

File No PLC/875

November 2009

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

FULL PUBLIC REPORT

DK306 polymer in Epson Ink Cartridge

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, Water, Heritage and the Arts.

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**DK306 polymer in Epson Ink Cartridge****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

EPSON Australia Pty Ltd (ABN 91 002 625 783)
3 Talavera Road, 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, 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

USA

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

DK306

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) > 10000 Da

REACTIVE FUNCTIONAL GROUPS

The notified polymer contains only low concern functional groups.

3. PLC CRITERIA JUSTIFICATION*Criterion*

Molecular Weight Requirements
Functional Group Equivalent Weight (FGEW) Requirements
Low Charge Density
Approved Elements Only
Stable Under Normal Conditions of Use
Not Water Absorbing
Not a Hazard Substance or Dangerous Good

Criterion met

Yes
Yes
Yes
Yes
Yes
Yes
Yes

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa:	White solid
Glass Transition Temp	> 100°C
Density	1100 kg/m ³ at 25°C
Water Solubility	Not determined. The notified polymer is considered insoluble based on the hydrophobic and crosslinked structure.
Dissociation Constant	The notified polymer contains anionic functionality with typical acidity of pKa ≈ 4.
Particle Size	0.6 µm
Reactivity	Stable under normal environmental conditions. Hydrolysis is unlikely to occur in the environmental pH range (4 – 9) despite the presence of hydrolysable functional groups in the notified polymer.
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>
Tonnes	0.1-0.3	0.1-0.3	0.1-1	0.1-1	0.1-1

Use

Component of ink for use in inkjet printer.

Mode of Introduction and Disposal

The notified polymer will be imported as a component of inkjet printing inks in pre-packed cartridges. The inks will contain < 10% notified polymer.

6. HUMAN HEALTH IMPLICATIONS

Hazard Characterisation

No toxicological data were submitted. The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

Occupational Health and Safety Risk Assessment

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 (< 10%) in inkjet cartridges, and is therefore unlikely to cause significant levels of exposure by any route.

The notified polymer is of high molecular weight and has the potential to cause lung overloading. However, the notified polymer is imported in pre-packed cartridges and inhalation exposure to the ink is unlikely. Therefore it is not expected to pose an unreasonable risk.

Therefore notified polymer is not considered to pose an unacceptable risk to the health of workers, based on its assumed low toxicity, low concentration in inkjet inks and low potential for exposure.

Public Health Risk Assessment

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 not considered to pose an unacceptable risk to public health, based on its assumed low toxicity, low concentration in inkjet inks and low potential for exposure.

7. ENVIRONMENTAL IMPLICATIONS

Hazard Characterisation

No ecotoxicological data were submitted. Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is over-chelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone, which does not apply to the notified polymer. The toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups.

Environmental Risk Assessment

The notified polymer will be imported into Australia as an ingredient of an ink in sealed cartridges, which will be distributed to customers for direct use. Most of the notified polymer will be sent to landfill as a result of disposal of used paper or sludge waste from paper recycling. In landfill, the notified polymer will be slowly degraded, eventually forming water and oxides of carbon. The notified polymer is unlikely to reach aquatic ecosystems and would not be bioavailable to or bioaccumulate in aquatic organisms.

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

8. CONCLUSIONS AND RECOMMENDATIONS

Human health risk assessment

Under the conditions of the occupational settings described, the notified polymer is not considered to pose an unacceptable risk to the health of workers.

When used in the proposed manner, the notified polymer is not considered to pose an unacceptable risk to public health.

Environmental risk assessment

Based on the reported use pattern, the notified polymer is not considered to pose a risk to the environment.

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.

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.

Regulatory Obligations

Secondary Notification

This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the chemical under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified chemical, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified chemical is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under Section 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 Section 64(2) of the Act; if
 - the function or use of the polymer has changed from component of printer ink for use in inkjet printer, or is likely to change significantly;
 - the amount of polymer being introduced has increased from 1 tonne per annum, or is likely to increase, significantly;
 - if the polymer has begun to be manufactured in Australia;
 - additional information has become available to the person as to an adverse effect of the polymer on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

Material Safety Data Sheet

The MSDS of the product containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.