

File No PLC/691

February 2007

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

FULL PUBLIC REPORT

SREL-89

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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**Director
NICNAS**

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FULL PUBLIC REPORT**SREL-89****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, 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)
SREL-89

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

% of Low MW Species < 1000 < 10
% of Low MW Species < 500 < 5

REACTIVE FUNCTIONAL GROUPS

The notified polymer contains only low concern functional groups.

3. PLC CRITERIA JUSTIFICATION

| <i>Criterion</i> | <i>Criterion met (yes/no/not applicable)</i> |
|--|--|
| 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 | Pale yellow granules |
| Melting Point/Glass Transition Temp | Decomposes below boiling point. |
| Density | 1210 kg/m ³ at 20°C |
| Water Solubility | < 0.001 g/L at 20°C. |
| Dissociation Constant | Approximately 1000 mg and 100 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. |
| Particle Size | The notified polymer contains a small amount of COOH groups, which are expected to have pKa values of 3-4. 1.0~6.6mm |
| Reactivity | Particle size was calculated from the diameter of representative 50 grains from a test sample of 10 grams measured by a slide calliper. 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. |

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> |
|---------------|----------|----------|----------|----------|----------|
| <i>Tonnes</i> | < 1 | < 2.5 | < 3.5 | < 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 of up to 75%. The notified polymer will also be imported as developer in 650g development units at a concentration of up to 6.5%. Both toner cartridges 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.

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 toner cartridges and in plastic bottles. 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.

The relatively high molecular weight indicates that the polymer is unlikely to cross biological membranes and bioconcentrate.

Emptied toner cartridges containing a residue of notified polymer will be sent to landfill for disposal. 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.

Empty plastic bottles containing the developer will be disposed of to landfill. The residual in the imported plastic bottles are expected to contain up to 0.5% of the notified polymer. Some losses (up to 0.5%) of the polymer may occur as a result of incidental spills during loading of a printer with developer, however, the small size of the containers will limit the size of the spill. Spills will be collected by a vacuum cleaner, with collected spilt material being disposed of to landfill.

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

ENVIRONMENTAL FATE

The notified polymer contains polyester functionality that might hydrolyse under severe conditions, but is expected to be stable under normal environmental conditions. Due to its low water solubility, notified polymer disposed of to landfill is expected to remain bound within the soils and sediments and eventually degrade through biotic and abiotic processes. It is not expected to be readily biodegradable and due to its high molecular weight, it is not expected to bioaccumulate. Incineration of the notified polymer will result in the formation of water vapour and oxides of carbon.

7.2. Environmental Hazard Characterisation

No ecotoxicological data were submitted. Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is overchelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. This is unlikely to 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.

7.3. Environmental Risk Assessment

While environmental exposure is limited during toner use, the total import volume of the notified polymer will ultimately be disposed of in either landfill or be incinerated. The widespread use pattern indicates that landfills throughout Australia would receive the notified polymer bound into the toner matrix within cartridges and on paper products. The used toner would be expected to remain within the container unless breached. On paper the notified polymer will interact with other components to form a stable polymer matrix and, once dry, is expected to be immobile and pose little 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.

The notified polymer is not likely to present a risk to the environment when it is stored, transported, used, recycled and disposed of in the proposed manner.

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

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.

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.

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.