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

FULL PUBLIC REPORT

Polymer in RC4091

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, Water, Heritage and the Arts.

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**

Part 2 –PLC Self Assessment

Polymer in RC4091

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT

Akzo Nobel Pty Limited (ABN 59 000 119 424)

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, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, Concentration of the Polymer in the Imported Product, Use Details, Import Volume.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

The ionic form of RC4091 polymer has been notified under PLC/497 (May, 2005) for polymer in RC3518.

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)

RC4091 (Product containing the notified polymer)

REACTIVE FUNCTIONAL GROUPS

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

OR

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	The notified polymer at 65% w/w in solvent is a clear, almost colourless, viscous liquid.
Melting Point/Glass Transition Temp	N/A (Polymer is not extracted from solution)
Density	1000 kg/m ³ (temperature not specified)
Water Solubility	N/A (Polymer is not extracted from solution). Based on its structure, the notified polymer is expected to have low solubility.
Dissociation Constant	pKa = N/A (Contains low amounts of carboxylic acid functional groups with typical acidity.). The notified polymer is expected to be largely ionised in the environmental pH range.
Particle Size	N/A. Imported in solution.
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use. The notified polymer contains hydrolysable functionality, but hydrolysis is unlikely to occur under ambient abiotic conditions in the environmental pH range of 4–9.

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>	3-10	3-10	3-10	3-10	3-10

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer will be shipped from Japan as a solution in solvent containing 60-70% w/w of the polymer in export quality, closed head steel drums. The port of entry will be Melbourne, Victoria. The drums will be transported from the wharf to the Sunshine North factory by road.

Reformulation/manufacture processes

The notified polymer will be reformulated into the ionic form rendering it water reducible, which in turn will be used to manufacture a waterbased coating.

After arriving at the Akzo Nobel site, the palletised drums have raw material/safety labels affixed and are stored in an approved bunded storage area. The palletised, coded drums are then taken by fork-lift to the Resin Plant where the polymer solution is partially stripped of solvent, neutralised with amine and reduced with water to 30% w/w content of ionised polymer in water/cosolvent. This process will be carried out in a closed reactor. Following manufacture, a sample is removed for quality control (QC) purposes. The ionic polymer solution will be filtered and filled through fixed transfer lines into drums. The labelled drums are stored under cover until required for paint manufacture.

During paint manufacture, the ionic polymer solution (30% w/w) will be pumped from 200 L drums into the closed mixer. Following mixing with other ingredients, a sample of the paint containing 1 – 10% of ionic polymer is removed for QC. The paint is then filtered and filled into 200 L drums and stored in a warehouse prior to distribution to car manufacturers in Victoria.

Use

The notified polymer will be used as converted to the salt form for automotive paint.

At the car manufacturer's plant, the paint will be pumped into the application tank and then sprayed onto car bodies by robots and operators in a dedicated spray area. The coated cars travel through an oven where the coating is cured.

6. HUMAN HEALTH IMPLICATIONS**6.1. Exposure Assessment****OCCUPATIONAL EXPOSURE**

- The notified polymer is handled as a solution; the relevant levels of organic solvents present and residual monomers are the source of exposure hazards. The polymer itself (never isolated) is considered non-hazardous.
- During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging (steel drums) is accidentally breached.
- Potential occupational exposure to the notified polymer is prevented by virtue of safeguards in place for other hazardous ingredients in the polymer solution. These safeguards include isolation of the resin process, engineering controls such as local exhaust ventilation, safe working practices according to standard operating procedures and personal protective equipment (gloves, overalls, goggles and respirators).
- Paint manufacture and industrial application of the paint is covered in separate notification as the salt of the polymer.

PUBLIC EXPOSURE

The notified polymer is intended only for use in industry and as such public exposure to the notified chemical is not expected. Also, once applied (as a salt in paint) to car bodies, the notified polymer is cured into an inert matrix and is hence unavailable to exposure.

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 low hazard and low exposure as well as the engineering controls and personal protective equipment used by workers.

Dermal and ocular exposure may occur during certain processes involving the notified polymer such as container handling, and during reformulation/paint manufacturing/application. However, exposure to significant amounts of the notified polymer would be adequately controlled through the use of fully automated/semi-automated processes, the engineering controls and personal protective equipment. Significant inhalation exposure is not expected from the proposed mode of use in the form of the notified polymer as introduced.

Once the paint has been applied, the salt of the notified polymer is cured into an inert matrix and effectively eliminating any potential for exposure. Overall, the OHS risk presented by the notified polymer is expected to be low, based on the likely low exposure to workers and the low intrinsic hazard of the polymer.

PUBLIC HEALTH

Risk to the public is considered very low because the polymer is only used in industrial applications and its salt becomes cured in an inert paint matrix; the notified polymer itself is non-hazardous.

The notified polymer is intended only for use at industrial and commercial sites and as such, risk of public exposure to the notified chemical is considered low. Members of the public may make dermal contact with the cars containing the salt of the notified polymer. The risk to the public is considered to be minimal, based on expected low hazard and very low exposure.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

The amount of notified polymer released directly to the environment will be virtually nil during transport from wharf to reformulation site and at the reformulation site.

Indirectly, release would be:

- Accidental spills (including transport and storage) which would be contained under existing procedures (bundling, use of absorbent material and disposal by licensed centre).
- Empty drum residues are disposed of by licensed drum reconditioners. The amount of notified polymer disposed of in this manner is estimated at 40 kg per annum.

There is potential for release of the notified polymer or its salt during mixing, spray-gun loading, spraying, equipment cleaning, from container residues and in the event of an accidental spill. Approximately 30% of the polymer salt could be released through overspray within spray booths. This will be captured by standard engineering controls, treated and the solid waste disposed to landfill. An estimated 2.5% of the polymer will remain as residues in containers, which will cure and harden before disposal to landfill. Less than 1% of waste polymer will be generated from cleaning the application equipment. Therefore the total waste polymer could amount to approximately 34% of the import volume at market maturity. It is expected that no waste notified polymer would enter the sewerage system or natural waterways.

ENVIRONMENTAL FATE

Once reformulated in Akzo Nobel's Resin Plant, the notified polymer is converted to a salt of the polymer and becomes a new chemical, which has been previously notified as RC3518 (PLC/497).

Upon curing of the paint, the polymer salt RC4091 becomes part of an inert matrix in the paint on the car.

The notified polymer contains groups in the side chains that might hydrolyse under severe conditions, but is expected to be stable under normal environmental conditions. Due to its low water solubility, the notified polymer in solid wastes is expected to remain bound within the soils and sediments of landfills and eventually degrade through biotic and abiotic processes. If spilt on land, the notified polymer is expected to bind to soil and become immobilised in the soil layer. If spilt to water, it is not expected to dissolve but rather disperse or settle to sediment. It is not expected to be readily biodegradable but due to its high molecular weight, it is not expected to bioaccumulate. Incineration of the notified polymer will result in the formation of water vapour and oxides of carbon.

Ultimately, the metal in the car is usually recycled resulting in the incineration of the polymer salt with release of water vapour and oxides of carbon.

7.2. Environmental Hazard Characterisation

No ecotoxicological data were submitted. PLCs without significant ionic functionality are of low concern to the aquatic environment.

7.3. Environmental Risk Assessment

Accidental spills (expected to be negligible) 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.

Up to 3.4 tonnes per annum of waste notified polymer or its salt might be generated during coatings manufacturing and use each year 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, 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 polymer salt used in automotive finishes will eventually be incorporated in metal recycling programs or sent to landfill for disposal following its lifecycle. During metal reclamation, the notified polymer would be destroyed in furnaces and converted to water vapour and oxides of carbon.

8. CONCLUSIONS

8.1. Human health risk assessment

Under the conditions of the occupational settings described and when used in the proposed manner, the notified polymer is not expected to pose an unreasonable risk to workers and the public.

8.2. Environmental risk assessment

The notified polymer is not considered to pose a risk to the environment based on the 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

- 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 the notifier to minimise environmental exposure during (manufacture, formulation, use) of the notified polymer:
 - bunding
 - standard operating procedures.

Disposal

- The notified polymer should be disposed of (in the event of a spill) to landfill.
- Empty containers should be sent to local recycling or waste disposal facilities.

Storage

- The following precautions should be taken by the notifier regarding storage of the notified polymer:
 - Bunding.
 - Ensure drums tightly sealed.
 - Standard Operating Procedures used.

Emergency procedures

- Spills/release of the notified polymer should be handled by treating with approved absorbent and put into suitable container for disposal. Contaminated containers can be re-used after cleaning.

10.1. Regulatory Obligations

Secondary Notification

This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the polymer 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 polymer, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer 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 notified polymer has changed from as a component of automotive paint topcoat, or is likely to change significantly;
 - the amount of notified polymer being introduced has increased from 10 tonnes per annum, or is likely to increase, significantly;
 - if the notified polymer has begun to be manufactured in Australia;
 - 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.

No additional secondary notification conditions are stipulated.