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

FULL PUBLIC REPORT

Polymer in Waterbased Epoxy Sorbate Resin

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, 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**

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FULL PUBLIC REPORT**Polymer in Waterbased Epoxy Sorbate Resin****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

The Valspar (Australia) Pty Ltd (ABN: 82 000 039 369)
203 Power Street
Glendenning, NSW, 2761

NOTIFICATION CATEGORY

Limited: Synthetic polymer with Mn \geq 1000 Da.

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 and import volume.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: Melting Point, Density, Vapour Pressure, Water Solubility, Hydrolysis as a Function of pH, Partition Coefficient, Adsorption/Desorption, Dissociation Constant, Particle Size, Flash Point, Autoignition Temperature, Explosive Properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

CEC/768

NOTIFICATION IN OTHER COUNTRIES

USA

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Waterbased Epoxy Sorbate Resin (<35% notified polymer in a solvent blend)

OTHER NAME(S)

13Q80, Ezdex, WE0215P

MOLECULAR WEIGHT

>1000 Da

ANALYTICAL DATA

IR and GPC reference spectra were provided.

3. COMPOSITION

DEGREE OF PURITY >90%

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS

All hazardous impurities and residual monomers are present at levels under the concentration cut-offs.

NON HAZARDOUS IMPURITIES/RESIDUAL MONOMERS (>1% by weight)

None.

ADDITIVES/ADJUVANTS

The notified polymer is in dispersion with solvents that may result in irritation by inhalation and by contact with skin or eyes (R36/37/38).

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

None under normal conditions of use.

DEGRADATION PRODUCTS

None under normal conditions of use.

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20°C AND 101.3 kPa: Hazy viscous liquid (Waterbased Epoxy Sorbate Resin). The notified polymer is dispersed in aqueous solvent blend.

Property	Value	Data Source/Justification
Melting Point	Not determined	Polymer is dispersed in a solvent blend and is not isolated.
Density	Not determined	Polymer is dispersed in a solvent blend and is not isolated.
Vapour Pressure	Not determined	Based on the high molecular weight of the polymer the vapour pressure is expected to be low
Water Solubility	Not determined	The notified polymer is expected to have low water solubility based on its predominately hydrophobic structure and the manufacturer's empirical observations
Hydrolysis as a Function of pH	Not determined	The notified polymer is expected to hydrolyse very slowly over the environmental pH range (4–9) at ambient temperature
Partition Coefficient (n-octanol/water)	Not determined	The high molecular weight of the notified polymer indicates that it will not cross biological membranes
Adsorption/Desorption	Not determined	The notified polymer is expected to adsorb to solids based on its predominantly hydrophobic structure and amphoteric properties
Dissociation Constant	Not determined	The notified polymer is a salt that will ionise in the environmental pH range
Particle Size	Not determined	Polymer is dispersed in a solvent blend and is not isolated.
Flash Point	91 °C	For Waterbased Epoxy Sorbate Resin; Stated on MSDS.
Autoignition Temperature	Not determined	Polymer is dispersed in an aqueous solvent blend. Waterbased Epoxy Sorbate Resin is stated on MSDS to be non-flammable.
Explosive Properties	Not determined	The notified polymer contains no functional groups that would imply explosive properties.

DISCUSSION OF PROPERTIES

Reactivity

The notified polymer is expected to be stable under normal conditions of use. It is not compatible with strong oxidising agents and heat should be avoided.

Dangerous Goods classification

Based on the limited physical-chemical data provided the notified polymer cannot be classified according to the Australian Dangerous Goods Code (NTC, 2007).

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

The notified polymer will be introduced into Australia in a solvent blend in 200 kg steel drums. The supplied drums contain <35% (by weight) of the notified polymer.

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	<150	<350	<500

PORT OF ENTRY

The notified polymer will be imported (sea or airfreight) into Melbourne, VIC or Sydney, NSW.

IDENTITY OF MANUFACTURER/RECIPIENTS

The Valspar (Australia) Corporation Pty Ltd

TRANSPORTATION AND PACKAGING

The notified polymer will be supplied in 200 kg steel drums. The drums will be transported within Australia by road in accordance with any hazardous substances and dangerous goods requirements.

USE

The notified polymer is a component of a formulation that will be used for the coating of metal sheets for the production of cans. The coating containing the notified polymer will be present on both the internal and external surfaces of the cans. The manufactured cans will have food contact applications.

OPERATION DESCRIPTION

Upon delivery of the imported formulation (<35% notified polymer) to the coating sites, the formulation will be transferred from drums to a reservoir. The reservoir feeds into transfer rollers that will apply the resin to sheets of metal as they are fed through the machine. The sheets of metal are then fed through a multi-zone oven where heat dries and cures the coating prior to distribution of the metal sheets to manufacturing sites (*i.e.* for the production of cans).

The manufactured cans will have food contact applications and so will be available to the general public.

6. HUMAN HEALTH IMPLICATIONS

6.1 Exposure assessment

6.1.1 Occupational exposure

NUMBER AND CATEGORY OF WORKERS

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration (hours/day)</i>	<i>Exposure Frequency (days/year)</i>
Transport and storage	10	1	200
Roller coating operators	30	4	220
Cleaning and maintenance workers	10	1	200

EXPOSURE DETAILS

Transport and storage workers may come into contact with the imported formulation (<35% notified polymer) only in the event of accidental rupture of containers.

The roller coating will be an automated process with local exhaust ventilation. Dermal or ocular exposure to the notified polymer may occur during transfer processes (drum to reservoir), during connection/disconnection of hoses and during cleaning and maintenance of equipment. Exposure will be mitigated by the use of exhaust ventilation and personal protective equipment [PPE (as recommended in MSDS for imported formulation): chemical goggles, impervious gloves and appropriate industrial clothing]. Due to the nature of the processes and the expected low volatility of the notified polymer, inhalation exposure is not anticipated.

Once the coating is cured, the notified polymer is not expected to be bioavailable and further dermal contact

should not lead to exposure.

6.1.2. Public exposure

The notified polymer is intended for industrial use only, therefore the public may be exposed to the imported formulation (<35% notified polymer) only in the event of a transport accident. The public may be exposed to the applied coating. However, once the material is cured, it will crosslink to form an inert, rigid can coating.

The notifier has advised that the notified polymer is not expected to migrate from the cured can coating. However, no migration studies are available.

6.2. Human health effects assessment

No toxicity data were submitted for the notified polymer.

Toxicokinetics, metabolism and distribution.

Based on the high molecular weight (>1000 Da) of the notified polymer, the potential of the notified polymer to cross the gastrointestinal (GI) tract by passive diffusion or to be dermally absorbed after exposure is limited.

Health hazard classification

Due to the lack of toxicity data/information, the notified polymer cannot be classified according to the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human health risk characterisation

6.3.1. Occupational health and safety

No toxicological data are provided for the notified polymer. However, it is in dispersion with solvents that may result in irritation by inhalation and by contact with skin or eyes. The polymer particles cannot be isolated from the solvent.

Due to the control measures in place to reduce exposure, including automated processes and the use of PPE, the overall risk of exposure to the notified polymer will be low and it is, therefore, not considered to be unacceptable to the health of workers.

6.3.2. Public health

The notified polymer is intended for use in industrial applications by qualified operators. The public may be exposed to the applied coating in cans. However, once the material is dried, it will not be in particle form and is not expected to be bioavailable unless leaching or migration occurs. A risk assessment for exposure through the use in food contact materials has not been undertaken.

Exposure to the general public is expected to be very low and is not considered to be unacceptable. A copy of this report will be forwarded to Food Standards Australia New Zealand (FSANZ) for informational purposes.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1 Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The notified polymer is imported as a component of a resin system and will not be repackaged or reformulated in Australia. If a spill occurs during storage or transportation, products containing the notified polymer are expected to be absorbed into inert materials (e.g. vermiculite) and collected into suitable containers for disposal to landfill.

RELEASE OF CHEMICAL FROM USE

Roller coating of the notified polymer onto metal sheets is carried out using automated processes. Roller application is efficient (approximately 90%) with any coating not applied (i.e. excess material) being retained and recycled or going through a solvent recovery plant. The solids from the process will be sent to landfill. Equipment cleaning and container residues will be handled in the same manner as the application excess. It is estimated that up to 10% per annum of the imported quantity of the notified polymer will be disposed of during

coating application and equipment cleaning and 1% per annum of the notified polymer will be disposed of during drum cleaning. The notified polymer present in these wastes will be disposed to landfill.

RELEASE OF CHEMICAL FROM DISPOSAL

The fate of the bulk of the imported quantity of notified polymer will be tied to the fate of cans to which it is applied as an internal and external coating. Most used aluminium cans will be recycled (WSN, 2010). During recycling the metal cans are smelted in furnaces (WSN, 2010). At the high temperature in furnaces the notified polymer will be destroyed by conversion to oxides of carbon, nitrogen and water vapour.

7.1.2 Environmental fate

No environmental fate data were submitted. The notified polymer is expected to be cured into a solid polymer matrix as part of its normal use pattern and is not therefore expected to be bioavailable or biodegradable. The majority of the imported quantity of notified polymer is expected to be thermally decomposed during recycling of cans to which it is applied. Bioaccumulation of the uncured polymer is unlikely due to the high molecular weight of the notified polymer and its limited potential for aquatic exposure. Notified polymer disposed of to landfill is not expected to be mobile, and it will slowly degrade *in situ* primarily by abiotic processes.

7.1.3 Predicted Environmental Concentration (PEC)

The notified polymer is not expected to be present in significant concentrations in the aquatic environment because of its anticipated low water solubility and very low potential for direct release to surface waters when used can coatings. A PEC has therefore not been calculated.

7.2. Environmental effects assessment

No ecotoxicity data were submitted. The toxicity of ionic polymers depends on the cation to anion ratio (CAR), and polymers that pose the greatest concern for the environment have a net cationic charge. The CAR for the notified polymer is ≤ 0.40 , indicating that it is anionic overall. The notified polymer is unlikely to be an overchelation hazard to algae and is also not expected to be either water soluble or significantly water dispersible. Therefore, the notified polymer is not expected to pose a significant hazard to the aquatic environment (Boethling and Nabholz, 1996).

7.2.1 Predicted No-Effect Concentration

A Predicted No-Effect Concentration (PNEC) was not calculated as no ecotoxicological data were submitted.

7.3. Environmental risk assessment

A Risk Quotient is unable to be quantified as a PEC and PNEC were not calculated. The reported use pattern of the notified polymer indicates that there is no anticipated aquatic release and the majority of the imported quantity of polymer will be destroyed during metal recycling. Hence, the environmental exposure is expected to be minimal. On the basis of the reported use pattern, the notified polymer is not expected to pose a risk to the environment.

8. CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

Due to the lack of toxicity data/information, the notified polymer cannot be classified according to the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)].

Human health risk assessment

Under the conditions of the occupational settings described, the notified polymer is not considered to pose an unacceptable risk to the health of workers.

When used in the proposed manner, the notified polymer is not considered to pose an unacceptable risk to public health.

Environmental risk assessment

On the basis of the reported use pattern, the notified polymer is not expected to pose a risk to the environment.

Recommendations**CONTROL MEASURES****Occupational Health and Safety**

- As no toxicological data is available for the notified polymer, the following personal protective equipment is recommended to be used by workers to minimise occupational exposure to the notified polymer (as introduced):
 - overalls, gloves, goggles and respiratory protection where exposure to vapours/fumes is possible.
- A copy of the MSDS should be easily accessible to employees.
- If products and mixtures containing the notified chemical are classified as hazardous to health in accordance with the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)] workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

Disposal

- The notified polymer should be disposed of to landfill.
- Emergency procedures
- Spills or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

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(2) of the Act; if
 - the function or use of the polymer has changed from a component of a can coating formulation (at <35% concentration), or is likely to change significantly;
 - the amount of polymer being introduced has increased from 500 tonnes per annum, or is likely to increase, significantly;
 - the polymer has begun to be manufactured in Australia;
 - additional information has become available to the person as to an adverse effect of the polymer 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.

Material Safety Data Sheet

The MSDS of a product containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.

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