

File No PLC/722

August 2007

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

FULL PUBLIC REPORT

Polymer in Adhesion Resin EPDS 1300

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 Water Resources.

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 Adhesion Resin EPDS 1300****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Degussa Coatings and Colourants Pty Ltd (ABN: 16 079 823 313)
30 Commercial Drive
Dandenong VIC 3175

AND

International Sales and Marketing Pty Ltd (ABN: 36 467 259 314)
262 Highett Road
Highett VIC 3190

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, 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)

None

NOTIFICATION IN OTHER COUNTRIES

US EPA

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Adhesion Resin EPDS 1300 (45 - 47% notified polymer in aqueous solution)

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) >1000

REACTIVE FUNCTIONAL GROUPS

The notified polymer contains only low concern functional groups.

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

The notified polymer exists as an aqueous solution at concentrations of 45 - 47% and is not isolated from solution. A number of the properties, as indicated below, are for the solution containing the notified polymer.

Appearance at 20°C and 101.3 kPa	White solid.
Melting Point	Approximately 100°C (for product).
Density	1100 kg/m ³ at 20°C (for product).
Water Solubility	The aqueous polymer solution is described as being milky white. This implies that the notified polymer is not soluble in water, but is dispersible in water following salt formation. This is consistent with the structure, which is largely hydrophobic with only limited anionic content.
Dissociation Constant	The notified polymer is likely to dissociate in water to form salts, with typical acidity (pKa 3-4).
Particle Size	Not applicable. The notified polymer is imported in solution.
Reactivity	While the notified polymer contains hydrolysable functionality, it is expected to remain stable under normal environmental conditions and pH 4-9.
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>	<20	<20	<20	<20	<20

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer will be imported in an aqueous solution at concentrations of 45 - 47% in 25kg polyethylene canisters or 200kg closed head screw cap drums. The notified polymer will be imported into Melbourne and Sydney by the notifiers. It will be transported from the wharf to the notifier's warehouses by truck and subsequently supplied to customers where it will be formulated into water based industrial coatings.

Reformulation processes

The notified polymer will be transferred from the import container through a vacuum hose line to a mixing vessel, or by using semi-automated processes (occasionally). In the vessel it will be mixed with other ingredients in a closed system. The blended product may be sampled for laboratory analysis. Filtration and filling of the final blended coating product (containing the notified polymer at concentrations of <10%) into 4L or 15L steel containers will occur using automated and metered processes.

Use

The notified polymer is used as a water-borne adhesion promoter for industrial coating products.

The majority (90%) of the coating product containing the notified polymer will be used by commercial applicators. During application, the coating product will be manually weighed and transferred to a mixing vessel. It will be applied by roller (estimated 75% of the coating product), brush (10%) or spray (15%) (mostly occurring in spray booths). An estimated 10% of the formulated coating products is expected to be used by the public for 'do-it-yourself' applications with roller or brush. Sanding of the cured coated surfaces may occur occasionally.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

Reformulation

Dermal or ocular exposure of workers to the notified polymer may occur during connection and disconnection of hose lines between the import containers, mixing vessel, and final containers, and during sampling and analysis of the blended product. Exposure should be minimised by the exhaust ventilation fitted to the blending equipment and in place during all transfer operations. In addition, workers are expected to wear personal protective equipment (PPE), including impervious gloves, safety goggles and coveralls.

End use

Dermal, ocular or inhalation exposure of workers to the notified polymer (<10%) may occur during application of the adhesive coating by roller, brush or spray. Exposure is expected to be reduced by workers wearing personal protective equipment during all types of application, including coveralls and impervious gloves. For brush and roller application, performing operations in a well-ventilated area should further reduce exposure. For spray application, exposure should be minimised by performing operations in a spray booth.

After the applied coating has cured, the notified polymer is not expected to be available for exposure.

PUBLIC EXPOSURE

Members of the general public may make dermal contact with the industrial products coated with coatings containing the notified polymer. However, the notified polymer is not expected to be bioavailable in this form and as such, exposure should be negligible.

Dermal and ocular exposure of the public to the notified polymer may occur as a result of drips, spills and splashes of the coating product when using it during 'do-it-yourself' applications. It is likely that the general public do not wear PPE, however, exposure is expected to be low due to infrequent uses and relatively short use durations. In addition, following curing of the coating, exposure to the notified polymer is not expected due to its encapsulation within a polymer matrix.

If the coatings are sanded, inhalation exposure to particulates of the notified polymer may occur. Such exposure should be reduced if operators wear personal protective equipment such as dust masks.

6.2. Toxicological Hazard Characterisation

No toxicological data were submitted. The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

6.3. Human Health Risk Assessment

OCCUPATIONAL HEALTH AND SAFETY

Although exposure to the notified polymer could occur during reformulation processes and end use application of coating products containing the notified polymer (particularly spray application), the risk to workers is considered to be low due to the predicted low hazard of the notified polymer.

PUBLIC HEALTH

Although the public will be exposed to the notified polymer during 'do-it-yourself' application of coating products, the risk to public health is considered to be low due to the low exposure of the public and the predicted low hazard of the notified polymer.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

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

Source of release	% Annual Volume	Released to
Residual notified polymer within import containers	<2%	Landfill
Accidental spills	<1%	Landfill
Reformulation equipment cleaning	<2%	Landfill
Residual notified polymer within consumer containers	<2%	Landfill
Application equipment cleaning and overspray (commercial)	<4%	Landfill
Application equipment cleaning ('do-it-yourself')	<1%	Sewer
Notified polymer at end of life-cycle	>88%	Landfill

Release to the environment during shipping, transport and warehousing will only occur in the unlikely event of accidental spills or leaks of the canisters, drums or steel packaged containers.

There is a potential for release during formulation of the water based coatings and application. The formulation process will take place at the customer site and in the unlikely event that a spill occurs it will be contained by existing plant bunding and collected for disposal to landfill. Washings are collected into holding tanks, which are emptied on a regular basis by licensed contractors for disposal to landfill. Some residue will also remain in the empty import canisters or drums after use. Drums are either re-conditioned by external recycling contractors and re-used with the residue being collected and disposed of to landfill, or sent straight to landfill. All canisters are disposed of to landfill.

Coatings containing the notified polymer will be applied predominantly by professional applicators. The losses from overspray during spray application of the coatings are likely to be 10%. The overspray may fall on and will adhere to the adjacent surfaces such as walls, ground, etc. The notifier estimates that up to 2% of the notified polymer contained in coating products would remain as residue in the steel containers after emptying. This will ultimately be disposed of to landfill along with the containers. As there will only be 10% 'do-it-yourself' use, losses to the sewer from washing of brushes and rollers will be <1%.

The remainder of the notified polymer will be bound in the coating matrix and not be available for direct release to the environment.

ENVIRONMENTAL FATE

The waste generated in formulating water based coatings and that remaining in the empty import canisters, drums and coating containers will ultimately be disposed of to landfill. Leaching of the notified polymer from landfill is unlikely, given the low solubility of the substance. Waste from cleaning equipment in the commercial application of the coating and loss due to overspray will be landfilled, but from DIY use it will likely be washed into the drain and end up in the sewer. Due to its structural properties, the notified polymer will likely adsorb to sewage sludge and be removed at sewage treatment plants. The notified polymer is expected to be hydrolytically stable and not to be readily biodegradable.

The coatings will dry to form an inert coating on coated surfaces. The notified polymer is not expected to cross biological membranes due to its low solubility and high molecular weight, and should not bioaccumulate.

7.2. Environmental Hazard Characterisation

No ecotoxicological data were submitted. 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 is when the acid is on alternating carbons of the polymer backbone. This is unlikely to apply to the notified polymer. However, 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 as a water-borne adhesive for industrial coatings uses and once applied

will be associated with the substrate. Release to the environment is expected to be minimal. It is not possible to estimate the Predicted Environmental Concentration (PEC) or Predicted No Effect Concentration, and thus, a PEC/PNEC calculation cannot be undertaken. However, the PEC is expected to be very low on the basis of exposure arguments. Thus, based on the low PEC and the likely low hazard of the notified polymer to the aquatic environment, the risk of use of the 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 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 MSDS of a product containing the notified polymer was provided by the notifier. 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 *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.

Environment

Disposal

- The notified polymer should be disposed of 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 NICNAS 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.
 - the notified polymer is introduced in particulate form, eg. as a powder.

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.