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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer in VISCOPLEX® 9/6243 / Polymer in VISCOPLEX® 9/6234

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.

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Director
NICNAS

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FULL PUBLIC REPORT

Polymer in VISCOPLEX® 9/6243 / Polymer in VISCOPLEX® 9/6234

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Degussa Australia Pty Ltd (ABN 80 005 415 752)
30 Commercial Drive
Dandenong, VIC 3175

NOTIFICATION CATEGORY
Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication:
Chemical Name, Other Names, CAS Number, Molecular and Structural Formulae, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, Use Details, and 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
US EPA in 2005
Korea NIER in 2005

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Polymer in VISCOPLEX® 9/6243 / Polymer in VISCOPLEX® 9/6234

MOLECULAR WEIGHT (MW)
Number Average Molecular Weight (Mn) >10000

REACTIVE FUNCTIONAL GROUPS
The notified polymer contains only low concern functional groups.

3. PLC CRITERIA JUSTIFICATION

Criterion	*Criterion met (yes/no/not applicable)*
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
Stable Under Normal Conditions of Use	Yes
Not Water Absorbing	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 25°C and 101.3 kPa	Yellow, highly viscous liquid
Melting Point	22°C (measured by DSC*)
Density	950 kg/m^3 at 20°C
Water Solubility	<2.5 mg/L at pH 7, 20°C (no buffer) <2.5 mg/L at pH 2, 20°C <2.5 mg/L at pH 9, 20°C <2.5 mg/L at pH 7, 37°C A flask method was used, with analysis by combustion and IR detection of carbon dioxide.
Reactivity	The polymer is reported to be stable until 200°C with depolymerisation occurring above this temperature.
Degradation Products	If thermal depolymerisation occurs monomers will be formed.

*DSC = Differential scanning calorimetry.

5. INTRODUCTION AND USE INFORMATION

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 AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer will be imported in Viscoplex 9/6243, a solution of the polymer in petroleum-based solvents, at a concentration of approximately 29% w/w, or in Viscoplex 9/6234 (a solution containing 21% of the notified polymer). The polymer solutions will be transported in 175 kg steel drums via ships from Europe and then via trucks from the port to the customer or to the importer's storage facilities.

Reformulation/manufacture processes

No reformulation or manufacturing processes will occur in Australia.

Use

The notified polymer will be used as a processing aid in the petroleum industry. At customers sites the product is pumped from its packing containers (steel drums) into blending vessels. Besides manual attachment of the pumping lines (which are heated 60-80 degrees to allow the viscous fluid to be pumped out) to the drums (175 kg), the process, including the removal of the by-product, is highly automated and computer controlled. After the processing procedure the notified polymer will end up in the by-product (at a concentration of up to 0.3%), which can be further processed for use in many industrial and consumer applications such as candles, tarpaulins, polishes, textile and paper sizings, metal and tyre castings, and packaging.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

The notified polymer is not manufactured and the products containing the notified polymer (21-29%) are not repackaged in Australia.

Customer Sites

Dermal and ocular exposure may potentially occur during certain processes (connection and disconnection of transfer lines, routine maintenance and equipment breakdown). However, exposure to significant amounts of the notified polymer is limited due to the highly automated processes, employee work practices (eg cleaning of equipment prior to maintenance) and the use of PPE (safety glasses, impervious gloves, and safety footwear).

End-Use Products

A processing by-product containing the notified polymer can be used in many industrial and consumer applications such as candles, tarpaulins, polishes, textile and paper sizings, metal and tyre castings, and packaging. Occupational exposure during manufacture of end-use products has not been supplied, however exposure will be minimised due to the low concentration of the notified polymer (up to 0.3%).

PUBLIC EXPOSURE

The product solution containing the notified polymer (21-29%) is intended only for use in industry and as such public exposure to the notified polymer at this concentration is not expected.

The public may come into contact with the notified polymer in products such as candles and polishes, however the notified polymer would be present at very low concentrations (up to 0.3%). The main route of exposure is likely to be dermal; however given the high molecular weight of the notified polymer it is unlikely to cross biological membranes.

6.2. Toxicological Hazard Characterisation

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. This is supported by genotoxicity studies conducted on the low molecular weight fraction of the notified polymer (Oligomer II) and on an analogue oligomer (Oligomer I). No indication of mutagenic activity was found in the Bacterial Reverse Mutation Test (OECD 471) conducted on Oligomer I and Oligomer II, or the chromosomal aberration assay in vitro (OECD 473) conducted on Oligomer I.

Endpoint	*Test Substance*	*Result*	*Classified?*	*Effects Observed?*	*Test Guideline*
Genotoxicity - bacterial reverse mutation	Oligomer I	non mutagenic	no	no	OECD TG 471
Genotoxicity - bacterial reverse mutation	Oligomer II	non mutagenic	no	no	OECD TG 471
Genotoxicity – in vitro chromosome aberration	Oligomer I	non genotoxic	no	no	OECD TG 473

All results were indicative of low hazard.

6.3. Human Health Risk Assessment

OCCUPATIONAL HEALTH AND SAFETY

The OHS risk presented by the notified polymer is expected to be low, based on the minimal exposure to workers and the low intrinsic hazard of the polymer.

PUBLIC HEALTH

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 of low hazard, and is present at low concentrations.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

As the notified polymer will not be manufactured locally, there will be no environmental exposure associated with this process in Australia. Release of the polymer during transport (due to spills) is expected to be very limited. Residual notified polymer in empty import containers is expected to account for < 1% of total import volume. It is anticipated that the empty drums will be washed with petroleum based solvents. The solvents will then be recycled via distillation and the residues will be disposed of through incineration or disposed of in accordance with local regulations. Empty drums which cannot be cleaned will be sent to landfill.

During the petroleum refining the notified polymer will end up in a by-product of the processing in low concentrations. This by-product will have applications such as candles, tarpaulins, polishes, textile and paper sizings, metal and tyre castings, and packaging. Direct environmental releases during petroleum refining are expected to be limited to accidental spills as the process is fully automated.

Releases of the notified polymer during formulation of product for end use application are expected to be minimal with waste being disposed of through licensed waste contractors.

ENVIRONMENTAL FATE

The majority of the imported notified polymer will share the fate of the products generated from the by-product of petroleum refining, such as candles, tarpaulins, polishes, textile and paper sizings, metal and tyre castings, and packaging. The fate of these products will vary. The majority of the notified polymer incorporated into candles will be incinerated, forming oxides of carbon and water. Polymer in the remaining products will be disposed of with domestic and industrial wastes in accordance with local regulations at the end of their useful lifetimes. The majority of this is expected to be to landfill.

7.2. Environmental Hazard Characterisation

No ecotoxicological data were submitted. Polymers without significant ionic functionality are of low concern to the aquatic environment.

7.3. Environmental Risk Assessment

The notified polymer will be used in petroleum refining and end up in a by-product of the refining process at a low concentration. This by-product will be incorporated into a range of products. The use of these products will result in the notified polymer either being incinerated or disposed of to landfill with the products at the end of their useful lifetime. Incineration of the polymer will result in its destruction and the formation of oxides of carbon and water. In landfill the notified polymer will be in a hydrophobic matrix of the by-product and is not expected to be mobile, it will eventually degrade through biotic and abiotic processes to oxides of carbon and water.

The proposed use pattern of the notified chemical is expected to result in limited environmental exposure. Due to the limited environmental exposure of the notified polymer it is not possible to determine a Predicted Environmental Concentration (PEC).

As a PEC and Predicted No Effect Concentration (PNEC) cannot be calculated, no risk quotient can be derived. However, based on the proposed use pattern, the notified polymer is not expected to pose an unacceptable risk upon the environment.

8. CONCLUSIONS

8.1. Level of Concern for Occupational Health and Safety

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

8.2. Level of Concern for Public Health

There is No Significant Concern to public health when used in the proposed manner.

8.3. Level of Concern for the Environment

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

9. MATERIAL SAFETY DATA SHEET

9.1. 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.

10. 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

- The following control measures should be implemented by end users to minimise environmental exposure during use of the notified chemical:

  - Do not allow material or contaminated packaging to enter drains, sewers or water courses.

Disposal

- The notified polymer should be disposed of either by authorised incineration or consignment to landfill.

Emergency procedures

- Spills or accidental release of the notified polymer should be handled by physical containment and where possible physically transferred to an appropriate container. Use of adsorbent material (diatomaceous earth, sand etc.) for small spills or large spill residues is appropriate for terrestrial spills. Collected material should be disposed either by authorised incineration or consignment to landfill.

10.1. 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.