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

FULL PUBLIC REPORT

FC-1584

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**Director
NICNAS**

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FULL PUBLIC REPORT**FC-1584****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Ricoh Australia Pty Ltd (ABN: 30 000 593 171)
 8 Rodborough Rd
 Frenchs Forest NSW 2086

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, Use Details, Manufacture/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)

None

NOTIFICATION IN OTHER COUNTRIES

Korea, China

2. IDENTITY OF CHEMICAL

OTHER NAME(S)

Toner DDP184 Blue (product containing the notified polymer)
 Developer DDP184 Blue (product containing the notified polymer)
 Toner DDP184 Red (product containing the notified polymer)
 Developer DDP184 Red (product containing the notified polymer)
 Toner DDP184 Green (product containing the notified polymer)
 Developer DDP184 Green (product containing the notified polymer)

MARKETING NAME(S)

FC-1584

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) >1000

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	Solid yellow beads
Melting Point	130°C (melting start temperature)
Density	1250 kg/m ³
Water Solubility	1.0 mg/L at 20°C Modified Shake-Flask method, weighing dried filtrate.
Dissociation Constant	Not determined. The notified polymer contains a low amount of carboxylic acid functionality likely to have typical acidity.
Particle Size	640 µm (50% median diameter) Inhalable fraction (<100 µm) = 0.02%
Reactivity	Stable under normal environmental conditions
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>	< 0.5	< 1	< 2	< 2	< 2

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer will be imported as a component of sealed toner cartridges (750g capacity) at concentrations ranging from 60-70%. The notified polymer will also be imported as a component of developers in 1.4 kg plastic bottles at concentrations ranging from 2 – 3.5%.

Reformulation/manufacture processes

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

Use

The notified polymer will be used as a component of toner cartridges and developers for industrial printing machines.

During end use the sealed toner cartridges will be inserted inside the printing equipment. Developer will be injected from the plastic bottles into printing equipment as required by opening and inserting into the dedicated inlet.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

<i>Number and Category of Workers</i>			
<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration (Hours/Day)</i>	<i>Exposure Frequency (Days/Year)</i>
Transport and storage	10-20	4-8	200
Service Technicians	200	8	200
Printer operators	>1000	0.1	5
Wholesale printer supplies	>1000	8	200

Service technicians may make dermal or ocular contact with the notified polymer during printer maintenance operations such as when replacing cartridges or feeding developer into printing machines. Exposure is expected to be controlled through the design of the toner cartridges and printing machines. In addition, printer maintenance personnel often wear cotton disposable gloves.

Printer operators may make infrequent dermal contact with the notified polymer if printed materials are handled before ink has dried. However, once dried, the toner and developer containing the notified polymer are cured into an inert matrix and are hence unavailable for exposure.

PUBLIC EXPOSURE

The notified polymer will not be sold to the public. The public may be exposed to the notified polymer in the unlikely event of a transport accident where the transport containers are breached and product is spilled. The public will come into contact with final products (e.g. printed paper) coated with the toner and developer containing the notified polymer. However, at this stage the notified polymer will be trapped within a matrix and will not be bioavailable.

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.

PUBLIC HEALTH

The public are only likely to come into contact with the notified polymer in a cured form on printed materials. In this form it is expected that the notified polymer will remain bound to the paper and will not be bioavailable. Therefore, the risk to public health presented by the notified polymer is expected to be low.

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 1.4 kg 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 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 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 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 (Nabholz *et al.* 1993).

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 No 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.