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

FULL PUBLIC REPORT

Polymer in Intermediate 171052N

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 Intermediate 171052N****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Dow Chemical (Australia) Ltd (ABN: 72 000 264 979)
541-583 Kororoit Creek Road
Altona VIC 3018

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, other names, molecular formula, structural formula, molecular weight, polymer constituents, residual monomers and impurities, introduction volume and details of use.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: melting point/glass transition temperature, water solubility, vapour pressure, hydrolysis as a function of pH, partition coefficient, adsorption/desorption and dissociation constant.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

USA PMN P05-578

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Betaseal Express (contains 15-30% notified polymer)
Betaseal Kwik 60

OTHER NAME(S)

Polymer in Intermediate 171052N (contains 30-60% notified polymer)

CAS NUMBER

Not assigned

MOLECULAR WEIGHT

$M_n > 10,000$ Da

ANALYTICAL DATA

Reference IR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY > 95%

NON HAZARDOUS IMPURITIES/RESIDUAL MONOMERS (>1% by weight) None

ADDITIVES/ADJUVANTS None

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: White liquid

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	Will be imported as a component of a solution from which it will not be isolated.
Boiling Point	Not determined	Will be imported as a component of a solution from which it will not be isolated.
Density	1004 kg/m ³	Supplied by notifier, source not specified
Vapour Pressure	< 1.3 × 10 ⁻⁹ kPa	Estimated based on the NAMW > 1,000 Da (US EPA, 2007)
Water Solubility	Not known	See below
Hydrolysis as a Function of pH	Not known	See below
Partition Coefficient (n-octanol/water)	Not known	See below
Adsorption/Desorption	Not known	See below
Dissociation Constant	Not determined	Will be imported as a component of a solution from which it will not be isolated.
Flash Point	> 110°C (closed cup) (For Intermediate 171052N, product containing the notified polymer)	MSDS
Flammability	Not determined	Not expected to be flammable under normal conditions of use.
Autoignition Temperature	Not determined	Not expected to autoignite under normal conditions of use.
Explosive Properties	Not expected to be explosive	The structural formula contains no explosives.

DISCUSSION OF PROPERTIES

The water solubility, hydrolytic stability, partition coefficient and adsorption/desorption could not be measured as the polymer is never isolated, but the following information can be deduced based on the structure provided and similar polymers that have been notified. The water solubility is expected to be low (in the mg/L range) but would be difficult to determine because the notified polymer is designed to cross link in the presence of moisture. The polymer chain is expected to be hydrolytically stable, but reactive end groups will undergo hydrolysis if the polymer is exposed to water. Partitioning between octanol and water cannot be reliably predicted as the notified polymer has a high molecular weight and would be expected to partition to phase boundaries rather than between bulk phases. For this reason, the notified polymer can be expected to be immobile in soils.

Reactivity

Exothermic reaction with amines and alcohols may occur. Reaction with water evolves carbon dioxide gas, which increases pressure and may lead to rupture of closed containers.

5. INTRODUCTION AND USE INFORMATION

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

Betaseal Express, which contains the notified polymer at a concentration of 15-30%, will be imported in foil packs as a viscous paste with the consistency of dough. Intermediate 171052N is a component of Betaseal Express and contains the notified polymer at a concentration of 30-60%.

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>	10-40	10-40	10-40	10-40	10-40

PORT OF ENTRY

Melbourne and Sydney

TRANSPORTATION AND PACKAGING

The notified polymer will be imported in 600 mL foil packs of Betaseal Express (contains the notified polymer at 15-30%).

USE

The notified polymer will be used as a component of glass adhesive (15-30%), which is used primarily in the post-market glass replacement industry, in particular, replacement of windscreens. Products containing the notified polymer will not be sold to the public.

OPERATION DESCRIPTION

The notified polymer will not be manufactured or reformulated within Australia.

The notified polymer will be contained in foil packages and will be a component in adhesive (15-30%) used for automotive glass. During the installation of automotive glass, workers will apply the adhesive to either the pinchweld or the glass in a V shaped bead using conventional pumping equipment (ie. caulking type guns). The glass will then be placed into the automobile body and any of the adhesive around the edge of the glass will be back paddled into the gaps. The adhesive completely cures within 24 hours to a rubber like consistency.

6. HUMAN HEALTH IMPLICATIONS**6.1 Exposure assessment****6.1.1 Occupational exposure**

Exposure of transport and storage workers to the notified polymer is not expected except in the event of accidental spillage or breach of packaging.

Dermal and ocular exposure to adhesive products containing the notified polymer at 15-30% is possible when workers are applying the adhesive. However, exposure to the notified polymer will be reduced by the paste like consistency of the adhesive containing the notified polymer and the proposed use of PPE by workers, such as gloves, protective clothing and safety glasses.

Inhalation exposure is unlikely given the expected low vapour pressure of the notified polymer and the viscous paste like consistency of the adhesive containing the notified polymer.

6.1.2. Public exposure

The products containing the notified polymer will not be sold to the public. Therefore the public will only be exposed to the notified polymer in the event of accidental spill during transportation. The public will come into contact with replacement glass held in place by the adhesive product containing the notified polymer. However, since the notified polymer will not be bioavailable, as it will be cured in to an inert solid shortly after application, the risk to public health is not considered unacceptable.

6.2. Human health effects assessment

No toxicological data were submitted for the notified polymer. In the absence of toxicological data on the notified polymer, the known hazards of isocyanates have been considered (ASCC).

Toxicokinetics, metabolism and distribution.

The notified polymer is not expected to be absorbed across biological membranes, based on the high molecular

weight (> 10,000 Da).

Irritation and Sensitisation.

Isocyanates are known to be hazardous to human health. The main hazards posed by isocyanates include respiratory sensitisation in the form of asthma, as well as decreased respiratory function with the possibility of interstitial fibrosis and pulmonary oedema (Tillman, 2007). The UK Employment Medical Advisory Service believes polymeric isocyanate aerosols are capable of causing respiratory sensitisation similar to monomer vapours (ASCC). Isocyanates may also cause respiratory sensitisation by skin contact (US EPA, 2002). Other adverse health effects of isocyanates may include skin and eye irritation, and skin sensitisation from repeated or prolonged exposure (Kirk-Othmer, 1995). However, given the minimal amounts of low molecular weight species present the irritancy and skin sensitisation potential of the notified polymer is not expected to be significant.

Health hazard classification

Based on the presence of unreacted isocyanate groups, the notified polymer is classified as hazardous under the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

Xn: R42 May cause sensitisation by inhalation.

6.3. Human health risk characterisation

6.3.1. Occupational health and safety

The main route of exposure to the notified polymer (15-30% concentration) to workers is expected to be dermal exposure, during application of the adhesive. Exposure is expected to be limited with the use of personal protective equipment that prevents eye exposure (protective glasses) and covers the skin (gloves, overalls). Although inhalation exposure to the notified polymer is unlikely, engineering controls such as local exhaust ventilation are expected. Therefore, although the notified polymer is classified as a respiratory sensitiser and a potential eye and skin irritant and skin sensitiser, given the proposed use of PPE and stated engineering controls, it is not likely to pose a significant health risk to workers.

6.3.2. Public health

The notified polymer is not available to the public, except after the product has been applied and cured and the notified polymer becomes bound within a matrix. The notified polymer will not be bioavailable and hence the risk to the public is negligible.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1 Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The notified polymer will be imported as finished product.

RELEASE OF CHEMICAL FROM USE

Very little of the notified polymer will be released during use. When exposed to atmospheric moisture, the notified polymer cures to form an inert solid of very high molecular weight. Waste material in the form of spillages, container residues and trimmed adhesive is expected to be sent to landfill in this form.

RELEASE OF CHEMICAL FROM DISPOSAL

The notified polymer is not expected to be released as a result of disposal because waste material will be disposed of in the form of an inert solid of very high molecular weight. Unopened material returned to the notifier will be sent to a permitted disposal site for incineration if it is no longer suitable for sale.

7.1.2 Environmental fate

No environmental fate data were submitted. The notified polymer is not expected to persist in the environment because it will react with atmospheric or liquid water to form an inert solid of very high molecular weight. No bioaccumulation is expected.

Because of its reactivity, the notified polymer will no longer exist when motor vehicles or broken windscreens with residual adhesive are disposed of. Disposal is likely to be to landfill, but automotive scrap may also be sent for metals reclamation. The cured solid that forms from the notified polymer would be immobile in landfill, and destroyed during metals reclamation.

7.1.3 Predicted Environmental Concentration (PEC)

It is neither necessary nor meaningful to calculate the PEC as the notified polymer is not expected to enter aquatic environments when used as intended, and would react to form an inert solid of very high molecular weight if spilt to water.

7.2. Environmental effects assessment

No ecotoxicity data were submitted.

7.2.1 Predicted No-Effect Concentration

The PNEC cannot be calculated as no aquatic toxicity data are available.

7.3. Environmental risk assessment

A risk quotient cannot be calculated, as the PEC and PNEC are not known. The notified polymer is not expected to enter aquatic environments, and would react to form an inert solid of very high molecular weight if spilt to water.

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

8. CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

Based on the available data the notified polymer is classified as hazardous under the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)]. The classification and labelling details are:

Xn: R42 May cause sensitisation by inhalation.

and

Due to the lack of toxicological data the classification of the notified polymer using the Globally Harmonised System for the Classification and Labelling of Chemicals (GHS) (United Nations 2003) was not carried out.

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 considered to pose a risk to the environment.

Recommendations

REGULATORY CONTROLS**Hazard Classification and Labelling**

- Use the following risk phrases for products/mixtures containing the notified polymer:
 - Conc \geq 1%: R42
- The following safety phrases should appear on the MSDS and label for the notified polymer:
 - S23 Do not breathe vapour or spray
 - S45 In case of accident or if you feel unwell seek medical advice immediately (and show the label where possible)

Health Surveillance

- As the notified polymer is a respiratory sensitiser, employers should carry out health surveillance for any worker who has been identified in the workplace risk assessment as having a significant risk of asthma.

CONTROL MEASURES**Occupational Health and Safety**

- Employers should implement the following engineering controls to minimise occupational exposure to products containing the notified polymer:
 - Local exhaust ventilation
- Employers should implement the following safe work practices to minimise occupational exposure during handling of products containing the notified polymer:
 - Avoid contact with skin and eyes
 - Clean spills immediately, taking care to avoid inhalation
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to products containing the notified polymer:
 - Gloves, overalls and goggles or face-shield

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 *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 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(1) of the Act; if
 - the polymer has a number-average molecular weight of less than 1000;
 - the polymer is imported in a powder, or in a mixture which can be aerosolised.

or

- (2) Under Section 64(2) of the Act; if
 - the function or use of the chemical has changed from a component of glass adhesive (15-30%), or is likely to change significantly;
 - the amount of chemical being introduced has increased from 40 tonnes, or is likely to increase, significantly;
 - if the chemical has begun to be manufactured in Australia;
 - additional information has become available to the person as to an adverse effect of the chemical 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 a products 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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