

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

POLYMER OF LOW CONCERN PUBLIC REPORT

Polymer in NeoRez R-2202

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government Department of Health, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Australian Government Department of the Environment and Energy.

This Public Report is 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:

Street Address: Level 7, 260 Elizabeth Street, SURRY HILLS NSW 2010, AUSTRALIA.
 Postal Address: GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
 TEL: + 61 2 8577 8800
 FAX: + 61 2 8577 8888
 Website: www.nicnas.gov.au

**Director
NICNAS**

January 2018

Table of Contents

SUMMARY	2
CONCLUSIONS AND REGULATORY OBLIGATIONS.....	2
ASSESSMENT DETAILS.....	5
1. APPLICANT AND NOTIFICATION DETAILS	5
2. IDENTITY OF POLYMER	5
3. PLC CRITERIA JUSTIFICATION	5
4. PHYSICAL AND CHEMICAL PROPERTIES.....	5
5. INTRODUCTION AND USE INFORMATION	6
6. HUMAN HEALTH RISK ASSESSMENT.....	6
7. ENVIRONMENTAL RISK ASSESSMENT	7
BIBLIOGRAPHY	7

SUMMARY

The following details will be published in the NICNAS *Chemical Gazette*:

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS SUBSTANCE	INTRODUCTION VOLUME	USE
PLC/1469	Reschem Technologies Pty Ltd	Polymer in NeoRez R-2202	No	< 200 tonnes per annum	Component of paints and coatings

CONCLUSIONS AND REGULATORY OBLIGATIONS

Human Health Risk Assessment

Provided that the recommended controls are in place to reduce worker exposure to ethanamine, *N,N*-diethyl- (triethylamine) that is released during drying of the paint films, the notified polymer is not considered to pose an unreasonable risk to the health of workers.

When used in the proposed manner, with labelling of paints regarding ventilation during use and drying, the notified polymer is not considered to pose an unreasonable risk to public health.

Environmental Risk Assessment

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Health and Safety Recommendations

- A person conducting a business or undertaking at a workplace should implement the following engineering controls to minimise occupational exposure to triethylamine, released from the paint during drying:
 - Adequate exhaust ventilation
- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure to triethylamine, released from the paint during drying:
 - Use in well ventilated areas
 - Avoid contact with skin and eyes
 - Avoid inhalation of vapours during drying of paint
- A person conducting a business or undertaking at a workplace should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to triethylamine, released from the paint during drying:
 - Gloves, coveralls and eye protection
 - Respiratory protection if exposure through inhalation is expected

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- Spray applications should be carried out in accordance with the Safe Work Australia Code of Practice for *Spray Painting and Powder Coating* (Safe Work Australia, 2015) or relevant State or Territory Code of Practice.

- Atmospheric monitoring should be conducted to measure workplace concentrations of triethylamine during use of products containing the notified polymer. Employers should ensure that the exposure standard for triethylamine, listed by Safe Work Australia in the *Hazardous Chemical Information System (HCIS)*, is not exceeded for all areas where the notified polymer is present.
- A copy of the SDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should be in operation.

Public Health

- The following measures should be taken by producers of paints and coatings containing the notified polymer for do-it-yourself (DIY) use to minimise potential public exposure to triethylamine:
 - Labelling of paints, recommending that they be used only in well ventilated areas
 - Labelling of paints, recommending avoidance of breathing the vapours during drying

Disposal

- Where reuse or recycling are not appropriate, dispose of the notified polymer in an environmentally sound manner in accordance with relevant Commonwealth, state, territory and local government legislation.

Emergency Procedures

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

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 polymer 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 polymer, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer 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 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
 - the function or use of the notified polymer has changed from a component of paints and coatings, or is likely to change significantly;
 - the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
 - the notified polymer has begun to be manufactured in Australia;
 - additional information has become available to the person as to an adverse effect of the notified polymer 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.

Safety Data Sheet

The SDS of the product containing the notified polymer was provided by the applicant. The accuracy of the information on the SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

Applicants

Reschem Technologies Pty Ltd (ABN: 90 315 656 219)
Suite 1103/4 Daydream Street
WARRIEWOOD NSW 2102

Exempt Information (Section 75 of the Act)

Data items and details claimed exempt from publication: chemical name, CAS number, molecular and structural formulae, molecular weight, polymer constituents, residual monomers/impurities, import volumes and use details.

2. IDENTITY OF POLYMER

Marketing Name(s)

NeoRez R-2202 (Imported product containing the notified polymer at a concentration of < 30%).

Molecular Weight

Number Average Molecular Weight (Mn) is > 10,000 g/mol.

3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</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	Blue white translucent liquid*
Melting Point/Glass Transition Temperature	Not determined; not isolated from solution under normal conditions of use.
Density	1,050 kg/m ³ at 20 °C
Water Solubility	Not available; expected to be dispersible in water due to its intended use in water-based coating formulations
Dissociation Constant	Contains ionic functionalities and expected to be ionised in the environmental pH range (4 – 9)
Reactivity	Expected to be stable under normal environmental conditions
Degradation Products	None expected under normal conditions of use

* Property of the product NeoRez R-2202 containing the notified polymer at a concentration of < 30%.

The notified polymer is not expected to be isolated from solution under normal conditions of use.

5. INTRODUCTION AND USE INFORMATION

Maximum Introduction Volume of Notified Chemical (100%) Over Next 5 Years

Year	1	2	3	4	5
Tonnes	< 30	< 75	< 125	< 125	< 200

Use

The notified polymer will not be manufactured in Australia. The notified polymer will be introduced in a water based formulation (NeoRez R-2202) at concentration < 30% into Australia in 120 kg drums or 1,050 kg intermediate bulk containers (IBCs) by sea to Melbourne, Sydney, Brisbane or Perth and transported by road to reformulation sites.

Reformulation will occur in Australia. The notified polymer will be mixed with other ingredients using semi-automated processes. Finished products containing the notified polymer (at a concentration of < 25%) will be packaged in 1 – 20 L containers. The products can be applied to different surfaces and may be used by both industrial workers and DIY users. The finished products can be applied by spray, brush or roller.

6. HUMAN HEALTH RISK ASSESSMENT

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

However, the notified polymer contains ethanamine, *N,N*-diethyl- (CAS No. 121-44-8) as the counter ion at > 1% concentration. Ethanamine, *N,N*-diethyl- is also known as triethylamine (TEA) and is listed by Safe Work Australia in the *Hazardous Chemical Information System (HCIS)* with the following hazard information:

Flammable liquid (Category 2)	H225: Highly flammable liquid and vapour
Acute toxicity (Category 4)	H302: Harmful if swallowed
Acute toxicity (Category 4)	H312: Harmful in contact with skin
Acute toxicity (Category 4)	H332: Harmful if inhaled
Skin corrosion (Category 1A)*	H314: Causes severe skin burns and eye damage

* Mixture containing triethylamine at 1% ≤ concentration < 3% should also be classified as Skin Irritation Category 2 (H315: Causes skin irritation).

Triethylamine has an Australian exposure standard for the workplace of 8 mg/m³ (2 ppm) time weighted average (TWA) and 17 mg/m³ (4 ppm) short-term exposure limit (STEL) (Safe Work Australia, 2013).

Based on the proposed maximum use concentration of the notified polymer in paints, the notifier stated that, in a worst case scenario the maximum amount of triethylamine liberated during drying would be 1.1 g/m² of painted surface. The concentration of the released chemical in air may vary depending on the volume, air flow and rate of emission from the paint film and it may exceed the Australian exposure standard in many use scenarios, especially when painting occurs indoors. Use of engineering controls, safe work practices and personal protective equipment (PPE) is expected to mitigate the exposure and risk to workers. In particular the paint application process should be carried out in well ventilated spaces, and mechanical ventilation used if possible. Dermal and ocular exposure is expected to be reduced by PPE such as gloves, coveralls and eye protection. Where ventilation is not adequate, respiratory protection should be used to reduce the potential for inhalation exposure.

DIY use of finished products containing the notified polymer is not expected to be frequent and in large scale. Warnings on the paint labels regarding use of good ventilation and avoidance of inhalation of paint fumes would reduce the exposure and risk to the public.

7. ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted. The notified polymer is amphoteric with anionic functional groups as part of its backbone and potentially cationic functional groups. The charge density of the cationic functionality is not considered substantial, and hence is of low hazard to aquatic life. The anionic functionalities are expected to be of low toxicity to fish and aquatic invertebrates (e.g., daphnids) (i.e., LC50 > 100 mg/L), however they can be moderately toxic to algae. The mode of toxic action is over-chelation of nutrient elements needed by algae for growth. This hazard is greatest when the polymer has acid functional groups on alternating carbons of the polymer backbone. As this is not the case for the notified polymer, it is not considered to be an over-chelation hazard to algae.

Release of the notified polymer to the environment during storage and transport are expected to be limited to accidental spills or leaks. These releases are expected to be collected with absorbent materials and disposed of to landfill in accordance with local government regulations. For industrial application of coatings, approximately 30% will be applied using spray (in spray booths), 30% using brush, and 40% using roller. Minimal release of the notified polymer to the aquatic environment is expected during industrial use (~80% of applications) as it generally involves closed application systems, trained applicators and management controls (e.g., wastes from equipment washing treated on-site or disposed of to landfill).

Release of the notified polymer to sewers is expected when brushes and coating application equipment are washed by DIY users. In a worst-case scenario the PECriver was calculated to be 1.1 µg/L, assuming 20% of the total import volume for DIY use over 365 days of the year, a 5% release to sewer and a 0% removal rate. The most toxic anionic polymers to algae have EC50 values of > 1 mg/L. As this is likely to be the most sensitive species, an assessment factor of 100 was used to estimate the PNEC. Therefore the PNEC is likely to be > 10 µg/L and hence the release of the notified polymer from DIY use is unlikely to lead to ecotoxicologically significant concentrations in the aquatic environment.

Most of the notified polymer will be irreversibly incorporated within the final cured paint or coating product once it has been applied onto timber, concrete, glass or other substrates. The notifier has estimated that < 0.5% of the notified polymer will end up as waste (residual product in containers, polymer on discarded applicators, brushes, etc.). Waste product will be treated as solid waste when water has evaporated and the polymer is fully cured. Containers with notified polymer residues are expected to be disposed of to landfill or recycled.

The notified polymer is expected to share the fate of the coated article which is to be disposed of to landfill or recycled during metal reclamation. In landfill, the notified polymer will be present as cured solids which will be neither bioavailable nor mobile. Furthermore, based on its high molecular weight, the notified polymer is not expected to cross biological membranes, and expected to have low potential to bioaccumulate. In landfill and during metal reclamation, the notified polymer is expected to degrade via biotic and abiotic processes to form oxides of carbon, nitrogen, and water vapour.

Therefore, based on its assumed low hazard and reported use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

BIBLIOGRAPHY

Safe Work Australia (2015) Code of Practice: Spray Painting and Powder Coating, Safe Work Australia, <https://www.safeworkaustralia.gov.au/doc/model-code-practice-spray-painting-and-powder-coating>.

Safe Work Australia (2013) Workplace exposure standards for airborne contaminants, Safe Work Australia, <https://www.safeworkaustralia.gov.au/doc/workplace-exposure-standards-airborne-contaminants>