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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer in Araldite XD 4763

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Director
Chemicals Notification and Assessment

TABLE OF CONTENTS

FULL PUBLIC REPORT

Polymer in Araldite XD 4763

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Vantico Pty Ltd, (ABN: 93 091 627 879)
235 Settlement Rd, Thomastown, VIC, 3074

NOTIFICATION CATEGORY
Limited: Polymer with NAMW ≥ 1000 (greater than 1 tonne per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication:
chemical name,
molecular and structural formulae,
molecular weight,
purity and impurities,
spectral data,
polymer constituents,
import volume,
specific use.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
Variation to the schedule of data requirements is claimed as follows:
melting point/boiling point,
specific gravity/density,
vapour pressure,
hydrolysis as a function of pH,
partition co efficient,
adsorption/desorption,
flash point,
flammability limits,
autoignition temperature,
explosive properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
CEC Permit 572

NOTIFICATION IN OTHER COUNTRIES
USA

2. IDENTITY OF CHEMICAL

OTHER NAME(S)
Genomer 3302

METHODS OF DETECTION AND DETERMINATION

ANALYTICAL METHOD	IR Spectroscopy
Remarks	A reference spectrum was provided

3. COMPOSITION

DEGREE OF PURITY
High

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS
The product containing the notified chemical polymer contains a number of ingredients as specified in the MSDS, some of which are classified as skin sensitisers, and eye, respiratory, and skin irritants.

4. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified polymer will be imported as a component of an adhesive in 20 kg steel pails. The adhesive will contain < 60% notified polymer. It will not be reformulated in Australia.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	10-30	10-30	10-30	10-30	10-30

USE
Component of an adhesive system for plastic substrates

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, Transport and Storage

PORT OF ENTRY
Melbourne, Victoria

IDENTITY OF MANUFACTURER/RECIPIENTS
Vantico Pty Ltd.

TRANSPORTATION AND PACKAGING
The notified polymer will be imported in 20 kg steel pails.

5.2. Operation Description

A pail containing the notified polymer is manually installed into a dispensing machine. A suction tube is inserted into the pail through a small opening at the top of the pail. The system is closed, and the notified polymer is suctioned into the dispensing equipment, where it is degassed brought to a constant temperature and dispensed onto plastic substrate. The dispensing equipment is fully enclosed and automated. Any residue left in the pail may be poured into the next pail to be used.

5.3. Occupational exposure

Number and Category of Workers

Category of Worker	*Number*	*Exposure Duration Hours/Day*	*Exposure Frequency*
Operator	1-3	8	48 weeks/year
Service Technicians	1-3	8	48 weeks/year
Storeman	1-3	8	48 weeks/year
Transport	≤5	2-4	30-60 days/year

Exposure Details

Each DVD factory contains 3 machines, attended by one operator. One to three shifts per day will operate at each factory.

Transport and warehousing

Workers are not expected to be exposed to the imported notified polymer, as they will be handling closed containers. The notified polymer will be supplied in 20 L pails and transported in secure pallets. Exposure is possible in the event of an accident where the packaging is breached.

Finished product manufacture

The manufacture process requires very little operator activity. Pails of the adhesive formulation containing the notified polymer will be transferred from defined chemical storage areas to the manufacture area as required. Operators will manually install the pails into dispensing machine and insert a suction tube through a small opening at the top pail. The system is closed and the adhesive is delivery under vacuum to the dispensing equipment. The dispensing is carried out in fully automated and computer controlled equipment. The manufacture areas, also called "clean room" areas are all maintained in a state of positive pressure with air constantly being changed. Local exhaust ventilation is used at the machine entry point.

Operators are only exposed to notified polymer when replacing the empty pail with new pail. Any residue remaining in pail is poured into the next pail to be used. Lids are replaced on pails when emptied. This activity occurs daily and takes approximately 5 minutes under normal conditions. Dermal and ocular exposure may occur during this activity, as a result of spills and drips. Workers involved in the process will wear gloves, dust coats and safety glasses.

Cleaning and maintenance work

Cleaning of pump and transfer lines and maintenance work on the equipment used to manufacture the final product is rarely required. Personnel undertaking maintenance tasks are required to wear gloves, dust coats safety glasses and a respirator if necessary.

5.4. Release

RELEASE OF CHEMICAL AT SITE

Release of the polymer in the adhesive is only expected in the event of accidental spills/leaks during transfer of 20 L pails into the dispensing machinery. Spills will be limited to the capacity of the pails. Spill kits are in place in the storage and production areas. Spills are collected with dry, absorbent material and disposed of through a licensed waste disposal contractor.

If cleaning of the equipment is required, only small quantities of waste adhesive, typically less than 1-2 kg will be generated. This is collected for re-use if possible, or is disposed of through a waste disposal contractor. The notifier indicates that the equipment used to bond plastic substrates rarely requires cleaning.

The notifier estimates that up to 4 kg per week (200 kg per annum) residual chemical remaining in the empty import pails will require disposal. Empty drums will be collected by a licensed waste

contractor and sent off-site for disposal.

RELEASE OF CHEMICAL FROM USE
No release of the notified polymer is anticipated once the adhesive is cured and incorporated in the plastic substrates. Plastic articles are most likely to end up in landfill at the end of their useful life.

5.5. Disposal

The empty import drums will be collected by a licensed waste contractor and disposed of to landfill according to local, state and federal regulations.

5.6. Public exposure

The public may come into contact with the notified polymer in the finished product. However at this stage, the polymer would be contained in solid matrix, sandwiched between substrate layers, and not bioavailable.

The public are unlikely to be exposed to the notified polymer during transport, storage, and manufacture except in the accident of an accidental spillage.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa Tan liquid

Melting Point/Freezing Point Not determined
Remarks The polymer is liquid at room temperature.

Density 1160 kg/m^3 at 20°C
Remarks Test report not available.

Vapour Pressure <1.3 x10^{-9} kPa at 20°C.
Remarks The vapour pressure has not been measured for the notified polymer. The relatively high molecular weight of the polymer suggests that it would have a low vapour pressure.

Water Solubility Not determined
Remarks The notified polymer is expected to have low water solubility based on the predominantly hydrophobic monomer composition. Furthermore, the hydroxyl groups are esterified, which would limit the water solubility.

Hydrolysis as a Function of pH Not determined
Remarks The notified polymer contains ester groups which may undergo hydrolysis under extreme temperatures and pressures, but the polymer is likely to undergo polymerisation in the presence of light before hydrolysis.

Partition Coefficient (n-octanol/water) Not determined
Remarks Given its low expected water solubility and hydrophobic nature the notified polymer would be expected to partition into the octanol phase.

Adsorption/Desorption Not determined
Remarks Based on its structure and the likely low water solubility, the notified polymer is expected to adsorb to soil and organic matter and be immobile.

Dissociation Constant Not determined
Remarks There are not groups expected to dissociate in the environmental pH range of 4-9.

Particle Size Not determined
Remarks The polymer is a liquid at room temperature.

Viscosity 18,000- 30, 000 mPa.s at 25°C

Remarks Test data not provided.

Flash Point >100°C
METHOD EC Directive 92/69/EEC A.9 Flash Point.
Remarks Test data not available.

Flammability Limits Not determined.
Remarks The notified polymer is not expected to be flammable.

Autoignition Temperature Not determined
Remarks The notified polymer will undergo polymerisation at temperatures >200°C. Thus, it is not expected to auto ignite.

Reactivity
Remarks The notified polymer polymerises in response to heat, light, and ultraviolet light.

7. TOXICOLOGICAL INVESTIGATIONS

No toxicity data were submitted

8. ENVIRONMENT

8.1. Environmental fate

No environmental fate data were provided.

8.2. Environmental Effects

No environmental effects data were provided.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

The notified polymer is a component in an imported ready-to-use adhesive used to bond plastic substrates. Bonding takes place in enclosed equipment, and hence, environmental release of adhesives containing the notified polymer is expected to be minimal during product manufacture. The notifier estimates that approximately 300 kg per annum of waste polymer could be generated from accidental spills, equipment cleaning, and as residues in empty containers.

The polymer reacts with UV light to form an inert solid. Thus, polymer wastes are expected to be disposed of in landfill as cured adhesive, in which case, the polymer will be incorporated into the inert matrix and unavailable to the environment.

Most of the notified polymer will ultimately become incorporated into plastic articles, where it will be unavailable to organisms. At the end of their useful lives, these plastic articles would most likely be disposed of in landfill.

9.1.2. Environment – effects assessment

No data were provided. In any case, limited aquatic exposure is anticipated during use of the notified polymer.

9.1.3. Environment – risk characterisation

The notified polymer does not pose a significant hazard to the environment based on its reported use pattern because there will be very low environmental exposure. The majority of the polymer will be chemically bound into the cured polymeric matrix of the adhesives in which it is used.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Worker exposure may occur during the manufacture of the finished product. Dermal and ocular exposure may occur as a result of drips and spills during the installation of pails in to the dispensing equipment and the transfer of residue adhesive in used pails to new pails. Exposure will occur during the maintenance and cleaning of the manufacture equipment.

Worker exposure will be minimised by use of the appropriate personal protection equipment. When installing the pails and during maintenance work workers will wear eye protection, gloves, dust coats and respirator, as required. Manufacture will occur in well ventilated areas, where local ventilation will be used.

Worker exposure during the transport, storage, and distribution of the imported notified polymer is unlikely to occur unless there is an accidental spillage or packaging breach.

9.2.2. Public health – exposure assessment

The public will be normally only be exposed to the notified polymer as a component of a solid matrix in the finished product. The notified polymer, at this stage will not be bioavailable.

Direct public exposure during transport and storage is unlikely.

9.2.3. Human health - effects assessment

No toxicological information was provided for the notified polymer and therefore the notified polymer can not be classified according to the NOHSC Approved Criteria for Classifying Hazardous Substances (NOSHC, 1999b). Since the notified polymer has a high NAMW, absorption across biological membrane and resultant systemic toxicity would be restricted. Based on the structure of the notified polymer, it is likely that it would have irritant and/or sensitising properties.

The polymer also contains hazardous impurities, which are listed on the NOHSC List of Designated Hazardous Substances (NOHSC, 1999a) and are assigned the risk phrases: R36/38- irritating to the eye and skin, and R43 – may cause sensitisation by skin contact. The notified polymer will only be imported as a component of an adhesive formulation, which has been classified as hazardous. The risk phrases for the adhesive formulation are: R20 - Harmful by inhalation, R36/37/38 - Irritating to the eyes, respiratory system, and skin, R43 - May cause sensitisation by skin.

9.2.4. Occupational health and safety – risk characterisation

Occupational exposure will occur when handling the imported adhesive formulation. During the manufacture of finished product, dermal and ocular exposure to the notified polymer may occur when the pails are changed and the residue from an empty pail is transferred to a new pail. Based on the physico-chemical data provided, dermal absorption of the notified polymer is unlikely, however protection against the irritant and sensitising properties of the adhesive formulation must be used. Workers involved in this process will wear gloves, dustcoats, and safety glasses. Local exhaust ventilation will also be used in the manufacture areas.

Worker exposure will occur in the cleaning of pumps, transfer lines and maintenance operations. Dermal and ocular exposure is possible at this time. Maintenance work occurs infrequently and workers wear gloves, dust coats, safety glasses and a respirator, if necessary.

Exposure may occur, if there is an accidental spill. It is recommended that these workers, wear overalls, safety glasses, and impervious gloves and use an organic vapour respirator when the risk of inhalation of vapour exists.

No toxicological information was provided for the notified polymer and therefore the notified

polymer can not be classified according to the NOHSC Approved Criteria for Classifying Hazardous Substances (NOSHC, 1999b). However, the notified polymer contains hazardous impurities, which are listed on the NOHSC List of Designated Hazardous Substances (NOHSC, 1999a) and the adhesive formulation it is imported in is classified as hazardous. The measures taken to minimise exposure to the impurities and the other ingredients of the adhesive formulation will be sufficient to ensure that the notified polymer will not pose a significant occupational risk under these conditions.

9.2.5. Public health – risk characterisation

The public may come to the contact with the finished product. However, at this stage the notified polymer is contained in solid matrix and not 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 Substances* (NOHSC, 1999b).

10.2. Environmental risk assessment

The polymer is not considered to pose 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 as described in the submission.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of the products containing the 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 the products containing the 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

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer as introduced:

- Local exhaust ventilation

- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer as introduced:
  - Prevent spills and splashes
  - Lids should be replaced immediately on empty pails
  - NOHSC Exposure Standards for all components of the final product should not be exceeded in the workplace

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer as introduced:
  - Chemical resistant gloves, protective clothing and safety goggles
  - Respirators should be used when there is potential for inhalation.

  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

Disposal

- The notified polymer should be disposed of to landfill or incinerated according to State and local government regulations.

Emergency procedures

- Spills/release of the notified polymer should be handled by absorbing with inert material and collection into a sealed container for disposal.

12.1. 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 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

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 (1999a) List of Designated Hazardous Substances [NOHSC:10005(1999)]. National Occupational Health and Safety Commission, Canberra, AusInfo.

NOHSC (1999b) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1999)]. National Occupational Health and Safety Commission, Canberra, AusInfo.