

File No SAPLC/77

24 October 2007

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

FULL PUBLIC REPORT

Polymer in HC 91-5560

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 Water Resources 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 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**

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	3
5. INTRODUCTION AND USE INFORMATION.....	4
6. HUMAN HEALTH IMPLICATIONS.....	4
6.1. Exposure Assessment	5
6.2. Toxicological Hazard Characterisation	5
6.3. Human Health Risk Assessment.....	5
7. ENVIRONMENTAL IMPLICATIONS	6
7.1. Exposure Assessment	6
7.2. Environmental Hazard Characterisation	6
7.3. Environmental Risk Assessment	6
8. CONCLUSIONS.....	7
8.1. Level of Concern for Occupational Health and Safety.....	7
8.2. Level of Concern for Public Health	7
8.3. Level of Concern for the Environment.....	7
9. MATERIAL SAFETY DATA SHEET.....	7
9.1. Material Safety Data Sheet	7
10. RECOMMENDATIONS	7
11. REGULATORY OBLIGATIONS	8

FULL PUBLIC REPORT**Polymer in HC 91-5560****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT

PPG Industries Australia Pty Ltd

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, CAS Number, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, Details of Use, Manufacture Volume, Site of Manufacture/Reformulation.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

No

NOTIFICATION IN OTHER COUNTRIES

None known

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in HC-91-5560

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (NAMW) >1000

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**

Liquid (based on product)

Melting Point/Glass Transition

Not available. Manufactured in solution.

Temp**Density**1020 kg/m³ at 25°C (based on product)**Water Solubility**

The notified polymer is expected to be insoluble due to its complex structure and relatively large molecular weight, with the mainly hydrophobic constituents outweighing the relatively small amount of polar functionality. Furthermore

the notified polymer is unlikely to be released to the aquatic environment during its normal course of use as it is converted into an inert coating of very high molecular weight during the curing process.

Dissociation Constant

The notified polymer contains a small amount of anionic groups which are expected to show typical acidity of a carboxylic acid.

Reactivity

Stable under normal environmental conditions (pH 4-9).

Degradation Products

Small amounts of monomers and oxides of carbon produced on combustion. None under normal conditions of use.

Comments

Water solubility testing has not been conducted. The notified polymer is never isolated from solution. The notified polymer is practically insoluble in water due to the lack of polar functionality except for terminal polymer groups.

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

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer is manufactured at the notifiers site as a 40-60% solution in organic solvent and transported to the notifiers paint plant by truck for reformulation.

The amount of notified polymer in paint produced at the notifiers paint plant is up to 45%. The product will be stored in a banded warehouse to await distribution to customers.

Reformulation/manufacture processes

Reformulation involves manual weighing out of the product, followed by automated mixing and filling of 1-4 L containers.

Use

The notified polymer is a component of a spray applied automotive refinish coating. The notified polymer forms the binder in the coating.

The applied coating contains up to 28% of the notified polymer.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

During polymer manufacture, workers will supervise automatic transfer of the finished polymer solution from manufacture vessels to drums. During formulation, workers will manually weigh and transfer the polymer solution to the mixing vessels. Workers will wear impermeable gloves, eye protection and overalls. 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.

There is little potential for occupational exposure to the notified polymer during transport and storage of the product. Exposure to the notified polymer is not expected during manufacture, warehousing or transportation of the product except in cases when the packaging is breached.

During mixing of the clearcoat and hardener, workers may be exposed to the notified polymer. Engineering controls via extraction (available typically within the application spray booth area) and personal protective equipment worn by workers should minimise any exposure risk to workers at this concentration. Workers will wear impermeable gloves, eye protection and overalls.

End users of the product may be exposed to the notified polymer via dermal, ocular or inhalation routes during spraying of the diluted coating mixture. The product is supplied to professionals. They apply the spray within a booth with an exhaust/filter system and workers wear supplied air respirator or mask fitted with organic vapour cartridge, face shield, gloves and protective suit.

Workers may be exposed to a dilute solution via dermal and ocular routes while cleaning and rinsing spray equipment using recirculated solvent. Exposure is minimised by utilising the same protective measures available during product application, namely cleaning within a booth with an exhaust/filter system and workers wear supplied air respirator or mask fitted with organic vapour cartridge, face shield, gloves and protective suit.

While there is greater potential for exposure during use outside a spray booth, the notifier stipulates that use will be confined to spray booths only.

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

PUBLIC EXPOSURE

The polymer solution is only sold to professional spray painters; therefore the solution is not expected to come into contact with members of the public.

The public may come into contact with the finished dried product on refinished automobiles however in this form the notified polymer will be bound in an inert matrix and as such will not be biologically active.

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 the low hazard associated with the notified polymer and the controls in place during manufacturing, reformulation and use. Local ventilation is used during application and the product will be handled only by professional spray painters.

PUBLIC HEALTH

The notified polymer is intended for use by professional spray painters in auto repair workshops only and will not be sold to the public. Following application, the notified polymer will be trapped within a coating and will not be bioavailable. Therefore the risk to public health is low, based on low hazard

and low exposure.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

During manufacture, formulation and packaging, spills are expected to be minimal. When spills occur they will be contained by bunding, collected with absorbant material and sent to a licensed off site waste disposal centre. Empty drums will be sent to drum reconditioners. Total waste from all sources is expected to be approximately 2% of the manufactured product.

Loss of containment during storage would be controlled by bunding within the warehouse.

The notified polymer is used as a coating in automotive applications. The process used by the paint end user would result in waste generated from overspray from the application process, cleaning of the application equipment and empty paint containers.

The notified polymer does not represent an emission hazard to the atmosphere as all paint overspray is trapped in the spraybooth or on masking material. The transfer efficiency as a result of spray application is approximately 30%. Of the paint mixed for actual application, 70% will be captured as overspray and collected within the spray booth, throughout its filtering system or on masking materials such as newspaper and kraft.

Cleaning of the application equipment will generate waste which will be collected and disposed of in the same manner as waste water from the spraybooth, involving licensed waste disposal contractors. The waste is then treated and sent to trade waste landfill.

Waste generated as a result of a small amount of coating remaining in the containers after use represent about 1% of the container contents. This will dry to form a non-leachable solid and will be disposed of as solid landfill.

ENVIRONMENTAL FATE

The waste remaining in the empty cannisters and that generated in overspray and cleaning equipment and spills will ultimately be disposed of to landfill. The notified polymer is potentially hydrolysable, however this is unlikely under standard environmental conditions (pH range 4-9). The notified polymer is likely to slowly degrade by biotic and abiotic process. Leaching of the notified polymer from landfill is unlikely given the low solubility of the notified polymer. The notified polymer is not expected to cross biological membranes due to the low solubility and high molecular weight, and should not bioaccumulate.

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 anionic group is on alternating carbons on the polymer backbone. This is unlikely to apply to the notified polymer. However, the toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups.

7.3. Environmental Risk Assessment

A worst-case scenario would be for 70% of the notified polymer to be wasted; however more realistically 50% is likely to be wasted. This would result in up to 10 tonnes per annum of waste notified polymer being generated from use as a result of incidental spills, equipment cleaning, overspray and residues in containers. The majority of this waste will be sent to landfill for disposal. In landfill, the notified polymer in solid wastes is expected to be immobile and eventually will degrade through biotic and abiotic processes. Consequently, there should be no significant risk to the environment

Spills of notified polymer to land are expected to bind to soil and should not be mobile or affect groundwater due to very low water solubility. Spills of notified polymer to waters are not expected to dissolve due to the lack of water solubility and thus the product is expected to disperse or to settle to sediment.

Most of the notified polymer used in automotive finishes will eventually be incorporated in metal recycling programs or sent to landfill for disposal following its life cycle. During reclamation, the notified polymer would be destroyed in furnaces and converted to water vapour and oxides of carbon.

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 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

- Spray painting applications should be in accordance with the ASCC *National Guidance Material for Spray Painting* [NOHSC (1999b)].
- 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 customers to minimise environmental exposure during use of the notified polymer:
 - Bunding
 - Exhaust ventilation with filter

Disposal

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

Storage

- The following precautions should be taken by the notifiers regarding storage of the notified polymer:
 - Bunding

Emergency procedures

- Spills/release of the notified polymer should be handled by absorbing with sand and put into suitable containers for disposal. Contaminated containers can be reused after cleaning.
- Do not flush the product containing the notified polymer into surface water or sewer system.

11. REGULATORY OBLIGATIONS

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 chemical has changed from a component of a spray applied automotive refinish coating or is likely to change significantly;
 - the amount of chemical being introduced has increased from 100 tonnes per annum, or is likely to increase, significantly;
 - the method of manufacture of the chemical in Australia has changed, or is likely to change, in a way that may result in an increased risk of an adverse effect of the chemical on occupational health and safety, public health, or the environment;
 - additional information has become available to the person as to an adverse effect of the chemical 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.