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

FULL PUBLIC REPORT

AK0586P Polyester Resin

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**Director
Chemicals Notification and Assessment**

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FULL PUBLIC REPORT**AK0586P Polyester Resin****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

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

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical name and synonyms;
Molecular formula;
Structural formula;
Polymer constituents;
Weight percentage of polymer constituents;
Residual monomers and impurities;
Estimated volume of manufacture.

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)

No

NOTIFICATION IN OTHER COUNTRIES

No

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

AK0586P Polyester Resin

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn)	1158
Weight Average Molecular Weight (Mw)	2028
Polydispersity Index (Mw/Mn)	1.75
% of Low MW Species < 1000	21.1
% of Low MW Species < 500	7.3

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

Functional Group	Category	Equivalent Weight (FGEW)
Carboxylic acid	Low Concern	N/A

Charge Density	The notified polymer has low charge density.
Elemental Criteria	The notified polymer contains only approved elements.
Degradability	The notified polymer is not biodegradable.
Water Absorbing	The notified polymer is not a water-absorbing polymer.
Residual Monomers	All residual monomers are below the relevant cut-off.
Hazard Category	The notified polymer is not classified as a hazardous substance.

The notified polymer meets the PLC criteria.

4. INTRODUCTION AND USE INFORMATION

USE

The resin will be used in formulations of inks that will be used for external decoration of beverage cans. The resin will be locally manufactured and formulated into ink products.

5. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Clear moderately yellow solution in tripropylene glycol solvent.
Melting Point/Glass Transition Temp	Not determined
Density	1,100 kg/m ³
Water Solubility	230 mg/L
	Modelling predicts very low water solubility. The notifier expects the measured solubility is likely to be from residual monomers such as dodecanoic acid.
Particle Size	Polymer is produced as a solution in solvent

6. TOXICOLOGICAL INVESTIGATIONS

No toxicological data were submitted.

7. ENVIRONMENTAL INVESTIGATIONS

No ecotoxicological data were submitted.

8. RISK ASSESSMENT

8.1 Environment

8.1.1 Environment – exposure assessment

The polymer will be manufactured at one site in an enclosed system. The potential for environmental release during manufacture is minimal. Control technology includes an in-line incinerator.

Water is generated during manufacture at a rate of approximately 8% of the manufacture volume. Assuming a maximum annual production of 100 tonnes of polymer, about 8000 L of water may be expected to be produced. This water is generated through a distillation and condensation method. The expected low solubility of the polymer suggests there is unlikely to

be significant amounts of polymer in the water. At worst, the polymer may be found at 230 ppm based on measured water solubility.

During manufacture, the level of polymer in wastewater is expected to be lower as there is a vacuum stage in the production process that lowers the residual monomer content. Assuming 230 ppm polymer is lost as a worst case, this results in <2 kg polymer per annum in waste water. The wastewater is not released to sewer but it is transported to the Lidcombe plant of Waste Service, NSW for treatment.

Drums are filled by gravity feed and the viscous nature of the polymer is expected to limit spills. Release through vapour emissions is expected to be negligible.

During ink formulations, the resin, pigments and other additives are blended, passed through a grinder and filled to the required pack size. The majority of the ink production is carried out at the same site as the resin manufacture.

The quantity of solid waste from the mixing and packing operations consists mainly of rags which have been used to clean up equipment or minor spills. The volume of waste from this source is approximately 20 kg per annum.

Ultimately, the polymer is used in around 700 formulations for decorative inks. These inks are used in the coating of beverage cans. This is an efficient process, and once cured onto the can, they are expected to share the fate of the can, which are either disposed of to landfill or as waste obtained from can recycling operations.

Modelling predicts that the polymer in its pure form will be degradable. The large molecular weight is expected to inhibit bioaccumulation.

Calculations to determine predicted concentrations in environmental media are not suitable given the polymeric nature of the product and its use pattern. However, total release of polymer to water is expected to be negligible, and releases on land are likely to be concentrated in landfill, and in a dispersed manner.

8.1.2 Environment – hazard assessment

No ecotoxicological data were provided for the notified polymer. There are no suitable structural activity relationships available to model ecotoxicity of this chemical.

Modelling suggests that the polymer is insoluble in water and is unlikely to result in adverse effects due to a lack of bioavailability.

There are insufficient data to provide an environmental hazard classification for this polymer under the GHS.

8.1.3 Environment – risk characterisation

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

8.2 Human health

8.2.1 Occupational health and safety – exposure assessment

Workers likely to be exposed to the notified polymer are those involved in manufacture, ink production, use, storage and transport, and the cleaning of spills and equipment.

MANUFACTURE OF POLYMER

Dermal contact is the main route of exposure. Workers may become contaminated when weighing and transferring the raw material into the reactor, and drumming off resin products

into 200 L drums. The manufacturing processes is enclosed and local exhaust ventilation (LEV) is used.

INK FORMULATION PROCESS

Workers may become exposed when weighing and transferring the polymer resin into a mixing vessel for subsequent blending with pigments and other additives, and when drumming off ink formulations into 10 L pails or 200 L drums. Similarly, the manufacturing process, ink formulation is enclosed and engineering controls such as LEV are in place.

USE OF INK

Details of ink application were not provided. Based on previous notification submitted by the notifier, ink application will be applied using highly efficient systems such as roller coaters and spray guns that produce very little waste. Skin, eye and inhalation exposure to the notified polymer and co-solvent may occur during preparation of the ink mixture. Exhaust ventilation are in place in the spray application and baking-oven (for curing) area. After application and once the ink containing the notified polymer is cured into an inert matrix, the notified polymer is not available for exposure.

TRANSPORT AND STORAGE

During transport and storage, workers are unlikely to be exposed to the notified polymer except when the notified chemical is accidentally spilled such as in a transport accident.

8.2.2 Public health – exposure assessment

The public is unlikely to be exposed to the notified polymer unless in a transport accident. However, the public will make contact with the notified polymer on the surface of food, beverage and industrial cans. At this stage, it will exist as a cured, inert film, which would not be bioavailable.

8.2.3 Human health – hazard assessment

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

8.2.4 Occupational health and safety – risk characterisation

The OHS risk presented by the notified polymer is expected to be low. The notified polymer may be present in formulations containing hazardous ingredients. If these formulations are classified as hazardous to health in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances (NOHSC, 1999a), workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

8.2.5 Public health – risk characterisation

The notified polymer will not be available to the public. Members of the public may make dermal contact with the cured film on cans coated with products containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is bound within a matrix once in the cured state and unlikely to be bioavailable.

9. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

9.1. Environmental risk assessment

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

9.2. Human health risk assessment

9.2.1. Occupational health and safety

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

9.2.2. Public health

There is Negligible Concern to public health when used in the formulation of ink for external decoration of beverage cans.

10. MATERIAL SAFETY DATA SHEET AND LABEL

10.1 Material Safety Data Sheet

The MSDS of the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a). It is published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

10.2. Label

The label for the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the label remains the responsibility of the applicant.

11. 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.
- During manufacture of the notified polymer, the NOHSC exposure standards (NOHSC, 1995) and NOHSC Workplace guidance for the relevant monomer ingredients (NOHSC, 1999b) should be adopted.
- 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 application to articles of the notified polymer and inks containing it:
 - Do not release the resin or products containing it to sewer. Do not allow product or containers to contaminate drains or waterways.

Disposal

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

Emergency procedures

- The MSDS provides suitable instructions for dealing with spills.

11.1. 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.

12. BIBLIOGRAPHY

- NOHSC (1994a) National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.
- NOHSC (1994b) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.
- NOHSC (1995) Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:3008(1995)] & [NOHSC:1003(1995)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.
- NOHSC (1999a) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1999)]. National Occupational Health and Safety Commission, Canberra, AusInfo.
- NOHSC (1999b) List of Designated Hazardous Substances [NOHSC:10005(1999)]. National Occupational Health and Safety Commission, Canberra, AusInfo.