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

FULL PUBLIC REPORT

RTP-007

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**Director
Chemicals Notification and Assessment**

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FULL PUBLIC REPORT

RTP-007

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Ricoh Australia Pty Ltd (ABN 30 000 593 171) of 8 Rodborough Rd, Frenchs Forest NSW 2086, and
Lanier Australia Pty Ltd (ABN 39 001 568 958) of 854 Lorimer St, Port Melbourne VIC 3207

NOTIFICATION CATEGORY

The notified polymer meets the PLC criteria.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Part B: Chemical Name, Other Names, CAS Number, Molecular and Structural Formulae, Molecular Weight, Spectral Data, Purity, Impurities (Hazardous/Non-hazardous), Additives/Adjuvants, Estimated Manufacture/Import Volume, and Site of Manufacture or Reformulation.

Part D: Identity and Composition of Polymer, Degradation Products and Loss of Monomers, Other Reactants, Additives, Impurities.

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)

Commercial evaluation permit (2001)

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

RTP-007 (notified polymer)

Ricoh Color LP Toner Cassette Type 105 (Black, Cyan, Magenta, Yellow)

Lanier Toners for 2138 (Black, Cyan, Magenta, Yellow)

3. COMPOSITION

DEGREE OF PURITY

High

Non-Confidential

4. INTRODUCTION AND USE INFORMATION

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

Import

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>	<10	<10	<10	<10	<10

USE

A component (binder resin) of toner products for use in colour photocopiers.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, Transport and Storage

PORT OF ENTRY

Sydney and Melbourne

IDENTITY OF MANUFACTURER/RECIPIENTS **Non-Confidential**

Ricoh Australia Pty Ltd and Lanier Australia Pty Ltd

TRANSPORTATION AND PACKAGING

The notified polymer will be transported and distributed as a component of an end-use product in sealed cartridges with four cartridges in a cardboard carton.

5.2. Operation Description

No manufacturing, reformulation, filling or refilling of containers will occur in Australia. The imported toner products will come in five different colours and contain not less than 70% notified polymer for use in colour photocopiers. Replacement of toner cartridges will be carried out by customer service engineers. It involves removal of the old toner cartridge from the copier and loading the new cartridge directly. Instructions on opening the photocopier and replacing the toner cartridge are printed on the product label and in the technical instructions for the photocopier.

5.3. Occupational exposure

Number and Category of Workers

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration</i>	<i>Exposure Frequency</i>
Waterside, transport and storage	6-8	2-3 hr/day	10-15 days/year
Customer service engineers	200	5-20 min/day	200 days/year

Exposure Details

Waterside, transport and storage workers who will load and unload cartons for either storage or distribution to customers are unlikely to be exposed to the notified polymer unless the packaging is breached.

Customer service engineers may be intermittently exposed to the notified polymer contained in the toner cartridge via skin contact when replacing the used cartridge and during maintenance and cleaning of photocopiers. Exposure by inhalation may also occur, although the amount of dust around the copiers is expected to be minimal. The service engineers will wear cotton gloves and receive proper training in servicing techniques. Toner cartridges are sealed and worker exposure to the toner is minimised by following instructions on opening the copier and replacing the toner cartridge recommended by the manufacturer.

Contact with paper printed with toners containing the notified polymer is unlikely to result in dermal exposure as the polymer will be bound to the paper and become inert.

5.4. Release

RELEASE OF CHEMICAL AT SITE

Not applicable.

RELEASE OF CHEMICAL FROM USE

Release of the toner to the environment is not expected under normal use as the cartridge is designed to prevent leakage and the sealed cartridges will not be opened during transport, installation, use or replacement. If leakage does occur, the toner will be collected and presumably disposed of in landfill.

The toner cartridges will be replaced by trained customer service engineers, placed into the replacement toner cartridge packaging and disposed of in landfill; spent cartridges are not recycled. Residues in the empty cartridges (approx. 10%) are expected to remain within the containers although release could occur from deterioration of the cartridge. Environmental release could also result from the disposal of paper containing the bound polymer with 25% of the import volume anticipated to enter the paper recycling process.

5.5. Disposal

The notified polymer will be either disposed of in landfill, recycling or incineration in accordance with the federal, state and local laws.

5.6. Public exposure

Public exposure through importation, transportation and storage is negligible. There is no processing or re-packaging within Australia. The notified polymer is a component of black-and-white and colour photocopier toners. The toner is contained within sealed cartridges which are not normally opened. There is potential for minor exposure to the polymer during cartridge changes. Toner on the printed page is bound to the paper and hence not biologically available.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Light yellow granular solid
Melting Point	Not determined
Density	1170 kg/m ³
Remarks	Relative density was determined using a buoyancy gauge method. A portion of test substance is weighed in ambient condition and transferred into the liquid of which the density value is known. Test substance in liquid is weighed. The liquid used was water.
Water Solubility	Not determined
Remarks	The polymer largely contains hydrophobic groups likely to confer low water solubility.
Hydrolysis as a Function of pH	Not determined
Remarks	The polymer is not expected to hydrolyse in the environmental pH range of 4-9 due to low water solubility.
Partition Coefficient (n-octanol/water)	Not determined
Remarks	The polymer is likely to partition into the organic phase due to its expected low water solubility.
Adsorption/Desorption	Not determined
Remarks	As a consequence of its expected hydrophobicity, the notified polymer is likely to bind with soil and sediment and become relatively immobile.
Dissociation Constant	Not determined

Remarks The polymer does not contain any groups which can undergo dissociation at the environmental pH of 4-9.

Particle Size 500 µm (mean)

Remarks	Particle size was determined using a sieve method.	
	<i>Range (µm)</i>	<i>Mass (%)</i>
	<106	4.09
	<250	17.88
	<600	63.45

Flammability Limits Not determined

Autoignition Temperature Not determined

Explosive Properties Test not conducted

Remarks High concentrations of dust and air mixture formed by the small particles may cause an explosion.

Reactivity Stable

Remarks Under normal conditions of storage, the polymer is not expected to undergo degradation or hazardous polymerisation. It does not contain any reactive functional groups.

7. TOXICOLOGICAL INVESTIGATIONS

A reverse mutation test of the notified polymer using bacteria was submitted for assessment. The study was conducted in accordance with the US EPA Test Guidelines 870.5100 using *S. typhimurium* (TA1535, TA1537, TA98, TA100), and *E. coli* (WP2 uvrA). Based on the test report, it was concluded that the notified polymer had no mutagenic potential under the conditions of the test (BRC, 2000).

8. ENVIRONMENT

8.1. Environmental fate

No environmental fate data were submitted.

8.2. Ecotoxicological investigations

No ecotoxicity data were submitted.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

Environmental exposure will result from the disposal of printed paper and discarded cartridges, as well as the possibility of accidental leakage of the cartridges during use or transport. If leakage does occur, the toner will be collected and presumably disposed of in landfill. Toner residues contained in the used cartridges are expected to be about 10% of the import volume and will remain within these containers, although release could occur from deterioration of the cartridge.

Some waste paper may be disposed of directly to landfill with the notified polymer strongly

bound to the paper (approx 65% of the import volume). It is anticipated that prolonged residence in an active landfill environment would eventually degrade the polymer. Incineration of waste paper will destroy the compound with the generation of water vapour and oxides of carbon.

In addition to landfill, another 25% of the printed paper will enter the paper recycling process. During such processes, waste paper is repulped in water using a variety of alkalis, 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. The wastes are expected to be neutralised and disposed of to a liquid waste facility by a licensed waste contractor. Trade sources estimate the washing process will recover 30-60% of the total amount of the toner and therefore at least 30% of the notified polymer in the recycled paper will be disposed of with sludge in landfill.

Ultimately, the total import volume of the notified polymer will be disposed of in landfill, recycling with paper or incineration. Based on the import volume and method of packaging, environmental exposure of the notified polymer is determined to be low and widespread.

9.1.2. Environment – effects assessment

Due to its low water solubility and large molecular weight which will inhibit passage through cell membranes, the notified polymer is not likely to present a hazard to the environment when it is stored, transported and used in the proposed manner.

9.1.3. Environment – risk characterisation

The notified polymer will enter environmental compartments indirectly by disposal of waste paper (for recycling, to landfill or for incineration) and by direct release from discarded toner cartridges at landfill sites. Wastes from the recycling process including sludge will be dried and disposed of in landfill. As a consequence, very little amount of the notified polymer is expected to partition to the supernatant water which is released to the sewer.

Abiotic or slow biotic processes would be largely responsible for the degradation of the notified polymer. Due to its expected low water solubility, the notified polymer is likely to be immobilised through adsorption onto soil particles and sediments. Bioaccumulation of the notified polymer is also not expected because of its low water solubility and large molecular weight which will inhibit passage through cell membranes.

On the basis of the available information, the overall environmental risk of the notified polymer is expected to be low.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Exposure of transport and storage workers to the notified polymer would be negligible as they are unlikely to be exposed to the polymer unless the packaging is accidentally breached. Spills will also be collected in a suitable container for disposal of in landfill in accordance with the government's regulations.

Customer service engineers may experience dermal and inhalational exposure when replacing used cartridges. However, the notified polymer will be imported in pre-packed cartridges and its design is such that exposure to the notified polymer should be low. In addition, the service personnel are trained in servicing techniques and often wear disposable cotton gloves during maintenance.

There will be frequent and widespread contact of office workers with papers printed with the toner containing the notified polymer. However, the polymer once fixed to the paper as part of the toner product will not be bioavailable.

9.2.2. Public health – exposure assessment

There will not be significant public exposure to the notified polymer as it is contained within

cartridges which are not normally opened and which release the toner in very small doses. Contact with residues/spills around photocopiers will be minimal. Contact with printed paper is unlikely to lead to dermal exposure, as the notified polymer is bound to the paper. On this basis, public exposure to the notified polymer is expected to be negligible.

9.2.3. Human health - effects assessment

The notified polymer meets the PLC criteria and therefore low hazard is expected due to the lack of reactive groups and the inability of the polymer to penetrate biological membranes. The bacterial reverse mutation test submitted also indicates that the notified polymer is not mutagenic to bacteria under the conditions of the test (BRC, 2000).

However, the toner powder may cause mechanical irritation to the eyes, and to the respiratory tract if inhaled. Repeated or prolonged skin contact may result in mild irritation.

9.2.4. Occupational health and safety – risk characterisation

Exposure of maintenance workers is anticipated predominantly via the dermal route, thus they are required to wear cotton or disposable gloves when servicing the photocopiers. Employers are responsible for maintaining the NOHSC exposure standard for nuisance dust of 10 mg/m³ TWA and for carbon black of 3 mg/m³ TWA (NOHSC, 1995). Photocopiers should also be located in well-ventilated areas.

Based on the expected low toxicity of the polymer and the expected low exposure, the OHS risk presented by the notified polymer is expected to be low.

9.2.5. Public health – risk characterisation

The risk to public health will be insignificant because of the design of the toner cartridge and the expected bio-unavailability of the notified polymer once bound to the paper on printing.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.1. Environment

On the basis of the available information, the polymer is not considered to pose a risk to the environment when used in the reported pattern.

10.2. Health hazard

Based on the available data the notified polymer is not classified as hazardous under the NOHSC Approved Criteria for Classifying Hazardous Substances (NOHSC, 1999).

10.3. Human health

10.3.1. Human health – Occupational health and safety

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

10.3.2. Human health – public

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

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS for the two toner products (Ricoh Color LP Toner Cassette Type 105 and Lanier Toners for 2138 containing not less than 70% notified polymer) provided by the notifiers were in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a). They are published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicants.

11.2. Label

The label for the two toner products (Ricoh Color LP Toner Cassette Type 105 and Lanier Toners for 2138 containing not less than 70% notified polymer) provided by the notifier were in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the label remains the responsibility of the applicant.

12. RECOMMENDATIONS

Occupational Health and Safety

No specific precautions are required for the notified polymer per se. However, due to the presence of potentially hazardous components in the two toner products:

- Employers should implement the following safe work practices to minimise occupational exposure to the toner products:
 - Adequate induction and training programs for service personnel.
- Employers should ensure that the following personal protective equipment is used by maintenance workers to minimise occupational exposure to the toner products:
 - Wearing of cotton or disposable gloves when servicing photocopiers or removing used cartridges.

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- Employers are responsible for maintaining dust levels around photocopiers below the NOHSC exposure standard for nuisance dust of 10 mg/m³ TWA and for carbon black of 3 mg/m³ TWA. Photocopiers 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 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.

Disposal

- The notified polymer should be disposed of either through recycling, landfill or incineration.

Emergency procedures

- Spills/release of the notified polymer should be contained as described in the MSDS (ie sweep onto paper and transfer to a sealable waste container) and the resulting waste is disposed of in landfill.

12.1. 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 Section 64(1) of the Act:
 - if the notified polymer is introduced in a chemical form that does not meet the PLC criteria.
- and

- (2) Under Section 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.

13. BIBLIOGRAPHY

NOHSC (1994a) National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

NOHSC (1994b) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

NOHSC (1995) Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:3008(1995)] & [NOHSC:1003(1995)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

NOHSC (1999) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1999)]. National Occupational Health and Safety Commission, Canberra, AusInfo.

BRC (2000) A reverse mutation test of [the notified polymer] using bacteria (Study no. M-1084). Tokyo, Japan, Bozo Research Centre Inc. (unpublished report submitted by the notifier).