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

**FULL PUBLIC REPORT**

**Polymer in ADVANCELL AEM001**

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  
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#### 4. 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>Kilograms</i>	<200	<200	<200	<200	<200

USE

Component of photocopying toner.

#### 5. PROCESS AND RELEASE INFORMATION

##### 5.1. Operation Description

The toner containing <10% notified polymer will be imported, distributed and supplied in sealed toner bottles/cartridges packaged in cardboard cartons.

The toner is used in photocopiers. To refill the toner, the toner bottle is firmly fitted into the copying machine and the shutter opened. To change the cartridge, the seal tape is removed and the cartridge is placed into the copying machine or printer. The toner bottle and cartridge are designed not to release the toner until the shutter is opened or seal tape is removed. Used cartridges may be disposed of to landfill, or collected and exported for recycling.

During the copying or printing operation, the toner will be transferred onto the paper and firmly fixed by heat.

#### 6. EXPOSURE INFORMATION

##### 6.1. Summary of Occupational Exposure

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 and service engineers to the notified polymer will potentially occur when replacing spent cartridges and clearing paper jams from the photocopier.

##### 6.2. Summary of Public Exposure

The notified polymer will not be available to the public. Members of the public may come into contact with the notified chemical bound to paper.

##### 6.3. Summary of Environmental Exposure

###### 6.3.1. Environmental Release

Photocopying toner, containing the notified polymer, will be imported in bottles or cartridges to Sydney where toner will be transported to a central warehouse. Small volumes may be relocated to company stores via road or air. No environmental releases are expected during routine storage, transport, or suggested use. While the public will change the bottles/cartridges, release during these operations is expected to be low. Most toner will be fixed to paper, with the remainder being disposed of to land fill with the used containers.

###### 6.3.2. Environmental Fate

While the notified polymer contains functional groups that are susceptible to hydrolysis it is expected that it will be hydrolytically stable due to its low water solubility. The notified polymer is not expected to be readily biodegradable. Due to its hydrophobic nature, it is expected that the notified polymer will associate with sediments and organic phases of soils and will not be mobile. It is unlikely to bioaccumulate in aquatic organisms due to its high molecular weight. Over time the polymer will slowly degrade to simple carbon compounds.

## 7. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance at 20°C and 101.3 kPa</b>	White opaque flowing emulsion in water (notified polymer emulsion); powder with mean diameter < 10 µm (toner).
<b>Melting Point/Glass Transition Temp</b>	Softening point 125°C (toner).
<b>Density</b>	Not determined.
<b>Water Solubility</b>	Not determined. Low solubility is expected.
<b>Dissociation Constant</b>	Not determined.
<b>Particle Size</b>	Mean diameter < 10 µm (toner).
<b>Reactivity</b>	Stable under normal environmental conditions
<b>Degradation Products</b>	None under normal conditions of use

## 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 toxicological data were submitted.

### 9.2. Environmental Hazard Assessment

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 could apply to the notified polymer, though the level of anionic functionality is low. 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). The aquatic toxicity may be expected to be low.

## 10. RISK ASSESSMENT

### 10.1. Environment

While environmental exposure is limited during toner use, the total import volume of the notified polymer will ultimately be disposed of by either landfill or incineration. 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 chemical matrix and, once dry, is expected to be immobile.

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.

## 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.

## 10.3. Public Health

The notified polymer will not be available to the public. Members of the public may make dermal contact with products containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is present at low concentrations and unlikely to be bioavailable.

## 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 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.
- Employers should implement safe work practices to minimise occupational exposure to the notified chemical during changing of the toner bottles or cartridges:
  - Measures to reduce inhalation exposure to the dust.
  - Measures to avoid skin contact.
- 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.

Emergency procedures

- Spills/release of the notified polymer should be handled by physical containment, collection and disposal to secure 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.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.

Reference:

Nabholz JV, Miller P & Zeeman M (1993) Environmental Risk Assessment of New Chemicals Under the Toxic Substances Control Act (TSCA) Section Five. In: Landis WG, Hughes JS & Lewis MA eds, Environmental Toxicology and Risk Assessment. ASTM STP 1179. American Society for Testing and Materials, Philadelphia, p 49.