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19 June 2006

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

**FULL PUBLIC REPORT**

**DP3002**

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 and Heritage.

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**Director  
NICNAS**

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**FULL PUBLIC REPORT****DP3002****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

DuPont (Australia) Ltd (ABN 59 000 716 469)  
168 Walker St  
North Sydney NSW 2060

Canon Australia Pty. Ltd (ABN 66 005 002 951)  
1 Thomas Holt Drive  
North Ryde NSW 2113

## NOTIFICATION CATEGORY

Polymer of Low Concern

## 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, Spectral data,  
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)

Expired Permits for the notified polymer held by DuPont (permit No. 525) under LVC/538, jointly  
notified with Canon Australia (permit No. 524), permits issued April 2003.

## NOTIFICATION IN OTHER COUNTRIES

USA 1993

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

DP3002

## MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) &gt;1000

## REACTIVE FUNCTIONAL GROUPS

The notified polymer contains only low concern functional groups.

**3. PLC CRITERIA JUSTIFICATION**

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</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**

Yellow solid. The notified polymer is introduced as a dispersion in water.

**Melting Point/Glass Transition Temp**

Not measured as polymer is introduced in solution.

**Density**

60% w/w solution in THF is 1140 kg/m<sup>3</sup> (temperature not supplied).  
Estimated density of solid 1100 to 1200 kg/m<sup>3</sup>.

**Water Solubility**

188 mg/L, based on the average of the highest values for dissolved carbon content of water in a polymer stability test.

**Dissociation Constant**

The notified polymer contains an anionic functionality expected to have typical acidity.

**Particle Size**

Not applicable. The notified polymer is introduced in solution.

**Reactivity**

Stable under normal environmental conditions.

**Degradation Products**

None under normal conditions of use.

#### Stability in Water

The notified polymer contains groups which are unlikely to hydrolyse under ambient environmental conditions (pH 4-9). A stability test has indicated that the polymer is stable at pH 2, 7 and 9. Initially, the molecular weight of the test material was determined and then samples were crushed and dissolved or dispersed in pure water to give a concentration of 1000 mg/L at pH 1.2, 2, 7 and 9. After 4 hours of agitation at 40°C in natural light the Dissolved Organic Carbon (DOC) was measured in all samples. The pH 2, 7 and 9 samples were then agitated for a further 14 days while the pH 1.2 sample was agitated for 15 days. The DOC was again measured and the samples were filtered and dried. The molecular weight of the dried material was then determined by GPC. Comparison of the DOC levels and the molecular weights did not show any significant changes, thus indicating the polymer was stable in the pH levels tested.

#### 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>
<i>Tonnes</i>	< 1	< 1	< 1	< 1	< 1

##### USE AND MODE OF INTRODUCTION AND DISPOSAL

##### Mode of Introduction

The notified polymer will be imported as a component (<10%) in printing ink in sealed cartridges.

##### Reformulation/manufacture processes

No manufacture or reformulation will occur in Australia.

##### Use

The printing ink cartridges containing the notified polymer are used in office and consumer printing.

## 6. HUMAN HEALTH IMPLICATIONS

### 6.1. Exposure Assessment

#### OCCUPATIONAL EXPOSURE

Dermal and inhalation exposure to the notified polymer may occur when refilling/replacing spent cartridges. However, the concentration of the notified polymer in the ink is low, and the design of the cartridges is such that exposure to the notified polymer should be low. Once the ink dries, the chemical would be trapped in the printed paper, and therefore dermal exposure to the notified chemical from contact with the dried ink is not expected.

#### PUBLIC EXPOSURE

The scenarios by which the public may be exposed to the notified chemical would involve home use of printers, and are similar to those for office workers. However, it is expected that the public will be using the printer less often than workers.

### 6.2. Toxicological Hazard Characterisation

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. This is supported by toxicological endpoints observed in testing conducted on an ink solution containing the polymer in <10% concentration.

<i>Endpoint</i>	<i>Result</i>	<i>Classified?</i>	<i>Effects Observed?</i>	<i>Test Guideline</i>
1. Skin sensitisation - LLNA.	no evidence of sensitisation.	no	no	OECD TG 429 (LLNA)
2. Genotoxicity - bacterial reverse mutation	non mutagenic	no	no	OECD TG 471 – 472

All results were indicative of low hazard.

### 6.3. Human Health Risk Assessment

#### OCCUPATIONAL HEALTH AND SAFETY

The OHS risk presented by the notified polymer is expected to be low, based on the minimal exposure to workers and the low intrinsic hazard of the polymer.

#### PUBLIC HEALTH

The risk to public health presented by the notified polymer is expected to be low due to its intrinsic low toxicity, low concentration in the ink and low potential for exposure.

## 7. ENVIRONMENTAL IMPLICATIONS

### 7.1. Exposure Assessment

#### ENVIRONMENTAL RELEASE

Environmental release of the notified polymer is summarised in the following table.

<i>Source of release</i>	<i>% Volume</i>	<i>Released to / Fate</i>
Residual notified polymer in cartridges	≤5%	Landfill
Notified polymer on printed paper	≤43%	Paper Recycling Facilities
Notified polymer on printed paper	≥52%	Landfill

#### ENVIRONMENTAL FATE

Notified polymer that is disposed of to landfill is expected to associate with soil and organic material

and should be immobile within the landfill environment. Over time, the notified polymer is expected to degrade by biotic and abiotic means to form simple organic compounds.

Notified polymer on printed paper sent for recycling is expected to be destroyed by the bleaching oxidation step or be removed as a suspension in the waste water where it is coagulated, dried and burnt in the mill boiler.

## **7.2. Environmental Hazard Characterisation**

No ecotoxicological data were submitted. Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is overchelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. This could apply to the notified polymer. However, the toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups.

## **7.3. Environmental Risk Assessment**

The notified polymer is imported into Australia in non-refillable print cartridges. Following its use, it is assumed that up to 43% will be destroyed during recycling of printed paper. The remainder is expected to be disposed of to landfill, either as residual within print cartridges or associated with printed paper. Release to the aquatic environment is not anticipated, and therefore, the overall environmental risk is expected to be acceptable.

## **8. CONCLUSIONS**

### **8.1. Level of Concern for Occupational Health and Safety**

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

### **8.2. Level of Concern for Public Health**

There is No Significant Concern to public health when used in the proposed manner.

### **8.3. Level of Concern for the Environment**

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

## **9. MATERIAL SAFETY DATA SHEET**

### **9.1. 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.

## **10. 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.

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- Service personnel should wear cotton or disposable gloves and ensure adequate ventilation is present when removing spent printer cartridges containing the notified polymer and during routine maintenance and repairs.
- 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.

#### Disposal

- The notified polymer should be disposed of to landfill.

#### Emergency procedures

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

### 10.1. 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.