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

PUBLIC REPORT

Polymer in DUROFTAL VPI 2801/75 BG Liquid Coating Resin

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/1815	Allnex Australia Pty Ltd PPG Industries Australia Pty Limited	Polymer in DUROFTAL VPI 2801/75 BG Liquid Coating Resin	ND*	< 1 tonne per annum	Component of 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 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

Under the conditions of the occupational settings described, the 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

- 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.

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 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 importation volume exceeds one tonne per annum notified polymer;

or

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

(Material) Safety Data Sheet

The (M)SDSs of the products containing the notified polymer provided by the notifier were reviewed by NICNAS. The accuracy of the information on the (M)SDSs remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

Allnex Australia Pty Ltd (ABN: 24 160 397 768)
Level 12, 680 George Street
SYDNEY NSW 2000

PPG Industries Australia Pty Limited (ABN: 82 055 500 939)
Mc Naughton Road
Clayton VIC 3168

NOTIFICATION CATEGORY

Limited-small volume: Synthetic polymer with Mn < 1,000 Da (1 tonne or less per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: chemical name, CAS number, molecular and structural formulae, molecular weight, analytical data, degree of purity, polymer constituents, residual monomers, impurities, additives/adjuvants and import volume

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: all physico-chemical endpoints

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

USA, Korea, China, Japan

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

DUROFTAL VPI 2801/75 BG Liquid Coating Resin (containing the notified polymer at up to 77%)

MOLECULAR WEIGHT

Mn > 500 Da

ANALYTICAL DATA

Reference IR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY

> 92%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: colourless to light yellow liquid*

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	Estimated by the notifier to be < 0°C
Boiling Point	100-200 °C	Product (M)SDS*
Density	1,100 kg/m ³ at 20 °C	Product (M)SDS*
Vapour Pressure	Not determined	Expected to be low based on molecular weight
Water Solubility	2.26 × 10 ⁻⁸ g/L at 25 °C	Calculated using WSKOW v1.42 (US EPA, 2011)
Hydrolysis as a Function of pH	Not determined	Stable under normal conditions of use; contains functional groups capable of

Partition Coefficient (n-octanol/water)	log Pow = 7.19 at 25 °C	hydrolysing under extreme pH conditions Calculated using KOWWIN v1.68 (US EPA, 2011)
Adsorption/Desorption	log Koc = 3.95 at 25 °C	Calculated using KOCWIN v2.00 (US EPA, 2011)
Dissociation Constant	Not determined	Does not contain any acid/base groups
Particle Size	Not determined	Imported in solvent
Flash Point	~ 75 °C	Product (M)SDS*
Autoignition Temperature	Not determined	Not expected to autoignite prior to decomposition
Explosive Properties	Predicted negative	Contains no functional groups that would infer explosive properties
Oxidising Properties	Predicted negative	Contains no functional groups that would infer oxidising properties

*For DUROFTAL VPI 2801/75 BG Liquid Coating Resin (containing the notified polymer at up to 77%)

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 at a concentration of up to 77% in the finished product.

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

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

PORT OF ENTRY

Melbourne and Sydney

TRANSPORTATION AND PACKAGING

The finished product containing the notified polymer will be imported in 205 L steel drums or 4 and 20 L metal cans and transported by road or rail.

USE

The notified polymer will be used as a component of coatings for aircraft, and will be applied by spray in an industrial environment. The notified polymer will not be available to the public.

OPERATION DESCRIPTION

The notified polymer will not be manufactured, reformulated or repackaged in Australia.

When imported in 205 L drums the contents (containing up to 77% notified polymer) will be pumped into the mixing tank. In the case of the smaller containers, the contents will be transferred manually by pouring them into the top of the mixing tank. Inside the mixing tank the imported product will be combined with a polyisocyanate cross linking agent, and tinter prior to making the final coating containing the notified polymer at a concentration of up to 54%. The mixed paint will then be manually added to the spray equipment reservoir. The spray application to aircraft external bodies will occur within a large aircraft painting hangar supplied with air extraction to remove vapours and paint particulate overspray. The ventilation system is expected to utilise a down-draft design, where paint overspray will be carried downward and then extracted from beneath the aircraft.

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 and Warehousing	0.5 – 2	20
Plant Operators/Spray Painters	20 – 40	200

EXPOSURE DETAILS

Transport and Warehousing

The notified polymer will be imported and stored in the original sealed containers. Therefore, workers would only come into contact with the notified polymer in the event of an accident where the containers are breached.

Mixing and end-use

During mixing of the imported product to make the final coatings and spray application of the coatings to aircraft external bodies, there is potential for dermal, ocular and inhalation exposure of workers to the notified polymer at up to 77%. The notifier has stated that all workers involved in the application of the coating are expected to wear appropriate personal protective equipment (PPE) including chemical resistant disposable overalls with hood, impermeable gloves, safety boots with disposable covers, and air-supplied full face respirators. Air extraction to remove hazardous vapours and paint particulate overspray is also expected to be used to minimise the inhalation exposure to workers.

Once the coating containing the notified polymer is cured, the polymer will be bound into the matrix of the finished coating and will not be bioavailable.

6.1.2. Public Exposure

The product containing the notified polymer (up to 77% concentration) will not be available to the general public. Once the final product containing the notified polymer is applied to aircraft and cured, it will be bound into the matrix of the finished coating and will not be bioavailable. Therefore, the potential for exposure to the public from the notified polymer is expected to be negligible.

6.2. Human Health Effects Assessment

No toxicity data were submitted.

Toxicokinetics, metabolism and distribution.

No toxicokinetics, metabolism or distribution studies were submitted for the notified polymer. For dermal absorption, molecular weights below 100 Da are favourable for absorption and molecular weights above 500 Da do not favour absorption (ECHA, 2014). If the partition coefficient of a substance is above 6 and/or the water solubility is < 1 mg/L, the rate of transfer between the stratum corneum and the epidermis will be slow and will limit absorption across the skin (ECHA, 2014). Due to the moderately high molecular weight (> 500 Da, < 10% < 500 Da), the calculated high partition coefficient (log Pow = 7.19 at 25 °C) and the calculated low water solubility (2.26×10^{-8} g/L at 25 °C) of the notified polymer, its dermal absorption is expected to be low.

The notified polymer does not contain any structural alerts of concern and combined with the predicted low dermal absorption, no systemic toxicity is expected following dermal exposure.

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

Workers may experience dermal, ocular and inhalation exposure to the notified polymer (at up to 77% concentration) during mixing of the imported product to make the final coatings and spray application of the coatings to aircraft external bodies. Occupational exposure to the notified polymer is expected to be minimised due to the presence of engineering controls (air extraction to remove vapours and paint particulate overspray) and the use of PPE (chemical resistant disposable overalls with hood, impermeable gloves, safety boots with disposable covers, and air-supplied full face 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.

Based on the use of measures used to mitigate exposure and the expected low systemic toxicity 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 notified polymer is intended for industrial use only. Given that the notified polymer will not be 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

The notified polymer will be imported into Australia and reformulated into surface coatings for aircraft. Minimal release of the notified polymer into the environment is expected, as blending is expected to occur within a closed system. Accidental spills and leaks during transport and blending will be contained and collected for disposal to landfill, in accordance with local government regulations.

RELEASE OF CHEMICAL FROM USE

The notified polymer will be used as a component of surface coatings for aircraft, to be applied by spray guns in specialised painting hangars. The major environmental release of the notified polymer is expected to come from overspray during application of the coatings (estimated by the notifier to be up to 40% of the import volume). Particulate overspray is expected to be contained by ventilation systems and collected on drop sheets to be disposed of to landfill.

It is estimated that a maximum of 2% of the import quantity of the notified polymer may be released to the environment as a result of accidental spills and leaks, as residue in import containers, and as waste material. Any significant spillage is expected to be contained on site and disposed of to landfill in accordance with local government regulations. Residues and waste material of the notified polymer in empty containers are expected to be disposed of to landfill, in accordance with local government regulation.

RELEASE OF CHEMICAL FROM DISPOSAL

The notified polymer in surface coatings are expected to share the fate of the substrate to which it has been applied, and are predominantly expected to be disposed of to landfill, or thermally decomposed during substrate reclamation.

Waste water, from the cleaning of equipment and transport containers, is expected to be collected by an approved waste management company for disposal via incineration in cement kilns. Release of the notified polymer to surface water is expected to be negligible.

7.1.2. Environmental Fate

No environmental fate data were submitted for the notified polymer. The notified polymer will become irreversibly bound to form part of an inert coating matrix once cured. The notified polymer will share the fate of the coated substrates, which will involve eventual disposal to landfill, or undergo thermal decomposition during substrate recycling. In its cured form, the notified polymer is not expected to be bioavailable nor biodegradable. The notified polymer in solid waste disposed of to landfill is not likely to be mobile in the environment, due to its limited solubility in water and potential to adsorb to soil and sediment, based on its predicted adsorption coefficient ($\log K_{OC} = 3.95$) and predicted partition coefficient ($\log P_{OW} = 7.19$). Bioaccumulation of the uncured notified polymer is unlikely, as it is not expected to cross biological membranes due to its high molecular weight

and low water solubility. The notified polymer is expected to eventually degrade by abiotic and biotic processes in landfill, or by thermal decomposition, to form water and oxides of carbon.

7.1.3. Predicted Environmental Concentration (PEC)

As significant aquatic exposure is not expected at any stage of the notified polymer's life-cycle within Australia, the predicted environmental concentration (PEC) has not been calculated.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted for the notified polymer. The notified polymer is a non-ionic polymer which is generally of low concern to the environment. The notified polymer is not expected to be bioaccumulative due to its high molecular weight, nor expected to bioconcentrate in aquatic organisms due to its low solubility in water. The majority of the notified polymer will be irreversibly bound to an inert coating matrix, and is not expected to be bioavailable. Therefore, the notified polymer has not been formally classified under the Globally Harmonised System of Classification and Labelling of Chemicals (GHS, United Nations, 2009) for acute and chronic effects.

7.2.1. Predicted No-Effect Concentration

The predicted no-effects concentration (PNEC) has not been calculated for the notified polymer, as no ecotoxicity data were submitted. Based on its assessed usage pattern, ecotoxicologically significant quantities are not expected to be released to the aquatic environment.

7.3. Environmental Risk Assessment

The Risk Quotient ($Q = \text{PEC}/\text{PNEC}$) has not been calculated for the notified polymer as it is not expected to reach ecotoxicologically significant concentrations, based on its assessed usage pattern as a component of surface coatings. The notified polymer is not likely to be released into the aquatic environment in a bioavailable form, as the notified polymer is irreversibly bound into an inert coating matrix. In landfill, the notified polymer is expected to adsorb to soil and sediment based on its calculated adsorption coefficient and low water solubility. Therefore, use of the notified polymer is not expected to pose an unreasonable risk to the environment.

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