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

PUBLIC REPORT

Polymer in Crystic Crestapol PD10178

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 Sustainability, Environment, Water, Population and Communities.

For the purposes of subsection 78(1) of the Act, this Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This 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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SUMMARY

The following details will be published in the NICNAS *Chemical Gazette*:

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS SUBSTANCE	INTRODUCTION VOLUME	USE
LTD/1590	Karpelo Holding Pty Ltd	Polymer in Crystic Crestapol PD10178	ND	≤ 50 tonnes per annum	Component of structural adhesives

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

As no toxicity data were provided for the notified polymer, it 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 unreasonable risk to the health of workers.

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

Environmental risk assessment

On the basis of the assessed use pattern and assumed low hazard, the notified polymer is not considered to pose an unreasonable risk to the environment.

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer, as imported and in end-use products:
 - Avoid skin and eye contact
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer, as imported and in end-use products:
 - Gloves, goggles, coveralls

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.
- Where not already contained in the MSDS for products containing the notified polymer, appropriate engineering controls, safe work practices and personal protective equipment to reduce exposure should be recommended on the product MSDS.
- If products and mixtures containing the notified polymer 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.

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 polymer 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 polymer, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer 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(1) of the Act; if
 - the polymer has a number-average molecular weight of less than 1000 Da;

or

- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from component of structural adhesives, or is likely to change significantly;
 - the amount of polymer being introduced has increased from 50 tonne 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.

Material Safety Data Sheet

The MSDS of the 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.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Karpelo Holding Pty Ltd (ABN 79 003 741 035)
Level 9, 221-223 Miller St
North Sydney NSW 2060

NOTIFICATION CATEGORY

Limited: Synthetic polymer with $M_n \geq 1000$ Da.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: chemical name, CAS number, molecular and structural formulae, molecular weight, polymer constituents, residual monomers/impurities, use details, import

volume and site of manufacture.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

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

PHYSICAL CHEMICAL PROPERTIES

Melting Point, Boiling Point, Density, Vapour Pressure, Water Solubility, Hydrolysis as a Function of pH, Partition Coefficient, Dissociation Constant, Flash Point, Autoignition Temperature and Flammability, Explosive Properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

US

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Crystic Crestapol PD10178 (product containing the notified polymer at < 20%)

OTHER NAME

Unsaturated urethane acrylate

ANALYTICAL DATA

Reference GPC spectrum was provided.

3. COMPOSITION

DEGREE OF PURITY > 95%

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

The polymer is stable under normal condition of use.

DEGRADATION PRODUCTS

The notified polymer is stable under normal conditions. Degradation products are expected to be oxides of nitrogen and carbon.

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: yellow liquid (product)*

Property	Value	Data Source/Justification
Boiling Point	50 – 150 °C	Product MSDS*
Density	1,045 kg/m ³ at 25 °C	Product MSDS*
Vapour Pressure	Not determined	Based on the high molecular weight, vapour pressure is expected to be low.
Water Solubility	Not determined	Expected to have limited solubility based on its predominantly hydrophobic structure
Hydrolysis as a Function of pH	Not determined	Contains hydrolysable functionality. However, based on its assumed limited water solubility, it is expected to hydrolyse very slowly in the environmental pH range (4-9) at ambient temperature.
Partition Coefficient (n-octanol/water)	Not determined	Expected to partition from water to n-octanol on the basis of its hydrophobicity.
Adsorption/Desorption	Not determined	Expected to adsorb to soil, sediment and sludge and have low mobility in

Dissociation Constant	Not determined	soil based on its hydrophobicity. Does not contain any readily dissociable functional groups.
Flash Point	Not determined	Imported in flammable product
Autoignition Temperature	Not determined	Not expected to autoignite
Explosive Properties	Not determined	Contains no functional groups that would imply explosive properties.

*For the imported product containing < 20% notified polymer.

DISCUSSION OF PROPERTIES

Reactivity

The notified polymer contains reactive groups and is expected to react in end-use.

Dangerous Goods classification

Based on the submitted physical-chemical data in the above table the notified polymer is not classified according to the Australian Dangerous Goods Code (NTC, 2007). However, the data above do not address all Dangerous Goods endpoints. Therefore consideration of all endpoints should be undertaken before a final decision on the Dangerous Goods classification is made by the introducer of the polymer.

Note: The product containing the notified polymer at < 20% concentration will be classified as a Class 3 (Flammable) dangerous good 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 imported in 0.4 L cartridges as part of a formulation (containing < 20% 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>	< 5	< 10	< 15	< 50	< 50

PORT OF ENTRY

Melbourne, Sydney, Brisbane and Perth

IDENTITY OF RECIPIENTS

Karpelo Holdings Pty Ltd

TRANSPORTATION AND PACKAGING

The formulation containing the notified polymer will be transported by road or rail in sealed 0.4 L cartridges.

USE

The notified polymer will be used as a component of structural adhesives.

The adhesives may be used on a variety of different substrates including glass, wood, plastic and aluminium. The adhesives will be used in the marine, building and construction, transportation and wind energy industries.

OPERATION DESCRIPTION

There will be no formulation or repackaging of the imported product prior to distribution to end users.

At the end use sites the adhesive containing < 20% notified polymer will be applied to the substrate using conventional pumping equipment (i.e. caulking type guns). The material reacts with atmospheric moisture at the time of application to form an inert solid matrix. Any excess adhesive will be cleaned using a specially formulated cleaning product and a cloth.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

<i>Category of Worker</i>	<i>Exposure Duration (hours/day)</i>	<i>Exposure Frequency (days/year)</i>
Transport	2-3	10-15
Application	8	260

EXPOSURE DETAILS

Transport and Storage

Transport and storage workers are not expected to be exposed to the notified polymer except in the unlikely event of an accident.

Application

Dermal and ocular exposure to < 20% notified polymer may occur during the manual addition of the adhesive to the application equipment. Dermal exposure may also occur during the application and cleaning of the applied product and during the cleaning of equipment.

To minimise exposure to the hazardous product containing the notified polymer, the end users are expected to wear eye protection, coveralls and gloves. Where ventilation is not sufficient, a ventilator/mask is expected to be worn.

Workers may make dermal contact with the notified polymer once the adhesive formulation is dried to the substrate, however once dried the polymer will be fully reacted into the matrix and will not be bioavailable.

6.1.2. Public Exposure

The notified polymer is present in formulations which are for industrial use only. In the unlikely event that the general public come in contact with the cured adhesive containing the notified polymer, the polymer will be fully reacted into the matrix and will not be bioavailable.

6.2. Human Health Effects Assessment

No toxicity data were submitted.

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. However, the polymer contains a proportion of low molecular weight species (< 1000 Da) that may be absorbed.

The notified polymer contains a functional group that has been associated with irritation and sensitisation effects (US EPA, 2010). The potential for these effects is likely to be limited by the high molecular weight of the polymer. However, sensitisation and/or irritant effects following exposure to the notified polymer cannot be ruled out, particularly due to the presence of low molecular weight species.

Health hazard classification

Based on a structural alert and the presence of low molecular weight species, the notified polymer may have irritation and skin sensitisation properties.

As no toxicity data were provided for the notified polymer, it 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

The notified polymer has the potential to cause skin sensitisation as well as skin and eye irritation. The potential is likely to be reduced at the concentration of use of < 20%.

The products containing the notified polymer are classified as hazardous, and the precautions against exposure to these products may reduce exposure and risk from the notified polymer.

Provided that control measures are in place to minimise worker exposure, including the wearing of PPE when handling the notified polymer, the risk to the health of workers from use of the notified polymer is not considered to be unreasonable.

6.3.2. Public Health

The notified polymer is intended for use in industrial applications by qualified operators. The public may come into contact with products to which the adhesives have been applied and cured. However, the notified polymer will be unavailable for exposure. Therefore, when used in the proposed manner, the risk to public health from the notified polymer is not considered to be unreasonable.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The notified polymer is not manufactured or reformulated in Australia; therefore there will be no release from these activities. The release of the notified polymer to the environment during importation, storage and transport is unlikely and the most likely source of release to the environment during these activities will be a transport accident. Releases that do occur as a result of accidents are expected to be physically contained, absorbed into inert material and sent for safe disposal.

RELEASE OF CHEMICAL FROM USE

During industrial use of the notified polymer in adhesives, it is estimated that up to 1% of the notified polymer may be spilt. These spills are expected to be contained and disposed to landfill. Less than 1% of the notified polymer may remain as residues in the end-use containers which are expected to be disposed of to landfill. When adhesive formulations containing the notified polymer are applied, it is anticipated that < 10% of the notified polymer will be collected as waste extruded material. The extruded material, as well as cloths and cleaning products used to clean the extruded product from articles, are all expected to be disposed of to landfill. Equipment used to apply adhesive formulations may be rinsed with solvent and this is expected to be collected, treated and disposed of by a licensed waste contractor.

RELEASE OF CHEMICAL FROM DISPOSAL

Notified polymer in adhesives is expected to share the fate of the substrate to which it has been applied and is predominantly expected to be disposed of to landfill. Notified polymer in adhesives applied to metal articles may be thermally decomposed during metal reclamation processes at the end of the article's useful life.

7.1.2. Environmental Fate

No environmental fate data were submitted. The majority of the notified polymer is expected to be cured within an inert polymer matrix adhering to articles following its use in adhesive applications. Up to 90% of the notified polymer may be used in the marine industry. However, the notified polymer is not expected to be in direct contact with marine environment and no releases to the marine environment are expected. Notified polymer that is disposed of to landfill is expected to remain associated with the substrate to which it has been applied and in its cured form it is not expected to be bioavailable nor biodegradable. Notified polymer in solid waste disposed of to landfill is not likely to be mobile due to its expected limited water solubility and incorporation into an inert matrix. The notified polymer will eventually degrade in landfill, or by thermal decomposition during metal reclamation processes, to form water, and oxides of carbon and nitrogen.

7.1.3. Predicted Environmental Concentration (PEC)

The predicted environmental concentration (PEC) was not calculated as, based on its reported use pattern, ecotoxicologically significant quantities are not expected to be released to the aquatic environment.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted. Polymers without significant ionic functionality are generally of low concern to the environment. The notified polymer is not expected to cross biological membranes due to its high molecular weight and it is therefore not expected to bioaccumulate.

7.2.1. Predicted No-Effect Concentration

A predicted no-effect concentration (PNEC) has not been calculated for the notified polymer as, based on its reported use pattern, ecotoxicologically significant quantities are not expected to be released to the aquatic environment.

7.3. Environmental Risk Assessment

The risk quotient ($Q = \text{PEC}/\text{PNEC}$) for the notified polymer has not been calculated as release to the aquatic environment in ecotoxicologically significant quantities is not expected based on its reported use pattern. The majority of the notified polymer will eventually be disposed to landfill following its use in adhesives. In its cured state the notified polymer will be irreversibly bound into an inert matrix and is unlikely to leach or be bioavailable. On the basis of the assessed use pattern and assumed low hazard, the notified polymer is not considered to pose an unreasonable risk to the environment.

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