

File No: LTD/1826

July 2015

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

PUBLIC REPORT

WB Acrylic Copolymer

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (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 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.

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**

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SUMMARY

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

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS CHEMICAL	INTRODUCTION VOLUME	USE
LTD/1826	PPG Industries Australia Pty Ltd	WB Acrylic Copolymer	ND*	≤ 10 tonnes per annum	Component of coatings

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System for the Classification and Labelling of Chemicals* (GHS), as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

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

On the basis of the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- No specific engineering control, work practices 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.

- Spray applications should be carried out in accordance with the Safe Work Australia Code of Practice for *Spray Painting and Powder Coating* (SWA, 2012) or relevant State or Territory Code of Practice.
- 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

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

Regulatory Obligations

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 chemical 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 chemical, 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 polymer has a number-average molecular weight of less than 1000;or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from component of coatings or is likely to change significantly;
 - the amount of polymer being introduced has increased, or is likely to increase, significantly;
 - the polymer has begun to be manufactured in Australia;
 - additional information has become available to the person as to an adverse effect of the 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 the product containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

This notification has been conducted under the cooperative arrangement with Canada. The health and environmental hazard assessment components of the Canadian report were provided to NICNAS and, where appropriate, used in this assessment report. The other elements of the risk assessment and recommendations on safe use of the notified polymer were carried out by NICNAS.

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

PPG Industries Australia Pty Ltd (ABN: 82 055 500 939)

14 – 20 McNaughton Road

Clayton VIC 3168

NOTIFICATION CATEGORY

Limited (Reduced fee notification): Synthetic polymer with Mn ≥ 1,000 Da – Assessed by Comparable Agency

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, analytical data, degree of purity, polymer constituents, residual monomers, impurities, use details, and import volume.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed for all physico-chemical endpoints.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

Canada (2014), China, Japan, New Zealand and South Korea

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

WB Acrylic Copolymer

MOLECULAR WEIGHT

> 1,000 Da

ANALYTICAL DATA

Reference GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY

> 90%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: liquid*

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	Introduced in aqueous solution
Boiling Point*	Not determined	Introduced in aqueous solution
Density*	1,060 kg/m ³	(M)SDS
Vapour Pressure	Not determined	Expected to be low based on high molecular weight of notified polymer
Water Solubility	Soluble	(M)SDS
Hydrolysis as a Function of pH	Not determined	The notified polymer contains hydrolysable functionalities. However, no significant hydrolysis is expected to occur

Partition Coefficient (n-octanol/water)	Not determined	in the environmental pH range of 4 – 9 Expected to be low, based on the water solubility. Not expected to significantly partition to n-octanol based on its high water solubility
Adsorption/Desorption	Not determined	Despite the low log P _{OW} , the notified polymer is expected to adsorb strongly to soils and sludge sediments due to the presence of the potential cationic functionality
Dissociation Constant	Not determined	The notified polymer is a salt and it is expected to be ionised under normal environmental conditions (pH 4 – 9)
Flash Point*	91 °C	(M)SDS
Flammability	Not determined	Introduced in an aqueous solution
Autoignition Temperature	Not determined	Introduced as an aqueous solution
Explosive Properties	Not determined	Not expected to be explosive based on structure
Oxidising Properties	Not determined	Not expected to be oxidising based on structure

* For imported product containing the notified polymer at < 50% concentration in aqueous solution.

DISCUSSION OF PROPERTIES

Reactivity

The notified polymer is expected to be stable under normal conditions of use.

Physical hazard classification

Based on the submitted physico-chemical data depicted in the above table, the notified polymer is not recommended for hazard classification according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia.

5. INTRODUCTION AND USE INFORMATION

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

The notified polymer will be imported into Australia as a component of a finished automotive coating at < 5% concentration.

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

Year	1	2	3	4	5
Tonnes	< 10	< 10	< 10	< 10	< 10

PORT OF ENTRY

Melbourne

TRANSPORTATION AND PACKAGING

The notified polymer will be imported in finished automotive coatings at < 5% concentration by sea freight, packaged within drums (~200 L) and transported by road within Australia.

USE

The notified polymer will be used as a component of automotive coatings at < 5% concentration.

OPERATION DESCRIPTION

The notified polymer will not be manufactured in Australia. No reformulation or repackaging of the finished automotive coatings containing the notified polymer at < 5% concentration will occur. The coating will be applied by manual spray process in industrial settings only.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

EXPOSURE DETAILS

Transport and storage workers may come into contact with the notified polymer in the imported product at < 5% concentration, only in the unlikely event of an accident.

End-use

Dermal, ocular and inhalation exposure to the notified polymer at < 5% concentration may occur during spray application. Exposure is expected to be minimised by the use of well-ventilated areas or local exhaust ventilation and the use of personal protective equipment (PPE) such as coveralls, impermeable gloves, eye protection and a respirator (if required). Once the coating containing the notified polymer at < 5% concentration is cured and dried, the notified polymer will be bound within an inert matrix and will not be bioavailable.

6.1.2. Public Exposure

The coatings containing the notified polymer at < 5% concentration will be used in industrial settings only and will not be sold to the public. The public may come into contact with surfaces coated with the notified polymer. However, once the coating is cured and dried, the notified polymer will be bound within an inert matrix and will not be available for exposure.

6.2. Human Health Effects Assessment

As no toxicological data were submitted, it is not possible to establish the hazard potential of the notified polymer. Based on the high molecular weight of the notified polymer (> 1000 Da) and low proportion of low molecular weight species (< 1000 Da), absorption across biological membranes is not expected. Furthermore, the notified polymer does not contain any structural alerts of concern for human health.

Health hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System for the Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety

No toxicity data were provided for the notified polymer. Based on the high molecular weight and the absence of structural alerts for toxicity, the notified polymer is not expected to pose a hazard to human health.

Given the expected low hazardous nature of the notified polymer, the risk to workers from use of the notified polymer is not considered to be unreasonable.

6.3.2. Public Health

The finished automotive coatings containing the notified polymer are for industrial use only and will not be sold to the general public. Once cured and dried, the notified polymer will not be available for exposure. Therefore, the notified polymer is not considered to pose an unreasonable risk to public health.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The notified polymer will not be manufactured or reformulated in Australia; therefore, there will be no release from these activities. Environmental release during importation, transport and distribution may occur as a result of accidental spills. In the event of a spill, the notified polymer is expected to be contained and collected with an inert absorbent material and either reused or disposed of to landfill.

RELEASE OF CHEMICAL FROM USE

The notified polymer will be used in automotive coatings and will be applied by manual spray process. Spraying is expected to be typically conducted in a controlled environment, in industrial settings.

The main release of the notified polymer from end-use is expected as a result from overspray, spills, and leaks, from cleaning of equipment and from residues in empty containers. It is anticipated that between 20-30% of the coating products will form overspray and be collected as waste material. As the application of coating is expected to be conducted at industrial sites in designated spray booths, the overspray is expected to be captured in the spray booth filters or other capture systems. The captured notified polymer and empty containers are expected to be disposed of to landfill. Washings from equipment cleaning are expected to be collected by licensed waste contractors. Therefore, a significant release of the notified polymer to the environment from these activities is not expected.

RELEASE OF CHEMICAL FROM DISPOSAL

The notified polymer is expected to share the fate of the coated automobile parts to which it has been applied, and at the end of the car's useful life, the notified polymer is likely to be either thermally decomposed during metal reclamation processes or disposed of to landfill.

7.1.2. Environmental Fate

No environmental fate data were submitted. Since the notified polymer is amphoteric and has a molecular weight greater than 1,000 Da. and no significant percentage of low molecular weight constituents, it is not expected to be able to cross biological membranes and therefore is not expected to bioaccumulate. Further, bioaccumulation of the uncured polymer is unlikely due to its high water solubility and low n-octanol/water partition coefficient. The polymer is expected to sorb to soil/sediment based on its amphoteric structure. If released to environment prior to curing, the notified polymer is anticipated to be available to aquatic organisms. However based on the high molecular weight and cationic functionality, high removal during waste-water treatment (90% based on Boethling and Nabholz, 1997) would be expected while the remaining fraction would be expected to adsorb onto dissolved organic matter and settle to sediments. The majority of the notified polymer is expected to be cured by adhering to articles following its use in coatings. The notified polymer that is disposed of to landfill is expected to remain associated with the substrate to which it has been applied. In its cured form it is not expected to be mobile, bioavailable or biodegradable. Ultimately, the notified polymer is expected to eventually degrade via biotic and abiotic processes in landfill, or by thermal decomposition during metal reclamation processes, to form water and oxides of carbon and nitrogen.

7.1.3. Predicted Environmental Concentration

The predicted environmental concentration (PEC) for the notified polymer has not been calculated since no significant release of the notified polymer to the environment is expected based on its reported use pattern. Therefore, it is not appropriate to estimate a PEC as this concentration is not expected to reach ecotoxicologically significant levels.

7.2. Environmental Effects Assessment

No ecotoxicological data were submitted for the notified polymer. The cationicity of the notified polymer may contribute ecotoxicity to aquatic life. Therefore, the ecotoxicological endpoints for the notified polymer were calculated based on Structure Activity Relationships (SARs) equations for estimating the toxicity of polycationic polymers (Boethling and Nabholz, 1997). The endpoints are summarised in the table below. As a worst case scenario, the toxicity values predicted by SARs have not been modified by mitigation factors to reflect the actual toxicity in the natural aquatic environments to account for the anticipated binding of the polymer with organic carbon in surface waters.

<i>Endpoint</i>	<i>Result</i>	<i>Assessment Conclusion</i>
Fish Toxicity	LC50 (96 h) = 15.78 mg/L	Predicted to be harmful to fish
Daphnia Toxicity	LC50 (48 h) = 646.49 mg/L	Predicted to be not harmful to aquatic invertebrates
Algal Toxicity	EC50 (96 h) = 35.15 mg/L	Predicted to be harmful to algae

The notified polymer is expected to be harmful to fish and algae and not harmful to aquatic invertebrates in environmental waters with typical levels of total organic carbon. The QSAR estimation procedure used here is a standard approach and is considered reliable to provide a general indication of the likely environmental effects of the polymer. However, this method is not considered sufficient to formally classify the acute and long term hazard of the notified polymer to aquatic life under the Globally Harmonised System for the Classification and Labelling of Chemicals (United Nations, 2009).

7.2.1. Predicted No-Effect Concentration

No significant release of the notified polymer to the aquatic environment is expected based on the reported use pattern. Therefore, a predicted no-effect concentration (PNEC) has not been derived.

7.3. Environmental Risk Assessment

A risk Quotient ($Q = \text{PEC}/\text{PNEC}$) value has not been calculated since neither PEC nor PNEC were derived. Bioaccumulation of the uncured polymer is unlikely due to its high water solubility, low n-octanol/water partition coefficient and high molecular weight. The notified polymer will be disposed of to landfill as cured coated articles or thermally decomposed during metal reclamation processes. The notified polymer in coatings is physically bound into a solid inert matrix, and is unlikely to be bioavailable or leach in this form. The notified polymer is not expected to pose an unreasonable risk to the environment based on the assessed use pattern.

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