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

FULL PUBLIC REPORT

Polymer in AK0027P Siliconised Polyester

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**Director
Chemicals Notification and Assessment**

FULL PUBLIC REPORT

Polymer in AK0027P Siliconised Polyester

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

The Valspar (Australia) Corporation Pty Ltd of 203 Power Street, Glendenning, NSW 2761

NOTIFICATION CATEGORY

Synthetic 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 formula

Structural formula

Polymer constituents

Import volume

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

No

NOTIFICATION IN OTHER COUNTRIES

Canada and USA

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

AK0027P Siliconised Polyester

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
No Substantial Degradability	Yes
Not Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Not a Hazard Substance or Dangerous Good	Yes

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>	100-300	100-300	300-1000	300-1000	300-1000

USE

The notified polymer will be used in paint formulations for industrial coil coating.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

Polymer Manufacture (Resin Plant)

The notified polymer (resin) will be manufactured in Australia at Valspar's Glendenning Plant. Raw materials in 25 kg bags and 1000 kg bulk bag will be fed to the enclosed reactor for batch processing. Sampling from the reactor will be done for QC testing. The finished resin will either be stored into 200 kg drums or, after storing in a tank, fed directly to the paint plant.

Formulation of Paint (Paint Plant)

The resin will be blended on site with pigments solvents and other additives in a mixer (1500 – 20000 L).

After loading and mixing, the resin/pigment mixture is passed via enclosed lines to an enclosed Horizontal Bead Mill where pigments are ground to the required dispersion. A sample is taken at this point for QC control. The mixture from this mill then flows to a makeup tank where further resin, solvents and additives are added to produce the finished paint formulation. After QC approval, the product is then filled into 200 L drums as a paint formulation.

Paint Application

Paint is applied using coil coating equipment using a fully automated process.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

Polymer Manufacture

The potential for environmental release during polymer manufacture is minimal. Control technology includes an in-line incinerator, which would emit CO, CO₂ and water.

There is water generated through distillation and condensation during the resin manufacture at a rate of about 9.5% of the manufacture volume. Due to the means of water generation and the insolubility of the polymer, it is unlikely that there will be significant amounts of the polymer in the water generated, if any. This water is not released to sewer, but held in a wastewater tank and then transported to the Lidcombe plant of Waste Service, NSW.

The manufacturing vessels will not be cleaned. The batch sequence is designed so that any residual resin can be used in the subsequent batch.

Initially the resin formulation will be filled into drums (200 L) and filled by gravity feed. The viscous nature of the polymer is expected to limit spills. Release through vapour emissions is expected to be negligible. For the projected production of 100 tonnes in the first year, approximately 500 kg of polymer will remain as residues in drums after emptying. Used drums are to be sent offsite to a licensed drum recycler. As production of the resin increases, a dedicated bulk storage tank will be made available, replacing the use of drums and thereby reducing waste significantly, as the container will not require cleaning between fills.

Paint Formulation

Paint formulation comprises mixing of the resin, pigments and other additives. These are blended, pass through a grinder and filled into 200 L drums. Spills will be minimal. The paint production equipment will not be cleaned after every batch, but washed with a caustic solution, which is held in a tank and disposed of to the Lidcombe plant of Waste Service, NSW, when the tank is full. Notified polymer that is in the cleaning solution will end up in the sludge at the bottom of the tank, and also disposed of to

Lidcombe. The amount of residue remaining in the blending equipment will be dependent on the batch size. For large batches the residue will account for approximately 0.05% and 0.2% for small batches. As a worst case, at the maximum production rate in small batches washed between each batch, there will be a maximum of approximately 2000 kg of the polymer waste annually.

Paint Application

The paint is used for industrial applications only, and applied via a fully automated process, so any wastes generated (eg spills or cleaning wastes) will be collected and disposed of to landfill. It is estimated that residues in drums would account for approximately 0.25% of the drum contents. Hence, a maximum of a further 2500 kg of the notified polymer will be disposed of through licensed drum recyclers.

The paint will be applied to coils in a closed system at various sites. The application to coils is very efficient process hence little waste is expected. Any waste paint generated will be disposed of to landfill.

Release to water is expected to be negligible, and releases on land are likely to be restricted in landfill, and in a fairly dispersed manner throughout the life of the products coated with the paint containing the polymer.

The notified polymer contains ester linkages that could be expected to undergo hydrolysis under extreme pH conditions. However, in the environmental pH range of 4 to 9, significant hydrolysis is unlikely to occur. It's low water solubility and likely hydrophobic nature are indicative of partitioning into the octanol phase and the polymer's immobility in soil.

6.2. Summary of Occupational Exposure

Manufacture of Resin (Resin Plant)

At the resin manufacturing plant, worker exposure to the notified polymer during transport and storage is only possible in the event of an accidental breakage of bags. Workers may be exposed to the notified polymer during filling of drums or transfer to a storage tank, particularly if spills or leaks occur. The most likely route of exposures is dermal.

Use of Resin (Paint Plant)

Dermal and ocular exposure to the notified polymer can occur during formulation processes while transferring the resin and mixing with other ingredients. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls (closed vessel under vacuum) and personal protective equipment (coveralls, chemical goggles, PVC gloves) worn by workers.

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

End Use (Paint Application)

Worker exposure during paint application is unlikely due to the automated nature of the coil coating process

6.3. Summary of Public Exposure

The notified polymer is intended only for use in industry with little opportunity for exposure by the public.

7. PHYSICAL AND CHEMICAL PROPERTIES

As the notified polymer is manufactured in an organic solvent, the properties listed below are for the resin solution, unless otherwise stated.

Appearance	Clear moderately yellow solution
Melting Point	N/A
Density	1.06
Water Solubility	0.05% w/w

	No test report was provided. Silicones are known to be insoluble
Flammable Limits:	
LEL	0.6%
UEL	7.5% for the solvent in the resin solution
Autoignition temperature	450°C for solvent
Explosive Properties:	
Flash Point of Solvent	44°C
Reactivity	Stable under normal conditions

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

No toxicological information has been provided.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and is therefore considered to be of low hazard.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

No toxicological data were submitted.

9.2. Environmental Hazard Assessment

No ecotoxicity data were provided for the notified polymer. Nonionic polymers with a number average molecular weight in excess of 1000 are generally of low concern for ecotoxicity because they often have negligible water solubility

10. RISK ASSESSMENT

10.1. Environment

The notified polymer will be manufactured in Australia and formulated into paints. The paints will be applied in a closed system by roller coating and losses are expected to be small. Solid wastes containing the notified polymer resulting from spills and application of the paint will be disposed of in landfill or incinerated. As the coating physically degrades over time, any fragments, chips and flakes of the coating will be of little concern as they are expected to be chemically inert. At the end of their useful lives metal coated with the polymer is likely to be placed into landfill or recycled. Empty drums and any residual polymer they contain will be recycled. Wastes solvents containing the notified polymer generated from the cleaning of application equipment will be sent to solvent recycling firms to recover the solvent. The solid wastes generated from the reclamation of solvents will be disposed either to landfill or incinerated.

Polymer disposed of to landfill is expected to become associated with the soil matrix and slowly decompose. It is anticipated that the polymer adhering to drums and metal surfaces will be incinerated during recycling. Incineration of the notified polymer is expected to give water vapour and oxides of carbon and silicon.

The polymer is not expected to cross biological membranes, due to its high molecular weight and low water solubility, and as such should not bioaccumulate.

While no toxicity data are available, based on exposure and use pattern, the notified polymer is unlikely to pose an unacceptable risk to the environment.

10.2. Occupational health and safety

The OHS risk presented by the notified polymer is expected to be low based on the low hazard of the polymer and the low potential for exposure.

10.3. Public health

The notified polymer will not be available to the public. Public exposure to the notified polymer is only likely to occur if there is a spill of the solid material during transport to and from the crushing plant, or during transport to the customer site. The public may have low-level contact with products and articles made from the resin. However, the risk to public health will be negligible because the notified polymer is bound within a matrix and unlikely to be bioavailable.

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 Low 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

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.

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

- The following control measures should be implemented by the manufacturers to minimise environmental exposure during manufacture and use of the notified polymer and paint containing it:
 - Do not release the resin or paint products to sewer. Do not allow resin, paint products or containers to contaminate drains or waterways.

Disposal

- The notified polymer should be disposed of by incineration or to landfill.

Emergency procedures

- Spills/release of the notified polymer should be contained by absorbent material (eg sand), manually collected (along with absorbent material) and placed in a sealable, labelled container for disposal to 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.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.