File No PLC/557

24 June 2005

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

KP-1

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
NICNAS

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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Ricoh Australia Limited, (ABN 30 000 593 171) of 8 Rodborough Road, Frenchs Forest NSW 2986

NOTIFICATION CATEGORY
Assessment: Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication:
Chemical Identity, Composition, Residual Monomers/Impurities, Specific Use Details and Import volumes

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, Japan

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
KP-1, Component in RC-C21 (Cyan), RC-C11 (Cyan), RC-M21 (Magenta), RC-M11 (Magenta), RC-Y21 (Yellow), RC-Y11 (Yellow) print cartridges.

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

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

Criterion	*Criterion met*
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. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified polymer will be imported as a component of printing ink at <5%.

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

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

USE
Used as a component of printing ink.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The notified polymer is not manufactured or reformulated in Australia. It will be imported as a component of printing ink. The ink will be imported and supplied in purpose built, sealed cartridges, which are inserted inside the printing equipment. The sealed cartridges will be handled by service technicians or office workers replacing the spent cartridges in the printer.

6. EXPOSURE INFORMATION

6.1. Summary of Occupational Exposure

Number and Category of Workers			
Category of Worker	*Number*	*Exposure Duration Hours/Day*	*Exposure Frequency (Days/Year)*
Transport and storage	10-20	4-8	200
Service Technicians	200	8	200
Office Staff	>5000	0.1	5
Retail	>1000	8	200

Transport and warehousing

Workers are not expected to be exposed to the imported notified polymer, as they will be handling closed containers. Exposure is possible in the event of an accident where the packaging is breached.

Service technicians

Service technicians will come in contact with the sealed cartridges 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 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 mist is unlikely. 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 ink cartridges are sealed and worker exposure to the ink 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 manufacturer's instructions. The main route of exposure will be dermal. However, since the cartridges are sealed, there is low risk of exposure.

Retail Workers

These workers will be involved in opening cardboard cartons, removing the cartridges, which will be contained within a outer cardboard box and stacking the individual boxes onto shelves. These workers will not have any contact with the cartridge and minimal exposure to the notified polymer.

6.2. Summary of Public Exposure

The notified polymer will not be manufactured, reformulated or packaged in Australia. The imported

cartridges may be transported by air, ship, rail, or truck to their distribution location. The notified polymer is contained in the cartridge and the physical design of the cartridge prevents handlers from accidentally touching the ink. The design also prevents leakage of its contents.

The loading and removal of a cartridge into or from its containment area in a printer can be readily accomplished without any contact with ink. Skin contact with the ink may occur if an attempt is made to insert or remove a damaged cartridge or to correct a paper-jam. Exposure may be possible from handling printed pages prior to the ink being fully dried or if the paper is ingested. Typically 0.06 g of ink per page is deposited onto the paper in a typical print job. The polymer would not be volatile and is expected to adsorb onto the paper matrix and once the ink has dried, the polymer will be trapped within the ink matrix. Thus, exposure via contact with the paper containing the ink will not be significant.

The cartridges are not intended for refilling, although this could occur to a small extent. Spent cartridges contain on average <1% of the notified polymer. The remaining ink is absorbed on foam contained within the cartridge and cannot be removed without breaking it. Ink on paper will be bound to the paper and is unlikely to be transferable to a person's skin.

6.3. Summary of Environmental Exposure

6.3.1. Environmental Release

RELEASE OF CHEMICAL AT SITE

No release is expected as reformulation or repackaging of the notified polymer or products containing it will not take place in Australia.

RELEASE OF CHEMICAL FROM USE

Release of the contents of the cartridge to the environment is not expected under normal use. The cartridges are designed to prevent leakage. These will be changed by service technicians, office workers and the public. However, if minor leakage or spill does occur, the ink will be wiped with absorbent material which will be disposed of in landfill.

Once the notified polymer is release onto the paper, most of the notified polymer is expected to remain adsorbed to the paper and trapped within the dried print on the paper. The notified polymer is expected to have a low vapour pressure. Thus it is not expected to volatize or be emitted into the air from printing application.

Based on the typical print job, 0.06 grams of ink is deposited per page. The concentration of the notified polymer in the ink is <5%. Paper to which the notified polymer will be bound will eventually be buried in landfill or incinerated. The majority of the notified polymer is expected to be disposed of in this way.

A small portion of the paper may be recycled and the polymer may be released in effluent from de-inking processes. The notified polymer is expected to be deposited in the sludge from the waste water treatment plant. The sludge will be disposed of to landfill.

Residues left in empty cartridges (estimated as <1%) will most likely be disposed of to landfill.

6.3.2. Environmental Fate

There are no data for the biodegradation of the notified polymer. However, based on the chemical structure, the notified polymer is not expected to be readily biodegradable.

The notified polymer has a relatively high molecular weight, it does not contain any charged groups or any groups which can under dissociation. Thus the notified polymer is not expected to have any significant water solubility. It is expected to bind strongly to organic matter in soil or sludge from wastewater.

Given that the notified polymer has a high molecular weight it is unlikely to cross biological membranes and bioconcentrate within aquatic organisms.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20ºC and 101.3 kPa	Milky white solid
Glass Transition Temp	>120ºC
Specific gravity	1.0 at 20ºC
Water Solubility	Based on the structure, the polymer is expected to be slightly soluble.
Dissociation constant	Based on the structure, expected to be remain ionised.
Particle Size	Not reported
Reactivity	Stable under normal environmental conditions
Degradation Products	Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide and/or sulfur oxides.

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

No toxicological data were submitted.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

No eco-toxicological data were submitted.

9.2. Environmental Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

10. RISK ASSESSMENT

10.1. Environment

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 cartridges. 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 notified polymer meets the PLC criteria and is expected to be of low environmental hazard. In addition, the relatively high molecular weight indicates that the polymer is unlikely to cross biological membranes and bioconcentrate.

Emptied ink 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.

A portion of the paper products containing the notified polymer may be released 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.

10.2. Occupational Health and Safety

The notified polymer meets the PLC criteria. The notified polymer or the printing components containing it will not be manufactured in Australia. Office workers and service technicians may be exposed to only low levels of the notified polymer given its low concentration in the printer

component. The notified polymer is sealed within the cartridge and is only subject to slow, controlled release from the purpose built cartridge during use. There is little likelihood of leakage or rupture of the cartridge. Once released onto the paper, the notified polymer is expected to remain bound to the paper or the cured print matrix. Overall, the release of the notified polymer will be low and of diffuse nature. Therefore, the health risk to workers is assessed as 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.

10.3. Public Health

The printer components containing the notified polymer may be sold to the public. The public may be exposed to only low levels of the notified polymer given its low concentration in the printer component. The notified polymer is sealed within the cartridge and is only subject to slow, controlled release from the purpose built cartridge during use. There is little likelihood of leakage or rupture of the cartridge. Once released onto the paper, the notified polymer is expected to remain bound to the paper or the cured print matrix. Overall, the release of the notified polymer will be low and of diffuse nature. Therefore, the risk to public from exposure to the notified polymer is considered low.

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

12. MATERIAL SAFETY DATA SHEET

12.1. 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.

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.

- Service personnel should wear cotton or disposable gloves when replenishing developer and servicing copying machines and printers.

Guidance in selection of personal protective equipment can be obtained from Australian,

Australian/New Zealand or other approved standards.

- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer:
  - Use according to the manufacturer's instructions.

- 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.

Public Health

- The following measures should be taken to minimise public exposure to the notified polymer:

  Do not swallow. Keep out of reach of children. Avoid contact with eyes

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 or be destroyed through incineration

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.

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.

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.