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

**FULL PUBLIC REPORT**

**Polymer in RC3518**

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**Director  
NICNAS**

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<b>Polymer in RC3518</b>
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**1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

BASF Akzo Nobel Automotive OEM Coatings P/L (ABN 092127501) of 51 McIntyre Rd, Sunshine, VIC, 3020.

and

Akzo Nobel Pty Ltd (ABN 000 017 354) of 51 McIntyre Rd, Sunshine, VIC, 3020.

## 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, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Manufacture/Import Volume, Identity of Recipient and Formulation Details.

## 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

The polymer has been notified in Japan. It has a pre-manufacture Notice under the Toxic Substances Control Act in the United States.

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

The polymer is a component of the polymer emulsion RC3518

## CAS NUMBER

None assigned

**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 (see note below)
Approved Elements Only	Yes
No Substantial Degradability	Yes
Not Water Absorbing	Yes
Not a Hazard Substance or Dangerous Good	Yes

Although the notified polymer contains a cationic species, this is a counter ion rather than the polymer itself therefore 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>	3-10	3-10	3-10	3-10	3-10

##### USE

The polymer emulsion containing the notified polymer will be used in the formulation of automotive primers. These will be supplied to car manufacturers for application onto car bodies and parts. The coating will be applied by spray and cured by oven baking.

#### 5. PROCESS AND RELEASE INFORMATION

##### 5.1. 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 30% 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 30% notified polymer will be transported by road in 200 L steel drums from the Wharf to Akzo Nobel Pty Ltd. The polymer solution (containing 30% notified polymer) will be pumped from 200 L drums into the closed mixer. Following mixing with other ingredients, a sample of the coating formulation containing between 1 and 10% 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 between 1 and 10% 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.

#### 6. EXPOSURE INFORMATION

##### 6.1. Summary of Occupational Exposure

##### 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 of 30% 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 30%), the removal of a QC sample (concentration between 1 and 10%), the QC testing of the sample (concentration between 1 and 10%),

during the filling of the final coating formulation and during general cleaning and maintenance (concentration 30% and 1-10%). 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 between 1 and 10% 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.

### **6.2. Summary of 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.

### **6.3. Summary of Environmental Exposure**

#### **6.3.1. Environmental Release**

The notified polymer is imported into Port Melbourne as an ingredient (30% w/w) of a polymer emulsion product (RC3518) and transported approximately 20 km by road in 200 L steel drums to a manufacturing plant in Sunshine, Victoria. Potential environmental exposure arises from accidental spills from either the mishandling of containers in forklift manoeuvring operations or from transport accidents.

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 import containers will be left as residue, which represents approximately 100 kg per annum of the notified polymer. This residue will remain in the empty containers that are disposed of to secure landfill.

The product is blended with other ingredients into a finished coating emulsion containing between 1 and 10% w/w of the notified polymer, which is then stored in 200 L steel drums. There are three potential environmental exposure sources. The first is by accidental spills, which are estimated to be 35 kg per annum of notified polymer. These spills would be recovered and disposed to secure landfill. The second potential exposure source is from the process stream and is also estimated to be 35 kg per annum of notified polymer. This is disposed of as trade waste to the sewer treatment plant (STP), where the notified polymer will be physically removed via the sludge and disposed of to secure landfill. The third potential environmental exposure source is from rejected product. This will be disposed of by incineration.

The formulated coating emulsion is then sold and transported by road tanker transport to the end user (a car manufacturing plant) in Victoria. Potential environmental exposure hazards arise from accidental spills from transport accidents and from decontamination of the road tankers.

The end user applies the coating emulsion to car bodies in a well controlled, automated manufacturing facility. Overspray accounts for an estimated 20% of the applied volume of solution. This equates to up to 2,000 kg per annum of notified polymer of overspray waste, which is collected by licensed operators and disposed of to secure landfill.

Once applied the coating is then cured and fixed onto the car body by baking. Additional coatings of other products are then applied. The notified polymer is consequently fixed in the cured and covered primer matrix on the car body, and has effectively no further environmental exposure. Potential environmental exposure arises from accidental spills and leaks (estimated to be 35 kg per annum), and from process streams (estimated to be 35 kg per annum of notified polymer). Released chemical from both sources passes to the STP as Trade Waste, where it will be physically removed and finally disposed of to secure landfill.

### 6.3.2. Environmental Fate

The ultimate fate of the notified polymer will be linked to the disposal of the treated cars which is usually direct to landfill where the notified polymer, due to its low expected solubility, is expected to associate with the soil matrix and sediments and slowly degrade through abiotic and biotic processes. If recycled, it will decompose to water vapour, oxides of carbon and nitrogen. Despite having hydrolysable functionality, the notified polymer is not expected to hydrolyse, nor is it expected to cross biological membranes due to its high molecular weight and is therefore not expected to bioaccumulate.

## 7. PHYSICAL AND CHEMICAL PROPERTIES

The notified polymer is never isolated out of the emulsion RC3518. The following physicochemical properties are for RC3518 which contains 30% notified polymer.

<b>Appearance at 20°C and 101.3 kPa</b>	Pale yellow viscous liquid with an amine odour
<b>Boiling Point</b>	100-193°C. The notified polymer is expected to decompose before boiling.
<b>Density</b>	1010 kg/m <sup>3</sup> at 20°C
<b>Water Solubility</b>	Not determined. Based on its structure the notified polymer is expected to have low water solubility. The notified polymer is imported as a polymer emulsion in water.
<b>Dissociation Constant</b>	Contains low amounts of acid functional groups with typical acidity. The notified polymer is expected to be largely ionized in the environmental pH range.
<b>Reactivity</b>	Expected to be stable under normal conditions of use. Contact with strong mineral acids, strong alkalis and strong oxidising agents should be avoided.
<b>Degradation Products</b>	The notified polymer will thermally degrade above 150°C although the specific temperature is unknown, Oxides of Carbon and Nitrogen.

## 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

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. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. Whether this applies to the notified polymer is unlikely. 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 (Nahbolz *et al.* 1993). The aquatic toxicity is therefore likely to be low.

## 10. RISK ASSESSMENT

### 10.1. Environment

Up to 2 tonnes per annum of waste notified polymer may be generated during coating manufacture and use, 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

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 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 lifecycle. During reclamation, the notified polymer would be destroyed in furnaces and converted to water vapour, and oxides of carbon and nitrogen.

### 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 coating 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 No 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 a 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

- Prevent uncontrolled release to the environment.

#### Disposal

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

#### Storage

- Product containing the notified polymer should be stored in suitably banded storage facilities.

#### Emergency procedures

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

### 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.

No additional secondary notification conditions are stipulated.