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

FULL PUBLIC REPORT

Polymer in WF-038

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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. INTRODUCTION AND USE INFORMATION.....	3
5. PROCESS AND RELEASE INFORMATION	4
5.1. Operation Description.....	4
6. EXPOSURE INFORMATION	4
6.1. Summary of Occupational Exposure	4
Paint Application.....	4
6.2. Summary of Public Exposure	5
6.3. Summary of Environmental Exposure.....	5
6.3.1. Environmental Release	5
6.3.2. Environmental Fate.....	5
7. PHYSICAL AND CHEMICAL PROPERTIES	5
8. HUMAN HEALTH IMPLICATIONS.....	6
8.1. Toxicology.....	6
8.2. Human Health Hazard Assessment.....	6
9. ENVIRONMENTAL HAZARDS	6
9.1. Ecotoxicology.....	6
9.2. Environmental Hazard Assessment	6
10. RISK ASSESSMENT	6
10.1. Environment	6
10.2. Occupational Health and Safety	7
10.3. Public Health	7
11. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS.....	7
11.1. Environmental Risk Assessment	7
11.2. Human Health Risk Assessment.....	7
11.2.1. Occupational health and safety	7
11.2.2. Public health.....	7
12. MATERIAL SAFETY DATA SHEET	7
12.1. Material Safety Data Sheet	7
13. RECOMMENDATIONS	7
13.1. Secondary Notification	8

FULL PUBLIC REPORT**Polymer in WF-038****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

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

NOTIFICATION CATEGORY

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 and Residual Monomers.

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)

No

NOTIFICATION IN OTHER COUNTRIES

No

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in WF-038

3. PLC CRITERIA JUSTIFICATION

<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

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	< 3	< 3	< 3

USE

Component of paint

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The notified polymer will be imported as an ingredient of Polymer in WF-038 at a concentration of 70%. After import, the notified polymer will be formulated.

Paint Formulation

Laboratory Scale

The ingredients required for making the paint, including the notified polymer (concentration 70%), will be combined in a container in the laboratory under stirring. The paint (containing < 10% notified polymer) will then be sprayed onto panels in a spraybooth having appropriate extraction. The panels are then baked in an oven and the finished paint film subjected to various tests.

Production Scale

The polymer solution (containing 70% notified polymer) will be pumped from 200 L drums into the closed mixer via a lance the operator places in the drum. The lance is manually transferred from drum to drum until the required amount of polymer has been added to the mixer. Following mixing with other ingredients, approximately 500 mL of the formulated paint (containing 3.2% notified polymer) will be sampled for testing. When approved the formulated paint will be filled through dedicated pipework and filling equipment into closed head 200 L drums. The filling equipment automatically places a short fill pipe through the bung hole in the top of the drum and fills the drum.

QC Testing

The operator will adjust the paint containing the notified polymer and spray panels for baking and testing. Several tests such as solids, viscosity and weight per litre are performed on the wet paint.

Paint Application

The 200 L drums of paint (containing 3.2% notified polymer) will be pumped into the circulating mix tank using a dedicated lance, pipework and pump. Once in the tank, solvent is added to adjust the paint to application viscosity. This paint will be pumped around a circulation system from which it is sprayed onto car bodies by robots and operators in a dedicated ventilated spray area. Operators spray the paint onto specific areas of the car that are not painted by the robots. The painted cars travel through an oven where the notified polymer undergoes a heat activated chemical reaction with other polymers in the paint, thereby forming the final paint film on the car.

During production breaks, operators use cloths dampened with solvent to clean residual paint from the spray equipment.

6. EXPOSURE INFORMATION

6.1. Summary of Occupational Exposure

Exposure to the notified polymer at a concentration of 70% (pre-manufacture) and 3.2% (post-manufacture) is expected. However, the possibility of dermal exposure to drips and spills exists during opening and closing of container, transfer of the notified polymer and formulated paint product, collection of quality control samples, quality control testing, cleaning of the tanks and general maintenance. Workers are provided with appropriate protective equipment i.e. safety glasses, gloves, and protective clothing as per the MSDS.

Certain quality control tests involve spraying. The potential for exposure by inhalation of paint is prevented as the paint is only sprayed in a properly designed spray-booth.

Overall, the risk to workers is expected to be low due to the expected low toxicity of the notified polymer and the use of engineering controls and PPE.

Paint Application

The majority of the spray application is automatic (by robots). Where manual spray coating occurs (to certain areas of the car) the worker will wear a fully body suit and vapour masks. Exposure to the notified polymer at a concentration of 3.2% could occur during transfer of the paint and cleaning of the spray equipment. Overall, the risk to workers is expected to be low due to the expected low toxicity and the use of engineering controls and PPE.

6.2. Summary of Public Exposure

The notified polymer will not be directly available to the public. The notified polymer is used in an automotive paint that is cured prior to reaching the public. The notified polymer does not exist as a separate entity in the polymer-coating network. Therefore, although the public will come into contact with the exterior of car bodies, the notified polymer will not be available for exposure.

6.3. Summary of Environmental Exposure

6.3.1. Environmental Release

Release to the environment during shopping, transport and warehousing will only occur through accidental spills or leaks of the 200 L steel drums.

During formulation and packaging, spills are expected to be minimal. When spills occur, they will be contained by standard physical engineering means, including bunding, collected with absorbent material and set to a licensed off site waste disposal centre. Empty drums will be sent to drum reconditioners, where it is expected that residual notified polymer will be incinerated. Total waste from all sources is expected to be less than 3% of total imported volume.

Residual waste arising from the mixing vessel is expected to account for less than 0.5% of the total imported volume of notified polymer. This waste will be collected during routine cleaning and will be sent to the onsite solvent recovery system. Solid residues from this system, containing the notified polymer, will be sent to secure landfill.

It estimated that the total waste notified polymer generated by normal use procedures, including through mixing, overspray and cleaning, will account for a 40% of the total imported quantity of notified polymer. Wastes from application will be hardened and disposed of to landfill. Empty drums containing approximately 2% of the total imported volume of notified polymer will be sent to drum reconditioners, where the notified polymer is expected to be incinerated.

The remainder of the notified polymer is applied to automobiles and is cured by baking to form a final stable paint film matrix in which the notified polymer is contained.

6.3.2. Environmental Fate

Notified polymer that is disposed of by thermal decomposition in incinerators is expected to form oxides of carbon and hydrogen. Notified polymer that is disposed of to secure landfill solid form is expected to be immobile. The notified polymer contains functional groups which have the potential to hydrolyse. However, in the environmental pH range of 4-9, it is expected that it will be hydrolytically stable. Over time it should degrade through biotic and abiotic process to form oxides of carbon and hydrogen.

The fate of applied notified polymer is associated with the fate of the automobile itself. Most notified polymer would eventually incorporated in metal recycling programs or sent to landfill for disposal following its lifecycle. During reclamation, the notified polymer would be destroyed in furnaces and converted to water vapour and oxides of carbon.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Pale yellow clear viscous liquid
Melting Point	Not applicable
Density	1151 kg/m ³
Flammability Limit	Not tested
Water Solubility	Less than 60 mg/L, as determined by preliminary gravimetric test dissolving 10 g in 50 mL water.

Dissociation Constant	The notified polymer contains considerable acid functionality, which are expected to have typical acidity and be dissociated except at low pH (~4).
Reactivity	The notified polymer will thermally degrade at temperatures above 200°C although the specific temperature is unknown. WF-038 is incompatible with strong mineral acids, strong alkalis and strong oxidising agents.
Stability	Under normal conditions of processing and use, the polymer in WF-038 will not undergo hydrolysis, photodegradation, thermal degradation or depolymerisation.

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

No toxicity 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

Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is overchelation of nutrient elements needed by algae for growth. Based on structural considerations it is unlikely that the highest toxicity to algae observed for anionic polymers would apply to the notified polymer. The toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups. The aquatic toxicity may be expected to be low.

Following application and curing, the notified polymer will be within an inert matrix and be unavailable to organisms. Due to its large molecular weight, the potential for bioaccumulation is very low.

10. RISK ASSESSMENT

10.1. Environment

Up to 1.2 tonnes per annum of waste notified polymer may be generated during coatings manufacturing and use each year as a result of incidental spills, equipment cleaning, 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, and consequently, should not pose a significant risk to the environment.

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

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

vapour and oxides of carbon.

10.2. Occupational Health and Safety

The OHS risk presented by the notified polymer is expected to be low due to limited exposure as a result of the use of engineering controls and PPE, and the predicted low toxicity of the notified polymer.

10.3. Public Health

The paint formulated with the notified polymer is intended for use by professional spray painters in automotive manufacturing plants only, and will not be sold to the public. Following application, the notified polymer will become trapped within a film and will not be bioavailable. Therefore, the risk to public from exposure to the notified polymer is considered to be negligible.

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.
- 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

- The notified polymer should be disposed of by thermal decomposition in high temperature incinerators or to secure landfill.

Emergency procedures

- Spills/release of the notified polymer should be handled by physical containment, collection and disposal to landfill or by thermal decomposition in high temperature incinerators.

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.