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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

RSE-801

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 Heritage.

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Director
Chemicals Notification and Assessment

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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Ricoh Australia Pty Ltd of 8 Rodborough Road, Frenchs Forest, NSW 2086
Lanier Australia Pty Ltd of 854 Lorimar Street, 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: Chemical name, CAS number, molecular formula, structural formula, molecular weight details, residual monomers, and impurities and means of identification.

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.

NOTIFICATION IN OTHER COUNTRIES
None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
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3. COMPOSITION

All compositional information is exempt.

4. INTRODUCTION AND USE INFORMATION

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	0.8	0.8	0.8	0.8	0.8

USE **Non-Confidential**
The notified polymer is a component in photocopier toner, functioning as a binder at concentrations below 30%.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, Transport and Storage

PORT OF ENTRY
Not specified

TRANSPORTATION AND PACKAGING
The notified polymer will be imported in sealed, purpose-designed cartridges packed in cardboard boxes, with 4 cartridges per carton.

5.2. Operation Description

The notified polymer will be imported as a component of a photocopier toner. No reformulation of the notified polymer occurs in Australia.

5.3. Occupational exposure

Number and Category of Workers

Category of Worker	*Number*	*Exposure Duration*	*Exposure Frequency*
Transport and Storage workers	10-12	2-3 hrs/day	10-15 days/year
Customer Service Engineers	300-400	5-10 minutes/day	200 days/year

Exposure Details
Workers involved in the transport and storage of the toner would only be exposed to the notified polymer in the event of an accident.
Customer service engineers may come into contact with the toner during maintenance procedures, and are required to wear cotton gloves.
Office workers may come into contact with toner when changing cartridges.

5.4. Release

RELEASE OF CHEMICAL AT SITE
The notified polymer will not be manufactured in Australia.

RELEASE OF CHEMICAL FROM USE
Release of the toner containing the notified polymer to the environment is not expected under normal use as the cartridge (280 and 450 g of toner) is designed to prevent leakage. However, if leakage does occur, the toner will be contained and presumably disposed of in landfill. 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. Toner residues contained in the empty cartridges are expected to be about 10% of the import volume (up to 80 kg per annum) and to remain within these containers, although release could occur from deterioration of the cartridge. The total import volume of the notified polymer will ultimately be disposed of in either landfill (75% of annual import volume) or be incinerated or recycled with paper.

5.5. Disposal

The total import volume of the notified polymer will ultimately be disposed of in either landfill or be incinerated or recycled with paper.

5.6. Public exposure

The public will not be exposed to the notified polymer as it is normally contained within the enclosed toner cartridge. Although the cartridges are quite sturdy, exposure may occur if the cartridge is dropped during replacement the procedure.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20ºC and 101.3 kPa Pale yellow granules.

Melting Point 103ºC

Remarks Softening point

Density 1200 kg/m^3 at 20ºC

Water Solubility < 1 mg/L

Remarks: A summary test report indicates that the notified polymer (~100 mg) was added to water (0.5 L) and the resulting suspension was filtered and the percentage of weight loss determined. The notified polymer is classified as being slightly soluble.

Hydrolysis as a Function of pH Not determined

Remarks The notified polymer contains linkages that could be expected to undergo hydrolysis under extreme pH conditions. However, in the environmental pH range of 4 to 9, significant hydrolysis is unlikely to occur.

Partition Coefficient (n-octanol/water) Not determined

Remarks The partition coefficient has not been determined due to its expected low water solubility, and its likely hydrophobic nature, indicative of partitioning into the octanol phase.

Adsorption/Desorption Not determined

Remarks The notified polymer is expected to be relatively immobile in soil due to its expected low water solubility.

Dissociation Constant Not determined

Remarks The notified polymer contains terminal acid groups that are expected to have typical acidity.

Particle Size Mean particle diameter 6.8 μm (for toner)

Flammability Not flammable. Combustible.

Explosive Properties Not explosive.

Degradation Products
The chemical is considered to be stable under normal conditions of use and storage. Hazardous decomposition and polymerisation will not occur at room temperature.

Loss of Monomers, Other Reactants, Additives, Impurities
Once used, all chemical components are trapped.

7. TOXICOLOGICAL INVESTIGATIONS

No toxicological data were submitted.

8. ENVIRONMENT

No ecotoxicological data were submitted.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

Release of the notified polymer is discussed in Section 5.4. The majority of notified polymer will be strongly bound to the paper. It is anticipated that prolonged residence in an active landfill environment would eventually degrade the notified polymer. Incineration of waste paper will destroy the compound with the generation of water vapour and oxides of carbon.

In addition to landfill, some of the toner printed on paper will enter the paper recycling process. During such 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, ink detachment from the fibres, pulp brightness and the whiteness of paper. De-inking wastes are expected to go to trade waste sewers. Trade sources estimate the washing process will recover 30-60% of the total amount of toner and therefore at least 30% of the notified polymer in the recycled paper will be disposed of with sludge in landfill.

Based on the import volume, method of packaging and low concentration of the notified polymer in toner, release of the notified polymer to the environment is expected to be low but widespread. Waste from the recycling process includes sludge which is dried and disposed of to landfill, and very little of the notified polymer will partition to the supernatant water which is released to the sewer.

Abiotic or slow biotic processes are expected to be largely responsible for the degradation of the notified chemical as it is not expected to be readily biodegradable. As a consequence of its low water solubility, the notified chemical is likely to be immobilised through adsorption onto soil particles and sediments. Releases to the sewer will be low because very little of the notified chemical is expected to reach water and partition to supernatant water. Furthermore, the substance is not expected to bioaccumulate due to its low water solubility and limited release to water.

9.1.2. Environment – effects assessment

No ecotoxicological data were provided.

9.1.3. Environment – risk characterisation

The notified chemical will enter environmental compartments indirectly by disposal of waste paper (for recycling, to landfill or for incineration) and by direct release from discarded printer cartridges at landfill sites. Based on the import volume, method of packaging and low concentration of the notified chemical in toner, release of the notified chemical to the environment is expected to be low but widespread. Waste from the recycling process includes sludge which is dried and disposed of to landfill, and very little of the notified chemical will partition to the supernatant water which is released to the sewer.

While no data are available on the likely effects of the notified polymer to organisms in the environment, exposure to these organisms is not expected to be significant. Therefore, the environmental risk from the notified polymer is expected to be low.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

Dermal and inhalation exposure of office workers to the notified chemical will potentially occur when replacing spent cartridges and clearing paper jams from the printer or photocopier.

Dermal and inhalation exposure of maintenance workers to the notified chemical is possible during routine maintenance but is expected to be low due to the low concentration of the notified

chemical in the toner. Nevertheless, due to the probable fine nature of the toner, skin, eye and respiratory exposure should be avoided. The national exposure standard for nuisance dusts is 10 mg/m3 TWA [NOHSC, 1995]. Australia has no exposure standard for respirable dust, however, the ACGIH TLV of 3 mg/m3 TWA is recommended [ACGIH, 2001]. Due to their frequent exposure to toners, maintenance personnel should wear cotton or disposable gloves. However, the design of the cartridges is such that exposure to the notified polymer should be low. The predicted airborne concentration of toner dust in the vicinity of a photocopier is <0.1 mg/m^3 (EASE).

9.2.2. Public health – exposure assessment

On printed paper the notified polymer will be contained in a cured ink preparation and will be inaccessible to human contact. The potential for exposure of the public to the notified polymer is therefore 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 toner dust may cause mechanical irritation to the eyes, and to the respiratory tract if inhaled.

9.2.4. Occupational health and safety – risk characterisation

The risk of adverse health effects arising from occupational exposure to the notified chemical is low due to its expected low toxicity, low concentration in toner and low potential for exposure.

9.2.5. Public health – risk characterisation

As there will be no exposure of the public to the notified polymer or products containing the notified polymer, except when bound to paper, the risk to the public from exposure to the notified polymer is considered low.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of the notified polymer provided by the notifier was not in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a), as it does not give an Australian contact address or contain an appropriate hazard statement. However, the notified polymer is not being introduced to Australia except in the product.

The MSDS of the toner product containing the notified polymer provided by the notifier was 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 applicant.

11.2. Label

The label for the products containing the chemical 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

CONTROL MEASURES

Occupational Health and Safety

- A copy of the MSDS for the toners should be easily accessible to employees.
- 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.
- If products containing the notified polymer are hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances,* workplace practices and control procedures consistent with State and Territory hazardous substances regulations must be in operation.

Disposal

- The notified polymer should be disposed of in landfill.

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 disposed of in landfill.

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

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.

13. BIBLIOGRAPHY

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