

File No PLC/828

April 2009

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

FULL PUBLIC REPORT

Polymer SP-02

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**Polymer SP-02****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 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

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer SP-02

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*

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:	Pale yellow powder
Melting Point/Glass Transition Temp	64 – 67 ± 0.5°C
Density	1220 kg/m ³ at 22°C
Water Solubility	Visually estimated to be < 1.6 mg/L at 20±0.5°C by using a procedure based on the flask method, OECD Guideline 105. The water solubility of the notified polymer was also estimated to be ≤ 3.08 × 10 ⁻¹² g/L at 25°C by using an atom/fragment contribution method. The notified polymer is predicted to be insoluble in water based on the hydrophobic nature of the structure.
Dissociation Constant	The notified polymer may contain dissociable end groups which are expected to display typical acidity with a pKa ~4.
Particle Size	< 100 µm 20.5%, < 10 µm 4.67% and < 5.5 µm 0.951%
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use. The notified polymer contains hydrolysable functional groups. However, hydrolysis is unlikely to occur in the environmental pH range of 4 – 9.
Oxidising Properties	Not predicted to be oxidising

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	1-10	1-10	10-20	10-20

Use

The notified polymer is a component of toner ink at concentrations of 30-60%.

The notified polymer will not be manufactured, reformulated or repackaged within Australia. The imported toner cartridges will be used by office workers and the public.

Mode of Introduction and Disposal

The notified polymer will be imported in sealed toner cartridges that are ready for use, through the port of Sydney.

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.

The particle size of the notified polymer indicates that a significant portion of the notified polymer will be inhalable (20.5% < 100µm) with a small portion also respirable (4.67% < 10 µm). However, given the NAMW is < 10,000 Da, lung overloading is not expected. If the notified polymer is inhaled at low levels, it is likely to be cleared from the upper respiratory tract readily through mucociliary action. Small proportions of the notified polymer may reach the lower respiratory tract, but it should still be readily cleared from the lungs unless high levels are inhaled. When high concentrations of the notified polymer are inhaled, it is likely to be cleared from the lungs, but this may be slower and temporary respiratory impairment is possible.

Occupational Health and Safety Risk Assessment

Dermal and inhalation exposure of office workers and maintenance engineers to the notified polymer (at concentrations up to 60%) could potentially occur when replacing spent cartridges and clearing paper jams from the printer. However, the respirable proportion of the polymer is low (4.67%), and the design of the sealed cartridges should ensure leakage is unlikely and as such, exposure to the notified polymer should be low. Once the toner dries, the polymer would be trapped in the printed paper, and therefore dermal exposure to the notified polymer from contact with the dried toner is not expected.

Public Health Risk Assessment

The risk to public health presented by the notified polymer is expected to be low due to its intrinsic low toxicity and the low potential for exposure. Nevertheless, due to the particulate nature of the toner, skin, eye and 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 does not 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.

Environmental Risk Assessment

No significant release of the notified polymer to the aquatic environment is predicted from the application of the toner containing notified polymer in Australia. The polymer may either end up to landfill or be incinerated. In either method of disposal, the notified polymer will be decomposed into small molecules of water and oxides of carbon.

The notified polymer is not predicted to pose an unacceptable risk to the aquatic environment based on its reported use pattern and the hydrophobic nature.

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