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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

Polymer in Resydrol AY 586w/45WA

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Director
Chemicals Notification and Assessment

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Polymer in Resydrol AY 586w/45WA

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Pacific Resins (ABN 92 520 305 379)
2/9 Jannali Ave
JANNALI NSW 2226

NOTIFICATION CATEGORY
Synthetic Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
No details are claimed exempt from publication.

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
USA (P-02-0600).

2. IDENTITY OF CHEMICAL

CHEMICAL NAME
Fatty acids, linseed oil, polymers with conjugated sunflower oil fatty acids, iso-Bu methacrylate, isophthalic acid, methacrylic acid, pentaerythritol, tall oil fatty acids and p-vinyltoluene, ammonium salts

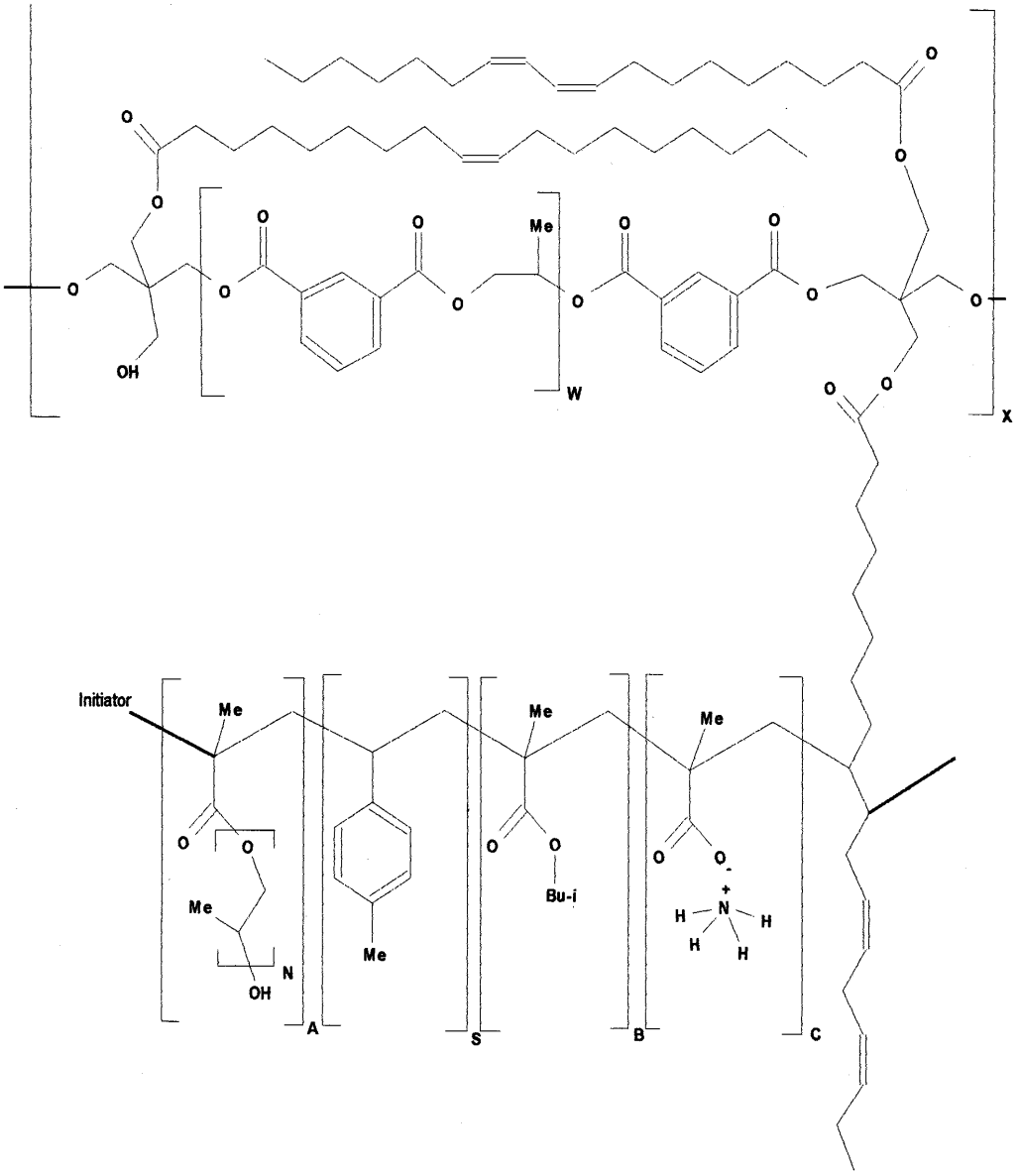
OTHER NAME
Fatty acids, linseed oil, polymers with conjugated sunflower oil fatty acids, 2-propenoic acid, 2-methyl-, isobutyl ester, 1,3-benzedicarboxylic acid, 1,3-propanediol, 2,2-bis(hydroxymethyl)-, 2-propenoic acid, 2-methyl-, tall oil fatty acids and benzene, 1-ethenyl-4-methyl-, ammonium salts

MARKETING NAME
The imported polymer dispersion contains 46% notified polymer and is referred to as Resydrol AY 586w/45WA, Resydrol AY 586w/42WA or Resydrol AY 586w/38WA.

CAS NUMBER
178233-64-2

MOLECULAR FORMULA
Unspecified.

STRUCTURAL FORMULA



MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn)	2580
Weight Average Molecular Weight (Mw)	62576
Polydispersity Index (Mw/Mn)	24.25
% of Low MW Species < 1000	9.85
% of Low MW Species < 500	5.89

POLYMER CONSTITUENTS

Chemical Name	*CAS No.*	*Weight % starting*	*Weight % residual*
fatty acids, tall oil	61790-12-3	27.2	< 0.1
fatty acids, linseed oil	68424-45-3	15.3	< 0.1
1,3-propanediol, 2,2-bis(hydroxymethyl)-	115-77-5	13.0	< 0.1
1,3-benzenedicarboxylic acid	121-91-5	11.8	< 0.1
2-propenoic acid, 2-methyl-, 2-methylpropyl ester	97-86-9	10.0	< 0.1
fatty acids, sunflower oil, conjugated	68953-27-5	7.9	< 0.1
2-propenoic acid, 2-methyl-	79-41-4	7.6	< 0.1
benzene, 1-ethenyl-4-methyl-	622-97-9	2.2	< 0.1
Poly[oxy(methyl-1,2-ethanediyl)], α-(2-methyl-1-oxo-2-propenyl)-ω-hydroxy-	39420-45-6	1.8	< 0.1

PLC CRITERIA JUSTIFICATION

Criterion	*Criterion met (yes/no/not applicable)*
Meets Molecular Weight Requirements	Yes
Meets Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
No Substantial Degradability	Yes
Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

4. INTRODUCTION AND USE INFORMATION

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	20	20 - 100	20 - 100	20 - 100	100

USE

Component of industrial waterborne coatings.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The notified polymer will be imported in 200 L drums as a component (at 46%) of a resin emulsion. This solution will be transferred to a mixing vessel for reformulation in batches of 500 L to 5000 L. Following mixing, the final products (water-borne coatings) will be filled into 1, 4, 20 and 200 L containers. The coatings will be applied by either handheld or robotic spray guns.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

6.1.1. Environmental Release

There will be no environmental exposure associated with the manufacture of the notified polymer in Australia. Equipment and empty import drums will be cleaned by solvent wash and the residues will be collected and disposed of by incineration or landfill. The drums containing the formulated coatings will be cleaned with water and rinsings added to the next batch.

Coating overspray is collected via a forced air fume collection system to be recycled into the next batch as much as possible. Spray equipment is cleaned periodically comprising approximately 20% of last batch every 20 days. The drums with any leftover residues and the waste material collected from periodic cleaning are disposed of by incineration or in a chemically approved landfill. The forced air-drying stream, which is expected not to contain the notified polymer will be incinerated in a solvent incinerator.

A total of up to 57 tonnes of the notified polymer (including 2% left in import drums, up to 50% in overspray and 5% waste resulting from cleaning up mixing and spraying equipment) is expected to be released during the formulation and application of water-borne coatings.

6.1.2. Environmental Fate

The notified polymer contains ester linkages that could undergo hydrolysis under extreme pH conditions. However, in the environmental pH range of 4 to 9, significant hydrolysis is unlikely to occur. Its poor solubility and likely hydrophobic nature are indicative of partitioning into the octanol phase and immobility in soil.

6.2. Summary of Occupational Exposure

Dermal and ocular exposure can occur during certain formulation processes. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

After application and once dried, the adhesive/paint containing the notified polymer is cured into an inert matrix and is hence unavailable for exposure.

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

6.3. Summary of Public Exposure

The notified polymer is intended only for use in industry and will not be available to the public. Members of the public may come into contact with products containing the notified polymer.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20ºC and 101.3 kPa	Opaque to brown liquid (emulsion).
Melting Point/Glass Transition Temp	Not determined.
Density	1020 kg/m^3 (emulsion).
Water Solubility	It is claimed that the notified substance is not soluble in water and is supplied as a water based emulsion. The polymer is composed largely of hydrophobic constituents.
Dissociation Constant	Carboxylate groups are expected to have typical acidity.
Reactivity	Stable under normal environmental conditions.
Degradation Products	Not determined.

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology
No toxicological data were submitted.

8.2. Human Health Hazard Assessment
The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology
No toxicological data were submitted.

9.2. Environmental Hazard Assessment
The majority of wastes generated during the formulation and spray application will be recycled or disposed of by incineration or landfill. Once the coating is applied, it is expected to form an inert coating on the surface and the notified polymer will no longer be available for exposure. The surfaces coated with the formulation containing the notified polymer are intended only for industrial use. Leaching of the polymer from the coated surfaces is not expected to be significant due to its low water solubility and its affinity to the surface bound status within the coating.

The coating will remain on the surface until it is gradually worn down. At the end of its useful life it will presumably be removed and replaced by another coat of a similar product. The coating containing the notified polymer will be broken up into solid particulate matter by the removal process and most likely disposed to landfill. The surfaces themselves may also be disposed of to landfill as inert solid waste at the end of their useful lives.

In landfill, the polymer contained in waste or on the coated surfaces is expected to be immobile due to its inert state and its poor water solubility. Although not expected to be readily biodegradable, it is anticipated that prolonged residence in an active landfill environment would eventually degrade the notified polymer due to abiotic or slow biotic processes to give water vapour and oxides of carbon and nitrogen. If these are incinerated, the polymer will be decomposed to water vapour and oxides of carbon and nitrogen.

10. RISK ASSESSMENT

10.1. Environment
It is not possible to determine a meaningful predicted environmental concentration (PEC) value in order to assess the risk to aquatic organisms, as the use pattern of the notified polymer will result in limited if any exposure to the aquatic environment. While no ecotoxicity data are available, due to the limited release to water, it is unlikely that the polymer would exist at levels which could pose a threat to aquatic organisms or to bioaccumulate. The high molecular weight indicates a low potential for bioaccumulation. Based on the proposed use pattern, the risk of the notified polymer to the environment is expected to be very low.

10.2. Occupational health and safety
The OHS risk presented by the notified polymer is expected to be low. The notified polymer may be present in formulations containing hazardous ingredients. If these formulations 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.

10.3. 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 bound within a matrix and unlikely to be bioavailable.

11. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

11.1. Environmental risk assessment

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

11.2. Human health risk assessment

11.2.1. Occupational health and safety

There is No Concern to occupational health and safety under the conditions of the occupational settings described.

11.2.2 Public health

There is Negligible Concern to public health when used as described.

12. MATERIAL SAFETY DATA SHEET

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.

13. 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 in accordance with government regulations for the disposal of specific waste via a licensed waste disposal contractor to a regulated landfill or incinerator.

Emergency procedures

- Spills/release of the notified polymer should be handled by collecting mechanically or with binding material (e.g. sand and sawdust) and flushing the spill area with water.
- Large spills should be contained with dikes and material should be transferred to suitable containers for disposal.
- Prevent the material from entering drains or water courses.

13.1. 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 Section 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 Section 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.