File No PLC/690

March 2007

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

SREP-011EX

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 and Water Resources.

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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

TABLE OF CONTENTS

FULL PUBLIC REPORT

SREP-011EX

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Ricoh Australia Pty Ltd (ABN: 30 000 593 171)
8 Rodborough Rd
Frenchs Forest NSW 2086

and

Lanier Australia Pty Ltd (ABN: 39 001 568 958)
854 Lorimar Street
Port Melbourne VIC 3207

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, Specific Use, Residual Monomers/Impurities, Percentage of notified polymer in final product 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)
No

NOTIFICATION IN OTHER COUNTRIES
No

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
SREP-011EX

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn)	>10000
% of Low MW Species < 1000	< 2
% of Low MW Species < 500	< 2

REACTIVE FUNCTIONAL GROUPS

The notified polymer contains a high concern functional group but the FGEW is predicted to be > 5000.

3. PLC CRITERIA JUSTIFICATION

Criterion	*Criterion met (yes/no/not applicable)*
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

OR

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Pale yellow granules
Melting Point/Glass Transition Temp	Decomposes below boiling point
Density	1162 kg/m^3 at 20°C
Water Solubility	<0.001 g/L at 20°C Approximately 1000 mg, 100 mg and 40 mg of test material (particle size: 60 mesh; 80 mesh) were weighed and added to vials containing 500 ml of ion-exchange water, N-heptane, tetrahydrofuran and N-octanol. The samples were mixed frequently by hand at 40°C for 1 hour and were mixed at 25°C for 24 hours. After 24 hours, the samples were filtered and the filtrate was dried under reduced pressure (10 torr) at 60°C for 5 hours and weighed. The amount of chemical dissolving in solvent was determined by subtracting the amount collected on the filter from the amount originally added to the solvent.
Dissociation Constant	Not determined. Expected to be pKa 10.4 based on an analogue chemical.
Particle Size	4.58 mm
Reactivity	The polymer does not hydrolyse and does not undergo photo- or thermal degradation or depolymerisation under normal conditions of use. Results of a stability test at pH 1.2, 4.0, 7.0 and 9.0 indicated 0.1% weight loss after shaking for 2 weeks at 25°C.
Degradation Products	None under normal conditions of use. While the notified polymer contains hydrolysable functionality, hydrolysis is not expected to occur within the ambient environment.

Comments

This polymer has amino groups. However the FGEW is predicted to be > 5000 thus the level of polycationic functionality is unlikely to pose an unacceptable hazard to the aquatic environment.

5. INTRODUCTION AND USE INFORMATION

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	< 0.5	< 1	< 2	< 4	< 4

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction
The notified polymer will be imported as a component of sealed toner cartridges (910 g capacity) at a concentration ranging up to 15%. The notified polymer will also be imported as developer in 650 g development units at a concentration up to 2%. Both toner cartridge and developer units will be used in industrial printing machines.

Reformulation/manufacture processes
The notified polymer will not be manufactured or reformulated in Australia. It will be imported as a component of sealed toner cartridges and developer units for industrial printing machines. The toner will be imported and supplied in purpose built, sealed toner cartridges, which are inserted inside the printing equipment.

The developer will be supplied in 650 g development units and will be injected into the printer when the indicator light flashes showing that developer is running out. The photocopier has a dedicated inlet on the front of the machine to feed the developer. The development unit is opened and inserted into the inlet, which automatically feeds the developer into the photocopy machine. Trained service technicians will handle both products containing the notified polymer.

Use
As a component of toner cartridges and developers for industrial printing machines.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE
Transport & Warehousing
Workers are not expected to be exposed to the imported notified polymer during transport and storage, as they will be handling closed containers. Dermal exposure is possible in the event of an accident where the packaging is breached.

Service Technicians
Service technicians will come into contact with the sealed cartridges and developer during printer maintenance. Any empty or defective cartridges will be replaced with new ones. No attempt will be made to repair or refill the cartridges. The most likely route of exposure to the notified polymer is dermal. Inhalation exposure is unlikely as the notified polymer is of high molecular weight and is expected to have negligible vapour pressure and the formation of dust is unlikely due to the sealed nature of the cartridge. Similarly, 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 often wear cotton disposable gloves. Pre-packed toner cartridges are sealed and worker exposure to the toner 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 manufacture's instructions. The main route of exposure will be dermal. However, since the cartridges are sealed, there is low risk of such exposure.

Retail Workers
These 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 and thus minimal exposure to the notified polymer is expected.

PUBLIC EXPOSURE
The notified polymer will not be sold to the public. The public may be exposed in the unlikely event of a transport accident where the transport containers are breached and product is spilled. The public will also come into contact with final product (e.g. printed paper) coated with the toner and developer containing the notified polymer.

6.2. Toxicological Hazard Characterisation

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

6.3. Human Health Risk Assessment

OCCUPATIONAL HEALTH AND SAFETY
The OHS 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.

Although exposure to the notified polymer could occur in the event of an accident, the risk to workers is considered to be low due to the intrinsic low hazard of the notified polymer and the protective measures recommended by the manufacturer.

PUBLIC HEALTH
The risk to public health presented by the notified polymer is expected to be low due to its intrinsic low toxicity and low potential for exposure.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE
The notified polymer or the printing components containing it will not be manufactured in Australia. The notified polymer will only be imported in sealed purpose built 910 g toner cartridges and developer in 650 g development units. The release of the notified polymer will be low and diffuse. The environmental safety controls and use pattern for the notified polymer would indicate a limited potential for its release into the environment. Aquatic release of the formulation containing the notified polymer is considered unlikely and after drying the notified polymer is likely to be stable within an inert matrix on printed-paper products.

Emptied toner cartridges containing a residue of notified polymer will be sent to landfill for disposal. Empty development units containing the developer will be disposed of to landfill. The residues in the imported development units are expected to contain up to 0.5% of the annual import volume of notified polymer. Some losses of the polymer may occur as a result of incidental spills during loading of printer with developer, however the small size of the containers will limit the size of spill. It is estimated that 0.5% of the annual import volume of notified polymer may be released from spills. Spills are expected to be collected with a vacuum cleaner. Collected spilt material will be disposed of to landfill.

A portion of the paper products containing the notified polymer may be released to the environment via printed waste paper, however, the expected small quantity and stable form is unlikely to pose an unacceptable risk to the environment.

During recycling processes, waste paper is repulped using a variety of alkaline, dispersing and wetting agents, water emulsifiable organic solvents and bleaches. These agents enhance fibre separation, toner detachment from the fibres, pulp brightness and the whiteness of paper. These aqueous wastes are expected to go to sewer. Very little of the notified polymer is expected to partition to the supernatant water which is released to the sewer. Sludge generated during the washing process is dried and incinerated or sent to landfill for disposal.

ENVIRONMENTAL FATE
There are no data for the biodegradation of the notified polymer.

The notified polymer has a relatively high molecular weight and has negligible solubility in water. It is expected to bind strongly to sludge or organic matter in soil. Thus, it is expected to be relatively immobile in the environment. In a landfill, the notified polymer is expected to be immobile, and eventually it will degrade through biotic and abiotic processes, and consequently, should not pose a significant exposure hazard to the environment.

7.2. Environmental Hazard Characterisation

No ecotoxicological data were submitted. The notified polymer contains a high concern potentially cationic functional group. Aquatic toxicity in clean water (that is, TOC <2 mg/L) increases exponentially with increasing cationic charge density, that is protonated and/or quarternarised -N, S or P. However, the FGEW of the charged functional group of the notified polymer is predicted to be > 5000 and therefore, is not expected to pose an unacceptable hazard to the aquatic environment. In addition, the relatively high molecular weight indicates that the polymer is unlikely to cross biological membranes and bioconcentrate.

7.3. Environmental Risk Assessment

Based on the minimal and diffuse release of the notified polymer and the high molecular weight, the risk to the environment posed by the proposed use patterns and volume is expected to be acceptable.

8. CONCLUSIONS

8.1. Level of Concern for Occupational Health and Safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

8.2. Level of Concern for Public Health

There is Negligible Concern to public health when used in the proposed manner.

8.3. Level of Concern for the Environment

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

9. MATERIAL SAFETY DATA SHEET

9.1. Material Safety Data Sheet

The notifier has provided MSDS as part of the notification statement. The accuracy of the information on the MSDS remains the responsibility of the applicant.

10. 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 NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Environment

- Do not allow material or contaminated packaging to enter drains, sewers or water courses

Disposal

- The notified polymer should be disposed of in landfill.

Emergency procedures

- Spills/release of the notified polymer should be handled by collecting the cartridge intact and landfilled.
- Contain the spill and absorb with sawdust, sand or earth.
- Place used absorbent in suitable sealed containers and follow state or local regulation for the disposal of the waste.

10.1. Secondary Notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

(1) Under subsection 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 not used as a component of toner cartridges and developers for industrial printing machines.

or

(2) Under subsection 64(2) of the Act:
  - if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.