

File No: PLC/370

15 May 2003

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

**FULL PUBLIC REPORT**

**Polymer in LC-38-5745 Acrylic Latex**

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:	<a href="http://www.nicnas.gov.au">www.nicnas.gov.au</a>

**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.....	4
6. PHYSICAL AND CHEMICAL PROPERTIES.....	4
7. HUMAN HEALTH IMPLICATIONS.....	4
7.1 Toxicology.....	5
7.2 Occupational Health .....	5
7.3 Public Health .....	5
7.3.1 Public Exposure .....	5
7.3.2 Exposure Assessment .....	5
8. ENVIRONMENTAL IMPLICATIONS .....	6
8.1 Ecotoxicology .....	6
8.2 Environmental Contamination.....	6
8.2.1 Environmental Exposure.....	6
9. RISK ASSESSMENT .....	6
10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS.....	7
10.1 Hazard classification.....	7
10.2. Environmental risk assessment .....	7
10.3. Human health risk assessment .....	7
12. RECOMMENDATIONS.....	7
12.1. Secondary notification .....	8
13. BIBLIOGRAPHY .....	8

**FULL PUBLIC REPORT****Polymer in LC-38-5745 Acrylic Latex****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

PPG Industries Australia Pty Ltd of McNaughton Road, Clayton, VIC 3168

## EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

- Chemical Name,
- Molecular/Structural formula,
- Means of Identification,
- Molecular weight figures,
- Charge Density,
- Polymer/Residual Monomers/Impurities Constituents,
- Reactive functional groups,
- Manufacture/Import volume,
- Site of Manufacture/Reformulation,
- Purity

## 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

Notified in Canada &amp; United States in 1993.

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

LC-38-5745 Acrylic Latex

**3. COMPOSITION**

## PLC CRITERIA JUSTIFICATION

Functional Group	Category	Equivalent Weight (FGEW)
Hydroxyl group	Low Concern	
Carboxylic Acid group	Low concern	

Charge Density	The notified polymer has low charge density.
Elemental Criteria	The notified polymer contains only approved elements.
Degradability	The notified polymer is not biodegradable.
Water Absorbing	The notified polymer is not a water-absorbing polymer.
Residual Monomers	All residual monomers are below the relevant cut-off.
Hazard Category	The notified polymer is not classified as a hazardous substance.

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>	<30	10-30	10-30	10-30	10-30

##### USE

LC-38-5745 Acrylic Latex, a polymer dispersion containing 30-60% notified polymer, will be imported in 200 L drums. In Australia, LC-38-5745 Acrylic Latex will be formulated into automotive waterborne basecoats at up to 20% (w/w) and packaged in 200 L drums.

These basecoat products are used under clear coatings on the external primed surfaces of car bodies. The application methods include both hand spray gun and automatic spray machine.

#### 6. PHYSICAL AND CHEMICAL PROPERTIES

The physical and chemical property data are determined from LC-38-5745 Acrylic Latex.

<b>Appearance at 20°C and 101.3 kPa</b>	Viscous white liquid with little or no solvent odour.
<b>Melting Point/Glass Transition Temp</b>	Not determined for a water dispersion.
<b>Density</b>	Approximately 1 000 kg/m <sup>3</sup>
<b>Water Solubility</b>	Estimated to be < 1 mg/L  The polymerisation process occurs in an aqueous phase. Once a critical molecular weight is reached the polymer becomes insoluble in water. Therefore, the notified polymer is not soluble but is emulsified in water.
<b>Particle Size</b>	Not determined for a water dispersion.
<b>Degradation Products</b>	Not stated.
<b>Loss of monomers, other reactants, additives impurities</b>	Stable under normal use.
<b>Hydrolysis as a Function of pH</b>	The notified polymer contains ester and carbamate linkages that could be expected to undergo hydrolysis under extreme pH conditions. However, in the environmental pH range of 4 to 9, significant hydrolysis is unlikely to occur.
<b>Partition Coefficient (n-octanol/water)</b>	The expected low water solubility and hydrophobic nature of the notified polymer are indicative of partitioning into the octanol phase.
<b>Adsorption/Desorption</b>	The notified polymer is expected to have a high affinity for soil and sediment and will be immobile in the environment due to its low water solubility.
<b>Dissociation Constant</b>	The notified polymer contains some free carboxylic acid functionality and hence has typical acidic characteristics.

#### 7. HUMAN HEALTH IMPLICATIONS

## 7.1 Toxicology

### 7.1.1 Toxicological Investigations

No toxicological data were submitted.

### 7.1.2 Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

## 7.2 Occupational Health

### 7.2.1 Occupational Exposure

In Australia, there will be one site of laboratory development and paint formulation, and two sites of paint application.

<i>Nature of work</i>	<i>Number of workers exposed</i>	<i>Maximum duration of exposure</i>	
		<i>(hours/day)</i>	<i>(days/year)</i>
Dockside/Transport			
Unloading containers	4-6	6	10
Transport to PPG site	4	4	10
Formulation site			
Laboratory development			
-manufacture and testing	3	8	80
Paint Manufacture			
-paint make-up	18	4	200
-QC testing	3	4	200
-filling into drums	3	4	200
Customers sites			
Adding paint to circulation tank	<u>18</u>	<u>2</u>	200
Hand spray pick-up	60	8	200
Cleaning of spray equipment	18	2	200

### 7.2.2 Exposure Assessment

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

Dermal, ocular and inhalation exposure to the notified polymer may occur during formulation and painting processes. Exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

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

## 7.3 Public Health

### 7.3.1 Public Exposure

The notified polymer is intended only for use in industry, and will not be available to the public. Members of the public will not come into contact with the notified polymer as the notified polymer is in a cured inert matrix under the coating.

### 7.3.2 Exposure Assessment

Negligible public exposure to the notified polymer is expected.

## **8. ENVIRONMENTAL IMPLICATIONS**

### **8.1 Ecotoxicology**

#### **8.1.1 Ecotoxicological Investigations**

No ecotoxicological data were submitted.

#### **8.1.2 Environmental Hazard Assessment**

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

### **8.2 Environmental Contamination**

#### **8.2.1 Environmental Exposure**

During coating production, the notifier estimates that up to 800 kg per annum of waste containing the notified polymer will be generated from cleaning up minor spills and cleaning of manufacturing and formulation equipment. The notifier further estimates that up to 8 tonnes per annum of the notified polymer from the collection of overspray (manual and automated electrostatic spray equipment will be used) will be disposed of during coating use and up to 800 kg of the notified polymer will be disposed of in empty product containers.

The notified polymer in waste from spills and equipment cleaning and drum disposal will be collected and treated by a distillation process whereby, the solvent is reclaimed and the remaining solid containing the notified polymer will be disposed of by landfill. The notified polymer in overspray will also be disposed of to landfill. The notifier indicates that incineration of waste may also occur.

The majority of the notified polymer will be applied to vehicles. At the end of their useful lives it will either be disposed of to landfill or recycled.

#### **8.2.2 Exposure Assessment**

The notified polymer is expected to have low water solubility and immobile in both the terrestrial and aquatic compartments. As a consequence, the notified polymer is expected to associate with the soil matrix and sediments and will slowly degrade through abiotic and biotic processes to water vapour and oxides of carbon. Liquid wastes resulting from the cleaning of formulation and application equipment will undergo a solvent reclamation process described above and the resulting solid residue disposed of by landfill. Incineration of waste may also occur and would result in the production of water vapour and oxides of carbon and nitrogen.

The notified polymer is not expected to cross biological membranes due to its high molecular weight and low water solubility and is therefore not expected to bioaccumulate (Connell 1989).

## **9. RISK ASSESSMENT**

### **9.1 Environment**

Most of the notified polymer will be reacted 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 metal panels and car bodies coated with the polymer are likely to be either recycled for steel reclamation or be placed for landfill at the end of their useful life. When recycled the polymer would be destroyed in furnaces and converted to water vapour and oxides of carbon and nitrogen.

The notified polymer is not likely to present hazard 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. 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.

### 9.3 Public health

The notified polymer is intended for use by professional spray painters in automotive coating only, and will not be sold to the public. Following application, the notified polymer will become trapped within a 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

### 10.1 Hazard classification

Based on the available data the notified polymer is not classified as hazardous under the NOHSC Approved Criteria for Classifying Hazardous Substances (NOHSC, 1999).

### 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 Negligible Concern to public health based on its reported use pattern.

## 12. 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.

#### Disposal

- The notified polymer should be disposed of by landfill. Liquid wastes should either be incinerated or evaporated to dryness and the resulting solid residue disposed of by landfill.

#### 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 by an authorised landfill authority.

**12.1 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.

No additional secondary notification conditions are stipulated.

**13. BIBLIOGRAPHY**

Connell DW (1989) General characteristics of organic compounds which exhibit bioaccumulation. In: Connell DW ed. Bioaccumulation of xenobiotic compounds. Boca Raton, USA, CRC Press, pp 47-57.

NOHSC (1999) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1999)], National Occupational Health and Safety Commission, Canberra, AusInfo.