

File No PLC/397

26 August 2003

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

FULL PUBLIC REPORT

Polymer in QRXP-1657 PMN

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.

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

Library
National Occupational Health and Safety Commission
25 Constitution Avenue
CANBERRA ACT 2600
AUSTRALIA

To arrange an appointment contact the Librarian on TEL + 61 2 6279 1161 or + 61 2 6279 1163.

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
Chemicals Notification and Assessment**

TABLE OF CONTENTS

FULL PUBLIC REPORT	3
1. APPLICANT AND NOTIFICATION DETAILS	3
2. IDENTITY OF CHEMICAL	3
3. COMPOSITION.....	3
4. INTRODUCTION AND USE INFORMATION.....	3
6. PHYSICAL AND CHEMICAL PROPERTIES.....	4
7.1 Toxicology.....	4
7.1.1. Toxicological Investigations	4
7.2 Toxicology.....	4
7.1.2. Toxicological Investigations	5
7.1.3. Human Health Hazard Assessment	5
7.3 Occupational Health and Safety	5
7.2.1 Occupational Exposure	5
7.2.2 Exposure Assessment	5
7.3 Public Health	5
7.3.1 Public Exposure	5
7.3.2 Exposure Assessment	5
8. ENVIRONMENTAL IMPLICATIONS	5
8.1 Ecotoxicology.....	5
8.1.1 Ecotoxicological Investigations	6
8.2. Environmental Contamination	6
8.2.1 Environmental Exposure.....	6
Storage Sites	6
Paint Manufacture	6
Paint Application.....	6
8.2.2 Exposure Assessment	6
9. RISK ASSESSMENT	6
9.1. Environment.....	6
9.2 Occupational health and safety	7
9.3 Public health.....	7
10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS	7
10.2. Environmental risk assessment	7
10.3. Human health risk assessment	7
10.3.1. Occupational health and safety.....	7
10.3.2. Public health.....	7
11. RECOMMENDATIONS.....	7
. Secondary notification.....	8

FULL PUBLIC REPORT

Polymer in QRXP-1657 PMN

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Rohm and Haas Australia Pty. Ltd of 4th Floor, 969 Burke Road, Camberwell, VIC 3124

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

- Chemical identity information
- Molecular weight data
- Customer sites.

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 2002

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in Primal QRXP-1657 (17%w/w notified polymer)

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

Functional Group	Category	Equivalent Weight (FGEW)
Hydroxyl group	Low Concern	Not applicable

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</i>
Meets Molecular Weight Requirements	Yes
Meets Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
No Substantial Degradability	Yes
Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

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>Tonnes</i>	<3	3-10	3-10	3-10	3-10

USE

- The notified polymer (17% w/w in water) is manufactured as a polymer dispersion and will be used as a rheology modifier for aqueous house paints by both professional painters and home handymen. The end-use product will contain 0.3% w/w of the notified polymer.
- The polymer dispersion will be transported in 200 L steel drums to the paint formulator. Once formulation is complete the final painting product is filled into 0.5, 1, 4, 10, 15 and 20 L steel paint cans/pails.
- The application methods include brush and roller. Some spray application may be used.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	The polymer dispersion is a clear to hazy, colourless to pale yellow liquid.
Melting Point/Glass Transition Temp	Not provided
Density	1020 kg/m ³ (polymer solution)
Water Solubility	Readily soluble in water.
Particle Size	Not applicable as it exists as a solution in water.
Degradation Products	Not provided.
Loss of monomers, other reactants, additives impurities	Stable under normal ambient temperature. Isocyanates on thermal decomposition.

OTHER PROPERTIES

Hydrolysis as a Function of pH	The polymer contains ether and carbamate linkages which should not hydrolyse under ambient environmental conditions.
Partition Coefficient (n-octanol/water)	The expected high water solubility suggests partitioning into the aqueous phase.
Adsorption/Desorption	The notified polymer is expected to have a low affinity for soil and sediment and be mobile in the environment due to its high expected water solubility.
Dissociation Constant	The notified polymer does not contain any functional groups expected to dissociate in the environmental pH range of 4-9.

7. HUMAN HEALTH IMPLICATIONS

7.1 Toxicology

7.1.1. Toxicological Investigations

No toxicological data were submitted.

7. HUMAN HEALTH IMPLICATIONS

7.2 Toxicology

7.1.2. Toxicological Investigations

No toxicological data were submitted.

7.1.3. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. The MSDS for QRXP-1657 PMN states that the solution is a slight irritant to skin, eyes and respiratory tract.

7.3 Occupational Health and Safety

7.2.1 Occupational Exposure

<i>Nature of Work</i>	<i>Number of Workers Exposed</i>	<i>Maximum Duration of Exposure</i> (hour/day)	<i>Frequency</i> (day/year)
(a) Transport			
Warehouse workers	10-15	0.5	30
Delivery to Customers	10-15	0.5	30
(b) Paint Manufacture			
Reformulation Operators	15-20	4 - 6	40
Laboratory personnel	10-15	0.5	40
Paint Packers	20-30	6-8	100
Salespeople	>100	0.5	100
(c) Paint application			
Professional tradesmen and Home handymen	>5,500	6-8	100

7.2.2 Exposure Assessment

The notified polymer solution is intended to be sold to 5-10 paint manufacturers throughout Australia. Dermal, ocular and inhalation exposure to the notified polymer may occur during paint formulation and painting processes. Exposure to significant amounts of the notified polymer is limited because of the engineering controls present during paint manufacture and the low concentration of notified polymer in the paints.

After application and once dried, the paint containing the notified polymer is cured into an inert matrix and is hence unavailable to exposure.

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

7.3 Public Health

7.3.1 Public Exposure

Members of the public may apply the paint containing the notified polymer by brush or roll-on method. They are not expected to apply the paint frequently. Limited PPE or control measures may be used at home. Painted surfaces/ substrates containing the notified polymer once dried will be bound to the matrix of dry paint film.

7.3.2 Exposure Assessment

Public exposure to the notified polymer is expected to be moderate, for home renovators, and low for the other members of the public due to the low concentration of notified polymer in paint (max. 0.3%).

8. ENVIRONMENTAL IMPLICATIONS

8.1 Ecotoxicology

8.1.1 Ecotoxicological Investigations

No ecotoxicological data were submitted.

8.2. Environmental Contamination

8.2.1 Environmental Exposure

Storage Sites

The notified polymer will be transported by road from the port to a licensed chemical storage facility with engineering controls (ie. concrete floor and bunding) to safeguard against environmental release from spills. It will be distributed by road to customers including paint companies (~5-10) located throughout Australia.

Environmental release is unlikely during importation, storage and transportation. Spillage during a transport accident being the most likely reason for environmental release. The extent of any release would be limited by individual container capacity and container specifications.

Paint Manufacture

The notified polymer will be formulated into house paints. Batch ingredients are either metered directly to the mixer or manually added from drums. Paints are stored and transported in 0.5-20 L epoxy lined paint cans and transported by road and rail. The final concentration of the notified polymer in paints will be less than 0.5% by weight.

During the reformulation process, there is potential for the release of the notified polymer through spills and as residues in empty drums. The amount released through spillage at each paint manufacturers site is not expected to exceed 20 kg per annum of the notified polymer. Residues in empty drums are expected to account for less than 40 kg per annum.

Paint Application

The major release to the environment of the notified polymer is anticipated during the cleaning of paint application equipment (brushes and rollers) by painting contractors or do-it-yourself painters. Washings from the equipment are expected to enter the sewer, at a rate less than 400 kg per annum Australia wide.

8.2.2 Exposure Assessment

The majority of the notified polymer (>95%) is expected to be contained in dry paint films, where it is anticipated that it will be bound within the paint matrix. Hence, it is expected that the polymer will share the fate of the substrate to which it has been applied. These substrates may either be incinerated or disposed of to landfill. In landfill, it is anticipated that the polymer will remain immobile within the cured paint matrix. Incineration of the notified polymer will generate water and oxides of carbon and nitrogen.

The notified polymer (<400 kg) will enter the sewer through the washing of application equipment. This release will be diffuse and at a low level as the notified polymer is present in paints at levels below 0.5%. This release will result in a predicted environmental concentration of 0.3 ppb (Assuming an Australian population of 19.5 million people releasing an average 200 L of water per person per day to sewers Australia wide).

The notified polymer has high water solubility and, as a result, may be mobile in both the terrestrial and aquatic compartments. However, it is expected that the notified polymer will eventually associate with the soil matrix and sediments and slowly degrade through abiotic and biotic processes to water vapour and oxides of carbon and nitrogen.

The notified polymer is not expected to cross biological membranes due to its very high molecular weight (>>1000) and is therefore not expected to bioaccumulate (Connell 1989).

9. RISK ASSESSMENT

9.1. Environment

Most of the notified polymer will be bound with other paint components to form a very high molecular weight and stable polymer matrix and, as such, is expected to be immobile and pose little risk to the environment. As the coating degrades over time, any fragments, chips and flakes

of the coating will be of little concern as they are expected to be inert. The substrates coated with the polymer are likely to either be incinerated or be placed into landfill at the end of their useful life.

When use volume peaks, up to 650 kg per annum of waste notified polymer may be generated during coatings manufacturing and use each year as a result of incidental spills, equipment cleaning (brushes and rollers), and residues in containers. The majority of this waste will be sent to landfills for disposal. In landfill, the notified polymer in solid wastes is expected to be immobile, and eventually will degrade through biotic and abiotic processes, and consequently, should not pose a significant exposure hazard to the environment. Polymer released to the sewer through equipment cleaning eventually associate with the soil matrix and sediments and slowly degrade through the processes described above.

The notified polymer is not likely to present a risk to the environment when it is stored, transported and used in the proposed manner.

9.2 Occupational health and safety

The OHS risk presented by the notified polymer is expected to be low, due to the limited potential for exposure, the low concentration of polymer in the imported solution and paints, and the expected low toxicity of the polymer. However, the imported polymer solution is a slight irritant and precautions are required when handling this solution.

9.3 Public health

Paint products containing the notified polymer will be used by members of the public. The health risk presented by the notified polymer is expected to be low due to its non-hazardous nature, and the intermittent use by the users. Following application, the notified polymer will become trapped within an inert matrix and will not be bioavailable. Therefore, the health risk to public from exposure to the notified polymer is considered low.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.2. Environmental risk assessment

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

10.3. Human health risk assessment

10.3.1. Occupational health and safety

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

10.3.2. Public health

There is Low Concern to public health based on its reported use pattern.

11. 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

Disposal

- Wastes generated during industrial application should be disposed of through a licensed waste contractor.

Storage

- On site facilities should be designed for storage of the dispersion polymer within the temperature requirement of 1 to 49°Cs with bunding for spill containment and control of ignition sources.

Emergency procedures

- Spills/release of the notified polymer should be contained as described in the MSDS (ie. collect spilled material with an inert absorbent) and the resulting waste disposed of by an authorised landfill authority.

• **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.

No additional secondary notification conditions are stipulated.