

File No PLC/501

March 2005

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

FULL PUBLIC REPORT

Polymer in Vinnapas RE 523 Z

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 Heritage.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at:

Library
National Occupational Health and Safety Commission
25 Constitution Avenue
CANBERRA ACT 2600
AUSTRALIA

To arrange an appointment contact the Librarian on TEL + 61 2 6279 1161 or + 61 2 6279 1163.

This Full Public Report is 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
Chemicals Notification and Assessment**

TABLE OF CONTENTS

| | |
|---|---|
| FULL PUBLIC REPORT..... | 3 |
| 1. APPLICANT AND NOTIFICATION DETAILS | 3 |
| 2. IDENTITY OF CHEMICAL | 3 |
| 3. COMPOSITION | 3 |
| 4. INTRODUCTION AND USE INFORMATION..... | 4 |
| 5. PROCESS AND RELEASE INFORMATION | 4 |
| 5.1. Operation Description..... | 4 |
| 6. EXPOSURE INFORMATION | 4 |
| 6.1. Summary of Environmental Exposure..... | 4 |
| 6.2. Summary of Occupational Exposure | 5 |
| 6.3. Summary of Public Exposure | 5 |
| 7. PHYSICAL AND CHEMICAL PROPERTIES | 5 |
| 8. HUMAN HEALTH IMPLICATIONS..... | 6 |
| 8.1. Toxicology..... | 6 |
| 8.2. Human Health Hazard Assessment..... | 6 |
| 9. ENVIRONMENTAL HAZARDS | 6 |
| 9.1. Ecotoxicology..... | 6 |
| 9.2. Environmental Hazard Assessment | 6 |
| 10. RISK ASSESSMENT | 6 |
| 10.1. Environment | 7 |
| 10.2. Occupational Health and Safety | 7 |
| 10.3. Public Health | 7 |
| 11. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS..... | 7 |
| 11.1. Environmental Risk Assessment | 7 |
| 11.2. Human Health Risk Assessment..... | 7 |
| 11.2.1. Occupational health and safety | 7 |
| 11.2.2. Public health..... | 7 |
| 12. MATERIAL SAFETY DATA SHEET | 7 |
| 12.1. Material Safety Data Sheet | 7 |
| 13. RECOMMENDATIONS | 7 |
| 13.1. Secondary Notification | 8 |

FULL PUBLIC REPORT**Ingredient in Vinnapas RE 523 Z****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Wacker Chemicals Australia Pty Ltd (ABN 42 005 712 489)
 18/20 Duerdin Street
 Clayton North VIC 3168

NOTIFICATION CATEGORY

Synthetic Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical Name

CAS Number

Molecular Formula

Structural Formula

Molecular Weight

Polymer Constituents

Residual Monomers

Use Details

Identity of Test Substance for Toxicological Studies

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows:

Melting Point

Density

Flammability

Auto-ignition

Explosivity

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

Low Volume Chemical permit number 637 (file number LVC/654)

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Vinnapas RE 523 Z (containing <1% notified polymer)

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

| <i>Criterion</i> | <i>Criterion met (yes/no/not applicable)</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> | 0.2 | 0.2 | 0.5 | 0.5 | 0.5 |

USE

The notified polymer will be used in self-levelling flooring compounds, construction adhesives, floor screeds and repair mortars.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

Import and Distribution

The notified polymer will be imported by Amtrade International as a component (<1%) of the commercial product Vinnapas RE 523 Z. Vinnapas RE 523 Z is a dry powder that will be imported in bulk bags (700 or 1000 kg) of woven polypropylene (FIBC). It will be stored in 2 warehouses, in Laverton VIC and Wetherill Park NSW, before being distributed to commercial customers for reformulation.

Reformulation

Approximately 5-10 industrial formulators will use the notified polymer. Vinnapas RE 523 Z will be mixed with other dry materials to produce powder products such as dry mortars, adhesives and trowelling compounds. Vinnapas RE 523 Z will be pumped automatically into the mixing vessel. The formulation is then spray dried. Final products will be packaged in paper bags of approximately 25 kg, for sale to industrial construction companies.

End Use

End use customers at industrial building construction sites will mix the dry mortar, adhesive or trowelling products with water. Mixing may be done by hand or machine. Typical end use products will contain 1-7% Vinnapas RE 523 Z, i.e. <0.07% notified polymer.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

The notified polymer is a minor ingredient (<1% (w/w)) of a product that is imported in powder form in flexible intermediate bulk containers (FIBCs) containing 700 – 1000 kg of the formulation. The product is stored at two warehouses, prior to being distributed to six reformulating sites. It is estimated that less than 1 kg of the formulated product will remain in the FIBC's. This equates to <10 g of the notified polymer that will remain in the FIBCs. As no information has been provided regarding their fate, it is assumed that the FIBCs will either be returned to the supplier for refilling or more likely will be disposed of in a secure landfill.

The formulated product containing the notified polymer is reformulated with other ingredients to produce industrial adhesive and mortar products that are typically packaged in paper bags of

approximately 25 kg of <0.07% (w/w) notified polymer.

The end use of the notified polymer is in industrial construction adhesives and mortar, and will be bound up in the hardened matrix of adhesive/mortar. Possible environmental release will be in the form of wind dispersal of the dry adhesive/mortar product during container opening and transfer. Due to the very low concentration of the notified polymer within the end-use product, this is unlikely to be a significant route of environmental exposure.

There are only eight sites within Australia where the product is likely to be stored in any significant quantity or concentration and therefore there is minimal risk of environmental exposure from these sources if procedures for prevention and clean up of spillage are followed.

The ultimate fate of the notified polymer will be linked to the disposal of construction materials from building demolition which is usually direct to landfill where the notified polymer is expected to associate with the soil matrix and sediments and slowly degrade through abiotic and biotic processes to water vapour, oxides of carbon and sulfur and sodium salts. The notified polymer is not expected to cross biological membranes due to its high molecular weight and water solubility and is therefore not expected to bioaccumulate.

6.2. Summary of Occupational Exposure

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

At reformulation sites, typically 1-2 workers will supervise mixing of Vinnapas RE 523 Z into end use dry powder products. Dermal and ocular exposure are possible; however this will be limited by the use of automated systems and personal protective equipment including respirators for fine dust, gloves and safety goggles for use when handling powders.

At end use sites, typically 1-2 workers will be involved in mixing powder products with water, before application to the building site. Exposure to the notified polymer will be limited by its very low concentration (<0.07% (w/w) before addition of water) in end use products.

6.3. Summary of Public Exposure

The notified polymer is intended only for use in the construction industry and will not be available to the public.

7. PHYSICAL AND CHEMICAL PROPERTIES

The notified polymer is produced as an aqueous solution and dried before formulation into powdered products. The notified polymer will only be introduced to Australia in the product Vinnapas RE 523 Z.

| | |
|---|---|
| Appearance at 20°C and 101.3 kPa | The notified polymer is produced as a red-brown 40% aqueous solution, pH 7-9. It dries to a red-brown powder. |
| Melting Point | MP is not known for the notified polymer, as it is produced in aqueous solution. |
| Density | The imported product Vinnapas RE 523 Z has a thermal decomposition temperature >250°C. The notified polymer is produced as a 40% aqueous solution with a density of approximately 1230 kg/m ³ . |
| Water Solubility | The imported product Vinnapas RE 523 Z has a bulk density of 440-540 kg/m ³ . |
| Dissociation Constant | >490 g/L at 20°C for the notified polymer. |
| Particle Size | Not known. For the imported product Vinnapas RE 523 Z: Mean particle size 93.53 µm Respirable range (<100 µm) 60% |

| | |
|--|--|
| Ignition Temperature Reactivity | Inspirable range (<5 µm) 2.8% >500°C for Vinnapas RE 523 Z. |
| Degradation Products | The notified polymer is not anticipated to undergo further reaction under normal conditions of use. The notified polymer is not expected to degrade, decompose or depolymerise. |

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

The following toxicological endpoints were submitted based on a polymer considered chemically equivalent to the notified polymer for the purpose of toxicological testing:

| <i>Endpoint</i> | <i>Result</i> | <i>Classified?</i> | <i>Effects Observed?</i> |
|---|--------------------------------------|--------------------|---|
| Rat, acute oral | LD50 > 5000 mg/kg bw low toxicity | no | Slight depression in all animals up to 4 hours post-dose. Compound-coloured faeces and urine up to 3 days post-dose. |
| Genotoxicity – bacterial reverse mutation | non mutagenic | no | no |

The following toxicological endpoint was submitted based on the imported product containing <1% notified polymer:

| <i>Endpoint</i> | <i>Result</i> | <i>Classified?</i> | <i>Effects Observed?</i> |
|------------------------------------|------------------------|--------------------|--|
| Rabbit, primary skin irritation | slightly irritating | no | Slight, well defined erythema that resolved within 72 hours in all animals |

All results were indicative of low hazard.

8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. This conclusion is supported by the toxicological data provided.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

The following ecotoxicological endpoints were provided for an aqueous solution of the notified polymer. Results have been adjusted to reflect the notified polymer in its pure, dried form.

| <i>Endpoint</i> | <i>Result and Conclusion</i> |
|-------------------------------------|---|
| Ready Biodegradability | Not readily biodegradable |
| Fish Toxicity | LC50 <i>Leuciscus idus</i> : 2991 mg/L |
| Inhibition of Bacterial Respiration | EC 10 <i>Pseudomonas putida</i> : >12800 mg/L |

The notified polymer is not expected to cross biological membranes due to its high molecular weight and water solubility and is therefore not expected to bioaccumulate.

9.2. Environmental Hazard Assessment

From the limited data available, toxicity to aquatic organisms is likely to be low. This is in line with the literature (R. S. Boethling and J. V. Nabholz; “Environmental Assessment of Polymers under the U.S. Toxic Substances Control Act”, Chapter 10 (pp 187-234) of Ecological Assessment of Polymers, J. D. Hamilton and R. Sutcliffe (Eds) Van Nostrand Reinhold (1997)).

10. RISK ASSESSMENT

10.1. Environment

While it may be possible to determine the Predicted No-Effect Concentration (PNEC), based on the single fish result and an assessment factor of 1,000, it is not possible to determine the Predicted Environmental Concentration (PEC), and therefore a PEC/PNEC calculation cannot be undertaken. However, based on exposure information the PEC will be very low, and combined with the likely low hazard of the notified polymer to the aquatic environment, the risk to the environment is low.

10.2. Occupational Health and Safety

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, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

The level of atmospheric nuisance dust should be maintained as low as possible. The NOHSC exposure standard for atmospheric dust is 10 mg/m³.

10.3. Public Health

As there will be no exposure of the public to the notified polymer or products containing the notified polymer the risk to the public from exposure to the notified polymer is considered to be low.

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 as a component of construction adhesives, screeds and mortars in the industrial building construction industry.

12. MATERIAL SAFETY DATA SHEET

12.1. 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.

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

- Prevent uncontrolled release to the environment.

Disposal

- **Product:** Excess product containing the notified chemical should be collected and allowed to harden prior to disposal to landfill.
- **Packaging:** Packaging which cannot be reused or recycled should be disposed of to landfill or in accordance with local regulations.

Storage

- While in the moderately soluble form of the product Vinnapas RE 523Z, the product should be stored away from sources of moisture.

Emergency procedures

- Spills/release of the notified polymer should be handled by physical containment of the product. Any dissolved product should be collected and allowed to harden before disposal to sealed landfill.

Transport and Packaging

- Due to the solubility of the notified polymer and the formulated product Vinnapas RE 523Z, control measures should be put in place to ensure that the product does not enter the environment in aqueous solution through exposure to moisture.

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.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.