File No PLC/442

12 May 2004

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

# FULL PUBLIC REPORT

## FCOAT

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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| | |
|---|---|
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**Director**
**Chemicals Notification and Assessment**

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### 1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Ricoh Australia Pty Ltd (ABN: 30 000 593 171)
8 Rodborough Road
FRENCHS FOREST NSW 2086

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

NOTIFICATION CATEGORY
Synthetic 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 formula
Structural formula
Polymer constituents
Import volume
Details of formulation

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
USA

### 2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
FCOAT

### 3. COMPOSITION

PLC CRITERIA JUSTIFICATION

| Functional Group | Category | Equivalent Weight (FGEW) |
|---|---|---|
| Amine | High Concern | 512 |

| *Criterion* | *Criterion met (yes/no/not applicable)* |
|---|---|
| Meets Molecular Weight Requirements | Yes |
| Meets Functional Group Equivalent Weight (FGEW) Requirements | Yes |
| Low Charge Density | Yes |
| Approved Elements Only | Yes |
| No Substantial Degradability | Yes |
| Not Water Absorbing | Yes |
| Low Concentrations of Residual Monomers | Yes |
| Not Hazardous Substance or Dangerous Good | Yes |

The notified polymer meets the PLC criteria. A polymer is low charge density if it is a solid that is not soluble or dispersible in water and is used only in its solid phase. The notified polymer will always be in the solid phase and not soluble in or discharged into water.

## 4. INTRODUCTION AND USE INFORMATION

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

| *Year* | *1* | *2* | *3* | *4* | *5* |
|---|---|---|---|---|---|
| *Tonnes* | <1 | <1 | <1 | <1 | <1 |

USE

The notified polymer is component of a photocopier/printer developer imported in a ready to use cartridge.

## 5. PROCESS AND RELEASE INFORMATION

### 5.1. Operation Description

The notified polymer will be imported as a component of photocopier developers, in purpose designed cartridges. Each cartridge will contain less than 6 grams of the notified polymer. The cartridges will be packed in cardboard cartons, with 6 cartridges per carton.

The cartons will be transported from the dockside to warehouses, stored at these sites and distributed to customer outlets around Australia. The cartons will be loaded and unloaded by transport and warehouse workers at warehousing and distribution sites. It is anticipated that waterside, transport, and warehouse workers will only be exposed to the material in the event of an accident, when the packaging is breached.

Copier service engineers will change developer cartridges. The used cartridge is removed from the machine and replaced with the new cartridge without direct contact with the developer containing the notified polymer. The developer containing the notified polymer remains sealed until the sealing tape is removed just before installation. Inhalation and dermal exposure to the notified polymer during the replacement process, in the event of a container leak or spill. Developer particles may be remain in the machine and disturbance of this will result in the inhalation exposure.

## 6. EXPOSURE INFORMATION

### 6.1. Summary of Environmental Exposure

**Environmental Exposure**

- The notified polymer will not be manufactured or reformulated in Australia.

- Due to the packaging, environmental release of the notified polymer from cartridges during importation, transportation, storage, handling and use is unlikely. In the event of an accidental leakage, clean-up procedures are expected to efficiently remove the majority of the released notified polymer.

- It is estimated that annually less than 10% of the notified polymer will remain in empty cartridges, most of which will be disposed of to landfill. It is estimated that approximately 22% of the notified polymer will enter the paper recycling process annually. The remaining 68% of the imported notified chemical will be disposed of to landfill, or possibly incinerated, bound to printed paper.

**Exposure Assessment**

- Due to its very slight water solubility, the notified polymer is not likely to be mobile in soils. It is unlikely to move from the landfilled printed waste material into leachate or groundwater with the majority bound to the paper in an inert matrix. If the polymer does enter the leachate it will be present at very low concentrations and will be released in a diffuse manner across Australia. The notified polymer will slowly degrade through abiotic and biotic processes.

- Incineration of waste paper will destroy the notified polymer and will generate water vapour and oxides of carbon and nitrogen.

- During the paper recycling process, the paper will be repulped in water, decontaminated, deinked with alkali, washed, cooked, bleached, screened and then used in the normal process as in other pulp materials. The alkali mixture resulting from the deinking stage is most likely recycled or neutralised and disposed of to a wastewater treatment plants (WWTP) by a licensed waste contractor. It is expected that all of the formulation (including the bound notified polymer) removed from the paper/pulp during deinking will mostly move to sludge, due to its very slight water solubility.

The notified polymer is not expected to bioaccumulate due to its high molecular weight (Connell 1989).

### 6.2. Summary of Occupational Exposure

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

The notified polymer will be imported in pre-packed cartridges. Dermal and inhalation exposure to the notified polymer may occur when replacing spent cartridges. However, the concentration of the notified polymer in the developer is low, and the design of the cartridges is such that exposure to the notified polymer should be low.

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.

### 6.3. Summary of Public Exposure

The notified polymer will not be sold to the general public and is only to be used for commercial purposes. Exposure is only possible in the event of accidents during transport. Exposure will be minimal as the notified polymer is contained within the enclosed toner cartridge. Once printed onto the paper, the notified polymer is fixed and the risk of exposure to the public via this route is considered low.

## 7. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Appearance at 20°C and 101.3 kPa** | Straw coloured granules |
| **Melting Point/Glass Transition Temp** | >150°C |
| **Density** | 1200 kg/$m^3$ at 20°C |
| **Water Solubility** | <2 x $10^{-4}$ g/L at 20°C (OECD TG105)<br>An estimated water solubility was then determined using WSKOW, Syracuse Research Corporation software version 1.40 and based on the lowest possible molecular weight. The estimated water solubility was 6.71 x $10^{-5}$ mg/L. |
| **Dissociation Constant** | The carboxylate groups present could undergo dissociation; $pK_a$ of 3 – 5. |
| **Particle Size** | The proportion of test material less than 100 μm was 0.319%. |
| **Reactivity** | The notified polymer is not highly flammable, does not have any explosive properties, and does not have a relative self-ignition temperature below 400°C. The notified polymer is considered stable under normal conditions of use and storage |
| **Degradation Products** | Hazardous decomposition and depolymerisation will not occur under normal conditions of use. |

## 8. HUMAN HEALTH IMPLICATIONS

### 8.1. Toxicology

The following toxicological end-points were submitted:

| *Endpoint* | *Result* | *Classified?* | *Effects Observed?* |
|---|---|---|---|
| Rat, acute oral LD50 >5000 mg/kg bw | low toxicity | no | yes |
| Rabbit, skin irritation | non-irritating | no | no |
| Guinea pig, skin sensitisation - non-adjuvant test. | no evidence of sensitisation | no | no |
| Genotoxicity - bacterial reverse mutation | non mutagenic | no | no |

#### 8.1.1 Discussion of Observed Effects

Acute Oral Toxicity Study

Gasping respiration was observed in all animals and brown staining around the nose was observed in one female. Recovery, determined by the external appearance and behaviour was complete by Day 3. No clinical signs were observed in the males throughout the study. A low bodyweight gain was noted in one female at Day 15.

### 8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. The results of the toxicity testing conducted with the notified polymer supports this conclusion.

## 9. ENVIRONMENTAL HAZARDS

### 9.1. Ecotoxicology

No toxicological data were submitted.

### 9.2. Environmental Hazard Assessment

The notified polymer has an amine and a FGEW of 512, therefore it may be toxic to aquatic organisms, particularly algae.

## 10. RISK ASSESSMENT

### 10.1. Environment

The notified polymer will be imported into Australia as a component in of a photocopier/printer developer in finished cartridges. Release of the polymer to the environment is not anticipated because the formulation is housed in sealed cartridges, designed to prevent release until the cartridges are inserted into the printer. Ultimately most of the notified polymer in the formulation will be bound to printed paper (in stable polymer matrix formed by reaction with other components), which at the end of its useful life will be either buried in landfill, incinerated, or recycled. Polymer contained in recycled paper will stay with the sludge and be landfilled.

The notified polymer in ruptured landfilled cartridges will be not be mobile in soil, rather becoming associated with soil organic matter. If any polymer does enter the leachate or groundwater, it will be at very low concentrations. The polymer is expected to undergo slow degradation by biotic and abiotic processes. Incineration is expected to destroy the notified polymer resulting in the release of combustion products such as water and oxides of carbon and nitrogen.

Given these considerations, the potential risk to the environment posed by the use of the polymer is low.

### 10.2. Occupational health and safety

The OHS risk presented by the notified polymer is expected to be low. The notified polymer may be present in formulations containing hazardous ingredients. If these formulations 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.

The level of atmospheric nuisance dust should be maintained as low as possible. The NOHSC exposure standard for atmospheric dust is 10 mg/m$^3$.

### 10.3. Public health

The notified polymer will not be available to the public.

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

### 11.1. Environmental risk assessment

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

### 11.2. Human health risk assessment

#### 11.2.1. Occupational health and safety

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

#### 11.2.2 Public health

There is Low Concern to public health when used as described in the notification.

## 12. MATERIAL SAFETY DATA SHEET

**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.

## 13. 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

- The following control measures should be implemented by distributor to minimise environmental exposure during use of the notified polymer:
  - Clear instructions on installation of cartridge and disposal of any spilt material and empty cartridges.

Disposal

- The cartridges which hold the product containing the notified polymer will be disposed of to domestic landfill. The pages on which the notified polymer has been applied to will either be landfilled, incinerated or recycled.

Emergency procedures

- Spills/release of the notified polymer should be contained and not allowed to enter any water body or course, then should be manually collected and placed in a container ready for disposal to landfill.

**13.1. 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.
- If uses are proposed that lead to aquatic exposures, a secondary notification should be submitted addressing the potential aquatic toxicity of the amine containing polymer.

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.