

File No SAPLC/105

October 2009

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

**FULL PUBLIC REPORT**

**RP3979**

This Self Assessment has been compiled by the applicant and adopted by NICNAS 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), administered by the Department of Health and Ageing and the Department of Environment, Water, Heritage and the Arts has screened this assessment report. The data supporting this assessment will be subject to audit by NICNAS.

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**

**FULL PUBLIC REPORT****Polymer RP3979****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT

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

## 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, Manufacture/Import Volume.

## PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

Form 6: Advice of Introduction of a New Chemical for Site Limited Research and Development lodged 03/10/07 (NICNAS ref. SLR/1 dated 27 February 2008).

## NOTIFICATION IN OTHER COUNTRIES

None.

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

RP3979

## MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (NAMW) >1000 Da

## 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

The notified polymer meets the PLC criteria.

**4. PHYSICAL AND CHEMICAL PROPERTIES****Appearance at 20°C and 101.3 kPa**

Clear amber resinous solid .

**Glass Transition Temp**

25 - 30°C

**Density**

1150 kg/m<sup>3</sup> at 25°C

<b>Water Solubility</b>	The notified polymer is expected to have very low water solubility due to the predominantly hydrophobic nature of its monomers.
<b>Dissociation Constant</b>	Not applicable (the notified polymer has an acid equivalent weight of over 50,000, i.e., very low acidity).
<b>Particle Size</b>	Not applicable
<b>Reactivity</b>	Stable under normal environmental conditions. While it contains hydrolysable functionalities, this should not occur under ambient environmental conditions (pH range 4-9).
<b>Degradation Products</b>	None under normal conditions of use.
<b>Comments</b>	The notified polymer is a viscous liquid at elevated temperatures (greater than 75°C).

## 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>	20-30	50-100	50-100	150-200	150-200

### USE AND MODE OF INTRODUCTION AND DISPOSAL

#### Mode of Introduction

The notified polymer will be manufactured in a conventional polyester reactor plant, located at Akzo Nobel's Sunshine North address, Victoria. The notified polymer is a variant on a polymer in current routine production using conventional in-house standard operating procedures. The notified polymer is formed at approximately 150 to 240°C. Samples are taken for quality control purposes to achieve designed end-point parameters. The completed polymer (100% neat) is cooled to approximately 100°C for discharge to 200 L steel drums. On cooling to ambient, the drums are palletised and transported by fork-lift to an approved storage bund until required for reformulation into paint. The notified polymer itself will not be transported off Akzo Nobel's Sunshine site.

#### Reformulation/manufacture processes

The notified polymer will be reformulated into a waterbased emulsion which in turn will be used to make paint at the Akzo Nobel Sunshine North factory using current standard operating procedures. The notified polymer will be pre-heated in drums in hot-boxes to facilitate loading into a conventional paint mixing vessel known as a "HSD" which designates "High Speed Dispenser". Under high speed mixing, other paint components (cross-linker and additives) will be added. Then water will be fed into the mixture at defined rates and intervals to form an emulsion. This emulsion will be used to make an industrial paint by incorporation of pigments in the same HSD vessel. The finished industrial paint will have approx. 25-35% w/w content of notified polymer. The paint will be filled to 200 L lined steel drums to 180 L capacity for eventual shipment to the customer.

#### Use

The notified polymer will be used as a paint component for an industrial application and will not be available to the general public. The liquid paint containing the polymer will be used to coat metal sheet for use in the building industry. The polymer content of the thermosetting paint will be typically 25-35% w/w and the polymer will act as the main film former.

## 6. HUMAN HEALTH IMPLICATIONS

## **6.1. Exposure Assessment**

### **OCCUPATIONAL EXPOSURE**

Potential dermal and ocular exposure to the notified polymer is prevented by virtue of safeguards in place for other hazardous ingredients in the paint. These safeguards include isolation of the paint manufacturing 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).

The above issues also apply to the industrial applicator of the paint. The industrial paint containing the notified polymer will only be applied using the Coil Coating Application technique. The paint is transferred by a pump from a drum into a trough. Workers involved would wear overalls, goggles and gloves. The paint is picked up from the trough by a stationary roller and applied continuously to a moving metal sheet. From this point the metal and coating are baked and the notified polymer is cured into an inert matrix and the polymer is hence unavailable to exposure.

### **PUBLIC EXPOSURE**

The notified polymer is intended only for use in industry and as such public exposure to the notified polymer is not expected. Once applied to metal sheet, 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 not considered to be unacceptable, based on the assumed low hazard of the notified polymer and low exposure as well as the engineering controls and personal protective equipment used by the workers.

### **PUBLIC HEALTH**

The low hazard of the notified polymer translates to a low risk to the public. In addition, paint containing the notified polymer will not be sold to the public, only being used by industrial applicators. Once the paint is applied and cured, the polymer will be contained in an inert matrix, and hence will not be bioavailable. Therefore, the risk to public health from the notified polymer is not considered to be unacceptable.

## **7. ENVIRONMENTAL IMPLICATIONS**

## 7.1. Exposure Assessment

### ENVIRONMENTAL RELEASE

The amount of notified polymer released directly to the environment will be virtually nil at the manufacturing/reformulation site and at the applicator (coil coating) plant.

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).
- Polyester Reactor Residues: using standard operating procedures for cleaning the reactor with recycled wash solvent, the new polymer residues will be concentrated to sludge combined with other in-house polymer residues after solvent recovery. The combined sludge will be incinerated or disposed of to land-fill by an EPA approved waste handler. This will also be the fate of QC samples.
- Empty drums with new polymer residues will be sent to a licensed drum re-conditioner who will incinerate the residues during the drum cleaning procedure.
- Paint vessel residues: initially, these will be washed with water and taken off site by an EPA approved waste controller to be disposed of in accordance with licensed regulations. Upon scale-up to routine large volume manufacture, the dedicated paint vessel will not require cleaning.

In the coil coating process, the amount of notified polymer (in the paint) lost directly to the environment will be nil. Indirect losses will be:

- Accidental spills, contained under existing procedures whereby the paint containing the polymer would be cleaned up with absorbent material. The absorbed polymer would be incinerated or discarded to approved landfill. With existing good practices in place, spills would be minimal.
- Empty drums containing paint residues are collected by licensed drum reconditioners who incinerate the contents or wash out the residues. The eventual concentrated residues are incinerated or discarded to approved landfill.
- If any painted metal sheet is rejected, it is disposed through metal recycling where the fully cross-linked polymer is incinerated during metal recovery.

It is expected that approximately 800 kg per annum of notified polymer will be generated as waste from the manufacturing/reformulation activities and approximately 800 kg per annum waste polymer from the coating activities at peak production.

### ENVIRONMENTAL FATE

The notified polymer contains groups in the backbone 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. 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.

## 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

Up to 1600 kg per annum of waste notified polymer might be generated during polymer/paint manufacture 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 degrade via biotic and abiotic processes to form simple organic compounds, 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 ground water due to very low water solubility, and the product is expected to disperse or to settle to sediment.

Therefore, the notified polymer is not expected to pose an unacceptable risk to the aquatic environment based on its reported use pattern and volume.

## 8. CONCLUSIONS

### 8.1. Level of Concern for Occupational Health and Safety

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

### 8.2. Level of Concern for Public Health

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

### 8.3. Level of Concern for the Environment

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

## 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 and the applicator to minimise environmental exposure during (manufacture, formulation, use) of the notified polymer:
  - *bunding*
  - *standard operating procedures*

#### Disposal

- The notified polymer should be disposed of to landfill.
- Empty containers should be sent to local recycling or waste disposal facilities.

#### Storage

- The following precautions should be taken by the notifier and the applicator 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. (Full details in MSDS.) Contaminated containers can be re-used after cleaning.

## 11. 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 chemical 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 chemical, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified chemical 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 chemical has changed from a [paint component for industrial application](#), or is likely to change significantly;
  - the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
  - [the method of manufacture of the chemical in Australia has changed, or is likely to change, in a way that may result in an increased risk of an adverse effect of the chemical on occupational health and safety, public health, or the environment](#);
  - 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.