

File No SAPLC/42

May 2006

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

FULL PUBLIC REPORT

Polymer in Dispermax 8

This Self Assessment has been compiled by the applicant and adopted by NICNAS 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), administered by the Department of Health and Ageing and the Department of the Environment and Heritage has screened this assessment report. The data supporting this assessment will be subject to audit by NICNAS.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at:

Library
Australian Safety and Compensation Council
25 Constitution Avenue
CANBERRA ACT 2600
AUSTRALIA

To arrange an appointment contact the Librarian on TEL + 61 2 6279 1162 or email ascc.library@dewr.gov.au

This Full Public Report is 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:

Street Address: 334 - 336 Illawarra Road MARRICKVILLE NSW 2204, AUSTRALIA.
Postal Address: GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
TEL: + 61 2 8577 8800
FAX + 61 2 8577 8888.
Website: www.nicnas.gov.au

**Director
NICNAS**

TABLE OF CONTENTS

| | |
|--|---|
| FULL PUBLIC REPORT | 3 |
| 1. APPLICANT AND NOTIFICATION DETAILS..... | 3 |
| 2. IDENTITY OF CHEMICAL | 3 |
| 3. PLC CRITERIA JUSTIFICATION | 3 |
| 4. PHYSICAL AND CHEMICAL PROPERTIES | 4 |
| 5. INTRODUCTION AND USE INFORMATION..... | 4 |
| 6. HUMAN HEALTH IMPLICATIONS..... | 5 |
| 7. ENVIRONMENTAL IMPLICATIONS | 6 |
| 8. CONCLUSIONS..... | 7 |
| 9. MATERIAL SAFETY DATA SHEET..... | 7 |
| 10. RECOMMENDATIONS | 7 |

FULL PUBLIC REPORT**Polymer in Dispermax 8****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Rohm and Haas Australia Pty. Ltd. (ABN 29 004 513 188)

4th Floor, 969 Burke Road

Camberwell, VIC 3124

NOTIFICATION CATEGORY

Self Assessment: Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical Name, Other Names, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, Use Details, Manufacture/Import Volume.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

The polymer has been notified in the USA and Canada (2006)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in Dispermax 8 (15-20% notified polymer in water)

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</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 | Clear, colourless to pale yellow liquid as produced in a solution of the polymer in water. |
| Melting Point/Glass Transition Temp | Not applicable because the polymer is not isolated from solution. |
| Specific Gravity | Approximately 1.02 as a 16% w/w solution of the notified polymer in water |
| Water Solubility | >16% w/w. This is in line with the structure of the notified polymer. |
| Dissociation Constant | The notified polymer has an anionic group expected to have typical acidity. |
| 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> | 0.3-1.0 | 0.3-1.0 | 1-3 | 1-3 | 1-3 |

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer is intended to be used as a pigment dispersant and binder for ink jet printer inks. The notified polymer will not be manufactured in Australia.

It is anticipated that the notified polymer will be imported in three different forms as follows:

- As a component (3-10% w/w) of pigment dispersions (black, yellow, cyan and magenta) contained in 200 litre open head steel drums for later reformulation in Australia into inkjet printer inks. It is expected that approximately 15% of the notified polymer will be imported in this form.
- As a component (1-3% w/w) of inkjet printer inks contained in 200 litre open head steel drums for later repacking in Australia into inkjet printer cartridges. It is expected that approximately 30% of the notified polymer will be imported in this form.
- As a component (1-3% w/w) of inkjet printer inks contained in sealed inkjet cartridges. It is expected that approximately 55% of the notified polymer will be imported in this form.

Currently no end use customers have been established for importation of the notified polymer in any of the forms listed above.

Typically, water based pigment dispersions containing the notified polymer will be imported in 200 litre steel drums. The drums will be transported from the wharf by road to the importer's warehouse where it will be stored under cover in a bunded area until such time that it is sold and transferred by road to the ink manufacturer's factory where it will be stored in a bunded area until such time that it is reformulated into ink.

Typically, water based inkjet inks containing the notified polymer will be imported in 200 litre steel drums. The drums will be transported from the wharf by road to the importer's warehouse where they will be stored under cover in a bunded area until such time that they are sold and transferred by road to the ink repackers site where they will be stored in a bunded area until such time that it is repacked into inkjet cartridges.

Typically, inkjet cartridges containing approximately 20-30 grams of ink (or approximately 0.25g notified polymer) will be imported by sea in vacuum sealed wrappers, boxed and contained in larger

cartons (10-20 per carton). The cartridges will be transported from the wharf by road to the inkjet importer's warehouse, where they will be stored until distribution to retail and commercial outlets. The inkjet cartridges will be purchased and used by both domestic and commercial users as replacement cartridges in computer printers and photocopiers.

Reformulation/manufacture processes

The imported pigment dispersions containing the notified polymer will be reformulated by ink manufacturers into inkjet inks. During formulation, the notified polymer will be manually weighed and then transferred to a mixing vessel. Once combined with other ingredients into the finished ink product, it will be manually filled into a variety of plastic and steel containers from 1 litre up to 200 litres. The packaged containers will then be shipped to a variety of companies who will use the finished product for filling inkjet cartridges.

Repackaging process

At the repackaging companies, finished inkjet inks containing the notified polymer will be manually transferred to inkjet cartridge filling equipment. Filling equipment may be semi-automatic to fully automatic. Filled inkjet cartridges will be wrapped and packed into larger cartons containing 10-20 cartridges per carton. Filled cartridges will then be shipped to a large number of wholesalers and retailers throughout Australia.

Use

The notified polymer is intended to be used as a pigment dispersant and binder for inkjet printer inks.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

Transport and warehousing workers may come into dermal and ocular contact with the notified polymer through accidental leaks and spillages of the drums and containers.

During formulation, workers will manually weigh and transfer the polymer solution to the mixing vessels. Workers will wear impermeable gloves, eye protection and coveralls. Exposure from the notified polymer to these workers can occur by either dermal or ocular routes, however significant exposure will be limited due to the workplace practices and personal protective equipment used.

During cartridge filling operations, workers will manually transfer the polymer solution to filling equipment. Workers will wear impermeable gloves, eye protection and coveralls. Exposure from the notified polymer to these workers can occur by either dermal or ocular routes, however significant exposure will be limited due to the workplace practices and personal protective equipment used.

Inkjet cartridges will be used in office and commercial situations. These workers may come into contact with the notified polymer through dermal routes during installation of inkjet cartridges. Ocular exposure to these workers is unlikely. However, the risk of exposure will be minimal because the notified polymer is contained in sealed inkjet cartridges.

After application to paper and once dried, the ink containing the notified polymer is bound to the substrate and the polymer is less available for exposure.

PUBLIC EXPOSURE

The notified polymer will not be sold directly to the public. Members of the public may come into contact with inks containing the notified polymer when installing inkjet cartridges into home printers. However, the risk of exposure will be minimal because the notified polymer is contained in sealed inkjet cartridges. After application to paper and once dried, the ink containing the notified polymer is bound to the substrate and the polymer is not expected to be readily 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 low hazard and low exposure, as well as the personal protective equipment used by workers.

PUBLIC HEALTH

The notified polymer will not be sold to the public. Potential for exposure to the notified polymer when installing inkjet cartridges is low. Once the polymer is applied and dried it will be bound to the substrate and hence will not be readily bioavailable. Risk to the public is considered low.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

The majority (>90%) of the notified polymer is expected to eventually be released to the environment. Release to the environment during shipping, transport and warehousing will only occur through accidental spills or leaks of the drums or steel packaged containers.

During reformulation and packaging and filling operations, spills are expected to be minimal. When spills occur, they will be contained by bunding, collected with absorbent material and sent to a licensed off site waste disposal centre. Empty drums from import will be sent to drum reconditioners. Total waste from the above sources is expected to be approximately 2 % of the import volume.

Most of the notified polymer will be bound to printed paper which will either be buried in landfills, incinerated or released from effluent during recycling deinking processes. Recycling of treated paper could result in release of a proportion of the notified polymer to the aquatic compartment. However, the environmental concentration is expected to be low. Where recycling does not occur the notified polymer will be disposed of to landfill where it is expected to remain bound to paper.

ENVIRONMENTAL FATE

The notified polymer is expected to be hydrolytically stable and to not be readily biodegradable. Due to its high molecular weight and hence inability to cross biological membranes, the notified polymer is not expected to bioaccumulate.

Due to its anionic nature, the notified polymer is likely to be immobilised through adsorption onto soil particles and sediments, hence reducing potential to reach the aquatic environment.

The majority of the notified polymer will go to landfill in the form of empty cartridges or bound to paper where it will slowly degrade through abiotic and biotic processes to oxides of carbon and water.

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 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. This could apply to the notified polymer.

7.3. Environmental Risk Assessment

Inkjet inks will contain low concentrations of the notified polymer and products containing these inks will be used throughout Australia. The majority of the notified polymer will be disposed of to landfill and is expected to be widely dispersed.

Although the notified polymer is readily soluble in water, and has some potential to leach to the aquatic environment where it could pose some hazard to algae, the majority of the notified polymer is likely to be immobilised through adsorption onto soil particles and sediments due to its anionic nature, hence reducing potential to reach the aquatic environment.

Based on the proposed use pattern, the release of the notified polymer to the aquatic environment is expected to be in low concentrations and dispersed. Adsorption to sludge, soil and sediment as well as

dilution in receiving waters should reduce environmental concentrations to acceptable levels. Abiotic or slow biotic processes are expected to eventually degrade the notified polymer.

Given the above, environmental exposure and the overall environmental risk are expected to be low.

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 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 an 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.

- 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

- The following control measures should be implemented by formulators and repackers to minimise environmental exposure during formulation and repacking of the notified polymer:
 - Bunding

Disposal

- The notified polymer should be disposed of to landfill or incinerated.
- Empty drums should be sent to local recycling or waste disposal facilities.

Storage

- The following precautions should be taken by formulators and repackers regarding storage of the notified polymer:

- Storage methods should minimise potential for release to the aquatic environment in the event of accidental spillage.

Emergency procedures

- Accidental spills/release of the notified polymer should be handled by absorbing with sand and put into suitable container for disposal. Contaminated containers can be re-used after cleaning.
- The notified polymer should not be allowed to enter drains or waterways.

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.