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

PUBLIC REPORT

Polymer in RCP8355

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 and Energy.

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**Director
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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/2015	Axalta Coating Systems Australia Pty Ltd	Polymer in RCP8355	ND*	< 10 tonnes per annum	Component of automotive and industrial 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 of Classification and Labelling of Chemicals (GHS), as adopted for industrial chemicals in Australia.

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

- 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 finished coating products:
 - Enclosed, automated processes, where possible
- 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 in the finished coating products:
 - Avoid contact with skin and eyes
- 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 finished coating products:
 - Coverall
 - Impervious gloves
 - Goggles
 - Respirators for any spray applications

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 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.

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 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 1,000 g/mol;

or

- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from component of automotive and industrial 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.

Safety Data Sheet

The SDS of the products containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

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 Number Average Molecular Weight (Mn) \geq 1,000 g/mol

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, use details, import volume and identity of recipients.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed for all physical and chemical properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

Canada (CEPA 2002)
United States (EPA 2007)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in RCP8355

MOLECULAR WEIGHT

Number Average Molecular Weight (Mn) is $>$ 1,000 g/mol.

ANALYTICAL DATA

Reference IR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY

$>$ 99%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: Clear liquid dispersion*

Property	Value	Data Source/Justification
Melting Point/Freezing Point*	Not determined	Expected to be $<$ 0 °C
Boiling Point*	96 °C at 101.3 kPa	SDS
Density*	980 kg/m ³	SDS
Vapour Pressure*	36.6 hPa	SDS
Water Solubility	~0.5 g/L at 20 °C	Measured for an acceptable analogue. The measurement includes water dispersed polymer and other material, which could not be separated from solution.
Hydrolysis as a Function of pH	Not determined	Contains functionalities susceptible to hydrolysis but unlikely to occur in the environmentally relevant pH range (4-9)

Property	Value	Data Source/Justification
Partition Coefficient (n-octanol/water)	Not determined	Supplied as a solution in organic solvents. Expected to partition to n-octanol based on hydrophobic functionalities.
Adsorption/Desorption	Not determined	Expected to sorb to soil and sediment, and have low mobility in the environment on the basis of its high molecular weight, and the presence of both hydrophobic and cationic functional groups
Dissociation Constant	Not determined	Does not contain dissociable functionalities
Flash Point*	10 °C	SDS
Flammability	Not determined	Not expected to be highly flammable
Autoignition Temperature*	393 °C	SDS
Explosive Properties	Not determined	Contains no functional groups that would imply explosive properties
Oxidising Properties	Not determined	Contains no functional groups that would imply oxidative properties

* Properties of the product RCP8355 that contains the notified polymer in organic solvent. The notified polymer will be manufactured in the organic solution and is not expected to be isolated during use.

DISCUSSION OF PROPERTIES

For full details of tests on physical and chemical properties, refer to Appendix A. The notified polymer is cationic under normal environmental conditions.

The notified polymer will be manufactured overseas in organic solvents and will not be isolated after manufacture. Products containing the notified polymer may be highly flammable due to the presence of organic solvents.

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.

However, the imported finished coating products containing the notified polymer at < 15% concentration may be classified as highly flammable liquids and vapours due to the presence of organic solvents. Introducers of the products should consider their obligations under Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG code) (NTC, 2017).

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. It will be imported into Australia as a component of finished products at concentrations < 15%, which will be distributed for use as industrial and automotive coatings. Local reformulation of the finished coating products using the notified polymer will not occur.

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

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

PORT OF ENTRY

Sydney (primary), Melbourne and Brisbane

TRANSPORTATION AND PACKAGING

The finished coating products containing the notified polymer will be imported in 1 L, 4 L or 20 L steel cans or pails ready for sale, and transported across Australia as full container loads (FCL). The coatings products will not be repackaged within Australia for distribution.

USE

The notified polymer will be used as a resin component of automotive and industrial coatings at < 15% concentration.

OPERATION DESCRIPTION

The finished coating products containing the notified polymer at concentration of < 15% will be applied by spray or brush in an industrial setting, such as automotive workshops and vehicle manufacturing facilities. The coating products may be blended with other paint additives. Individual samples may be taken from various stages for quality control prior to application. Equipment used to apply the coatings will be cleaned with appropriate solvents and wastes will be collected for disposal in accordance to the environmental regulations.

6. HUMAN HEALTH IMPLICATIONS**6.1. Exposure Assessment****6.1.1. Occupational Exposure****CATEGORY OF WORKERS**

<i>Category of Worker</i>	<i>Exposure Duration (hours/day)</i>	<i>Exposure Frequency (days/year)</i>
Transport (wharf to warehouse)	4	20
Warehouse	1.5	20
Transport (warehouse to refinish shop)	4	20
Spray painters	0.7	250

EXPOSURE DETAILS*Transport and Storage*

Transport and warehouse workers may come into contact with the notified polymer only in the unlikely event of accidental breaching of the containers. Appropriate personal protective equipment (PPE) is recommended for use by workers to reduce the potential for exposure.

End use

Professional workers will apply the coating products containing the notified polymer at < 15 % in a controlled industrial setting, and may have the potential to be exposed via dermal, ocular and inhalation routes to the notified polymer during applications of the coatings by brush or spray. Exposure will be minimised through the use of PPE as described on the product SDS, including coveralls, gloves and goggles as well as respiratory protection and designated booths when applied by spray.

Once the coatings have dried, the notified polymer will be bound within a polymer matrix and will not be available for exposure.

6.1.2. Public Exposure

The finished coating products containing the notified polymer will not be available to the general public. The products will require specialised equipment to apply and will be used exclusively by professional workers. Members of the public may come into contact with coated articles; however, once the coatings are cured, the notified polymer is expected to be bound into the inert matrix and will not be bioavailable for exposure.

6.2. Human Health Effects Assessment

No toxicology data were submitted for the notified polymer or any suitable analogues. Based on the relatively high molecular weight ($M_n > 1,000$ g/mol) with low level of low molecular weight species (< 5% molecules with molecular weight < 1,000 g/mol), absorption of the notified polymer across the skin or biological membranes is expected to be limited.

Irritation and sensitisation

The notified polymer contains structural alerts for irritation and sensitisation. The potential for skin sensitisation via systemic exposure is expected to be limited due to the relatively high molecular weight of the notified polymer. However, considering that the notified polymer is cationic with irritation structural alert, the potential for irritation cannot be totally ruled out.

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.

6.3. Human Health Risk Characterisation**6.3.1. Occupational Health and Safety**

During end-use, professional workers may come into contact with the notified polymer at up to < 15% concentration. Workers may have potential for exposure via dermal route and, incidentally, via ocular route. However, the potential for the polymer to cause adverse health effects including irritation is expected to be limited, provided that appropriate PPE is used and safe work practices are followed to minimise the exposure.

Under the conditions of the occupational settings described, the notified polymer is not considered to pose an unreasonable risk to the health of workers.

6.3.2. Public Health

Products containing the notified polymer will not be available to the public. Members of the public may come into contact with articles coated with finished coating products containing the notified polymer. However, the notified polymer in cured coatings is expected to be bound with the inert matrix and will not be available for exposure.

When used in the proposed manner, 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, repackaged or reformulated at the storage facility, and the release during transport and storage is expected to be from leaks and spills only. These leaks and spills are expected to be absorbed into inert materials and disposed of to landfill.

RELEASE OF CHEMICAL FROM USE

The notifier estimated that up to a maximum of 65% of the import volume will be generated as wastes during use (e.g., overspray, mixing containers and equipment washings). These wastes are expected to be collected and disposed of to landfill.

RELEASE OF CHEMICAL FROM DISPOSAL

Residual polymer is expected to be in packaging and cleaning materials that are disposed of to landfill. At the end of their useful lives, the products containing the notified polymer will eventually be disposed of to landfill or recycled. Therefore most of the notified polymer will be present in landfill and irreversibly bound within the cured paint film. As such the notified polymer is not expected to be released to the environment from landfill as it will not be mobile. Thermal degradation is expected to occur during recycling of coated products, and hence release of the notified polymer to the environment from this process is also unlikely.

7.1.2. Environmental Fate

No environmental fate 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, as the majority of the imported notified polymer is expected to be irreversibly bound within the end product coatings. At the end of their useful lives, the products containing the notified polymer will eventually be sent to landfill or recycled. The notified polymer is not expected to be mobile in landfill or bioavailable given that it is most likely be bound within coatings. In addition, the polymer is not likely to be readily biodegradable in the environment based on the structure of the compound. Therefore, it is likely to undergo slow degradation in landfill via biotic and abiotic processes, eventually forming water and oxides of carbon and nitrogen. The notified polymer is expected to undergo thermal degradation during recycling to water and oxides of carbon and nitrogen.

7.1.3. Predicted Environmental Concentration (PEC)

The predicted environmental concentration (PEC) for the notified polymer has not been calculated since no significant release to the environment is expected based on its reported use pattern.

7.2. Environmental Effects Assessment

The notified polymer is cationic, and hence may have toxic effects to aquatic organisms. However, based on its use pattern and limited exposure to the aquatic environment, the notified polymer is not expected to be readily bioavailable to cause any adverse effect to the aquatic organisms.

7.2.1. Predicted No-Effect Concentration

A predicted no-effect concentration (PNEC) has not been calculated for the notified polymer as, based on its reported use pattern, eco-toxicologically significant quantities are not expected to be released to the aquatic environment.

7.3. Environmental Risk Assessment

The risk quotient ($Q = \text{PEC}/\text{PNEC}$) for the notified polymer has not been calculated as the PEC and PNEC were not calculated for the notified polymer. The release of the notified polymer to the aquatic environment is not expected to reach eco-toxicologically significant quantities. Therefore, on the basis of the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES**Water Solubility** ~ 0.5 g/L at 25°C based on an acceptable analogue**Method** In house method similar to OECD TG 105 Water Solubility.

Three samples of 10 g each were added to 500 mL of water and stirred for 24, 28 and 72 hours respectively at 25°C. Aliquots (70 mL) of the aqueous phase were centrifuged at 3,000 rpm for 2 hours, the supernatant transferred to evaporating dishes and baked for one hour at 110°C. Observations made in the water solubility study suggest that a dispersion of the test substance was formed, the test substance increased over time suggested equilibrium was not reached, and there may have been interference by suspended particles in the aqueous phase. Modifications were made so that aliquots (70 mL) of the aqueous phase were centrifuged at 1,700 rpm for 2 hours, supernatant was filtered through a 0.5 µm filter, supernatant was then transferred to an evaporating dish, and sample was baked for two hours at 110°C. There was still an increase of solubility over time under the revised method.

Remarks Flask Method**Test Facility** DuPont (2006)

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- NTC (2017) Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG code), Edition 7.5, National Transport Commission, Commonwealth of Australia
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