File No: LTD/1894

July 2016

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

PUBLIC REPORT

Polymer in RC–8370

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.

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

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/1894	Axalta Coating Systems Australia Pty Ltd	Polymer in RC-8370	ND*	≤ 15 tonnes per annum	Component of automotive and industrial coatings

* Not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification
Based on the available information, the notified polymer is not recommended for classification according to the *Globally Harmonised System of 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
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

CONTROL MEASURES

Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer during spray painting:
  - Spray booths or closed systems

- Employers should implement the following safe work practices to minimise occupational exposure during handling of products containing the notified polymer as introduced:
  - Avoid skin and eye contact

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer as introduced:
  - Safety goggles or face shield, gloves and protective clothing
  - Respiratory protection (when spray painting)

  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, 2015) or relevant State or Territory Code of Practice.

- 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 *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)] workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must 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 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 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:

Under Section 64(2) of the Act; if

- the function or use of the polymer has changed from being a component of automotive and industrial coatings, or is likely to change significantly;
- the amount of polymer being introduced has increased from 15 tonnes per annum, 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 MSDS of the product containing the notified polymer was provided by the applicant. The accuracy of the information on the MSDS 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.

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Axalta Coating Systems Australia Pty Ltd (ABN: 53 158 497 655)
15-23 Melbourne Road
RIVERSTONE NSW 2765

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, analytical data, degree of purity, polymer constituents, residual monomers, impurities, additives/adjuvants, use details, manufacture/import volume and site of manufacture/reformulation.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
TSCA 2012, CEPA 2014 and China.

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
RC-8370 (product containing the notified polymer)

MOLECULAR WEIGHT (MW)
Number Average Molecular Weight (Mw) > 1,000 Da

3. COMPOSITION

DEGREE OF PURITY
> 95%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: Clear liquid (polymer solution)

Property	Value	Data Source/Justification
Boiling Point	78 °C	(M)SDS*
Density	0.99 kg/m^3	(M)SDS*
Vapour Pressure	2.53 kPa	(M)SDS*
Water Extractability	> 2%	Measured
Hydrolysis as a Function of pH	< 10% after 5 days at 50 °C for pH 4, pH 7 and pH 9	Analogue data
Partition Coefficient (n-octanol/water)	log Pow = 1.3–4.0 at 20 °C	Analogue data
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	Contains potential cationic functionalities. Therefore, the notified polymer is expected to be ionised at the environmental pH range of 4–9.
Flash Point	-9 °C	(M)SDS*
Flammability	Flammable liquid. Vapours may form explosive mixtures with air (RC-8370 solution)	(M)SDS*
Autoignition Temperature	404 °C	(M)SDS*
Explosive Properties	Not determined for the notified polymer. RC-8370 solution has explosive properties, as in lower explosion limit of 1% and higher explosion limit of 11%.	Notified polymer contains no pyrophoric groups
Oxidising Properties	Not determined	Notified polymer contains no functional groups that would imply oxidative properties.

* The value corresponds to the product containing the notified polymer

DISCUSSION OF PROPERTIES
Full details of tests on physical and chemical properties were assessed in Canada.

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 of 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 chemical will not be manufactured in Australia. The notified chemical will be imported into Australia as a component of coating formulations and imported as a solution to be reformulated into end-use products.

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	<5	<10	<10	<15	<15

PORT OF ENTRY
Sydney, Melbourne and Brisbane

IDENTITY OF MANUFACTURER/RECIPIENTS
The notified polymer will not be manufactured in Australia. The resin or finished paints containing the notified polymer will be imported, reformulated and distributed by the notifier.

TRANSPORTATION AND PACKAGING
Finished products containing the notified polymer will be imported in 1, 2 or 4 L steel cans or plastic containers and transported as full container load for sale in the local market (automotive refinishing shops/industrial applications) at <20% concentration.

The notified polymer will also be imported as a resin solution in 200 L steel drums (at <50% concentration) and transported to the Riverstone site for storage, before reformulation into end-use products.

USE
The notified polymer will be used as component of automotive and industrial coatings.

OPERATION DESCRIPTION

The notified polymer (imported as a resin solution) will be used as an intermediate in local tinters where both manual and automated mixing will take place. During automated mixing the notified polymer will be transferred by automated means into the blending vessel, where it will be mixed with other ingredients. Once mixing is complete, samples will be taken for quality control testing and the finished paint products containing the notified polymer will be transferred to containers, labelled and stored for distribution to automotive refinishing shops or industrial applicators. The notifier states that the automated mixing will occur in a well-ventilated area and that workers will wear personal protective equipment in accordance with the appropriate Australian standards (respirators [AS1716, AS1715], eye protection [AS1336, AS1337], glove [AS2161], clothing [AS2919]).

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 driver from wharf to warehouse	4	20
Warehouse – inbound	1	20
Warehouse – outbound	0.5	20
Transport driver warehouse to spray shop	4	20
Refinish shop store man inwards	0.1	250
Spray painter decanting paint to spray gun reservoir/pot	0.1	250
Spray painter spraying car	0.3	250
Spray painter cleaning gun and equipment	0.2	250

EXPOSURE DETAILS

Transport and storage

Transport and storage workers may come into contact with the notified polymer as a component of finished paint or resin solution, only in the event of accidental rupture of the containers.

At the notifier warehouse and spray shop, the primary work activity undertaken by transport and warehouse workers will include the handling, loading and off-loading of containers containing the notified chemical in steel cans/drums or plastic containers. Warehouse workers are also expected to open the containers and sort the cans/drums containing the notified chemical for storage. Exposure of these workers will be limited to accidental spillage only. If such an event occurs, a worker may be exposed through dermal or ocular contact. The notifier states that such exposures will be minimised to the extent possible through the use of personal protective equipment (PPE) including protective coveralls and shoes.

Reformulation

Spray painters will decant resin containing the notified polymer into spray guns for downstream application. Mixing and/or decanting are expected to be carried out in a well-ventilated area with flame proof electrical systems.

End-use

The paint will be sprayed in a closed booth with an exhaust/filter system to catch overspray. At the end of spray application the spray painter is expected to empty the residual paint into a used paint drum and wash the spray gun.

The principal route of exposure of the notified polymer will be dermal, while ocular and inhalation exposure is also possible. The notifier states that spray painters will wear appropriate PPE during decanting and use air respirator, face shield, gloves and protective suit during spray application to protect from potential exposure to overspray. Also, the spray painting booths are subject to design specifications under AS/NZS 4114:1995. The notifier states that due to use of appropriate PPE and oversight of the spray booths, the risk of exposure of the notified polymer during various stages of spray application varies from minimal to moderate.

6.1.2. Public Exposure

The notified polymer is intended for industrial use only. Once the coating processes are complete, the notified polymer will be cured into inert coatings, trapped under the protective film, and subsequently will not be bioavailable for exposure.

6.2. Human Health Effects Assessment

Full details of the studies were assessed in Canada. A study summary for acute oral toxicity was provided (analogue, LD50 > 5,000 mg/kg female rats). There are no structural alerts in the notified polymer for skin irritation and genotoxicity.

Health hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System of 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 structural alerts known to be associated with human health hazards were identified. Based on analogue data, the notified polymer is expected to exhibit low acute oral toxicity. After the coating has been applied and cured, the notifier polymer will be bound into an inert matrix and will not be bioavailable for further exposure. Under the proposed occupational settings and control measures, the notified polymer is not considered to pose an unreasonable risk to workers.

6.3.2. Public Health

Members of the public may come into contact with surfaces coated with coating products containing the notified polymer. However, after the coatings are cured, the notified polymer will be bound into an inert matrix and will not be bioavailable for exposure. Based on very low exposure potential, the risk of the notified polymer to public health is not expected to be unreasonable.

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, no release of the notified polymer to the environment is expected from these activities. The notified chemical will be blended into paint products in automated/enclosed facilities. Environmental release during importation, transport, blending, repacking 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 disposed of in accordance with local regulations.

RELEASE OF CHEMICAL FROM USE

The notified polymer is expected to be used in industrial settings and will not be sold to the public. At the applicator's site, the product containing the notified polymer will be mixed with other additives prior to application using spray guns and/or brushes. Up to 65% of the import volume of the notified polymer is expected to be released into the environment as wastes such as overspray, residues in import containers, mixing containers and equipment washings generated during use. The above releases are expected be captured and disposed of to landfill through authorised facilities.

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. The polymer incorporated in the coating will be disposed of along with the coated articles, at the end of their useful life, and will either go to metal recyclers or be disposed of to landfill.

7.1.2. Environmental Fate

No environmental fate data were submitted. The majority of the notified polymer is expected to be bound within an inert matrix of cured paints as part of its normal use pattern as a component in automotive and industrial paints. The notified polymer in wastes disposed of to landfill is expected to be in solid cured paint and it is not expected to be bioavailable, biodegradable nor mobile in this form. Based on the high molecular weight of the notified polymer, it is not likely to cross biological membranes, hence bioaccumulation is not expected. Furthermore, bioaccumulation of the notified polymer is unlikely due to limited bioavailability in its solid form in landfill and its limited release to surface waters during use. Due to the high molecular weight and the presence of potentially cationic functionality, the notified polymer is expected to be adsorbed to soil particles and to not be mobile in the soil compartment. Based on its chemical composition, size, and structure, the notified polymer is not expected to undergo significant environmental degradation. Therefore, the substance may persist in the environment. However, the notified polymer will eventually degrade 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 (PEC)

The predicted environmental concentration (PEC) has not been calculated for the notified polymer as, based on its reported use pattern, ecotoxicologically significant quantities are not expected to be released to the aquatic environment.

7.2. Environmental Effects Assessment

The results from ecotoxicological investigations conducted on an acceptable analogue polymer is summarised in the table below.

Endpoint	*Result*	*Assessment Conclusion*
Algal Toxicity	E_rC50 (72 h) > 100 mg/L NOEC (72 h) = 30 mg/L	Not harmful to algae

Above values are based on nominal concentrations adjusted for 47% active ingredient and mitigated by a factor of 3.55.

Based on the endpoints for toxicity of the notified polymer to algae, the notified polymer is not considered to be harmful to aquatic organisms under the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)* (United Nations, 2009). Therefore, the notified polymer is not formally classified under the GHS. Based on its measured toxicity, expected low biodegradability and expected low bioaccumulation potential, the notified polymer is not formally classified under the GHS for the chronic hazard.

Ecotoxicological endpoints for the notified polymer can be calculated based on structure activity relationship (SAR) equations assuming a worst case cationic charge density for the polymer (Boethling and Nabholz, 1997). The endpoints are summarised in the table below and have been modified by mitigation factor of 3.55 to account for the anticipated binding of the polymer with dissolved organic carbon in surface waters.

Endpoint	*Result*	*Assessment Conclusion*
Acute Toxicity		
Fish Toxicity (96 hour)	LC50 = 16.7 mg/L	Harmful
Daphnia Toxicity (48 hour)	EC50 = 100.7 mg/L	Not harmful
Algal Toxicity (96 hour)	EC50 = 9.8 mg/L	Toxic

Based on the worst case SAR estimations, the notified polymer is potentially harmful or toxic to aquatic organisms 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 general indications of the likely environmental effects of the polymer for the purposes of risk assessment. 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 GHS.

Based on above results, the notified polymer is not expected to exhibit acute aquatic toxicity based on the experimental algae data for the read-across polymer, and would, at worst, exhibit potentially harmful or toxic effects to aquatic organisms based on predicted data.

7.2.1. Predicted No-Effect Concentration

A predicted no-effect concentration (PNEC) has not been calculated on the basis that the notified polymer is not expected to have significant ecological hazard properties based on measured ecotoxicological data. Further, the release of the notified polymer to the aquatic environment will be very limited based on its reported use pattern.

7.3. Environmental Risk Assessment

The risk quotient (Q = PEC/PNEC) for the notified polymer has not been calculated as release to the aquatic environment is not expected based on its reported use pattern. The majority of the notified polymer will ultimately be cured into an inert matrix. In its cured state, the notified polymer is irreversibly bound within an inert polymer matrix, and is not expected to be bioavailable or mobile. Therefore, based on its use pattern and limited aquatic exposure, the notified polymer is not considered to pose an unreasonable risk to the environment.

BIBLIOGRAPHY

Boethling, RS & Nabholz VJ (1997) Environmental Assessment of polymers under the U.S. Toxic Substances Control Act. In: Hamilton, JD Sutcliffe R ed. Ecological Assessment of Polymers Strategies for Product Stewardship and Regulatory Programs, 1st ed. New York, Van Nostrand Reinhold, pp 187-234.

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

SWA (2015) 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.