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

FULL PUBLIC REPORT

Alkyd Polymer in RA-38-8233

This Self 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. The data supporting this assessment will be subject to audit by NICNAS.

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**Director
NICNAS**

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FULL PUBLIC REPORT**Alkyd Polymer in RA-38-8233****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)
PPG Industries Australia Pty Ltd (ABN 82 055 500 939)
McNaughton Road Clayton VIC 3168

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, Use Details, and 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
None.

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Alkyd Polymer in RA-38-8233

MOLECULAR WEIGHT (MW)
Number Average Molecular Weight (Mn) 1000 < Mn < 10000

3. COMPOSITION

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</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. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

Manufactured.

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

As a <30% component of an automotive refinish coating.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The notified polymer will be manufactured as a 60% w/w solution in solvent at PPG Australia plant at Clayton, Victoria and packed into 200 L closed head drums. The drums will be stored in a bunded warehouse or yard facility before use in the paint factory. The sealed polymer manufacture vessels and facility are bunded and under extraction at all accessible points, ie loading, sampling/testing and drum filling. Reaction vapours not condensed back into the reactor are passed through a thermal oxidiser at 800°C and destroyed.

The paint containing <30% notified polymer is formulated under exhaust ventilation in a mixing vessel. The paint is packed into 4L and 20L containers and stored in a bunded warehouse to await distribution to customers.

The vessel and system cleaning solvent for both polymer and paint plants is processed through an on-site solvent recovery plant. The sludge solids which may contain residues of the notified polymer are further processed by an outside agent and finally used as a fuel source in cement kilns.

At the application site, paint solution containing the notified polymer is blended with the hardener component and applied to vehicles using a spray gun in a spraybooth.

6. EXPOSURE INFORMATION

6.1. Summary of Occupational Exposure

There is little potential for occupational exposure to the notified polymer during transport and storage of the polymer solution and paint product. Exposure to the notified polymer in these instances is only likely to occur where the packaging is breached.

Exposure to the notified polymer may occur during manufacture of the polymer solution and paint product as well as during mixing of the paint and hardener. Engineering controls and personal protective equipment worn by workers should minimise any exposure to workers at this concentration.

End users of the product may be exposed to the notified polymer at up to 30% via dermal, ocular or inhalation routes during spraying of the diluted paint 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.

6.2. Summary of Public Exposure

The polymer solution is only sold to professional spray painters, therefore the wet paint is not expected to come into contact with members of the public. The public may come into contact with the finished cured 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.

The only other potential health exposure would arise from a spill during the transport of the product. This would be dealt with by the containment and clean up procedures recommended in the MSDS.

6.3. Summary of Environmental Exposure

6.3.1. Environmental Release

The commercial production of the notified polymer and of the coating made with the polymer will be carried out at the PPG plant in Clayton, Victoria.

The coating containing the polymer will be warehoused at the PPG warehouse in Clayton, Victoria. From this warehouse the product will be distributed to customers. Release to the environment during transport and warehousing will only occur through accidental spills or leaks of the steel containers. Manufacture processes are undertaken in a closed system and spills are controlled by bunding within the plants. Mixers and reactors are fitted with exhaust ventilation to capture volatiles at source and a regular maintenance program is pursued. Wastes produced during mixing are envisaged to be 2%. These wastes are collected and processed through an onsite solvent recovery plant, with resultant solids being disposed of by incineration in cement kilns. Exhaust vapours from the polymer reactor are passed through a thermal oxidiser at high temperatures and incinerated.

The notified polymer is used in a coating in automotive applications. The process used by paint end users 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 spray booth 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 spraybooth through its filtering system or on masking materials such as newspaper.

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 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 2% of the container contents. This will dry to form a non-leachable solid and will be disposed of as solid landfill.

6.3.2. Environmental Fate

Waste paint from auto repair shops will mostly be landfilled after hardening. In the environmental pH range of 4 - 9 it is expected that the notified polymer will be hydrolytically stable. The notified polymer is not expected to be readily biodegradable. Due to its low water solubility, it is expected that the notified polymer will associate with sediments and organic phases of soils and not be mobile.

Over time the notified polymer will slowly degrade to water and simple carbon compounds via abiotic and biotic means. During automotive recycling the notified polymer will be destroyed.

7. PHYSICAL AND CHEMICAL PROPERTIES

There is no, or very limited, data available on the physical and chemical properties of the polymer itself due to the polymer not being isolated from the in-situ manufactured polymer solution. The following data is in most cases for the 60% polymer solution.

Appearance at 20°C and 101.3 kPa	Clear viscous liquid
Melting Point/Glass Transition Temp	Not applicable as a liquid
Density	1.04 kg/m ³ at 20°C
Water Solubility	Not soluble (no data available)
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use

7.1. Comments

The 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.

The dissociation constant has not been measured but the polymer contains no structural units which would dissociate.

The product has low physical and chemical hazard. The polymer is not a dangerous good. However as it is only used and stored as a solution in solvents, containers will be marked to the appropriate hazard.

8. HUMAN HEALTH IMPLICATIONS**8.1. Toxicology**

No toxicological data were submitted.

8.2. Human Health Hazard Assessment

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

9. ENVIRONMENTAL HAZARDS**9.1. Ecotoxicology**

No toxicological data were submitted.

9.2. Environmental Hazard Assessment

Polyester polymers of NAMW >1000 are of low concern to the aquatic compartment.

10. RISK ASSESSMENT**10.1. Environment**

No ecotoxicological data are available for the polymer. In its end use application as an integral part of a hard and durable paint film it is unlikely to present a hazard to the environment. During use, polymer released into the factory environment during polymer manufacture, paint manufacture or paint application will be trapped by the standard engineering controls in place in the factories concerned for disposal to landfill.

Waste polymer and paint from manufacturing operations is treated via an on-site solvent recovery plant with the resultant solids being disposed of by incineration in cement kilns.

The main environmental exposure arises from paint overspray from spray painting operations being disposed of in landfills. The hazard is minimal, however as the polymer is effectively immobilised in landfills due to its low water solubility and high binding affinity to soil.

In the case of a spillage in transport, contamination of both land and the aquatic environment may occur. For a spill to land, the polymer solution will bind to the soil and become immobilised as it dries out and polymerises. Contaminated soil can then be collected and disposed of by landfill.

Should a spill occur in a stream, the polymer is expected to settle to the bottom and bind to the sediment. Due to its moderate high molecular weight, it is unlikely to be absorbed across biological membranes and consequently adverse effects on aquatic organisms are considered unlikely.

No aquatic exposure is anticipated during manufacture and end use of the notified polymer. It is expected that practically all of the waste generated from the end user (70% as overspray) will be disposed of in appropriate landfills as inert solid waste. In landfill, the solid wastes should be

contained in the paint matrix and not pose a significant risk to the environment.

10.2. Occupational Health and Safety

The OHS risk presented by the notified polymer is expected to be low, based on the low hazard associated with notified polymer. Local ventilation will be used during application and the product will be handled by professional spray painters.

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.

10.3. Public Health

The notified polymer is intended for use by professional spray painters in automotive repair shops 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 from exposure to the notified polymer is considered low.

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

11.1. Environmental Risk Assessment

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

11.2. Human Health Risk Assessment

11.2.1. Occupational health and safety

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

11.2.2. Public health

There is Negligible Concern to public health when used in the proposed manner.

12. MATERIAL SAFETY DATA SHEET

12.1. 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.

13. 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.
- In the interest of occupational health and safety, the following guidelines and precautions should be observed for use of the notified polymer as a component of paint products:

- Adequate training for staff in handling paint products, including enforcing the adherence of industrial spray painters to the NOHSC *National Guidance Material for Spray Painting*;
 - Implementation of general health surveillance and monitoring programs as required.
- 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 the notifier and its customers to minimise environmental exposure during manufacture, formulation, and use of the notified polymer as a component of paint products:
 - 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.

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 systems.

13.1. 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.