

File No PLC/885

November 2009

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

FULL PUBLIC REPORT

NEJI-15

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:

Street Address:	334 - 336 Illawarra Road MARRICKVILLE NSW 2204, AUSTRALIA.
Postal Address:	GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
TEL:	+ 61 2 8577 8800
FAX	+ 61 2 8577 8888.
Website:	www.nicnas.gov.au

**Director
NICNAS**

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FULL PUBLIC REPORT**NEJI-15****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Epson Australia Pty Ltd
3 Talavera Road
NORTH RYDE NSW 2113

NOTIFICATION CATEGORY

Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Chemical Name, Other Names, CAS Number, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities 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

USA (2006)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

NEJI-15

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) > 10,000 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:	White-pale yellow solid
Melting Point/Glass Transition Temp	0°C
Density	1040 kg/m ³ (temperature unknown) (Note: units are kg/m ³ ; density in kg/m ³ is 1000 x density in g/cm ³)
Water Solubility	The notified polymer is expected to be insoluble in water based on the mainly hydrophobic structure.
Dissociation Constant	The notified polymer is expected to have a pKa = ~4 based on the presence of anionic functionalities in the molecule.
Particle Size	Average diameter: 101.4 nm (Range = 60.9-2000 nm)
Reactivity	Stable under normal environmental conditions. Hydrolysis is unlikely to occur in the environmental pH range (4 – 9) despite the presence of hydrolysable functional groups in the notified polymer.
Degradation Products	None under normal conditions of use

5. INTRODUCTION AND USE INFORMATION

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

Year	1	2	3	4	5
Tonnes	0.1-0.5	0.1-0.5	0.1-0.5	0.1-0.5	0.1-0.5

Use

Component of ink for use in inkjet printers.

Mode of Introduction and Disposal

The notified polymer will be imported as a component of inkjet printing inks in pre-packed cartridges (containing 10 to 15 g of ink). The inks will contain < 2% notified polymer.

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 Health and Safety Risk Assessment

The notified polymer is of high molecular weight and all of the particles are in the respirable and mostly nanometre range, therefore it has the potential to cause lung overloading. However, the notified polymer will not be handled in the powdered form but will be imported in pre-packed cartridges where it will form an emulsion with the ink; hence inhalation exposure to the notified polymer is unlikely. Therefore it is not expected to pose an unreasonable risk via the inhalation route.

Dermal exposure to the notified polymer may occur when refilling/replacing spent cartridges. However, the concentration of the notified polymer in the ink is low (< 2%), and the design of the cartridges is such that exposure to the notified polymer should be low. 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.

Overall, the OHS risk presented by the notified polymer is not considered to be unacceptable, based on the minimal exposure to workers and the assumed low hazard of the notified polymer.

Public Health Risk Assessment

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 often than workers.

The risk to public health presented by the notified polymer is not considered unacceptable due to its assumed low hazard, low concentration in inkjet inks and low potential for exposure.

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 does not apply to the notified polymer. The toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups.

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. Most of the notified polymer will be sent to 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 water, salts and oxides of carbon and sulphur. The notified polymer is unlikely to reach aquatic ecosystems and would not be bioavailable to, or bioaccumulate, in aquatic organisms.

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

Environmental Risk Assessment

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.

- 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 *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.
 - the notified polymer is introduced in the powdered form.

or

- (2) Under Section 64(2) of the Act; if
 - the function or use of the notified polymer has changed from component of printer ink for use in inkjet printers, 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.