

File No PLC/903

February 2010

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

**FULL PUBLIC REPORT**

**PU14**

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:

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**Director  
NICNAS**

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**FULL PUBLIC REPORT****PU14****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

Hewlett Packard Australia Pty Limited (ABN 74 004 394 763)  
353 Burwood Highway,  
Forest Hill, Victoria, 3131

## NOTIFICATION CATEGORY

Polymer of Low Concern

## EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Polymer name, CAS number, structural formula, empirical formula, monomer composition, residual monomers, spectral data, GPC, concentration in ink.

## 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)

PU14

## MOLECULAR WEIGHT (MW)

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

## REACTIVE FUNCTIONAL GROUPS

The notified polymer contains only low concern functional groups.

**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:	Amber liquid (polymer in water emulsion)
Density	~1070 kg/m <sup>3</sup> at 25°C (polymer in water emulsion)
Water Solubility	Expected to be water dispersible because of its use in water based inks and the presence of polar sub-units in the notified polymer
Dissociation Constant	The notified polymer is a salt and is expected to fully dissociate in water
Reactivity	Stable under normal 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>
Kilograms	<200	<200	<200	<200	<200

##### Use

The notified polymer will be used as a component of printing ink for inkjet printers.

##### Mode of Introduction and Disposal

The notified polymer will not be manufactured in Australia. It will be imported into Australia as a component in ink at < 5% in sealed cartridges.

#### 6. HUMAN HEALTH IMPLICATIONS

##### Hazard Characterisation

No toxicological data were submitted. The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

##### Occupational Exposure

The notified polymer or the printing ink components containing it will not be manufactured or reformulated in Australia. The notified polymer is contained in the sealed ink cartridge and the physical design of the cartridge prevents handlers from accidentally touching the ink. The design also prevents leakage of its contents. Moreover, Inhalation exposure is unlikely as the notified polymer is of very high molecular weight and is expected to have negligible vapour pressure and the formation of mist is unlikely.

The following is a table showing the workers exposure to the notified polymer:

<i>Number and Category of Workers</i>			
<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration Hours/Day</i>	<i>Exposure Frequency (Days/Year)</i>
Transport and storage	10-20	4-8	200
Service Technicians	200	8	200
Office Staff	>5000	0.1	5
Retail	>1000	8	200

##### Transport and warehousing

Workers are not expected to be exposed to the imported notified polymer, as the notified polymer will be only available in sealed cartridges.

Dermal exposure is only possible in the event of an accident where the packaging is breached.

##### Service technicians

Service technicians will come in contact with the sealed cartridges during printer maintenance. Any empty or defective cartridges will be replaced with new ones. There will be no attempt made to repair or refill the cartridges. The most likely route of exposure is dermal. Accidental oral exposure is not expected to be

significant. Exposure is expected to be controlled through the design of the cartridges and the printing machines. Printer maintenance personnel wear cotton disposable gloves. Pre-packed ink cartridges are sealed and worker exposure to the ink is minimised by the use of the replacement procedures recommended by the manufacturer.

**Office Workers**

Office workers will replace used empty cartridges as per the manufacturer's instructions. The main route of exposure will be dermal. However, since the cartridges are sealed, there is low risk of exposure to the ink.

**Retail Workers**

Retail workers will be involved in opening cardboard cartons, removing the cartridges, which will be contained within an outer cardboard box and stacking the individual boxes onto shelves. These workers will not have any contact with the cartridge. Dermal exposure to the notified polymer could only occur from defective sealed cartridges.

**Occupational Health and Safety Risk Assessment**

Overall, the occupational health and safety 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 Exposure**

The printer cartridges containing the notified polymer will be sold to the public. The notified polymer is sealed within the cartridge and is only subject to slow, controlled release from the purpose built cartridge during use. The loading and removal of a cartridge into or from its containment area in a printer can be readily accomplished without any contact with ink.

Skin contact with the ink may occur if an attempt is made to insert or remove a damaged cartridge or to correct a paper-jam. Exposure may be possible from handling printed pages prior to the ink being fully dried. Typically 0.06 g of ink per page is deposited onto the paper in a typical print job. The polymer would not be volatile and is expected to adsorb onto the paper matrix and once the ink has dried, the polymer will be trapped within the ink matrix. Thus, exposure via contact with the paper containing the ink will not be significant.

The cartridges are not intended for refilling, although this could occur to a small extent. 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.

Spent cartridges contain on average <5% residual ink. The remaining ink is absorbed on foam contained within the cartridge and cannot be removed without breaking it. Ink on paper will be bound to the paper and is unlikely to be transferable to a person's skin. Once the ink dries, the notified polymer would be trapped in the printed paper, and therefore dermal exposure to the notified polymer from contact with the dried ink is not expected.

**Public Health Risk Assessment**

Public may be exposed to only low levels of the notified polymer given its low concentration in the printer ink. There is little likelihood of leakage or rupture of the cartridge. Once release onto the paper, the notified chemical is expected to remain bound to the paper or the cured print matrix.

Therefore, the risk to public health from exposure is not considered to be unacceptable.

## 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. This does not apply to the notified polymer and it is therefore not considered to be an over-chelation hazard to algae.

**Environmental Risk Assessment**

The notified polymer will be imported into Australia as an ingredient of an ink in sealed cartridges, which will be distributed to customers for direct use. Approximately 50% of the paper on which the ink will be printed will be recycled. Most of the notified polymer will reach landfill as a result of disposal of used paper or sludge waste from paper recycling. In landfill the notified polymer will be slowly degraded, eventually forming oxides of carbon and nitrogen, water and inorganic salts. The notified polymer is a water dispersible poly-anion and may not be fully recovered by on site waste water treatment at paper recycling facilities. Small quantities of the polymer may therefore be released to surface waters as a result of the de-inking process. However, the notified polymer is not expected to be a toxic hazard to aquatic organisms and has a low potential to bioaccumulate. The notified polymer is therefore not likely to pose a risk to the environment based on the reported use pattern.

**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 considered 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 disposal.

**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 in sealed cartridges;
  - 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.