File No: PLC/310

October 2002

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME

FULL PUBLIC REPORT

Macrynal VSM 2800

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Director
Chemicals Notification and Assessment

TABLE OF CONTENTS

FULL PUBLIC REPORT

Macrynal VSM 2800

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Pacific Resins Pty Limited of 24 Van Buren Circuit, Bonnet Bay NSW (ABN 92 520 305 379), has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC) Macrynal VSM 2800.

NOTIFICATION CATEGORY
The notified polymer meets the PLC criteria.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication:

- Chemical Identity
- CAS Number
- Molecular Formula
- Structural Formula
- Gel Permeation Chromatogram
- List of polymer constituents
- Maximum weight percentage of residual monomers
- Estimated 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)
No

NOTIFICATION IN OTHER COUNTRIES
The notified polymer has been determined as eligible for polymer exemption in the US.

2. IDENTITY OF CHEMICAL

MARKETING NAME
Macrynal VSM 2800

METHODS OF DETECTION AND DETERMINATION

ANALYTICAL METHOD	Infrared Spectroscopy
TEST FACILITY	Not known

3. COMPOSITION

DEGREE OF PURITY
>99.7%

RESIDUAL MONOMERS

All residual monomers are below the relevant cut-offs for classification of the notified polymer as a hazardous substance.

DEGRADATION PRODUCTS
The notified polymer itself is stable under normal conditions however the product containing the notified polymer is flammable due to its solvent content. The Material Safety Data Sheet (MSDS) for the product containing the notified polymer lists carbon monoxide as a hazardous combustion gas.

4. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED POLYMER (100%) OVER NEXT 5 YEARS
The notified polymer will be imported as a component of the product 'Macrynal VSM 2800/70BAC' at a concentration of 70%.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	3-10	3-10	3-10	3-10	3-10

USE
A component in clear and pigmented topcoats for the automotive repair and industrial lacquer sectors. It may also be used for the formulation of automotive repair fillers.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, Transport and Storage

IDENTITY OF RECIPIENTS
Specific end users are not known. Coatings containing the notified polymer are expected to be used in industrial applications for automotive or appliance end users.

TRANSPORTATION AND PACKAGING
The product containing the notified polymer will be imported in 200L drums and distributed to customer sites. Formulations containing Macrynal VSM 2800/70 BAC for use in hand-held spray systems will be packaged in pail sized containers.

5.2. Operation Description

The notified polymer will be imported as a component of the product Macrynal VSM 2800/70BAC (70% Macrynal VSM 2800). The imported product is then distributed to customer sites for use. Macrynal VSM 2800/70BAC is used to produce topcoat formulation for application in automotive repair and industrial lacquer.

In automated spray booth operations, Macrynal VSM 2800/70BAC is pumped into robotic spray application equipment where it is blended with solvent to give a formulation containing 17-21% of the notified polymer (25-30% of Macrynal 2800/70BAC). This formulation is then sprayed by the robotic spraying equipment.

Macrynal VSM 2800/70BAC may also be manually blended and the finished formulation applied using hand held spraying equipment.

5.3. Occupational exposure

Number and Category of Workers

Category of Worker	*Number*	*Exposure Duration*	*Exposure Frequency*
Pumping Operator	1	25 minutes	Batch
Spraying Operator	1	1 minute	Batch
Clean-up Operator	1	4 hours	Once every 20 days
Drying Operator	1	8 hours	Batch

Exposure Details
It is envisaged that workers involved in the importation, interim warehousing and transportation to customer sites would only be exposed to the notified polymer in the event of an accidental spill or packaging breach.

Worker exposure results from application of coating material using hand held or robotic spray booth equipment. Robotic spray booth application is expected to be the major form of use. The workers involved in the process include pumping operators, spraying operators, clean-up operators, and drying operators.

Pump operators can be exposed to the notified polymer (at 70% concentration) in the coating formulation 'Macrynal VSM 2800/70BAC' during connection/disconnection of the pumps to the drums of 'Macrynal VSM 2800/70BAC' and during solvent rinsing of empty drums.

Spraying operators may be exposed to a solvent solution of the notified polymer (25-30% 'Macrynal VSM 2800/70BAC' or 17.5-21% notified polymer) during connection/disconnection of the robotic spray application equipment.

Clean up operators may be exposed to a solvent solution of the new chemical substance during solvent washing of the robotic spray equipment.

5.4. Release

RELEASE OF CHEMICAL AT SITE
The notified polymer will not be manufactured in Australia.

RELEASE OF CHEMICAL FROM USE
Generally, coatings containing the notified polymer are expected to be used in industrial applications for automotive or appliance end uses. However, it is not possible for the notifier to list specific end-use sites.

Emptied containers of manufactured coatings are cleaned and rinsed with solvent and the rinse materials are added to the next batch.

It is expected that most of the formulations containing the notified polymer will be used in bulk (drum sized containers) in a few (<10) industrial robotic spray application systems. Where this is the case, the non-aqueous paint overspray is typically collected with a water curtain, and the non-reactive nature of the ingredients allows excess paint to be skimmed off the water surface. This paint can be recycled resulting in minimal waste requiring disposal.

Where formulations are used in hand held spray systems, the product will be packaged in pail sized containers for application at an estimated 10-100 sites. Where hand held spray applicators are used, overspray cannot be collected economically for recycling, so the residues are collected by an air or water curtain for disposal.

Periodic clean up of the spray equipment results in a small loss of chemical with approximately 20% of the last batch every 20 days. This material is collected for disposal.

5.5. Disposal

Residues remaining in drums after cleaning and residues resulting from the periodic cleaning of spray equipment are disposed of by incineration or in landfill.

Where disposal of non-recyclable overspray is required, it will be through incineration or in landfill.

5.6. Public exposure

Formulations produced from Macrynal VSM 2800/70BAC are designed for use in industrial coatings products. These coatings are not expected by the notifier to be sold to the general public. The public will only be exposed to the notified polymer via the dried topcoat where it will be bound in an inert matrix and as such is biologically unavailable.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa Clear viscous liquid with ester like odour (as formulated in solution).

Boiling Point 100-200°C

Remarks Boiling point of product containing the notified polymer is provided by MSDS.

Density

Remarks Not determined.

Water Solubility

Remarks Not determined. The notifier states the notified polymer is insoluble in water and this insolubility forces the use of a butyl acetate and naphtha solvent system. The estimated water solubility is negligible. No test report was provided to support this claim although the largely hydrophobic nature of the constituents is noted.

Hydrolysis as a Function of pH Not determined

Remarks 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.

Partition Coefficient (n-octanol/water) Not determined

Remarks The partition coefficient has not been determined. However, due to the non-ionic nature of the polymer and its expected low water solubility, and likely hydrophobic nature, partitioning into the octanol phase could be anticipated.

Adsorption/Desorption Not determined

Remarks The notified polymer is expected to be relatively immobile in soil due to its expected low water solubility.

Dissociation Constant Not determined

Remarks The polymer contains a small amount of carboxylic acid functionality expected to have typical acidity. The notified polymer is expected to be mostly un dissociated under normal environmental conditions.

Particle Size

Remarks Not determined.

Flammability Lower limit 1.2% Upper limit 7.5% as formulated with solvent.

Remarks The notified polymer is present in a solvent formulation for which the flammability limits are provided.

Explosive Properties

Remarks Not determined.

7. TOXICOLOGICAL INVESTIGATIONS

No Toxicological data were submitted.

8. ECOTOXICOLOGICAL INVESTIGATIONS

No ecotoxicological data were submitted.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

Routes of release are discussed in Section 5.4. Quantifying these releases is difficult, however, as a worst case, the following may be assumed:

1% of the import volume is lost as waste through residues in containers totalling less than 100 kg per annum;

40% of the import volume is lost through overspray totalling less than 4000 kg per annum. It is not unusual for overspray losses to account for over 50% of losses; but as described above, a significant portion of the overspray of this chemical is expected to be recycled as it can be collected.

1% of the import volume is lost as waste through residues following cleaning of application equipment.

While waste product may be incinerated, as a worst case, all can be assumed to be disposed of to landfill and consequently remain in the environment. Waste product disposed to the environment is unlikely to be mobile and may persist. However, abiotic and biotic degradation mechanisms are expected to degrade the polymer over time.

Exposure to the aquatic compartment is not anticipated. However, if this were to occur (eg, in the instance of a spill), the notified polymer would be expected to associate with sediments. The size of the molecule indicates that it is unlikely to cross biological membranes and this, in addition to minimal exposure, suggests bioaccumulation is unlikely. There is a relatively high percentage of lower molecular weight material in the notified polymer but the lack of exposure to aquatic compartment should preclude these from causing adverse effects.

9.1.2. Environment – effects assessment

No ecotoxicological data were provided.

9.1.3. Environment – risk characterisation

The notified chemical will predominantly enter the environment through disposal of waste to landfill and this will be in a relatively diffuse manner due to the large number of end users.

Abiotic or slow biotic processes are expected to be largely responsible for the degradation of the notified polymer as it is not expected to be readily biodegradable. As a consequence of its low water solubility, the notified chemical is likely to be immobilised through adsorption onto soil particles and sediments.

Exposure to aquatic systems is expected to be negligible. While there is a significant percentage of low molecular weight species in the notified polymer, the potential for adverse effects is considered negligible due to a lack of exposure.

When used in the manner described, the notified polymer is not expected to result in adverse impacts on the environment.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

The notified polymer will be imported in 200L drums. During transport and storage workers are unlikely to be exposed to the notified polymer except when drums are accidentally breached.

Dermal and ocular exposure can occur during certain formulation processes such as pumping, spraying and clean up. Additionally, inhalation exposure may occur during hand held spraying due to the presence of aerosols containing the notified polymer.

Exposure to significant amounts of the notified polymer is, however, limited because of the engineering controls and personal protective equipment worn by workers. Overspray is collected by a forced air fume collection system and workers are advised to wear chemical resistant gloves, goggles and face shield.

After application and once dried, the coating containing the notified polymer is cured into an inert matrix and is hence unavailable to exposure. Drying operators are exposed to the notified polymer in this inert form and are expected to wear safety glasses.

The most likely worst-case scenario for worker exposure to the notified polymer is during hand-held spraying due to the high probability of aerosols in the immediate worker environment and the reliance on personal protective equipment.

9.2.2. Public health – exposure assessment

The notified polymer will not be available to the public. Members of the public may come into contact with products containing the notified polymer however the polymer is not bioavailable in this form.

9.2.3. Human health - effects assessment

No toxicological data were provided, however, the notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.
The product Macrynal VSM 2800/70BAC contains n-Butyl acetate which has a TWA of 150 ppm or 713 mg/m3 (NOHSC, 1995).
Due to the presence of n-butyl acetate, Macrynal VSM 2800/70BAC is classified in accordance with the Australian Dangerous Goods Code (FORS, 1998) as Class 3 – Flammable Liquid.

9.2.4. Occupational health and safety – risk characterisation

The notified polymer must be assessed for the contribution it makes to the hazards associated with spray application of the coatings.

The OHS risk presented by the notified polymer is expected to be low, however, 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.

The use of the paint containing the polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting* (NOHSC, 1999b). The presence of many potential and actual hazardous substances in paint formulations requires the use of stringent engineering

controls, such as a correctly constructed and maintained spray booth, and of a high level of personal protective equipment, such as impermeable overalls and gloves and a full face shield and respirator.

Manual spraying represents the worst-case scenario of worker exposure due to the high likelihood of aerosols of product in the immediate worker environment. The risk of exposure to the final formulation of coating containing 17-21% of the notified polymer is therefore greater during hand-held use. Workers should wear personal protective equipment including chemical resistant coveralls, goggles or faceshield, impervious gloves and respiratory protection such as supplied air or respirator with particulate filter and organic vapour cartridge.

The level of protection from exposure afforded by the standard protective measures will provide adequate protection from the polymer, which is likely to be less intrinsically toxic than most of the solvents and pigments and also some other paint resins.

9.2.5. Public health – risk characterisation

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

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

10.1. Hazard classification

Based on the available data the notified polymer is not classified as hazardous under the NOHSC *Approved Criteria for Classifying Hazardous Substance* (NOHSC, 1999a).

10.2. Environmental risk assessment

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

10.3. Human health risk assessment

10.3.1. Occupational health and safety

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

10.3.2. Public health

There is negligible concern to public health when used in the prescribed manner.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of Macrynal VSM 2800/70BAC, the product containing 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.

11.2. Label

The label for Macrynal VSM 2800/70BAC, the product containing 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.

12. 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.

  - Hand-held spraying requires a higher level of personal protective equipment than use within a spray-booth. Workers should wear goggles, impervious glovers and respiratory equipment suitable for use with all components of the formulation.

- The use of the product containing the polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting* (NOHSC, 1999b) where appropriate.

- 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* (NOHSC, 1999a), workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Environment - Disposal

Product

- Incineration of the notified polymer will liberate oxides of carbon and hydrogen and is an acceptable disposal option in a suitable incineration plant observing local regulations.
- Alternatively, the notified chemical should be disposed of in landfill.

Uncleaned packaging

- Contaminated packaging should emptied as much as possible. If recycling is not an option, packaging should be disposed of to landfill.

Emergency procedures

- Do not allow the notified polymer to enter drains or waterways. Spills/release of the notified chemical should be contained through picking up with absorbent material and the resulting waste disposed of in landfill.

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 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 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.

13. BIBLIOGRAPHY

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