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

FULL PUBLIC REPORT

Styrene Maleic Anhydride Resin

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 Water Resources.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at our NICNAS office by appointment only at 334-336 Illawarra Road, Marrickville NSW 2204.

This Full Public Report is also available for viewing and downloading from the NICNAS website or available on request, free of charge, by contacting NICNAS. For requests and enquiries please contact the NICNAS Administration Coordinator at:

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**Director
NICNAS**

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FULL PUBLIC REPORT**Styrene Maleic Anhydride Resin****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Hewlett Packard Australia Pty Ltd (ABN 74 004 394 763)
3 Richardson Place, North Ryde NSW 2113

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, 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

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

C8765, 8767, C9362 and C9364 Series

% of Low MW Species < 1000

< 15%

% of Low MW Species < 500

< 10%

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn)

> 1000 Da

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	Straw yellow liquid with a slight ammoniacal odour.
Freezing Point	0°C
Boiling Point	100°C
Density	1098 kg/m ³ at 4°C
Water Solubility	Completely soluble in water (> 360 g/L), which is consistent with the chemical structure of the polymer.
Dissociation Constant	Not determined. The notified polymer contains anionic functionality, which is expected to have a pKa of 3-4.
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use. Thermal decomposition products are: carbon monoxide, carbon dioxide and ammonia. The notified polymer is expected to be hydrolytically stable under ambient environmental conditions.

Comments

The above information was cited in the MSDS for a < 40% aqueous solution of the notified polymer.

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>	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer will be imported as a component of inkjet printing inks in pre-packed cartridges. The inks will contain a maximum of < 1% notified polymer.

Reformulation/manufacture processes

No reformulation or repackaging of the imported product containing the notified polymer will occur in Australia.

Use

The notified polymer acts as a surface-active agent in inkjet printing inks (used at < 1%). Sealed ink cartridges containing the notified polymer will be used as necessary to replace spent cartridges in inkjet printers. Office workers and the public will use these printers for varied printing work. The ink cartridges containing the notified polymer are designed for a single use, and will not be refilled.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

Transport and storage

Waterside, warehouse and transport workers are unlikely to be exposed to the notified polymer except if the packaging and cartridge were breached.

Printing and changing of cartridges (eg Office, imaging and printing service workers)

The notified polymer will be contained in sealed ink cartridges containing <100 ml of ink (< 1% notified polymer concentration). These cartridges are sealed, and worker exposure to the ink should be minimised by following the replacement procedures recommended by the manufacturer. Exposure should be limited to accidental dermal exposure. Due to the design of the cartridges and the low concentration of the notified polymer in the ink, exposure to the notified polymer should be low.

Dermal exposure during use of the printer could occur if printed pages were touched before the ink dried, or if ink-stained parts of the printer were touched. Such exposure is expected to be low and will be avoided by workers. Once dried, the notified polymer will be bound to the paper matrix and is not expected to be bioavailable.

Printer maintenance workers

Printer maintenance workers may be intermittently exposed to the notified polymer during repair maintenance and cleaning of the printers. Exposure is expected to be controlled through the design of the cartridges and the printing machines. Printer maintenance personnel often wear cotton disposable gloves to minimise incidental exposure.

PUBLIC EXPOSURE

The notified polymer will be used in inks designed for home use by consumers and in printing kiosks in shopping malls. During these uses, the possible exposure scenarios are similar to those for office or imaging workers. However, the public is expected to use inkjet printers less frequently than will office workers, and will therefore experience a lower overall exposure to the notified polymer.

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 primary route of exposure of workers to the notified polymer is likely to be dermal, during the use or maintenance of inkjet printers and/or handling of inkjet cartridges. Skin contact is likely to be avoided by workers to avoid staining of skin. The notified polymer is imported as a component of inkjet ink at low levels (< 1%) in small inkjet cartridges, and is therefore unlikely to cause significant levels of exposure by any route.

The notified polymer is therefore considered to present a low risk to the health of workers, based on its low toxicity, low concentration in inkjet inks and low potential for exposure.

PUBLIC HEALTH

The public's potential for exposure to the notified polymer during the handling of inkjet ink cartridges is similar to that of workers. Therefore, the notified polymer is likely to present a low risk to public health, based on its low toxicity, low concentration in inkjet inks and low potential for exposure.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

Printer ink will be imported in ready-to-use cartridges (containing < 1% notified polymer). No release is expected as manufacturing and reformulation of the ink containing the notified polymer will not take place in Australia. Environmental release of the notified polymer is unlikely during importation, storage and transportation, and spillage during a transport accident is the most likely reason for environmental release. Individual container capacity, container and packaging specifications would limit the extent of release.

The ink cartridges are designed to prevent leakage and will not open during transport, use, installation or replacement. Therefore, release of ink containing the notified polymer to the environment is not expected under normal conditions of use. Spills during installation and replacement will be contained with absorbent and disposed of in landfill.

Most of the notified polymer (> 98%) will be bound to the printed paper, which will be disposed of to landfill, recycled or incinerated. Recycling of treated paper may result in the release of a proportion of the notified polymer to the aquatic compartment. Waste paper is repulped using a variety of chemical treatments, which result in fibre separation and ink detachment from the fibres. The waste is expected to go to trade waste sewers. Approximately 50% of the ink printed on paper will enter paper recycling of which a proportion of the ink is expected to be recovered during recycling. While most may partition to water, due to the low percentage of the notified polymer in these inks and the widespread use, release to the aquatic compartment from any given recycling plant will still be low based on worst case assumptions. Any chemical absorbed to sludge during recycling process will be disposed of to landfill.

ENVIRONMENTAL FATE

The total import volume of the notified polymer will ultimately be disposed as normal office/domestic waste that will end up in either landfill or be incinerated. Some waste paper printed with the ink may be disposed of directly to landfill with the notified polymer bound to the paper. Some will enter the paper recycling process. Used cartridges will be sent to recycling and disposal centres. The cartridges will be broken down into component parts for recycling. Residual ink (< 2% of the notified polymer) left in the empty cartridges will be separated from the cartridges and incinerated during the recycling of the cartridges. If the used cartridges are not recycled, they are expected to be disposed of to landfill.

Notified polymer that is incinerated is expected to thermally decompose to form predominantly simple organic compounds and various salts. Similarly, notified polymer that is disposed of to landfill should eventually degrade to similar products.

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 could apply to the notified polymer. However, any toxicity to algae is likely to be reduced due to the presence of calcium ions, which will bind to the functional groups.

7.3. Environmental Risk Assessment

The notified polymer disposed of to landfill may be mobile, however, the low proposed annual import volume, and diffuse release throughout Australia will mitigate any potential exposure while the notified polymer slowly degrades.

In Australia, approximately 50% of printed paper is recycled. Given the low volume and diffuse release pattern, the overall environmental risk is expected to be acceptable.

8. CONCLUSIONS

8.1. Level of Concern for Occupational Health and Safety

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

8.2. Level of Concern for Public Health

There is No Significant 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 *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)] 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 or by incineration.

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 NICNAS 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.