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

FULL PUBLIC REPORT

Polymer in RC6119

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**Director
NICNAS**

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FULL PUBLIC REPORT

Polymer in RC6119

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

BASF Coatings Australia Pty Ltd (ABN 91 092 127 501)
51 McIntyre Road, Sunshine VIC 3020

Akzo Nobel Pty Ltd (ABN 59 000 119 424)
51 McIntyre Road, Sunshine VIC 3020

NOTIFICATION CATEGORY

Limited: Polymer with NAMW ≥ 1000 (more than 1 tonne per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical Name

Other Name

CAS Number

Molecular Formula

Structural Formula

Number Average Molecular Weight

Weight Average Molecular Weight

Weight Percentage of Species MW < 1000 and MW < 500

Polymer Constituents

Residual Monomers/Impurities

Additives/Adjuvants

Spectral Data

Import/Manufacture Volume

Purity

Specific use

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows:

Melting Point/Freezing point

Boiling point

Density

Vapour pressure

Water solubility

Hydrolysis as a Function of pH

Partition Co-efficient

Adsorption/Desorption

Dissociation Constant

Particle Size

Flash Point

Flammability Limits

Autoignition Temperature

Explosive Properties

Reactivity

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None.

NOTIFICATION IN OTHER COUNTRIES
US – PMN Notice.

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Polymer in RC6119

METHODS OF DETECTION AND DETERMINATION

METHOD Infrared spectroscopy, HPLC and GPC
Remarks Reference spectra were provided.

3. COMPOSITION

DEGREE OF PURITY
High

4. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The polymer will initially be imported with the possibility of manufacture in the future.

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>	1- 3	1- 3	1- 3	1- 3	1- 3

USE
The polymer emulsion containing the notified polymer will be used in the formulation of automotive primers.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, transport and storage

PORT OF ENTRY
Melbourne

IDENTITY OF MANUFACTURER/RECIPIENTS
Automotive manufacturer, Victoria

TRANSPORTATION AND PACKAGING
Transportation is by road in 200 L steel drums.

5.2. Operation description

Although initially the notified polymer will only be imported into Australia, there is the potential for manufacture to occur in the future. As such an operation description for both polymer manufacture and coating formulation has been included below.

Polymer Solution Manufacture

The polymer solution containing up to 50% notified polymer will be manufactured in closed reactors. Following manufacture a sample will be removed for quality control purposes. When approved the polymer will be filtered and filled through fixed transfer lines into drums. The drums are stored until the polymer solution is required for reprocessing.

Coating Formulation

When imported the polymer solution containing up to 50% notified polymer will be transported by road in 200 L steel drums from the Wharf to Akzo Nobel Pty Ltd. The polymer solution (containing up to

50% notified polymer) will be pumped from 200 L drums into the closed mixer. Following mixing with other ingredients (water, other polymers, organic solvent, pigment and additives), a sample of the coating formulation containing less than 1% of the notified polymer will be removed for quality control purposes. When approved, the formulated coating is filtered and filled into 200 L drums and stored in a warehouse prior to distribution to car manufacturers in Victoria.

Coating Application

The coating formulation containing less than 1% notified polymer will be pumped into the application tank and mixed with other ingredients. A sample may be removed for quality control purposes. The coating will be 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 coating is cured.

5.3. Occupational exposure

Number and Category of Workers

<i>Category of Worker</i>	<i>Number of Workers</i>	<i>Exposure Duration (hrs)</i>	<i>Exposure Frequency (days/year)</i>
<i>Import</i>			
Unloading at Wharf*	4	4	20
Delivery to Akzo Nobel plant*	4	4	20
<i>Manufacture and Formulation</i>			
Reactor operators	25	8	80-100
Maintenance personnel	2	1-2	80-100
Laboratory personnel	5	8	80-100
Storage and internal transport personnel	4	2-4	100-130
<i>Transport*</i>	10	1-2	40-50
<i>Application</i>			
Application operators	10	1-2	20
Maintenance personnel	2	1-2	20
Laboratory personnel	5	1-2	20

*These workers are not expected to be exposed to the notified substance during normal handling. Exposure will only occur during accidental spillage of the notified substance.

Exposure Details

Import, transport and distribution

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

Polymer solution manufacture

Dermal and ocular exposure to the notified polymer at a concentration up to 50% could occur from drips and splashes during quality control collection and sampling, filling processes and general cleaning and maintenance. Exposure to significant amounts of the notified polymer is limited because of the personal protective equipment worn by workers.

Coating Formulation

Incidental dermal or ocular exposure with the notified polymer could occur during initial transfer of the polymer emulsion containing the notified polymer (concentration $\leq 50\%$), the removal of a QC sample (less than 1%) the QC testing of the sample (less than 1%) during the filling of the final coating formulation and during general cleaning and maintenance (concentration $\leq 50\%$ and less than 1%) Overall exposure is expected to be low due to the low concentration of the notified polymer following formulation and the use of engineering controls and PPE.

Coating 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 air supplied respirator. Exposure to the notified polymer at a concentration of less than 1% could occur during transfer of the coating formulation, quality control collection and sampling and cleaning and maintenance. Overall exposure is expected to be low due to the low concentration of the notified polymer and the use of engineering

controls and PPE.

Once the coating has been cured the polymer is bound within an inert matrix and therefore will be unavailable for exposure.

5.4. Release

RELEASE OF CHEMICAL AT SITE

Initially the notified polymer will be imported into Australia, however there is the potential for manufacture to occur in the future. As such an operation description for both polymer manufacture and coating formulation has been included below.

At the manufacturing plant, the imported product is stored in bulk storage tanks. It is estimated that 1% of the initial amount of product in the imported containers will be left as residue. The residue remains in the empty containers that are disposed of to secure landfill.

The product is blended with other ingredients into a finished coating emulsion containing less than 1% of the notified polymer, which is then stored in 200 L steel drums. There are three potential environmental exposure sources.

- Accidental spills, which are estimated to be 20 kg per year. These spills will be recovered and disposed of to landfill.
- Process stream estimated to be 20 kg per year. Prior to release the polymer settles out and is collected and disposed of to landfill. Remaining water, free from the polymer, is disposed of as a trade waste to the STP.
- Rejected product. This will be disposed of by incineration.

The formulating coating emulsion is then sold and transported by road to the end user in Victoria.

Small quantities of the polymer will remain as residue in containers following import and transportation of polymer emulsion. These are not likely to exceed 10 kg and will be disposed of to landfill in the empty containers or by incineration.

RELEASE OF CHEMICAL FROM USE

The end-user applies the coating emulsion to car bodies in a well controlled, automated manufacturing facility. Overspray accounts for 20% of the applied volume of solution. This equates to up to 600 kg per year, which is collected by licensed operators and disposed of to landfill.

5.5. Disposal

A majority of the waste is collected by licensed operators and disposed of to landfill. A small quantity will be disposed as trade waste to the STP. Disposal of rejected product is by incineration.

5.6. Public exposure

The notified polymer is used in an automotive primer that is cured prior to reaching the public. Therefore, although the public will come into contact with the exterior of car bodies, the notified polymer will not be available for exposure.

6. PHYSICAL AND CHEMICAL PROPERTIES

The polymer is not separated from the polymer solution during the lifetime of the product. Consequently the physical and chemical properties of the polymer are not provided, nor are relevant for the product – since it is never separated. Properties for the polymer solution are included or estimations have been made based on the chemical structure of the polymer.

Appearance at 20°C and 101.3 kPa	Pale yellow liquid
Melting Point/Freezing Point	Not available as polymer is not separated from the solution.
Boiling Point	120°C (MSDS – polymer solution)

Density 1018 kg/m³ at 20°C (MSDS – polymer solution)

Vapour Pressure 1.013 kPa (MSDS – polymer solution)

Water Solubility Miscible
9 g/L- based on log Kow
176.5 g/L – based on fragment analysis

METHOD MSDS

Remarks EPIWIN Model (Analogue)

The information provided on the MSDS states the water solubility as “miscible”. The water solubility is based on the presence of water soluble functional groups. EPIWIN analysis was performed on the side chain containing the primary water soluble functional group and shows the side chain to be very soluble, therefore increasing the solubility of the polymer.

However, the presence of insoluble hydrocarbon chains is likely to decrease the solubility of the polymer.

Hydrolysis as a Function of pH 0.0238 L/mol-sec

METHOD EPIWIN (Analogue)

Remarks The hydrolysis coefficient of the side chain containing the functional group likely to undergo hydrolysis is 0.0238 L/mol-sec. Although, this side chain contains the functional group to most readily undergo hydrolysis, yet has a low hydrolysis coefficient. Consequently, the polymer will not be expected to undergo hydrolysis under normal environmental pH of 4 to 9.

Partition Coefficient (n-octanol/water) log Pow = 0.64 - side chain containing the water soluble functional groups

METHOD EPIWIN (Analogue)

Remarks Based on the miscibility and solubility of the polymer in water it would be expected that the partitioning coefficient would be low. EPIWIN v3.12 calculated the partitioning coefficient based up on the side chain containing the water soluble functional groups as 0.64.

Adsorption/Desorption log K_{oc} = 2.233- side chain containing the water soluble functional groups

METHOD EPIWIN (Analogue)

Remarks The results based on the chain containing the water soluble functional groups, the rest of the polymer would be expected to sorb onto soil as it contains large hydrocarbon chains.

Dissociation Constant The polymer is not expected to dissociate.

Remarks Dissociation constant has not been calculated as the polymer contains numerous functional groups and moieties that hinder calculation of a dissociation constant.

Particle Size Not applicable as polymer is not separated from the emulsion.

Flash Point 39 °C (MSDS – polymer solution).

Flammability Limits Not classified as flammable.

Autoignition Temperature	278°C – ignition temperature (MSDS – polymer solution)
Explosive Properties	3% - Lower explosive limit (MSDS – polymer solution)
Reactivity	The notified polymer is expected to be stable under normal environmental conditions.

7. TOXICOLOGICAL INVESTIGATIONS

No toxicity data were submitted.

8. ENVIRONMENT

8.1. Environmental fate

No environmental fate data were submitted

8.2. Ecotoxicological investigations

No ecotoxicity data were submitted. Poly nonionic polymers with NAMW >1000 are of low concern to the aquatic environment.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

Initially the notified polymer will be imported into Australia, however there is the potential for manufacture to occur in the future.

At the manufacturing plant, the imported product is stored in bulk storage tanks. It is estimated that 1% of the initial amount of product in the imported containers will be left as residue. The residue remains in the empty containers that are disposed of to landfill.

The product is blended with other ingredients into a finished coating emulsion containing less than 1% of the notified polymer, which is then stored in 200 L steel drums. There are three potential environmental exposure sources.

- Accidental spills, which are estimated to be 20 kg per year. These spills will be recovered and disposed to landfill.
- Process stream, also estimated to be 20 kg per year. Prior to release the polymer settles out and is collected and disposed of to landfill. Remaining water, free from the polymer, is disposed of as a trade waste to the STP.
- Rejected product. This will be disposed of by incineration.

The formulating coating emulsion is then sold and transported by road to the end users in Victoria. Small quantities of the polymer will remain as residue in containers following import and transportation of polymer emulsion. These are not likely to exceed 10 kg and will be disposed of to landfill in the empty containers or by incineration.

The end-user applies the coating emulsion to car bodies in a well controlled, automated manufacturing facility. Overspray accounts for 20% of the applied volume of solution. This equates to up to 600 kg per year, which is collected by licensed operators and disposed of to landfill.

9.1.2. Environment – effects assessment

No ecotoxicity data were submitted. However, aquatic exposure is expected to be minimal during normal usage of the coating containing the notified polymer. Aquatic toxicity is also likely to be limited by the expected high molecular weight and nonionic form of the polymer.

9.1.3. Environment – risk characterisation

The majority of the notified polymer will be incorporated at a low concentration level into coatings and, once applied and dried, will present little risk to the environment as a cured and inert matrix will be formed. Wastes generated during repackaging and application are expected to be landfilled or incinerated. The major loss (> 10%) in coating paint application is due to overspray, all of which will be disposed of to landfill.

If spilt on land, the notified polymer is expected to become immobilised in the soil layer and sediments of the landfill and will slowly degrade by abiotic processes. If wastes are incinerated then the notified polymer will be destroyed with the production of water vapour, and oxides of carbon. Furthermore, the limited exposure of the notified polymer to the aquatic compartment due to the nature of its industrial setting, nonionic form and the relatively high molecular weight, is unlikely to have an adverse effect on aquatic organisms.

The majority of the notified polymer will be applied to car surfaces and shares the fate of the car at the end of its useful life (most likely to landfill).

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Transport and Storage

During transport and storage, workers are unlikely to be exposed to the notified polymer unless packaging is breached. In the event of an accident, spills should be removed and treated in accordance with instruction provided in the MSDS.

Polymer Solution Manufacture and Coating Formulation

There is potential for dermal exposure to the notified polymer at a concentration up to 50% and < 1% during manufacture, formulation, transfer, filling and cleaning operations respectively. Exposure will be limited by the use of PPE.

QC Testing

There is potential for dermal exposure to the notified polymer at a concentration of < 1% during sampling and testing of the paint formulation. However, exposure is expected to be low due to the relatively small amounts involved, the low concentration of the notified polymer and the use of PPE. Certain quality control tests involve spraying but inhalation exposure is expected to be negligible as the paint is said to be only sprayed in a properly designed spraybooth. Once the paint surface has dried, the notified polymer is bound within an inert matrix and as such exposure is expected to be negligible.

Coating Application

Dermal exposure to the notified polymer at a concentration of < 1% could occur from contact with paint residues during transfer and cleaning operations. However, exposure is expected to be low due to the use of PPE and the low concentration of the notified polymer in the coating. The majority of the spray application is automatic (by robots) and hence exposure to the notified polymer is not expected. Although there is potential for inhalation exposure where manual spray coating occurs, this is considered to be negligible due to the use of engineering controls (ventilated (downdraft) spray area) and respiratory PPE (vapour masks).

9.2.2. Public health – exposure assessment

Public exposure to the notified polymer is expected to be negligible as the notified polymer will not be directly available to the public and although the public will come into contact with the exterior of car bodies painted with notified polymer, the notified polymer will be bound within an inert matrix and hence unavailable for exposure.

9.2.3. Human health – effects assessment

No toxicological data have been provided for the notified polymer and therefore the substance cannot be classified in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

The notified polymer contains functionality which may infer the potential for irritation effects. The notified polymer has a high number average molecular weight (>1000) and is therefore unlikely to be absorbed across biological membranes and as such is considered to be of low toxicity. However, there are some low molecular weight species present. Therefore the possibility of some irritating potential cannot be ruled out.

9.2.4. Occupational health and safety – risk characterisation

The major route of exposure to workers involved in paint manufacture or formulation and paint application is expected to be dermal. Dermal exposure to up to 50% of the notified polymer may occur during manufacture and transfer of the notified polymer and formulated paint product, collection of quality control samples, quality control testing, cleaning of the tanks and general maintenance. Dermal exposure and any irritating effects are limited by the use of PPE. In addition, the notified polymer is expected to have a low order of toxicity. Therefore, the risk to workers is expected to be low.

Significant inhalation exposure to the notified polymer during spray application of the paint is not expected due to the low concentration (<1%) of the notified polymer, the use of engineering controls (spraybooth/ventilated (downdraft) spray area) and in the case of spray application at the automotive manufacturer plant respiratory PPE (vapour masks). As such the risk to workers involved in spray application is expected to be low. However, workers handling up to 50% notified chemical will need skin and eye protection due to the potential irritant effects.

9.2.5. Public health – risk characterisation

Public exposure to the notified polymer is expected to be negligible even in the event of a transport accident and therefore the risk to public health is also expected to be negligible.

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

10.1. Hazard classification

No toxicological data have been provided for the notified polymer and therefore the substance cannot be classified in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

The notified polymer contains functionality which may infer the potential for irritation effects. The notified polymer has a high number average molecular weight (>1000) and is therefore unlikely to be absorbed across biological membranes and as such is considered to be of low toxicity. However, there are some low molecular weight species present. Therefore the possibility of some irritating potential cannot be ruled out.

10.2. Environmental risk assessment

The notified 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 when used in the proposed manner.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of the product containing the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety*

Data Sheets (NOHSC, 2003). It is published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

11.2. Label

The label for the product containing the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994). The accuracy of the information on the label remains the responsibility of the applicant.

12. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer in formulated paint products:
 - Spray application should be conducted in a down draft spray booth.
- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer as introduced and in formulated paint products:
 - Use of spray paints containing the notified polymer should be in accordance with the NOHSC National Guidance Material for Spray Painting (NOHSC, 1999)
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer as introduced and during coating formulation:
 - Impermeable gloves;
 - Overalls;
 - Chemical goggles/face shields for industrial spray painters;
 - Vapour respirators if required.

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 chemical 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

- Excess product containing the notified polymer should be collected and allowed to harden prior to disposal to landfill.

Emergency procedures

- Spills or accidental release of the notified chemical should be handled by physical containment of the product. Any dissolved product should be collected and allowed to harden before disposal to landfill.

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 Section 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

NOHSC (1994) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

NOHSC (1999) National Guidance Material for Spray Painting. National Occupational Health and Safety Commission, Canberra, AusInfo.

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