

File No: PLC/331

11 March 2003

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

FULL PUBLIC REPORT

RC49441

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**Director
Chemicals Notification and Assessment**

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FULL PUBLIC REPORT

RC49441

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

DuPont (Australia) Ltd (ABN 59000716469) of 49-59 Newton Road, Wetherill Park, NSW 2164.

NOTIFICATION CATEGORY

The notified polymer meets the PLC criteria.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: chemical name, CAS number, monomer composition, residual monomers, spectrum data, polymer structure, molecular weights, import volumes and percentage of notified polymer in products.

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

None.

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

RC49941

LE2001 (containing the notified polymer).

METHODS OF DETECTION AND DETERMINATION

ANALYTICAL IR

METHOD

Remarks An IR spectrum was provided.

TEST FACILITY Not stated.

3. COMPOSITION

DEGREE OF PURITY

High.

RC49441 is a solution of the notified polymer at >50% in butyl acetate and aromatic hydrocarbon.

4. INTRODUCTION AND USE INFORMATION

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

Import.

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

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

USE

RC49941 is a component of a formulated paint, LE2001, which is used for automotive refinish painting.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, Transport and Storage

PORT OF ENTRY

Not stated.

IDENTITY OF MANUFACTURER/RECIPIENTS

DuPont (Australia) Ltd.

TRANSPORTATION AND PACKAGING

The formulated product containing the notified polymer will be imported in 4 L containers.

5.2. Operation Description

The notified polymer will be imported as a component of the painting product, LE2001 in 4 L containers. LE2001 (part A) will be mixed with isocyanate catalyst (part B) before spraying onto vehicle bodies.

5.3. Occupational exposure

Number and Category of Workers

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration</i>	<i>Exposure Frequency</i>
Transport	10	4 h/container	10 containers/year
Warehouse	10	0.2 h/pallet (fork lift)	160 pallets/year
		0.05 h/can (outwards packing)	50 000 cans/year
		1 h/can (outwards transport)	50 000 cans/year
Weighing & mixing	3800	2 h/can	
Spray painting	3800	2 h/can	
Cleaning	3800	0.25 h/can	

Exposure Details

Formulated paints containing the notified polymer will be imported in 4 L cans. The individual product containers are not expected to be opened during transport and storage and the likelihood of a spill is low. Waterfront, transport and warehouse workers are not expected to be exposed to the notified polymer except in the case of an accident involving spillage of the paint or resin solution.

The spray painters who will be exposed to the notified chemical will be fully TAFE trained. Typically the spray painter will measure the appropriate amounts of the different components required in a particular formulation into an open container and pour this mixture into a spray gun. The spraying of the automobile will be carried out in a laminar flow downdraft spray booth which is designed to rapidly remove aerosol particles and solvent vapour from the atmosphere. Several possible booth designs may be used. In a dry floor booth, the overspray will be collected in filters contained in the floor of the booth; any unremoved particulates will reach the exhaust stack with the solvent vapours. In a wet floor booth, overspray will collect in a pool of water below the grill floor or in a wet scrubber in the exhaust and will be removed with a filter. The residual solids will be disposed of to secure landfill. The spray booths are subject to AS/NZS/4114.1:1995 *Spray Painting Booths – Design, Construction and Testing* and AS/NZS/4114.1:1995 *Spray Painting Booths – Selection, Installation and Maintenance*. After application of the paint, the automobile are heated to cure the coating.

Residual paint mixture is likely to be washed from the equipment manually, using recycled paint solvent, and the washings disposed of by solvent recyclers.

Once the final paint mixture has dried, the notified polymer will be irreversibly bound within the cured

matrix and not separately available for exposure to workers.

Spray painters will wear appropriate personal protective equipment at all times; impervious gloves and anti-static flame retardant overalls while mixing the paint, and, in addition, a full face shield and respirator conforming to AS/NZS1715 and AS/1716 while inside the spray booth.

5.4. Release

RELEASE OF CHEMICAL AT SITE

Formulated paints containing the notified polymer will be imported and there will be no release to the environment in Australia due to its formulation or packaging.

RELEASE OF CHEMICAL FROM USE

There is potential for release of the notified polymer during paint application. The paint is applied to automotive surfaces with approximately 50-80% efficiency in spray booths with control measures, such as a filtering system and masking materials, in place. Cleaning of the spray gun and mixing equipment will generate waste that will be collected and disposed of in the same manner as wastewater from the spray booth.

Some product residue will also remain in the 'empty' import containers. It is estimated that up to 1,500 kg of the notified polymer (5% of the container contents), will remain as residue in the 'empty' import containers and will be disposed to landfill. The notifier expects 20% to 50% overspray and losses up to 10% due to cleaning of mixing and spray equipment. During coating application, the notifier estimates a maximum of up to 18 tonnes/annum of notified polymer waste would be produced, including the losses due to cleaning of the spray and mixing equipment (up to 3,000 kg).

5.5. Disposal

The waste resulting from cleaning the mixing and spray equipment will be washed with solvent and sent to solvent recycling. The resultant dried solid residues will be also disposed to landfill or combined with asphalt to be used as road base tackifier. The MSDS recommends that spills and leaks of the notified polymer to be contained by soaking up with inert absorbent material and disposed of as special waste in compliance with local and State regulations. Detergents rather than solvents, are used in cleaning up.

5.6. Public exposure

There is little potential for public exposure to the notified polymer arising from transport, occupational use and disposal.

The notified polymer will enter the public domain only in the form of cured paint films on automobiles. This paint film will contain the polymer in a crosslinked unreactive form which will not be bioavailable.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa		Light yellow semi-viscous solution polymer in butyl acetate and aromatic hydrocarbons.
Melting Point/Freezing Point		Not determined.
Remarks	The notified polymer is not isolated from the solution.	
Density	990 kg/m ³ (RC49941), 960 kg/m ³ (LE2001).	
Water Solubility		Not determined.
Remarks	It is indicated that the notified polymer is expected to have negligible water	

solubility due to its high molecular weight and predominantly hydrophobic character.

Once mixed with isocyanate hardener, the polymer is crosslinked to infinite molecular weight. The end use as a component of an automotive coating where resistance to water penetration is a desired property

Particle Size Not determined.

Remarks The notified polymer is not isolated from the solution.

Flammability Lower flammability limit=1.0% (RC49941),
Upper flammability limit=11.5% (RC49941),
Lower flammability limit=0.9% (LE2001),
Upper flammability limit=13% (LE2001).

Remarks The Autoignition temperatures for RC49941 and LE2001 are 515°C and 425-515°C, respectively.

Explosive Properties RC49941 is not explosive as a dried film when free of carrier solvents.

Remarks The solvents in LE2001 may form an explosive mixture with air.

When sanding or abrading the dried film, the fine particles may cause a dust explosion.

Degradation Products

Remarks In the event of fire, carbon monoxide, carbon dioxide and nitrogen oxides may be formed.

Loss of monomers, other reactants, additives impurities

Remarks None.

Hydrolysis as a function of pH Not determined.

Remarks The polymer contains ester linkages that could be expected to undergo hydrolysis under extreme pH conditions. However, due to the expected low water solubility, this is unlikely in the environmental pH range of between 4 and 9.

Partition coefficient Not determined.

Remarks The determination of partition coefficient would be difficult. Due to its low water solubility, the polymer is expected to become associated with the octanol phase.

Adsorption/desorption Not determined.

Remarks The notified polymer is expected to be immobile in soil due to its low water solubility and to become associated with the organic component of soils and sediments.

Dissociation constant Not determined.

Remarks The notifier comments on the possibility of the terminal acrylic acid group of each molecule theoretically being available to act as an ionic species in water and that the remainder of the molecule has no groups capable of becoming charged. While the terminal acid group has typical acidity and has the potential to become negatively charged with the loss of a proton, the polymer's function as a water

barrier on automobiles is evidence that water does not penetrate the film so only those molecules on the surface of the film are available to become charged.

7. TOXICOLOGICAL INVESTIGATIONS

No toxicological data were submitted.

8. ENVIRONMENT

No ecotoxicological data were submitted.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

Once applied to the metal panels of motor vehicles the notified polymer will be incorporated in a water resistant coating and will not present a significant hazard. Any fragments, chips and flakes of the coating will be of little concern as they are expected to be inert. The notifier does not comment on the fate of the metal panels coated with the polymer, but they are likely to be either recycled for steel reclamation or be placed into landfill at the end of their useful life. When recycled the polymer would be incinerated in the blast furnaces and converted to water vapour and oxides of carbon.

The solid waste generated in the formulation and application of the coating will be disposed to landfill, although incineration is an option. The product when sprayed will be catalysed with an isocyanate activator, resulting in all overspray being crosslinked and becoming inert due to the very high molecular weight. The containers and their residue will also be disposed in this manner, which are expected to dry out to a hard residue. Leaching of the notified polymer from landfill sites is unlikely, given the expected low solubility of the substance and very high molecular weight. Under these conditions the notified polymer waste would very slowly degrade to gases such as carbon dioxide through the agency of abiotic and bacteriological processes.

Mixing containers and spray equipment will be washed with solvent that is collected and sent to solvent recycling. The resulting dried solid residues will be also disposed to landfill or combined with asphalt to be used as road base tackifier.

The notified polymer is not expected to cross biological membranes, due to the expected low solubility, high molecular weight and strong adsorption to soil, and as such should not bioaccumulate (Connell 1989).

9.1.2. Environment – effects assessment

No ecotoxicological data were submitted.

9.1.3. Environment – risk characterisation

The notified polymer crosslinks with other paint components to form a very high molecular weight water resistant film that is highly stable to light and temperature. The notified polymer, as part of this surface coating will, therefore, share the fate of the vehicle panel. When the vehicle panel is recycled, the notified polymer would be destroyed through incineration.

No repackaging of the notified polymer occurs and it will only be supplied to licensed professional spray painters who will formulate with activator on site directly prior to use. Overspray will be captured and disposed of to landfill (or possibly incinerated) as will paint residues in empty cans. Equipment residues will be washed with solvent and sent for solvent recycling and disposal of solid residues, to landfill or combined with asphalt to be used as road base tackifier. The notifier estimates that a maximum total of over 20,000 kg/annum of the notified polymer will be released to the environment due to the application process. The paint

film will contain the notified polymer as part of a crosslinked polymer matrix. The final fate of the notified polymer will presumably be the same as the final fate of the vehicle, that is either to landfill or to recycling where the polymer will be incinerated to water vapour and oxides of carbon.

In the event of accidental spillage of the paint into waterways the polymer is not expected to disperse into the water, but settle out onto sediments. If the polymer is spilt on land, either during usage or transport, it is expected that the polymer would become immobilised in the soil layer. Contaminated soil can then be collected and disposed to landfill. The small container sizes would also limit the level of the hazard in the event of a spill.

Given the above, environmental exposure and the overall environmental risk are expected to be low.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Dermal, ocular and inhalation exposure can occur during mixing and spraying processes. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

After application and once dried, the paint containing the notified polymer is cured into an inert matrix and is hence unavailable to exposure.

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

9.2.2. Public health – exposure assessment

The notified polymer will not be available to the public. Members of the public may come into contact with painted vehicles containing the notified polymer.

9.2.3. Human health - effects assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

9.2.4. Occupational health and safety – risk characterisation

Due to the expected low toxicity of the notified polymer and the limited potential for exposure, the OHS risk presented by the notified polymer is expected to be low.

The notified polymer must be assessed for the contribution it makes to the hazards associated with spray application of the paint. The presence of many potential and actual hazardous substances in paint formulations requires the use of stringent engineering controls, such as a correctly constructed and maintained spray booth, and of a high level of personal protective equipment, such as impermeable overalls and gloves and a full face shield and respirator. The use of the paint containing the polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting* (NOHSC, 1999b). The level of protection from exposure afforded by the standard protective measures will provide adequate protection from the polymer, which is likely to be less intrinsically toxic than most of the solvents and pigments and also some other paint resins.

9.2.5. Public health – risk characterisation

The notified polymer is intended for use by professional spray painters in [automotive plants](#) only, and will not be sold to the public. Following application, the notified polymer will become trapped within a film and will not be bioavailable. Therefore, the risk to public from exposure to the notified polymer is considered low.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.1. Hazard classification

Based on the available data the notified polymer is not classified as hazardous under the NOHSC *Approved Criteria for Classifying Hazardous Substances*.

10.2. Environmental risk assessment

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

10.3. Human health risk assessment

10.3.1. Occupational health and safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

10.3.2. Public health

There is Negligible Concern to public health based on its reported use pattern.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of the [product containing the polymer](#) provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a). It is published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

11.2. Label

The label for the [product containing the polymer](#) provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the label remains the responsibility of the applicant.

12. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- No specific engineering controls, work practices 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. The NOHSC *National Guidance Material for Spray Painting* (NOHSC, 1999b) should be followed when selecting personal protective equipment and industrial controls.
 - Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.
- 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.

Emergency procedures/Disposal

- Spills/release of the notified polymer should be contained by soaking up with inert absorbent material and dispose of as special waste in compliance with local and State regulations as recommended in the MSDS.

- Use detergents (avoid solvents) in cleaning up.
- Prevent product from entering drains..
- The waste resulting from cleaning the mixing and spray equipment should be washed with solvent and sent to solvent recycling. The resultant dried solid residues should be disposed to landfill as above or combined with asphalt to be used as road base tackifier.

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 the method of use changes in such a way as to greatly increase the environmental exposure of the notified polymer,
 - if additional information becomes available on adverse environmental effects of the polymer, or
 - if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.

13. BIBLIOGRAPHY

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