

File No: LTD/1401

May 2009

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

**FULL PUBLIC REPORT**

**Polymer in RC-6097**

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 the Environment, Water, Heritage and the Arts.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at our NICNAS office by appointment only at 334-336 Illawarra Road, Marrickville NSW 2204.

This Full 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:

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

<u>FULL PUBLIC REPORT</u> .....	3
1. APPLICANT AND NOTIFICATION DETAILS.....	3
2. IDENTITY OF CHEMICAL.....	3
3. COMPOSITION.....	3
4. PHYSICAL AND CHEMICAL PROPERTIES.....	4
5. INTRODUCTION AND USE INFORMATION.....	4
6. HUMAN HEALTH IMPLICATIONS.....	5
6.1 Exposure assessment.....	5
6.1.1 Occupational exposure.....	5
6.1.2 Public exposure.....	6
6.2. Human health effects assessment.....	6
6.3. Human health risk characterisation.....	7
6.3.1. Occupational health and safety.....	7
6.3.2. Public health.....	7
7. ENVIRONMENTAL IMPLICATIONS.....	7
7.1 Environmental Exposure & Fate Assessment.....	7
7.1.1 Environmental Exposure.....	7
7.1.2 Environmental fate.....	8
7.1.3 Predicted Environmental Concentration (PEC).....	8
7.2 Environmental effects assessment.....	8
7.3 Environmental risk assessment.....	8
8. CONCLUSIONS AND REGULATORY OBLIGATIONS.....	8
Hazard classification.....	8
Human health risk assessment.....	8
Environmental risk assessment.....	8
Recommendations.....	8
Regulatory Obligations.....	9
<u>BIBLIOGRAPHY</u> .....	10

**FULL PUBLIC REPORT****Polymer in RC-6097****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

Dupont (Australia) Ltd (ABN 59 000 716 469) of 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, Other Names, CAS Number, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, Use Details, 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

Registration has occurred simultaneously to this application in Japan, Korea and China .

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

RC-6097 (Resin containing 50-70% notified polymer)

## MOLECULAR WEIGHT

$M_n > 1000$  Da

## ANALYTICAL DATA

Reference IR and GPC spectra were provided.

**3. COMPOSITION**

DEGREE OF PURITY > 90 %

## HAZARDOUS IMPURITIES/RESIDUAL MONOMERS

All hazardous residual monomers and impurities are present below the relevant cut-offs for classification.

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

Any residual monomers would be expected to be available for release until the paint is cured. The residual monomers are only present at low concentrations.

## DEGRADATION PRODUCTS

The polymer back bone structure is acrylic and it is unlikely to degrade quickly. The ultimate degradation products will be  $CO_2$ ,  $CO$ ,  $H_2O$  and  $NO_x$

#### 4. PHYSICAL AND CHEMICAL PROPERTIES

The notified polymer will be imported as both a resin solution at a concentration of 50-70% (RC-6097) and finished Centari tinters at a concentration of < 55 %. No physicochemical data is available for the notified polymer itself. Limited physico-chemical data has been provided for RC-6097.

APPEARANCE AT 20°C AND 101.3 kPa: Viscous liquid (RC-6097)

Property	Value	Data Source/Justification
Boiling Point	125-140 °C at 101.3 kPa (RC-6097)	MSDS
Density	1000 kg/m <sup>3</sup> (RC-6097)	MSDS
Vapour Pressure	0.39 kPa (temperature not specified) (RC-6097)	MSDS
Water Solubility	< 1 × 10 <sup>-3</sup> g/L at 20°C (RC-6097)	Estimated. Based on high molecular weight and the majority of the functional units being hydrophobic.
Hydrolysis as a Function of pH	Not Determined	Contains potentially hydrolysable groups, but unlikely to hydrolyse in the environmental pH range (4-9).
Partition Coefficient (n-octanol/water)	Not Determined	Contains mainly hydrophobic groups, but due to high molecular weight, is unlikely to be soluble in either the water or n-octanol phase.
Adsorption/Desorption	Not Determined	Expected to bind to organic carbon in soil based on its water solubility. The potentially cationic functionality may bind to negatively charged sites in the soil matrix.
Dissociation Constant	pKa = ~ 10	Estimated. The notified substance has a potentially cationic functionality, which is expected to show typical acidity.
Flash Point	32°C (RC-6097) (see below)	MSDS
Flammability	Flammable liquid (see below)	Based on Flash Point
Autoignition Temperature	407-432°C (RC-6097)	MSDS
Explosive Properties	Not predicted to be explosive	Estimated. From examination of the structure, there are no chemical groups that would infer explosive properties; therefore the result has been predicted negative.

#### DISCUSSION OF PROPERTIES

The flash point and hence flammability is considered to be due to the solvent content of the resin solution and not the polymer itself.

#### Reactivity

The notified polymer is expected to be stable under normal conditions of use.

#### 5. INTRODUCTION AND USE INFORMATION

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

The notified polymer will be imported as both a resin solution at a concentration of < 50 - 70% (RC-6097) and finished Centari tinters at a concentration of < 55 %.

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

Year	1	2	3	4	5
Tonnes	<15	<15	<15	<15	<15

## PORT OF ENTRY

Sydney

## IDENTITY OF MANUFACTURER/RECIPIENTS

The notified polymer will be imported by DuPont (Australia) Ltd. The finished tinter products will be supplied to car manufacturers and car refinish shops.

## TRANSPORTATION AND PACKAGING

The resin solution RC6097 will be packed in mixed loads of other resins and solvents in 200L drums. The tinters are packed in 1L and 4L open head and screw top mild steel approved cans. These containers are packed into cardboard boxes, palletised with shrink wrap and containerised.

## USE

Component of an automotive topcoat resin system.

## OPERATION DESCRIPTION

Paint manufacture

A drum of resin containing the notified polymer (concentration 50-70%) will be picked up by a hydraulic trolley and transported to a pot or in plant mixer. The bung is removed manually, then the resin is mechanically poured from the drum by weight and mixed with a low speed mixer to form an even slurry. The slurry is then pumped or gravity drained and run through a bead mill to achieve dispersion limits for the pigment/resin mixture. The product containing the notified polymer at a concentration of < 55% will then be filled by gravity feed in to 1L and 4L containers and labelled before being sent to the contract warehouse for storage and distribution.

Spray application of paint

The paint may be mixed with other additives prior to application. The mixture is then loaded 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**

## NUMBER AND CATEGORY OF WORKERS

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration (hours/day)</i>	<i>Exposure Frequency (days/year)</i>
Transport driver inwards	1	4	8
Warehouse storemen	10	0.05	250
Transport drivers Outwards	30	100	250
<b>Paint Manufacture</b>			
Storemen	1	2	180
Factory hand (mixing resin solution)	1	6	180
Filling room	3	6	180
Quality Control	1	0.66	180
<b>Spray Application of paint</b>			
Weighing and mixing	< 10000	0.8	260
Spraying	< 10000	6	260
Cleaning	< 10000	0.25	260

## EXPOSURE DETAILS

### *Paint Manufacture*

Dermal exposure to the notified polymer at a concentration of up to 70% could occur during the transfer of the introduced resin or paint product or through contact with contaminated surfaces. Dermal and ocular exposure to the notified polymer could also occur if aerosols are generated during the transfer and milling processes. Workers are expected to wear personal protective equipment (PPE) to prevent contact with eyes and skin.

### *Spray Application of Paint*

Dermal and ocular exposure to the notified polymer (at up to 55%) may occur during weighing, mixing and transfer of the automotive paint. Inhalation exposure is unlikely due to the low vapour pressure of the notified polymer. 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.

Dermal and ocular exposure to the notified polymer (at up to 55%) may occur during spray application of the finished paints to automobile parts and when cleaning spray gun 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 also likely 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 for the notified polymer were available.

The notified polymer is not expected to be significantly bioavailable due to its high molecular weight and low proportion of low molecular weight species. As such, systemic toxicity following exposure to the notified polymer is expected to be limited.

The notified polymer contains a structural alert for corrosion/irritation (Hulzebos, 2005), however based on the molecular weight and low proportion of low molecular weight species, the irritation potential is considered to be slight at most.

### ***Health hazard classification***

No toxicity data for the notified polymer were available and therefore the notified polymer cannot be classified as hazardous under the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

### 6.3. Human health risk characterisation

#### 6.3.1. Occupational health and safety

##### *Paint manufacture*

Although exposure to the notified polymer may occur during paint manufacture activities, given the expected low order of toxicity of the notified polymer and the expected use of PPE, the risk to workers is not considered to be unacceptable.

##### *Spray application of paints*

Although the level of exposure will vary between workshops, given the expected low order of toxicity of the notified polymer, the risk to workers is not considered to be unacceptable.

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 is not 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 is not available for exposure, hence the risk to the public is negligible.

## 7. ENVIRONMENTAL IMPLICATIONS

### 7.1. Environmental Exposure & Fate Assessment

#### 7.1.1 Environmental Exposure

##### RELEASE OF CHEMICAL AT SITE

The notified polymer will not be manufactured in Australia but will be reformulated. The residual solution in the import drums is expected to be less than 0.2% (< 30 kg per annum), which will be sent to a drum-recycler. The notified polymer will be a component of a paint formulation which is to be sold as part of a paint system for use by professional spray painters.

##### RELEASE OF CHEMICAL FROM USE

Unused/leftover paint after mixing with thinners, hardener, etc, if not used when mixed, will be disposed of to a waste drum. This material will typically be sent to a licensed waste disposal company for solvent recovery. A solidified residue will be obtained as a result of this, which will then be disposed of to landfill.

Overspray will be caught in filters of the spray booth and may constitute from 20 - 50% (< 3-7.5 tonne per annum) of total paint sprayed. Solid residues will be trapped in the filter which will be disposed of to landfill.

It is estimated that in 30% of spray shops, a "wet floor" arrangement will be used in place of or in combination with dry filters. In this instance, a water trap will be used to catch overspray. Periodically (this may typically be every three to six months), water from the trap will be collected by a waste disposal company for treatment. This will usually undergo flocculation or centrifugation of the suspended material which will then be disposed of to landfill.

The painted vehicles will be baked to cure the notified polymer into a paint film. The cross-linked polymer will be effectively inert and be disposed of with the vehicles at the end of their useful lives.

##### RELEASE OF CHEMICAL FROM DISPOSAL

The fate of the notified substance will share the fate of the metal parts on which it is coated. At the end of their useful lives vehicles will enter metal recycling or be landfilled. The polymer is expected to eventually undergo in-situ degradation as an integral part of the paint formulation on the vehicles. During metal recycling the polymer is expected to be thermally degraded to forms oxides of carbon, nitrogen; and water vapour. Any uncured notified substance released to the environment is expected to attach to the organic matter in soil. Industrial waste steel cans used by industry are being recycled where any residual paint is thermally degraded during metal recycling.

### 7.1.2 Environmental fate

No environmental fate data were submitted. The notified polymer is not expected to undergo hydrolysis under normal environmental conditions, and as it is cured into a solid polymer matrix it is unlikely to undergo biodegradation. Bioaccumulation of the polymer is unlikely due to the high molecular weight of the polymer even before curing.

### 7.1.3 Predicted Environmental Concentration (PEC)

Based on its intended use the environmental exposure is expected to be minimal. It is neither useful nor possible to estimate the PEC other than to state that it is expected to be low.

### 7.2. Environmental effects assessment

No ecotoxicity data were submitted. Due to its high NAMW the polymer is not expected to cross biological membranes. However, it contains a small percentage of potentially cationic sites, which are potentially toxic to aquatic species.

### 7.3. Environmental risk assessment

A Risk Quotient cannot be quantified as a PEC and PNEC cannot be determined. However, the environmental exposure is expected to be minimal. The polymer is only likely to show minimal toxicity as a result of the relatively small number of potentially cationic sites. The overall risk is considered acceptable.

## 8. CONCLUSIONS AND REGULATORY OBLIGATIONS

### Hazard classification

No toxicity data for the notified chemical were available and therefore the notified polymer can not be classified as hazardous under 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 unacceptable risk to the health of workers.

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

### Environmental risk assessment

On the basis of likely toxicity of the notified substance and the reported use pattern, the notified polymer is not considered to pose a 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.

- Employers should implement the following safe work practices to minimise occupational exposure to the notified polymer during spray application:
  - Use of spray paints containing the notified polymer should be in accordance with the NOHSC National Guidance Material for Spray Painting (NOHSC 1999).
- A copy of the MSDS should be easily accessible to employees.



- If products and mixtures containing the notified chemical 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 chemical should be disposed of to landfill.

#### Emergency procedures

- Spills or accidental release of the notified chemical should be handled by physical containment and adsorption with non-combustible material (e.g. sand, earth, vermiculite diatomaceous earth). Collect and place in suitable container for disposal. Clean spill area with detergent and water. Do not allow wash water to enter waterways or drains.

### 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 chemical 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 chemical has changed from a component of automotive paint or is likely to change significantly;
  - the amount of chemical being introduced has increased from 15 tonnes, or is likely to increase, significantly;
  - the chemical has begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the chemical 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 product containing the notified chemical provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.

**BIBLIOGRAPHY**

- FORS (Federal Office of Road Safety) (1998) Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG code), 6th Edition, Canberra, Australian Government Publishing Service
- Hulzebos, E., Walker, J.D., Gerner, I. and Schlegel, K. (2005) Use of structural alerts to develop rules for identifying chemical substances with skin irritation or skin corrosion potential. *QSAR Combinatorial Science*. 24:332-342
- NOHSC (1994) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.
- NOHSC (1999) National Guidance Material for Spray Painting. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.
- NOHSC (2003) National Code of Practice for the Preparation of Material Safety Data Sheets, 2<sup>nd</sup> edition [NOHSC:2011(2003)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.
- NOHSC (2004) Approved Criteria for Classifying Hazardous Substances, 3<sup>rd</sup> edition [NOHSC:1008(2004)]. National Occupational Health and Safety Commission, Canberra, AusInfo.
- United Nations (2003) Globally Harmonised System of Classification and Labelling of Chemicals (GHS). United Nations Economic Commission for Europe (UN/ECE), New York and Geneva.