

File No PLC/692

April 2007

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

FULL PUBLIC REPORT

Polymer in AK0979P

This 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 and Water Resources.

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:

Street Address:	334 - 336 Illawarra Road MARRICKVILLE NSW 2204, AUSTRALIA.
Postal Address:	GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
TEL:	+ 61 2 8577 8800
FAX	+ 61 2 8577 8888.
Website:	www.nicnas.gov.au

**Director
NICNAS**

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FULL PUBLIC REPORT**Polymer in AK0979P****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

The Valspar (Australia) Corporation Pty Limited (ABN 82 000 039 396)
203 Power Street
Glendenning NSW 2761

NOTIFICATION CATEGORY

Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical Name, CAS Number, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, Use Details, Manufacture/Import Volume.

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

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in AK0979P

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) >1000

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 solid.
Melting Point/Glass Transition Temp	55°C (Estimated)
Density	1450 kg/m ³ at 25°C (Estimated)
Water Solubility	< 0.01%. 1 gram of the polymer was weighed into 100 mL of water. The suspension was stirred for 24 hours and then filtered. A 20 mL aliquot was evaporated to dryness at 105°C. The amount of residue was not recorded. The polymer is expected to have very low solubility as almost all of the functional groups are hydrophobic or only slightly water soluble.
Reactivity	Contains hydrolysable groups, but is expected to be stable under normal environmental conditions pH (4-9).
Degradation Products	None under normal conditions of use

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>	10-100	100-1000	100-1000	100-1000	100-1000

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer is manufactured as a solution (30-60%) in petroleum solvent. Initially it will be drummed off into 200 kg drums and transported to the paint formulation plant on the same Glendenning site. Once production volume has increased sufficiently the polymer solution will be filled into a dedicated bulk storage tank. It will then be pumped via fixed pipework directly to the paint formulation plant.

The finished paint formulation containing the notified polymer (10-30%) will be filled into 200 L drums and transported by road according to the Australian Dangerous Goods Code.

Reformulation/manufacture processes

Manufacture

The notified polymer is manufactured in an enclosed, heated reaction vessel fitted with stirring and an overhead condenser system. Ingredients are loaded into the reactor as solids via a chute. The chute is under slight negative pressure to minimise nuisance dust. Samples are taken during the manufacture for QC testing. Once manufacture is complete a hose is connected from the filling vessel to closed head type drums. The drums are gravity filled on weigh scales. Once production volume has increased sufficiently the filling process will change so that the polymer solution will be automatically filled into a bulk storage tank via fixed pipework.

Reformulation

Drum handling equipment is used for lifting and pouring the polymer solution into the mixer. Once the bulk storage tank is made available for the polymer solution the drum handling process will be replaced with an enclosed transfer of the polymer solution from the storage tank directly to the paint mixer. Exhaust ventilation is in operation in the mixer room with air intakes at the loading manhole for each mixer. Pigments and other additives are also added and the blended mixture is passed via enclosed lines to an enclosed Horizontal Bead Mill where the pigments are ground to the required dispersion. The mixture from this mill then flows to a makeup tank where further resins, solvents and

additives are added to produce the final paint formulation. Samples are taken for QC and then the paint is filled into 200 L drums.

Use

Component of paint formulations for industrial use.

The paint (containing 10-30% notified polymer) is intended for industrial use only and is applied as a coating using an automated roller application. Once the paint has dried on the articles the notified polymer is fully reacted into the coating.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

Exposure to the notified polymer is expected to be limited due to the largely enclosed and automated nature of the manufacturing and paint formulation processes. Inhalation exposure is not expected as the polymer is present only in a solution and is expected to have a low vapour pressure. Dermal and accidental ocular exposure to the notified polymer solution (30-60%) is most likely during QC testing from the reactor, drumming off after manufacture, and loading of polymer solution from drums into the paint mixer. Once drumming is no longer carried out, and the storage tank with enclosed and automated transfer systems is utilised, the exposure to the notified polymer will be decreased. Once the storage tank is utilised dermal exposure may occur during coupling of hoses for transfer operations. Dermal and ocular exposure is expected to be minimised during both manufacturing and paint formulation processes by the use of personal protective equipment such as protective overalls, safety glasses and impervious gloves.

During use of the formulated paint (10-30% notified polymer) exposure is expected to be minimal as the application method is automated. Dermal and accidental ocular exposure may occur during transfer of the formulated paint from drums to the coating machine. However, exposure will be limited due to the engineering controls such as exhaust ventilation, as well as PPE, expected to be used based on the hazardous nature of the other components of the paint.

PUBLIC EXPOSURE

The public may come into contact with articles that have been coated with paint containing the notified polymer. However at this stage the polymer is expected to be encapsulated in the coating and not bioavailable.

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 the minimal exposure to workers and the low intrinsic hazard of the polymer.

PUBLIC HEALTH

The notified polymer will not be available to the public. Members of the public may make dermal contact with products that have been coated with paint containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is of low hazard, and is bound within a matrix.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

The polymer will be produced and reformulated at a single production site. Release of the polymer during manufacture is expected to be minimal. The reaction vessel and condenser are closed units and any vapour containing the polymer is combusted in an incinerator to oxides of carbon and water.

Initially drums will be used for on-site transport of the polymer resin from the manufacturing plant to the reformulation plant. Once the production volume has increased fixed pipe-work and a bulk storage tank will be used. The 200 L drums initially used are expected to contain less than 1 L, equivalent to 0.5% (< 5 tonnes per annum) residue and will be sent to a local drum recycler. This is expected to fall to minimal levels once pipe-work and bulk storage is commissioned. On site spills based on historical data are expected to amount to < 0.01% (< 100 kg per annum).

The formulated paint is delivered to the customer's coating plant in 200 L drums and bulk containers. Approximately 1 L residue is expected to remain in the drums (0.5% wastage rate). The bulk containers are expected to have a similar wastage rate amounting to less than 5 tonnes per annum. Containers are expected to be cleaned at licensed facilities before re-use.

At the coating plant, the paint will be applied by automated rollers, which is an efficient process; and minimal waste (1%; < 10 tonnes per annum) is expected from spills, maintenance and cleaning. The plant is EPA licensed and it is expected that the waste will be treated on-site with no release to the environment.

The majority of the chemical will be used to form coated articles. The polymer is expected to fully react to form the coating. Any wastage of coated product is expected to enter on-site metal recycling, where the coating containing the reacted polymer is expected to be fully combusted to form oxides of carbon and water vapour.

ENVIRONMENTAL FATE

Coated products having the reacted polymer thereon are expected to be disposed of to landfill or enter metal recycling at the end of their useful lives. In landfill the reacted polymer is expected to eventually degrade in-situ by biotic and abiotic processes to landfill gases including methane, oxides of carbon and water vapour. The reacted polymer is expected to be fully combusted during metal recycling, forming oxides of carbon and water vapour.

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

A predicted no effect concentration (PNEC) and predicted environmental concentration (PEC) and consequently a risk quotient ($RQ = PEC \div PNEC$) cannot be calculated. However, the polymer is not expected to be released to the aquatic environment, and the reacted polymer is expected to be combusted or eventually degrade in landfill. Also PLCs without significant ionic functionality are of low concern to the aquatic environment. Therefore the polymer is not expected to pose an unacceptable risk to the environment.

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.

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.

Disposal

- The notified polymer should be disposed of by licensed hazardous waste disposal.

Emergency procedures

- Spills and/or accidental release of the notified polymer should be handled physical containment, preventing entry into waterways. Adsorb using inert adsorbent (sand, earth, vermiculite etc) and transfer to suitable drums for disposal.

10.1. 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.