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

FULL PUBLIC REPORT

Polymer in Uracron CS 115 XB

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**Director
Chemicals Notification and Assessment**

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FULL PUBLIC REPORT**Polymer in Uracron CS 115 XB****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)
PPG Industries Australia Ltd (ABN 82 055 500 939)
McNaughton Rd
Clayton VIC 3168

NOTIFICATION CATEGORY
Limited: Polymer with NAMW ≥ 1000 (greater than 1 tonne per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication:
Chemical name
CAS number
Molecular formula
Structural formula
Molecular weight
Spectral data
Polymer composition
Details of impurities
Import volume
Identity of customers

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)
No variation to the schedule of data requirements is claimed.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)
None

NOTIFICATION IN OTHER COUNTRIES
None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
Uracron CS115 XB

METHODS OF DETECTION AND DETERMINATION

ANALYTICAL METHOD	Infrared spectroscopy
Remarks	A reference spectrum was supplied

3. COMPOSITION

DEGREE OF PURITY
High

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS

The hazardous impurities comprise some of the residual monomers, all of which are present at below the concentrations which would lead to classification of the notified polymer as a hazardous substance.

ADDITIVES/ADJUVANTS

<i>Chemical Name</i>	xylene (mixed isomers)		
<i>CAS No.</i>	1330-20-7	<i>Weight %</i>	10 - 30

<i>Chemical Name</i>	1-butanol		
<i>CAS No.</i>	71-36-3	<i>Weight %</i>	10 - 30

DEGRADATION PRODUCTS

Oxides of nitrogen and sulphur may be produced if burnt.

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

None

4. INTRODUCTION AND USE INFORMATION

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

The notified polymer will be imported as a 60 % (w/w) solution in organic solvents and will be reformulated in Australia to produce exterior can coatings.

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

Less than 10 tonnes per annum notified polymer will be imported during each of the first five years.

USE

The notifier polymer is a component (< 5 %) of a can coating formulation.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, Transport and Storage

PORT OF ENTRY

Melbourne

IDENTITY OF MANUFACTURER/RECIPIENTS

Not specified; use of the can coating will occur at a small number of sites.

TRANSPORTATION AND PACKAGING

The notified polymer solution will be imported by sea from The Netherlands in 200 L drums. The formulated can coating containing the notified polymer will be transported by road in 20 and 200 L steel drum to the end user sites.

5.2. Operation Description

Coating Formulation

The polymer solution will be transferred into a high speed mixer and blended with other coatings ingredients. The resulting coatings solution is filtered and packaged into 20 and 200 L steel drums prior to distribution to end user sites.

Coatings Application

The coatings solution will be transferred under exhaust ventilation to a reservoir via a mechanical decanting pump. The reservoir feeds onto transfer rollers which then apply the coatings formulation to the sheet metal as it is fed through the coating machine. During the application process, any residual coatings formulation remaining on the application roller is removed by a scraper and returned into the reservoir via a drip tray for reuse. After application the sheet metal is fed into a multi-zone oven where heat dries and cures the coating prior to distribution to the can manufacturing sites.

5.3. Occupational exposure

The paint is manufactured in mixers under local exhaust ventilation to capture volatiles at source. The ventilation system is operated and maintained to meet the exposure standards for the solvent blend containing the notified polymer. The number of workers exposed is:

Paint manufacture	3 workers, 8 hours/day, 30 days/year
Quality control testing	3 workers, 8 hours/day, 30 days/year
Filling	3 workers, 8 hours/day, 30 days/year.

The possibility exists for dermal exposure due to minor spillage, cleaning and maintenance of equipment and from rinsing of the steel drums.

Roller coating of cans is carried out in an automated process with effective fume extraction systems. Engineering controls are designed to ensure the occupational exposure limits for organic solvents are met. Thirty workers will be exposed for 4 hours/day, 220 days/year. Dermal exposure may occur from minor spillage and from cleaning and maintenance of equipment.

5.4. Release

RELEASE OF CHEMICAL AT SITE

During coatings production, the notifier estimates that up to 100 kg per annum of waste containing the notified polymer will be generated from cleaning up minor spills, during the cleaning of formulation equipment and the rinsing of import drums.

RELEASE OF CHEMICAL FROM USE

The notifier further estimates that, given a transfer efficiency of at least 90%, up to 1000 kg per annum of the notified polymer will be disposed of during coatings application and equipment cleaning and up to 100 kg of the notified polymer will be disposed of during drum cleaning.

5.5. Disposal

The notified polymer in waste resulting from coatings formulation and application and empty import drums will be disposed of to landfill. The notifier indicates that incineration of wastes may also occur. The solvent used to clean formulation equipment will be collected and undergo the Dusol process by which the solvent is recycled and the remaining solid waste disposed of in landfill or incinerated.

5.6. Public exposure

The public will not be exposed to the notified polymer except in the event of a transportation accident. After the notified polymer has cured and crosslinked to form an inert can coating, there will be widespread contact, but the coating will not be bioavailable.

6. PHYSICAL AND CHEMICAL PROPERTIES

A number of data items for physical and chemical properties have been provided for the polymer solution, as the notified polymer itself is never isolated from solution under normal circumstances.

Appearance at 20°C and 101.3 kPa	Clear viscous liquid
Boiling Point	118°C at 101.3 kPa
Remarks	Boiling point of solvent.
Density	850 kg/m ³ at 25°C
Remarks	Polymer solution.
Vapour Pressure	Not volatile
Remarks	The notified polymer itself will not be volatile due to its high molecular weight.
Water Solubility	Not determined

Remarks	The notifier indicated that the notified polymer as it is not isolated from the organic solvent in which it is produced and that as a result no water solubility data is available. However, a solution/extractability test has been included in the submission. Aliquots of the ground test material (10 g) were added to water (1000 mL) and stirred for a period of 24 h at 20°C. After this time the solution was filtered to remove excess polymeric material and the total organic carbon content of the aqueous phase was determined. The authors of the study indicated that as the carbon content of the polymer was not known it was not possible to determine the mean dissolved polymer concentrations in the aqueous extracts. However, they have attributed the organic carbon found in the sample after filtration to dissolved butanol and xylene rather than the polymer. A low water solubility is consistent with the notified polymer's structure which consists of predominantly hydrophobic aromatic and aliphatic monomers.
TEST FACILITY	Chemex (2002)
Hydrolysis as a Function of pH	Not determined
Remarks	The notified polymer contains amide linkages and anhydride functional groups that could be expected to undergo hydrolysis under extreme pH conditions. However, in the environmental pH range of 4 to 9, significant hydrolysis is unlikely to occur.
Partition Coefficient (n-octanol/water)	Not determined
Remarks	The likely hydrophobic nature of the notified polymer is indicative of partitioning into the organic phase.
Adsorption/Desorption	Not determined
Remarks	The notified polymer is expected to be relatively immobile in soil due to its expected low water solubility and large molecular weight.
Dissociation Constant	Not determined
Remarks	The notified polymer does not contain any dissociable functional groups, although reaction with water will lead to formation of carboxylic acid groups.
Particle Size	Not determined
Remarks	The notified polymer will only be used in Australia in solution form.
Flash Point	24°C at 101 kPa
Remarks	For the solvent xylene
Flammability Limits	Upper: 11.3 % Lower: 1.4 %
Remarks	For the solvent 1-butanol
Autoignition Temperature	340°C
Remarks	For the solvent 1-butanol
Explosive Properties	
Remarks	Not expected to be explosive
Reactivity	
Remarks	Anhydride functional groups may hydrolyse to produce carboxylic acid groups; no

depolymerisation expected under normal environmental conditions.

7. TOXICOLOGICAL INVESTIGATIONS

No toxicity data were submitted.

8. ENVIRONMENT

8.1. Environmental fate

No environmental fate data were submitted

8.2. Ecotoxicological investigations

No ecotoxicity data were submitted.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

Exposure

The majority of the notified polymer will be applied as a coating to the external surface of cans and, once applied and heat cured, poses little risk to the environment. During coatings production up to 100 kg per annum of waste containing the notified polymer will be generated from cleaning up minor spills, during the cleaning of formulation equipment and the rinsing of import drums and up to a further 1000 kg per annum will be disposed of during coatings application. Wastes containing the notified polymer resulting from coatings formulation and application and empty import drums will be disposed of to landfill after evaporation of the solvent using the Dusol process. The notifier indicates that incineration of wastes may also occur. At the end of their useful lives, the can to which the coating has been applied will also be disposed to landfill.

Fate

The notified polymer is expected to be insoluble in water and as such is unlikely to be mobile in either aquatic or terrestrial compartments. As a consequence, in landfill it is expected to associate with soil and sediment and slowly degraded through biotic and abiotic processes to water and oxides of carbon, nitrogen and sulphur. Incineration of the notifier polymer will produce water vapour and oxides of carbon, nitrogen and sulphur.

Due to its large molecular weight ($>>1000$ MW), the notified polymer is not expected to bioaccumulate.

9.1.2. Environment – effects assessment

No ecotoxicological data were submitted.

9.1.3. Environment – risk characterisation

The majority of the notified polymer will be applied as a coating to the external surface of cans and, once applied and heat cured, poses little risk to the environment. Eventually most of the import volume will be disposed to landfill where over time as the coating disintegrates, the notified polymer is expected to associate with soil and sediment and slowly degraded through biotic and abiotic processes to water and oxides of carbon, nitrogen and sulphur. Incineration of the notifier polymer will produce water vapour and oxides of carbon, nitrogen and sulphur.

Based on low environmental exposure resulting from its limited potential for release to sewer and high coating transfer efficiency, the likely risk to the environment is expected to be low.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Dermal and ocular exposure may occur during certain formulation processes, and during coating application. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls (exhaust ventilation) and personal protective equipment worn by workers.

After application and once dried, the coating containing the notified polymer is cured into an inert matrix and is unavailable to exposure.

During transport and storage, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

9.2.2. Public health – exposure assessment

No exposure of the public to uncured notified polymer is expected; the cured notified polymer in can coatings will not be bioavailable.

9.2.3. Human health - effects assessment

The polymer contains the acid anhydride functional group at low levels (FGEW 3600). This may lead to some irritant properties. The notified polymer will be imported in solution in xylene and 1-butanol, and the solution is therefore a hazardous substance. It is possible that the anhydride will react with the butanol in the solution.

9.2.4. Occupational health and safety – risk characterisation

Based on the limited potential for exposure to the notified polymer and the low bioavailability of the polymer due to its high molecular weight, the OHS risk presented by the notified polymer is expected to be low.

9.2.5. Public health – risk characterisation

Due to the lack of public exposure to the notified polymer, the public health risk presented by the polymer will be minimal.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS**10.1. Hazard classification**

Based on the available data the notified polymer is not classified as hazardous under the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999).

10.2. Environmental risk assessment

The notified polymer is not likely to present a hazard to the environment when it is stored, transported and used in the proposed manner.

10.3. Human health risk assessment**10.3.1. Occupational health and safety**

There is Low Concern to occupational health and safety arising from the notified polymer under the conditions of the occupational settings described.

10.3.2. Public health

There is Negligible Concern to public health when used as an exterior can coating.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS of the notified polymer and products containing the polymer provided by the notifier were in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a). They are published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

11.2. Label

The label for the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the label remains the responsibility of the applicant.

12. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- 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 NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Disposal

- Once cured, solid waste containing the notified polymer should be disposed of in landfill or by incineration.

Emergency procedures

- Spills/release of the notified polymer should be contained as described in the MSDS (ie. Collect spilled material with an inert absorbent) and the resulting waste disposed of to an authorised landfill.

12.1. Secondary notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under Section 64(2) of the Act:
 - if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.

13. BIBLIOGRAPHY

Chemex (2002) Solution/Extraction Behaviour of Uracron CS 115 XB. Reference No. ENV6124/060201. Chemex Environmental International Limited, Cambridge, UK (unpublished report provided by the notifier).

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