File No: LTD/1803

February 2015

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

Polymer in 44 Series of Coatings

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:

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

TABLE OF CONTENTS

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/1803	PPG Industries Australia Pty Ltd	Polymer in 44 Series of Coatings	ND*	≤ 10 tonnes per annum	A component of aircraft coating formulations

*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
Provided that the recommended controls are being adhered to, under the conditions of the occupational settings described, the notified polymer is not considered to pose an unreasonable risk to the health of workers.

When used in the proposed manner, the notified polymer is not considered to pose an unreasonable risk to public health.

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
REGULATORY CONTROLS
CONTROL MEASURES
Occupational Health and Safety

- A person conducting a business or undertaking at a workplace should implement the following engineering controls to minimise occupational exposure to the notified polymer as introduced in the product:
  - Spray booths
  - Aircraft hangars with well-ventilated environment

- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer as introduced in the product:
  - Avoid skin and eye contact
  - Do not inhale vapours or mists
  - Avoid contact with uncured coatings or overspray

- 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 the notified polymer as introduced in the product:
  - Safety goggles
  - Impervious gloves
  - Coveralls
  - Respirators during spray operations

  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.

Disposal

- Where reuse or recycling are unavailable or impracticable, dispose of the chemical 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 containment, physical collection and subsequent safe 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 a component of aircraft coating formulations, 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 chemical 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 chemical were carried out by NICNAS and the Department of the Environment.

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
PPG Industries Australia Pty Ltd (ABN: 82 055 500 939)
23 Ovata Drive
Tullamarine, VIC 3043

NOTIFICATION CATEGORY
Limited: Synthetic polymer with Mn ≥ 1,000 Da

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, additives/adjuvants, import volume and use details.

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)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
44GN060 Base Component (product containing the notified polymer at ≤ 60%)

OTHER NAME(S)
44 Series of Coatings (product containing the notified polymer at ≤ 60%)
RB-008 (product containing the notified polymer at > 70%)

MOLECULAR WEIGHT
Mn > 1,000 Da

ANALYTICAL DATA
Reference GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY
> 75%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: green liquid*

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	Imported in solvent
Boiling Point*	99.4 to 167.8 °C	(M)SDS
Relative Density*	1.48	(M)SDS

Vapour Pressure*	0.6 kPa at room temperature	(M)SDS
Water Solubility*	Insoluble in cold water	(M)SDS
Hydrolysis as a Function of pH	Not determined	The notified polymer does not contain hydrolysable groups.
Partition Coefficient (n-octanol/water)	Not determined	The notified polymer contains hydrophilic units, as well as hydrophobic units, and is therefore expected to possess surfactant properties.
Adsorption/Desorption	Not determined	Expected to have surfactant properties
Dissociation Constant	Acidic (phenols) pKa = 9.7-10.7 Basic (amines) pKa ≤ 9.9	Estimated. ACD/pKa I-Lab Version 2.0
Particle Size	Not determined	Imported in solvent
Flash Point*	22.2 °C (closed cup)	(M)SDS
Autoignition Temperature	Not determined	Imported in solvent
Explosive Properties	Not explosive	The notified polymer does not contain chemical groups which are associated with explosive properties.
Oxidising Properties	Not oxidising	The notified polymer does not contain chemical groups which are associated with oxidising properties.

* Properties for 44GN060 Base Component (containing the notified polymer at ≤ 60%)

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. However, it is noted that the product containing the notified polymer at ≤ 60% concentration may be classified as flammable liquid due to the presence of other ingredients.

5. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS
The notified polymer will not be manufactured in Australia. The notified polymer will be imported as a component of aircraft coating formulations at up to 60% concentration.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	1-10	1-10	1-10	1-10	1-10

PORT OF ENTRY
Melbourne and Sydney

IDENTITY OF MANUFACTURER/RECIPIENTS
PPG Industries Australia Pty Ltd

TRANSPORTATION AND PACKAGING
The notified polymer will be imported in 1 gallon, 1 quart or 1 pint (equivalent to the volumes of 3.8 L, 946 mL or 473 mL respectively) metal cans and transported within Australia by road.

USE
The notified polymer will be used as a component (at up to 60% concentration) of coating formulations for the aerospace industry.

OPERATION DESCRIPTION
There will be no reformulation or repackaging of the product containing the notified polymer in Australia.

The product containing the notified polymer at up to 60% concentration will be mixed on-site with other components to make a final coating containing the notified polymer at up to 40% concentration, which will be applied to aircraft via spray.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

CATEGORY OF WORKERS

Category of Worker	*Exposure Duration (hours/day)*	*Exposure Frequency (days/year)*
Transport and storage	2-3	10-15
Spray application	6	260

EXPOSURE DETAILS

Transport and storage workers are not expected to be exposed to the notified polymer except in the unlikely event of an accident.

Dermal, ocular or inhalation exposure to the notified polymer at concentrations up to 60% may occur during mixing and spray application, and during cleaning and maintenance of equipment. The spray application of coating formulations containing the notified polymer to aircrafts will be only by trained professional operators, in an industrial environment. The notifier states that exposure to the notified polymer will be mitigated by the use of ventilated workplaces (including spray booths and/or aircraft hangars) and use of personal protective equipment (PPE), such as goggles, impervious gloves, appropriate industrial clothing and respirators, during spray, cleaning and maintenance operations.

Once the coating is cured, the notified polymer will be trapped in an inert polymer matrix and will be unavailable for further exposure.

6.1.2. Public Exposure

The notified polymer will be used in industrial settings and will not be available to the public. Once the coating is cured, the notified polymer will be trapped in an inert polymer matrix and will be unavailable for exposure.

6.2. Human Health Effects Assessment

No toxicity data was submitted.

The notified polymer contains potentially cationic secondary and tertiary amines that have been associated with structural alerts for irritation/corrosion and sensitisation. The notified polymer contains hydrophilic units, as well as hydrophobic units, and is therefore expected to possess surfactant properties that may imply potential for dermal absorption. Based on the high molecular weight (> 1000 Da) of the notified polymer, the potential of the notified polymer to be dermally absorbed is expected to be limited (ECHA 2012). However, the polymer also contains a proportion (< 10%) of low molecular weight species (< 500 Da) that may be absorbed by the dermal route. In addition, absorption across the respiratory tract is also possible. While the potential for health effects may be limited by the high molecular weight (and structure) of the polymer, sensitisation and/or irritation effects cannot be ruled out if workers are directly exposed to the notified polymer, repeatedly.

The notified polymer also contains Bisphenol A (BPA) in the structure, which may raise concerns for developmental toxicity for the polymer (USEPA, 2014). However, since BPA is present in the backbone, the notified polymer is not expected to have the same hazards as those associated with free BPA.

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

Occupational exposure to the notified polymer is expected to be minimal due to the industrial nature of application, the presence of engineering controls (spray booths and/or ventilated aircraft hangars) and use of PPE (goggles, impervious gloves, coveralls and respirators) during aircraft spray painting operations. Once the coating is cured, the notified polymer will be trapped in an inert polymer matrix and will not be bioavailable for further exposure.

Under the conditions of the occupational settings described, in the presence of engineering controls and PPE described above, the notified polymer is not considered to pose an unreasonable risk to occupational health.

6.3.2. Public Health

The notified polymer is intended for industrial use only. Given that the notified polymer is not bioavailable once the coating is cured, the risk to public health is not considered to be unreasonable.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1. Environmental Exposure

RELEASE OF CHEMICAL AT SITE

No manufacturing of the notified polymer will take place in Australia. Release of the notified polymer to the environment during importation, storage, and transport is unlikely. The most likely source of a release to the environment during these activities will be a transport accident. However, the capacity and specifications of the import containers are likely to minimise the extent of any such releases. Releases that do occur as a result of accidents are expected to be physically contained, absorbed on inert material and sent for disposal to landfill.

RELEASE OF CHEMICAL FROM USE

The spray application of coating formulations containing the notified polymer to aircrafts will be in an industrial environment, only by trained professional operators. Therefore, no significant release is expected from the application. However, when coating formulations containing the notified polymer are applied by spray techniques, 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 is expected to be disposed of to landfill. Once the coating containing the notified polymer is cured, the polymer is considered to be consumed and will not be available for further exposure. It is estimated that 1% of the notified polymer, in solvents, will be collected, treated and disposed of by a licensed waste contractor.

RELEASE OF CHEMICAL FROM DISPOSAL

The majority of the notified polymer will be cured into an inert matrix with other chemical substances as part of the coating process and hence will be immobilised within a polymeric film on coated articles. Therefore, the notified polymer will share the fate of articles to which it has been applied and is expected to be disposed of to landfill or thermally decomposed during metals reclamation processes.

7.1.2. Environmental Fate

No environmental fate data were submitted. The base component containing the notified polymer at < 60% will be mixed with the curing solution and the mixed coating containing the notified polymer at < 40% will then be applied to aircrafts via spray. It is expected to be cured into a solid polymer matrix as part of its normal use pattern and is therefore not expected to be mobile, bioavailable nor biodegradable, in its cured form. The majority of the imported quantity of notified polymer is expected to be ultimately disposed of to landfill or thermally decomposed during recycling of metal structures to which it is applied. The uncured notified polymer contains a significant proportion of low molecular weight species that may have the potential to bioaccumulate. However, the risk for bioaccumulation is low due to the limited potential for aquatic exposure of the uncured polymer. Notified polymer, both in the uncured and cured forms, that is disposed of to landfill is not expected to be mobile and will slowly degrade by abiotic and biotic processes to produce water and oxides of carbon and nitrogen.

7.1.3. Predicted Environmental Concentration (PEC)

The notified polymer is not expected to be present at significant concentrations in the aquatic environment because of the very low potential for direct release to surface waters when used in surface coatings. Therefore, a PEC has not been calculated.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted. The notified polymer has functionality that has the potential to be toxic to aquatic life. However, no significant exposure of the notified polymer to aquatic organisms is expected. Furthermore, the majority of the notified polymer will be cured with other chemical substances as part of the coating process and is not expected to be bioavailable.

7.2.1. Predicted No-Effect Concentration

A Predicted No-Effect Concentration (PNEC) was not calculated as no ecotoxicological data were submitted and there will be very low potential for aquatic exposure.

7.3. Environmental Risk Assessment

A Risk Quotient (Q = PEC/PNEC) was not quantified as a PEC and PNEC were not calculated. The reported use pattern of the notified polymer indicates that there is no significant anticipated aquatic release. Moreover, after curing, the majority of the imported quantity of notified polymer will be incorporated into an inert matrix with other chemicals and is not expected to be mobile, bioavailable nor biodegradable. Hence, the environmental exposure is expected to be minimal. On the basis of the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

BIBLIOGRAPHY

ECHA (2012) Guidance on Information Requirements and Chemical Safety Assessment: Chapter R.7c: Endpoint Specific Guidance, November 2012. European Chemicals Agency (ECHA), <http://echa.europa.eu/documents/10162/13632/information_requirements_r7c_en.pdf>.

NOHSC (2004) Approved Criteria for Classifying Hazardous Substances, 3rd edition [NOHSC:1008(2004)]. National Occupational Health and Safety Commission, Canberra, AusInfo.

SWA (2012) Code of Practice: Spray Painting and Powder Coating, Safe Work Australia, http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/spray-painting-and-powder-coating.

SWA (2012) Code of Practice: Managing Risks of Hazardous Chemicals in the Workplace, Safe Work Australia, http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/managing-risks-of-hazardous-chemicals-in-the-workplace.

United Nations (2009) Globally Harmonised System of Classification and Labelling of Chemicals (GHS), 3rd revised edition. United Nations Economic Commission for Europe (UN/ECE), <http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html >.

USEPA (2014) Bisphenol A in Thermal Paper: Chapter 4 Hazard Evaluation of Bisphenol A and alternative Final Report, January 2014. United States Environmental Protection Agency (USEPA), http://www.epa.gov/dfe/pubs/projects/bpa/bpa-report-chapter4.pdf.