File No PLC/827

June 2009

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer SP-01

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

TABLE OF CONTENTS

FULL PUBLIC REPORT

Polymer SP-01

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Fuji Xerox Australia Pty Ltd (ABN 63 000 341 819)
101 Waterloo Road
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, Molecular weight, Polymer constituents, Residual monomers/impurities, Use details, 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

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Polymer SP-01

OTHER NAME(S)
Styrene/acrylate copolymer

MOLECULAR WEIGHT (MW)
Number Average Molecular Weight (Mn) >1000 Da

REACTIVE FUNCTIONAL GROUPS
The notified polymer contains only low concern functional groups.

3. PLC CRITERIA JUSTIFICATION

Criterion	*Criterion met*
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:	White powder
Melting Point	60°C
Density	1100 kg/m^3 at 22.6°C ± 0.5°C
Water Solubility	< 1.2 × 10^{-3} g/L at 20 ± 0.5°C. The solubility was estimated visually based on a flask method and is consistent with calculations based on a group additivity method. The notified polymer is expected to be insoluble due to its predominantly hydrophobic and cross-linked structure.
Dissociation Constant	The notified polymer contains acidic functional groups that are expected to be dissociated in the environmental pH range. This expectation is supported by an acidity constant for one of the polymer side chains (pK_a = 3.98) estimated using Hammett equations (ACD/pK_a 8.03).
Particle Size	Inhalable particles < 100 µm = 19.3% Respirable particles < 10 µm = 5.54% < 5.5 µm = 1.22%
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	1- 10	10 - 100	10 - 100	10 - 100	10 - 100

Use
The notified polymer is a component of printer and photocopier toner at > 50%.

Mode of Introduction and Disposal
Imported by ships into Sydney as a component of sealed toner cartridges for printers and photocopiers. Spent cartridges are expected to be collected and sent to landfill or recycled.

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 a powder with very low water solubility and comprises a large proportion of the toner (> 50%). Dermal and inhalation exposure to the notified polymer may occur when replacing spent cartridges and clearing paper jams from printers or photocopiers but the design of the cartridges is such that inhalation and dermal exposure to the notified polymer should be low. Once the ink dries, the polymer will be bound within the matrix of the paper and become inert, therefore dermal exposure to the notified chemical from contact with the dried ink is not expected.

Although exposure to the notified polymer could occur, the risk to workers is considered to be low due to the intrinsic low hazard of the notified polymer. However due to the particulate nature of the toner, printers and photocopiers should be placed in well-ventilated areas and respiratory exposure should be avoided.

Public Health Risk Assessment
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. The risk to public health presented by the notified polymer is expected to be low due to the design of the cartridges and low potential for exposure. Nevertheless, due to the particulate nature of the toner, respiratory exposure should be avoided. Photocopiers and printers should be located in well-ventilated areas.

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 is unlikely to 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 a toner 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 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 when it is stored, transported, used, recycled or disposed of in the proper manner.

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 ensure adequate ventilation is present when removing spent toner cartridges containing the notified polymer and during routine maintenance and repairs.

- Photocopiers and printers should be located in well-ventilated areas.

- 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 a manner other than inside sealed cartridges,

or

(2) Under Section 64(2) of the Act; if
- the function or use of the notified polymer has changed from a component of printer and photocopier toner, 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 provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.