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

FULL PUBLIC REPORT

Polymer in MVA 1855

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**Director
NICNAS**

TABLE OF CONTENTS

FULL PUBLIC REPORT.....	3
1. APPLICANT AND NOTIFICATION DETAILS	3
2. IDENTITY OF CHEMICAL	3
3. PLC CRITERIA JUSTIFICATION	3
4. PHYSICAL AND CHEMICAL PROPERTIES	3
5. INTRODUCTION AND USE INFORMATION.....	4
6. HUMAN HEALTH IMPLICATIONS.....	5
6.1. Exposure Assessment	5
6.2. Toxicological Hazard Characterisation	5
6.3. Human Health Risk Assessment.....	5
7. ENVIRONMENTAL IMPLICATIONS	6
7.2. Environmental Hazard Characterisation.....	6
7.3. Environmental Risk Assessment	6
8. CONCLUSIONS.....	6
8.1. Level of Concern for Occupational Health and Safety	6
8.2. Level of Concern for Public Health	6
8.3. Level of Concern for the Environment.....	6
9. MATERIAL SAFETY DATA SHEET.....	7
9.1. Material Safety Data Sheet	7
10. RECOMMENDATIONS	7
10.1. Secondary Notification	7

FULL PUBLIC REPORT**Polymer in MVA 1855****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Degussa Construction Chemicals Australia Pty Ltd (ABN 46 000 450 288) of 3/14 Stanton Road
SEVEN HILLS NSW 2147

NOTIFICATION CATEGORY

Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

[Data items and details claimed exempt from publication:

Chemical Name, CAS Number, Molecular and Structural Formulae, Means of Identification, Molecular Weight, Polymer Constituents, Residual Monomers/Impurities, Charge Density, Reactive Functional Groups 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

USA and Korea

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

MVA 1855 1/47% N.D.

3. 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
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 20°C and 101.3 kPa**

Yellowish to brown aqueous solution (for MVA 1855).

Melting Point/Glass Transition Temp

The polymer has never been isolated from the aqueous solution.

Density

The polymer has never been isolated from

Water Solubility	the aqueous solution. The density of the polymer in aqueous solution is 1.10 g/cm ³ . Completely water soluble. The calculated solubility is approximately 517 g/L. Laboratory experiments reveals the solubility is even higher than the technical value.
Dissociation Constant	The notified polymer has never been isolated. It is expected that the pKa value could be in the range of 5.8 to 6.5.
Reactivity	Stable under normal environmental conditions.
Degradation Products	None under normal conditions of use.

5. 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>	Up to 30	Up to 30	Up to 30	Up to 40	Up to 40

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer will be imported as an aqueous solution (47%) in 200 L drums or 1000 L pallecons for reformulation. It is transported by road to the formulation site.

Reformulation/Manufacture Processes

During reformulation process Polymer in MVA 1855, stored in a bunded storage area, is pumped directly to enclosed mixing vessels via flexible hoses and blended with water and other additives to produce the finished admixture. The maximum concentration of the notified polymer in the admixture is 20%. After transfer of polymer to admixture tank the pipeline is rinsed with water. The admixture containing the polymer is transferred by pumping to bulk storage tanks, 1000 L pallecons, 200 L drums or 20 L cubes. The formulated admixture is then delivered to concrete production plants for end use.

End Use

The notified polymer is used in concrete applications. At the concrete production plant, the admixture is pumped into storage tanks before it is dosed automatically into a concrete mixer along with other additives to produce final concrete. The concentration of the notified polymer in the final concrete product is 0.05%. The concrete is then poured or fed into pre-cast concrete molds or ready-mix concrete trucks. The equipment used during concrete production will be cleaned using hose to wash down the upper flights of the transit mixer transferring any excess concrete back into the bowl of the transit mixer and then adding further water to facilitate cleaning the bowl. The bowl and water are rotated to clean the walls and fins of the transit mixer of any excess concrete. This water slurry is then discharged into the water recycling system at the plant where the solids are separated and the water re-used in concrete production. On site, concrete contractor equipment is usually cleaned manually with a hose and brush.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

Transport and Storage

Workers are unlikely to be exposed to the notified polymer during transport and storage of the imported polymer solution and formulated concrete admixture except when it is accidentally breached.

Reformulation

Dermal and ocular exposure to the 47% polymer solution may occur during reformulation processes while manually opening and closing of drums, transferring the polymer solution to enclosed mixing vessels and during rinsing. The worker exposure summary during reformulation is as follows:

<i>Number and Category of Workers</i>			
<i>Type of Activities</i>	<i>Number</i>	<i>Exposure Duration Hours/Day</i>	<i>Exposure Frequency Days/Year</i>
Unloading polymer at admixture plant	1	1	40
Distribution from admixture plant	1	2	40
Unloading at concrete plant	1	0.5	40
Concrete production	1	0.5	220

Dermal and ocular exposure to the notified polymer is also possible during packaging of formulated concrete admixture (maximum concentration of 20%). However, admixture workers' exposure to the notified polymer can be limited by use of engineering controls (closed vessel under vacuum) and personal protective equipment (coveralls, chemical goggles and PVC gloves).

End Use

During end use and cleaning of concrete product from used equipments, workers may come into contact with the notified polymer (0.05% concentration) through dermal and ocular routes.

PUBLIC EXPOSURE

The notified polymer will not be sold directly to the public. The public exposure via concrete is unlikely as once the concrete is dried and cured, it will form an inert polymer matrix and will not be bioavailable.

6.2. Toxicological Hazard Characterisation

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. An acute oral rat study conducted on an analogue polymer indicated a low acute toxicity ($LD_{50} > 2000$ mg/kg bw). No toxicological data are provided for the notified polymer.

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 low hazard and low exposure, as well as the engineering controls and personal protective equipment used by workers.

PUBLIC HEALTH

The notified polymer will not be sold to the public. Once the polymer is applied and cured it will be contained in an inert matrix, and will not be bioavailable. Hence, risk to the public is considered negligible.

7. ENVIRONMENTAL IMPLICATIONS

ENVIRONMENTAL RELEASE

Environmental release of the notified polymer is summarised in the following table.

Source of release	% Annual Volume	Released to
Accidental spills	<<1%	Sewer
Residual from unloading and cleaning processes	<1%	Landfill
Concrete products containing the notified polymer	>98%	Landfill

ENVIRONMENTAL FATE

The majority of the total imported volume of notified polymer is expected to be released to landfill within hardened concrete. In this form, the notified polymer is expected to be immobile. Overtime, as the concrete eventually degrades, the notified polymer is also expected to degrade via abiotic and biotic means to form simple organic compounds and simple salts.

In the unlikely event of an uncontained spill, release to sewer is possible. In the aquatic environment, the notified polymer is expected to remain in the aquatic compartment and degrade via abiotic and biotic means to form simple organic compounds and metal salts.

7.2. Environmental Hazard Characterisation

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. This is supported by environmental endpoints observed in testing conducted on an analogue polymer with similar structure.

<i>Endpoint</i>	<i>Result</i>	<i>Effects Observed?</i>	<i>Test Guideline</i>
Daphnia Toxicity	EC50 >1000 mg/L	no	EEC 92/69, C.2

The single result is indicative of low hazard. The notified polymer contains a small proportion of anionic functionality. Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is overchelation of nutrient elements needed by algae for growth. The highest toxicity occurring when the acids are on alternating carbons of the polymer backbone. This is unlikely to apply to the notified polymer. In addition, the toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups.

7.3. Environmental Risk Assessment

The notified polymer is used in concrete, and will be bound up in the hardened concrete matrix. Release to the environment is expected to be minimal. Therefore, it is not possible to predict the Predicted Environmental Concentration (PEC) or Predicted No Effect Concentration, and thus, a PEC/PNEC calculation cannot be undertaken. However, based on exposure pattern the PEC will be very low, and the unlikely hazardous nature of the notified polymer to the aquatic environment, the risk of use of this notified polymer is expected to be acceptable.

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 Negligible 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 an 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

Disposal

- The notified polymer should be disposed of by incineration or in hardened concrete to landfill.

Emergency procedures

- Spills and/or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

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.