

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

POLYMER OF LOW CONCERN FULL PUBLIC REPORT

Polymer in PUR-436

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government 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 Australian Government Department of Sustainability, Environment, Water, Population and Communities.

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 Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

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:

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**Director
NICNAS**

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Table of Contents

1. APPLICANT AND NOTIFICATION DETAILS.....	2
2. IDENTITY OF POLYMER.....	2
3. PLC CRITERIA JUSTIFICATION	2
4. PHYSICAL AND CHEMICAL PROPERTIES	2
5. INTRODUCTION AND USE INFORMATION	3
6. HUMAN HEALTH RISK ASSESSMENT	3
7. ENVIRONMENTAL RISK ASSESSMENT.....	3
8. RECOMMENDATIONS	4

1. APPLICANT AND NOTIFICATION DETAILS

Applicants

DuPont (Australia) Ltd (ABN 59 000 716 469)
Level 3, 7 Eden Park Drive
MACQUARIE PARK NSW 2113

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 and import volume

2. IDENTITY OF POLYMER

Marketing Name(s)

PUR-436 (Product containing the notified polymer at <40%)

Molecular Weight

Number Average Molecular Weight (Mn) is > 1,000 Da.

Reactive Functional Groups

The notified polymer only contains low concern functional groups.

3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</i>
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. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:	Opaque white solid
Melting Point/Glass Transition Temp	>200°C
Density	1050 kg/m ³ at 20°C
Water Solubility	3.594 g/L at pH 9, 0.799 g/L at pH 7 and 0.211g/L at pH 2 (Based on OECD TG 120)
Dissociation Constant	Not determined. The notified polymer is a salt and is expected to dissociate in aquatic environments.
Reactivity	Stable under normal environmental conditions. Stability tests confirm that although the notified polymer contains hydrolysable functionality it is hydrolytically stable under environmental conditions.
Degradation Products	None under normal conditions of use

5. INTRODUCTION AND USE INFORMATION

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>
Tonnes	<10	<10	<10	<25	<25

Use

The notified polymer will not be manufactured in Australia. It will be imported at a concentration of <40% in solution and subsequently reformulated. The notified polymer will be used as a component of coatings for use on vehicles at a concentration of <15%. Coatings containing the notified polymer will be applied by spray, which is expected to occur in spray booths.

6. HUMAN HEALTH RISK ASSESSMENT

No toxicological data were submitted. The notified polymer meets the PLC criteria and is therefore anticipated to be of low hazard. The risk of the notified polymer to occupational and public health is not considered to be unacceptable given the assumed low hazard.

7. ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted for the notified polymer. However, endpoints were provided for the counter-ion component of the notified polymer. Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is over-chelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone, which does not apply to the notified polymer. In addition, the toxicity to algae is likely to be further reduced due to the presence of calcium ions in the aquatic environment, which will bind to the functional groups. The counter-ion component of the notified polymer, however, is toxic to green algae (72 h EC₅₀ ≥ 1.47 mg/L), toxic to aquatic invertebrates (48 h EC₅₀ ≥ 3.8 mg/L) and harmful to fish (96 h LC₅₀ ≥ 22 mg/L).

The notified polymer is not expected to have significant release to the aquatic environment as a result of mixing or reformulation as the equipment is cleaned with solvent and the waste collected as sludge in settling tanks prior to disposal in landfill. A maximum of 4% of the notified polymer will be released to landfill as a result of the disposal of containers with residual polymer and wastes from cleaning of equipment used in mixing and reformulation.

The paint products containing the notified polymer will be used as coatings in car refinishing with application carried out mainly by spray. The main release (up to 50% as overspray during use) will typically entail landfill disposal, after interception by spray booth filters. Wastes from containers residues, mixing and cleanup are expected to be collected and reduced to an insoluble polymer mass for disposal to landfill. Discarded end use articles containing the notified polymer within the inert polymer matrix of the cured paint film will be disposed of to landfill, or recycled for metal reclamation, which will entail thermal decomposition of the notified polymer to form water vapour and oxides of carbon and nitrogen. The notified polymer is expected to be immobile in landfill and degrade slowly by abiotic and biotic processes. Bioaccumulation is not likely based on the high molecular weight of the notified polymer. The counter-ion component of the notified polymer is not readily biodegradable (5% after 28 days) but is not expected to bioaccumulate (log Pow = 0.95).

The notified polymer is used as a component of waterborne coatings. As a worst case scenario, whereby the product is disposed of incorrectly to sewer, it is assumed that up to 5% of the total polymer and/or its counter-ion component may be released to the aquatic environment. However, this release will be dispersed throughout Australia. Therefore, the concentration of the notified polymer in fresh water reaching sewage treatment plants would be a maximum of 1.14 µg/L on a nation wide basis (1.25 tonnes/21 million X 200 L per person X 260 days). Whilst the polymer component is

expected to adsorb to sludge, the counter-ion may dissociate in aquatic environments. As the counter-ion component is <5% concentration of the notified polymer, the predicted environmental concentration (PEC) will fall to <0.06 µg/L. Based on the ecotoxicological endpoint of 72 h EC50 ≥ 1.47 mg/L for green algae and as data is available for three trophic levels, the PNEC for the counter-ion is determined to be <14.7 µg/L with a safety factor of 100. Therefore, the Q value for the counter-ion component of the notified polymer (<0.06/14.7) is determined to be <<1, indicative of acceptable risk in the aquatic compartment.

The notified polymer has assumed low toxicity although the counter-ion component of the notified polymer is toxic to aquatic organisms. However, the notified polymer and its counter-ion are not expected to reach ecotoxicologically significant concentrations in surface waters and are therefore not expected to pose an unacceptable risk to the environment when used as proposed.

8. RECOMMENDATIONS

Human Health Risk Assessment

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

Environmental Risk Assessment

Based on the reported use pattern, the notified polymer is not considered to pose an unacceptable risk to the environment.

Health and Safety Recommendations

- 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.

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.
- Spray application should be carried out in accordance with the Safe Work Australia *National Guidance Material for Spray Painting* [NOHSC (1999)].
- 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 to landfill.

Emergency Procedures

- Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.
- Spills and/or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

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 polymer 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 polymer, 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 notified polymer is introduced in a chemical form that does not meet the PLC criteria.

or

- (2) Under Section 64(2) of the Act; if
 - the function or use of the notified polymer has changed from a component of coatings, or is likely to change significantly;
 - the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
 - the notified polymer 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 notified polymer and products containing the notified polymer were provided by the applicant. The accuracy of the information on the MSDS remains the responsibility of the applicant.