

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

POLYMER OF LOW CONCERN PUBLIC REPORT

2-Propenoic acid, polymer with ethenylbenzene, 2-ethylhexyl 2-propenoate and 2-propenamide, reaction products with formaldehyde, butylated

This Self Assessment has been compiled by the applicant and adopted by NICNAS 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), administered by the Department of Health and the Department of the Environment, has screened this assessment report. The data supporting this assessment will be subject to audit by NICNAS.

For the purposes of subsection 78(1) of the Act, this Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This 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**

September 2014

Part 2 – PLC Self Assessment Exempt Information

Table of Contents

SUMMARY:	2
CONCLUSIONS AND REGULATORY OBLIGATIONS.....	2
ASSESSMENT DETAILS.....	3
1. APPLICANT AND NOTIFICATION DETAILS	3
2. IDENTITY OF POLYMER	3
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

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
SAPLC/162	PPG Industries Australia Pty Ltd	2-Propenoic acid, polymer with ethenylbenzene, 2-ethylhexyl 2-propenoate and 2-propenamide, reaction products with formaldehyde, butylated	No	≤ 50 tonnes per annum	Component of external container coatings

CONCLUSIONS AND REGULATORY OBLIGATIONS**Human Health 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 health of workers and the public.

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

- 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, noting that the formulation may be classified because of hazardous impurities.

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

- A copy of the (M)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 for the 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.

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.

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 external container coatings, or is likely to change significantly;
 - the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
 - the method of manufacture of the notified polymer in Australia has changed, or is likely to change, in a way that may result in an increased risk of an adverse effect of the notified polymer on occupational health and safety, public health, or the environment;
 - 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.

(Material) Safety Data Sheet

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

ASSESSMENT DETAILS**1. APPLICANT AND NOTIFICATION DETAILS****Applicants**

PPG Industries Australia Pty Ltd (ABN: 82 055 500 939)
14 – 20 McNaughton Rd
CLAYTON VIC 3168

Exempt Information (Section 75 of the Act)

No data claimed exempt from publication.

2. IDENTITY OF POLYMER**Marketing Name**

RC-99-8056 (contains the notified polymer at 50-70% concentration in solvent solution)

Chemical Name

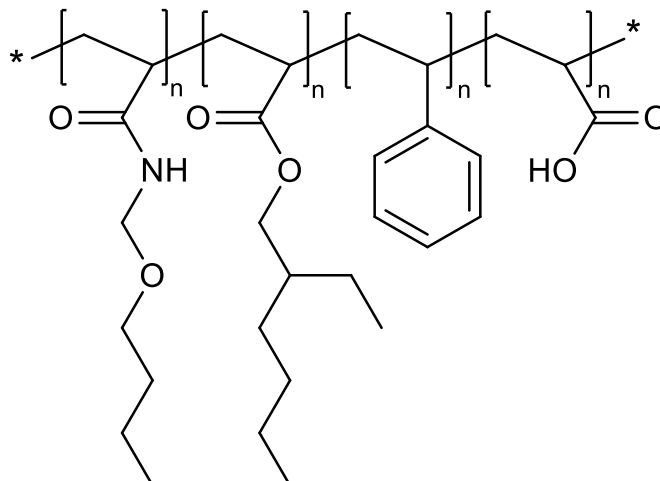
2-Propenoic acid, polymer with ethenylbenzene, 2-ethylhexyl 2-propenoate and 2-propenamide, reaction products with formaldehyde, butylated

CAS Number

68442-46-6

Molecular Formula

$(C_{11}H_{20}O_2.C_8H_8.C_3H_5NO.C_3H_4O_2.CH_2O)_x$

Structural Formula**Molecular Weight (MW)**

Number Average Molecular Weight (Mn)	11,868 Da
Weight Average Molecular Weight (Mw)	41,231 Da
Polydispersity Index (Mw/Mn)	3.5
% of Low MW Species < 1000 Da	1.2%
% of Low MW Species < 500 Da	0.4%

Reactive Functional Groups

The notified polymer contains only low concern functional groups.

Polymer Constituents

<i>Chemical Name</i>	<i>CAS No.</i>	<i>Weight % starting</i>	<i>Weight % residual</i>
2-Propenoic acid	79-10-7	2	0
Benzene, ethenyl-	100-42-5	50	≤ 0.001
2-Propenoic acid, 2-ethylhexyl ester	103-11-7	25	≤ 0.005
2-Propenamide	79-06-1	8	≤ 0.05
Formaldehyde	50-00-0	4	< 1
1-Butanol	71-36-3	9	0
<i>tert</i> -Dodecanethiol*	25103-58-6	< 1	0
Hydroperoxide, 1-methyl-1-phenylethyl*	80-15-9	< 2	0

* Not included in chemical name as at < 2 wt. %

Hazardous Impurities/Residual Monomers

<i>Chemical Name</i>	Formaldehyde
<i>CAS No.</i>	50-00-0
<i>Hazardous Properties</i>	Weight % < 1 Carc. Cat. 2; R49 T; R23/24/25 C; R34 R43 Conc. ≥ 25%: T; R49; R23/24/25; R34; R43 ≥ 10% Conc. < 25%: T; R49; R34; R20/21/22; R43 ≥ 5% Conc. < 10%: T; R49; R20/21/22; R36/37/38; R43 ≥ 3% Conc. < 5%: T; R49; R20/21/22; R43 ≥ 0.2% Conc. < 3%: T; R49; R43 ≥ 0.1% Conc. < 0.2%: T; R49
<i>Chemical Name</i>	Benzene, ethenyl-
<i>CAS No.</i>	100-42-5
<i>Hazardous Properties</i>	Weight % ≤ 0.001 Xn; R20 Xi; R36/38 Conc. ≥ 12.5%: Xn; R20; R36/38
<i>Chemical Name</i>	2-Propenoic acid, 2-ethylhexyl ester
<i>CAS No.</i>	103-11-7
<i>Hazardous Properties</i>	Weight % ≤ 0.005 Xi; R37/38 R43 Conc. ≥ 20%: Xi; R37/38; R43 ≥ 1% Conc. < 20%: Xi; R43
<i>Chemical Name</i>	2-Propenamide
<i>CAS No.</i>	79-06-1
<i>Hazardous Properties</i>	Weight % ≤ 0.05 Carc. Cat. 2; R45 Muta. Cat. 2; R46 Repr. Cat. 3; R62 T; R25-48/25 Xn; R21-48/20/21 Xi; R36/38 R43 Conc. ≥ 25%: T; R45; R46; R62; R25; R21; R48/25; R48/20/21; R36/38; R43 ≥ 20% Conc. < 25%: T; R45; R46; R62; R22; R48/25; R48/20/21; R36/38; R43 ≥ 10% Conc. < 20%: T; R45; R46; R62; R22; R48/25; R48/20/21; R43 ≥ 5% Conc. < 10%: T; R45; R46; R62; R22; R48/22; R43 ≥ 3% Conc. < 5%: T; R45; R46; R22; R48/22; R43 ≥ 1% Conc. < 3%: T; R45; R46; R48/22; R43 ≥ 0.1% Conc. < 1%: T; R45; R46

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	In solution the product is a clear liquid
Melting Point/Glass Transition Temp	Not determined
Density	950 kg/m ³ at 25 °C
Water Solubility	Insoluble. The notified polymer is mainly composed of hydrophobic species and has a high molecular weight

	(NAMW > 10,000 Da).
Dissociation Constant	Not determined. The notified polymer contains dissociable functionalities with expected pKa of 4 - 5. However, the notified polymer is not expected to be significantly ionised in the environment due to its limited water solubility.
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use or storage

Comments

The notified polymer is unlikely to be released to the aquatic environment during the normal course of its use as it is converted into an inert coating of very high molecular weight during the curing process.

5. INTRODUCTION AND USE INFORMATION

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

Year	1	2	3	4	5
Tonnes	50	50	50	50	50

Use

The notified polymer will be manufactured in Australia as a 50-70% w/w polymer in organic solvent, packed into 200 L steel drums and stored in a bunded area. Manufacturing will occur in fully enclosed PLC controlled resin reactors. Manufacturing operators will not be exposed to the notified polymer in its pure form but will handle the polymer in solution. The notified polymer solution will be mixed in enclosed vessels with additives in a manufacturing environment prior to being supplied to the end industrial user as a 30-50% solution in 200 L steel drums. The notified polymer will be used as the film forming agent in clear external acrylic varnishes for the packaging industry. The notified polymer makes up approximately 33% of the wet coating and 78% of the dried film (with the remaining film consisting of flow and slip additives). The formulated notified polymer will be applied to steel and aluminium by roller coater in an industrial setting. The notified polymer will have end-use in coatings for metal food and beverage containers. The types of containers may include 2-pc cans, 3-pc cans, can ends, bottle caps, closures, and metal bottles.

6. HUMAN HEALTH RISK ASSESSMENT

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

Although not considered in this risk assessment, the notified polymer contains residual monomers that are classified as hazardous according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia. These are present in the notified polymer as introduced above the cut off concentrations for classification.

The risk of the notified polymer to occupational and public health is not considered to be unreasonable given the assumed low hazard and the assessed use pattern.

7. ENVIRONMENTAL RISK ASSESSMENT

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

There is potential for environmental release during manufacture and application. Any spills that occur during manufacture and reformulation will be contained by bunding. Approximately 1000 kg per annum of waste is expected to be generated due to spills and cleaning equipment during varnish manufacture and usage. A licensed waste disposal contractor will collect the solvent based waste from the manufacturing process for destruction through cement kilns.

ENVIRONMENTAL FATE

The notified polymer contains groups in the side chains which have potential to hydrolyse under severe conditions, but is expected to be stable under normal environmental conditions. The notified polymer will be used in packaging coatings that will eventually be incorporated in metal recycling programs or sent to landfill for disposal following its lifecycle. After use, the notified polymer is expected to be cured on the surface of the substrate. Due to its low water solubility, the notified polymer in solid wastes is expected to remain bound within the soils and sediments of landfills and eventually degrade through biotic and abiotic processes. If spilt on land, the notified polymer is expected to bind to soil and become immobilised in the soil layer. If spilt to water, it is not expected to dissolve but rather disperse or settle to sediment. It is not expected to be readily biodegradable but due to its high molecular weight, it is not expected to bioaccumulate. The notified polymer will result in the formation of water vapour and oxides of carbon and nitrogen during thermal decomposition or by abiotic/biotic degradation in landfill.

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 over-chelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternative carbons of the polymer backbone, which is not applicable to the notified polymer. Therefore, the notified polymer is not considered to be an over-chelation hazard to algae.

7.3. Environmental Risk Assessment

No significant aquatic exposure is anticipated during end use of the notified polymer. The notified polymer is not expected to be either bioavailable or bioaccumulative. Based on its assumed low hazard and assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.