

File No PLC/959

February 2011

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

FULL PUBLIC REPORT

Polymer WHL-701

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 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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FULL PUBLIC REPORT**Polymer WHL-701****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

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, CAS Number, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, Use Details and 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

Japan, Korea, USA (2010)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

WHL-701

MOLECULAR WEIGHT (MW)

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

REACTIVE FUNCTIONAL GROUPS

Category	Equivalent Weight (FGEW)
High Concern	> 5,000 Da

3. PLC CRITERIA JUSTIFICATION*Criterion*

Molecular Weight Requirements
Functional Group Equivalent Weight (FGEW) Requirements
Low Charge Density
Approved Elements Only
Stable Under Normal Conditions of Use
Not Water Absorbing
Not a Hazard Substance or Dangerous Good

Criterion met

Yes
Yes
Yes
Yes
Yes
Yes
Yes

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Solid*
Melting Point/Glass Transition Temp	Not determined*
Density	Not determined*
Water Solubility	Not determined*
	The notified polymer is fully miscible in water up to 15% notified polymer in aqueous solution.
Dissociation Constant	Not determined*
	Based on structural considerations the pKa is 4-5.
Particle Size	Not determined*
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use
*The notifier states that the notified polymer is produced in situ in aqueous solution, and is never extracted from the aqueous solution at any stage in its life cycle. It is not possible to extract the notified polymer from solution without potentially altering the structural composition of the notified polymer.	

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>
Kg	< 50	< 100	< 100	< 500	< 500

Use

The notified polymer is a component of ink in sealed cartridges at < 1% for inkjet printers.

Mode of Introduction and Disposal

The polymer is not manufactured or reformulated in Australia. It is imported as a component of inkjet printer ink contained within sealed cartridges at < 1%.

6. HUMAN HEALTH IMPLICATIONS

Hazard Characterisation

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. This is supported by on the genotoxicity test results provided for the notified polymer.

<i>Endpoint</i>	<i>Result</i>	<i>Effects Observed?</i>	
Genotoxicity - bacterial reverse mutation	non mutagenic	no	OECD TG 471

Occupational Health and Safety Risk Assessment

The notified polymer in ink will be imported in sealed cartridges at < 1%.

Exposure to workers to the ink containing the notified polymer during transport and storage is possible only in the event of an accident where packaging is damaged or breached.

Limited dermal and ocular exposure of office workers and home office users to the notified polymer could occur during replacement of cartridges in printers. However, this will be very low due to the very low concentration of the notified polymer present in the ink cartridges (< 1%). Instructions on how to replace the cartridges safely are also included with the inkjet printer and the packaging of the cartridge.

Dermal exposure to the notified polymer from contact with the printed materials could occur. Once the ink dries, the polymer would be trapped in the print matrix, and therefore dermal exposure to the notified polymer from contact with the dried ink is not expected.

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

Public Health Risk Assessment

The general public could potentially be exposed to the notified polymer during use of the inkjet ink cartridges.

The scenarios by which the public may be exposed to the notified polymer 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 frequently than office workers and exposure is also expected to be lower.

Overall, the risk to the public is not considered to be unacceptable, based on the expected minimal exposure and the assumed low hazard of the notified polymer.

7. ENVIRONMENTAL IMPLICATIONS

Hazard Characterisation

No ecotoxicological data were submitted. 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 occurs to some extent in the notified polymer's back bone.

Environmental Risk Assessment

The notified polymer will be imported as a component of printer ink in ready-to-use cartridges. Printing cartridges are designed to prevent release of its contents during transport, installation and removal. Accidental spills are expected to be contained and disposed of to landfill. The ink will be used on paper articles, and notified polymer bound within the dried ink matrix will share the fate of the article. It is anticipated that approximately half of these articles will be disposed of to landfill and the remainder will be recycled at the end of their useful lifetime. During the recycling process, waste paper will be 'repulped' using a variety of alkaline dispersing and wetting agents, water emulsifiable organic solvents and bleaches. Aqueous wastes containing these agents are expected to be sent to the municipal sewage treatment plants (STPs) for processing. Due to the notified polymer's water solubility, some release of it to the water column is expected. Calculations indicate that the predicted environmental concentration, at worst, will be <1 µg/L, based on 50% of the notified polymer being released to the sewer and the water consumption of the Australian population. Toxicity to algae from nutrient over-chelation is not expected to any ecotoxicologically significant extent due to a limited proportion of alternating acids on the notified polymer's carbon backbone, and the presence of calcium ions in the water that bind with chelating functional groups to further reduce toxicity. Due to its high molecular weight, the notified polymer will not readily cross biological membranes, and a low potential for bioaccumulation is predicted. Notified polymer adsorbed to STP sludge will be disposed of to landfill or may be used for soil remediation, where it is expected to slowly degrade to form water and oxides of carbon and nitrogen.

8. CONCLUSIONS AND RECOMMENDATIONS

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

Based on the reported use pattern, the notified polymer is not expected to pose a risk to the environment.

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.

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

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 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 printing ink, 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 product containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.