vapour pressure of the notified polymer. Exposure should be minimised where PPE consisting of coveralls, gloves and eye protection are worn. The level of PPE will vary between workshops.

Dermal and ocular exposure to the notified polymer (< 5%) may occur during spray application of the finished paints to automobile parts and when cleaning spray equipment. Exposure should be minimised where PPE consisting of coveralls, gloves, safety boots and eye protection goggles are worn. The level of PPE will vary between workshops.

Due to the formation of aerosols, inhalation exposure is possible during spray application, particularly where the level of ventilation within the spray booth is insufficient, application occurs outside of a spray booth and/or workers do not wear respirators.

Workers will likely make dermal contact with the notified polymer after application. However, once the paint is cured, the notified polymer will be reacted into the polymer matrix and will not be bioavailable.

#### 6.1.2. Public Exposure

The general public will not use products containing the notified polymer. The public will likely make dermal contact with surfaces containing the notified polymer on automobiles, however once cured the notified polymer is bound within a polymer matrix and will not be bioavailable.

### 6.2. Human Health Effects Assessment

No toxicity data were submitted. The notified polymer contains no functional groups of concern and is therefore not predicted to be hazardous. In addition, the notified polymer is not expected to be absorbed across biological membranes, based on the high molecular weight and low percentage of low molecular weight (< 1,000 Da) species.

**Health hazard classification**

As no toxicity data were provided, the notified polymer cannot be classified according to the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

**6.3. Human Health Risk Characterisation****6.3.1. Occupational Health and Safety**

Although the level of exposure will vary between workshops, given the expected low toxicity of the notified polymer based on the absence of functional groups of concern, the risk to workers is not considered to be unreasonable.

To minimise exposure to aerosols, spraying should be carried out according to the National Guidance Material for Spray Painting (NOHSC, 1999).

**6.3.2. Public Health**

The notified polymer will not be available to the public, except after the product has been applied and cured and the notified polymer becomes bound within a matrix. The notified polymer will not be available for exposure, hence the risk to the public is not considered unreasonable.

**7. ENVIRONMENTAL IMPLICATIONS****7.1. Environmental Exposure & Fate Assessment****7.1.1. Environmental Exposure****RELEASE OF CHEMICAL AT SITE**

The notified polymer will be imported as part of a finished product. No further reformulation is expected to occur in Australia. No significant release is expected from transportation and storage of the product containing the notified polymer.

**RELEASE OF CHEMICAL FROM USE**Residues in container:

Residues remaining in the container are estimated to be up to 5% of the imported amount of the notified polymer, 50% of which is expected to be disposed of to landfill with the containers. The remaining 50% may be sent to metal recyclers where the residual paint is burnt in the furnace, forming water, oxides of carbon, and oxides of phosphorous.

Releases from spray application:

Releases of the notified polymer from over spray is estimated to be up to 40% of the total import volume and is expected to be captured and collected by solvent recovery firms as insoluble solid polymer for disposal to landfill.

Residues from spray equipment cleaning:

Residual paint remaining in the mixing container is estimated to be 5% and is expected to be washed out with solvent. The notified polymer is expected to be collected as waste solid following normal solvent recovery processes, and will most likely be disposed of to landfill.

In summary, the total amount of the notified polymer released from application is expected to be 50% of the import volume, which is expected to be sent to landfill.

**RELEASE OF CHEMICAL FROM DISPOSAL**

About 50% of the notified polymer will be associated with automotive bodies via coating and is expected to share the fate of the substrates, which may be either thermally decomposed via metal recycling processes or sent to landfill.

**7.1.2. Environmental Fate**

No environmental fate data were submitted. Given the high molecular weight, the notified polymer is not expected to be bioaccumulative in aquatic organisms. No significant release of the notified polymer to the aquatic environment is expected based on the report use pattern. Most of the notified polymer is expected to be



end up in landfill in forms of residues, over-spray waste or with used substrates. In landfill, leaching is not expected due to the high molecular weight and hydrophobic properties under normal conditions. With time, the notified polymer will be gradually degraded via biotic and abiotic pathways, forming water, oxides of carbon and oxides of phosphorous.

#### **7.1.3. Predicted Environmental Concentration (PEC)**

Since no significant release of the notified polymer to the environment is expected, the Predicted Environmental Concentration (PEC) has not been calculated.

### **7.2. Environmental Effects Assessment**

No ecotoxicity data were submitted. This is considered acceptable since no significant release of the notified polymer to the aquatic environment is expected from the proposed use pattern. According to the US report, no toxicity is expected at saturation based on structure activity relationships (SARs) for polyanionic polymers.

#### **7.2.1. Predicted No-Effect Concentration**

The Predicted No-Effect Concentration (PNEC) has not been calculated since no ecotoxicity data for the notified polymer is available.

### **7.3. Environmental Risk Assessment**

The Risk Quotient (PEC/PNEC) has not been calculated since the PEC and PNEC have not been calculated. The notified polymer is not expected to be released in any significant amount to the aquatic environment.

Therefore, the notified polymer is not expected to pose any unreasonable risk to the aquatic environment based on the assessed use pattern.

For PBT classification purpose, the notified polymer may meet the criteria for persistence, however, it is not considered to meet the criteria for bioaccumulation due to the high molecular weight. It is also not expected to meet the criteria for toxicity according to the US report's predicted toxicity of the notified polymer.

### **APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES**

**Water Extractability** 0.73% at pH 2, 1.42% at pH 7, and 100% at pH 9 at 40°C

Method OECD TG 120  
 Remarks Flask Method was used. Saturated aqueous solution was prepared at pH 2, 7 and 9 after agitation of the polymer/water mixture (10 g /L) for one day followed by filtration using a syringe-filter (0.45 µm). The amounts of polymer extracted were determined by total organic carbon. The 100% extractability indicates that the notified polymer is readily available in water under the tested conditions.  
 Test Facility KOPTRI (2008)

**Stability as a Function of pH** Stable at pH 1.2, 4, 7 and 9 at 40°C.

Method OECD TG 120 and Guideline of National Institute of Environmental Research (in Korea) for stability at acidic and basic conditions.

<i>pH</i>	<i>T (°C)</i>	<i>Mw change by GPC</i>	<i>Stability</i>
1.2	40	Negligible	Stable
4	40	Negligible	Stable
7	40	Negligible	Stable
9	40	Negligible	Stable

Remarks The stability test of the notified polymer was conducted at pH 1.2 and 40°C for one day, and at pH 4, 7 and 9 at 40°C for 2 weeks. Afterwards, both the insoluble and soluble parts were analysed using GPC and FT-IR to investigate molecular weight decrease or structural changes at pH conditions. The total carbon content (TOC) dissolved in water was also determined by TOC analyser. The test results indicate that the molecular weight changes were negligible in all pH conditions.

Test Facility KOPTRI (2008)

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