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

FULL PUBLIC REPORT

Polymer in KZ-420

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (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 Ageing, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Department of Sustainability, Environment, Water, Population and Communities.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This Full 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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FULL PUBLIC REPORT**Polymer in KZ-420****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

PPG Industries Australia Pty Ltd (ABN 82 055 500 939)
McNaughton Rd
CLAYTON VIC 3168

NOTIFICATION CATEGORY

Limited: Synthetic polymer with $M_n \geq 1000$ 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, use details and import volume.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: melting/boiling point, vapour pressure, water solubility, hydrolysis as a function of pH, partition co-efficient, absorption/desorption, dissociation constant, flash point, flammability limits, autoignition temperature, explosive properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

KZ-420 (containing <50% notified polymer)

ANALYTICAL DATA

Reference GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY >90%

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

None

DEGRADATION PRODUCTS

None

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20°C AND 101.3 kPa*: Yellow viscous liquid

| Property | Value | Data Source/Justification |
|------------------|---------------------------------|---|
| Melting Point* | Not determined | Liquid at room temperature |
| Boiling Point | Expected to decompose at >200°C | Estimated |
| Density* | 990-1030 kg/m ³ | MSDS |
| Vapour Pressure | <10 ⁻² kPa at 25°C | Estimated (US EPA, 2010) |
| Water Solubility | Not determined | The notified polymer is expected to have low solubility in water based on its predominately hydrophobic |

| | | |
|---|-------------------------------|---|
| Hydrolysis as a Function of pH | Not determined | structure and its use in solvent-borne coatings The notified polymer does not contain any readily hydrolysable functionality and is therefore expected to be hydrolytically stable |
| Partition Coefficient (n-octanol/water) | Not determined | The notified polymer may partition from water into octanol based on its hydrophobicity |
| Adsorption/Desorption | Not determined | Based on its presumed low solubility in water and potential cationic functionality, the notified polymer is expected to absorb to soil and sediment and have low mobility in soil |
| Dissociation Constant | Not determined | The notified polymer may be ionised in the environmental pH range (4-9) based on the presence of basic functional groups in the polymer structure |
| Flash Point* | 31°C | MSDS |
| Flammability* | Upper: 8.75% Lower: 1.13% | MSDS |
| Autoignition Temperature* | >305°C | MSDS |
| Explosive Properties | Not predicted to be explosive | Estimated based on chemical structure |

* Notified polymer as imported at <50% concentration as a solvent solution.

DISCUSSION OF PROPERTIES

For full details of tests on physical and chemical properties, refer to Appendix A.

Dangerous Goods classification

Based on the submitted physical-chemical data in the above table the notified polymer is not classified according to the Australian Dangerous Goods Code (NTC, 2007). However the data above do not address all Dangerous Goods endpoints. Therefore consideration of all endpoints should be undertaken before a final decision on the Dangerous Goods classification is made by the introducer of the polymer.

5. INTRODUCTION AND USE INFORMATION

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

The notified polymer will be imported as a component of a solvent solution at < 50%.

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

| <i>Year</i> | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> |
|---------------|----------|----------|----------|----------|----------|
| <i>Tonnes</i> | <10 | <10 | <10 | <10 | <10 |

PORT OF ENTRY

Melbourne

IDENTITY OF MANUFACTURER/RECIPIENTS

PPG Industries Australia Pty Ltd

TRANSPORTATION AND PACKAGING

The notified polymer will be imported by sea in sealed 1, 4 and 5 L cans, and transported to end use sites by rail or road.

USE

The notified polymer will be used at <50% concentration as a component of 2-part coatings for application to marine structures.

OPERATION DESCRIPTION

At end use sites, following decanting and blending with other paint components, the coating containing the notified polymer will be applied mainly by airless spray but potentially also by roller and brush to marine structures in industrial settings.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

6.1.1. Occupational Exposure

NUMBER AND CATEGORY OF WORKERS

| <i>Category of Worker</i> | <i>Number</i> | <i>Exposure Duration (hours/day)</i> | <i>Exposure Frequency (days/year)</i> |
|---------------------------|---------------|--|---|
| Transport and storage | 6-8 | 2-3 | 10-15 |
| Coating application | 100 | 6 | 260 |

EXPOSURE DETAILS

Exposure during transport and storage is not expected except in the case of an accident involving a breach of the containers.

Dermal and ocular exposure to spills and splashes of the notified polymer to painters at industrial sites is possible during decanting and mixing the imported solvent solution containing the notified polymer at <50% concentration.

Painters may come into contact with the notified polymer (<50%) through inhalation during spray application, as well as dermal and ocular routes during application, cleaning and maintenance of equipment. The use of personal protective equipment (PPE) such as organic vapour respirators, gloves, goggles and coveralls should minimise exposure.

After application and once cured and dried, the notified polymer will be reacted into the polymer matrix and will not be bioavailable.

6.1.2. Public Exposure

Coatings containing the notified polymer at <50% are intended for industrial use only and will not be sold to the public. Members of the public are unlikely to come into contact with marine structure surfaces that have been coated with coatings containing the notified polymer. Furthermore, once the coatings have cured and dried, the notified polymer will be reacted into the polymer matrix and will not be bioavailable.

6.2. Human Health Effects Assessment

No toxicity data were submitted.

The notified polymer contains a functional group of concern for irritation/corrosion with a functional group equivalent weight (FGEW) < 1000 Da. There is a significant percentage (<40%) of species <1000 Da. However, the percentage of species <500 Da. is <5%. Based on these percentages of low molecular weight species, there is potential for irritation/corrosion upon contact with the notified polymer.

Given the high molecular weight (>1000 Da.) and low water solubility of the notified polymer, absorption across biological membranes is not expected to be significant.

Health hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety

The notified polymer may cause corrosion/irritation.

Exposure to the notified polymer present at <50% as imported during blending with other coating components and application by spray, roller or brush is not expected to be significant for workers given the expected use of PPE (organic vapour respirators, gloves, goggles and coveralls).

Inhalation is expected to be the main route of exposure during manual spray application of paints containing the notified polymer (<50%). Dermal and ocular exposure is also anticipated during application. However, this is expected to be minimised by the use of PPE (organic vapour respirators, gloves, goggles and coveralls during spray application). After application and once dried, the notified polymer will be trapped in an inert polymer matrix and will not be bioavailable.

Overall, the risk to workers during blending and application of coatings containing the notified polymer at <50% is not expected to be unreasonable given the appropriate use of PPE and engineering controls as described above.

6.3.2. Public Health

Members of the public are unlikely to come into contact with surfaces coated with the notified polymer. Furthermore, after the coating has been applied and dried, the notified polymer will be cured into an inert matrix and will not be available for exposure, therefore 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 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 into inert material, and either reused or sent for safe disposal to landfill.

RELEASE OF CHEMICAL FROM USE

During industrial use of the notified polymer it is estimated that up to 1% of the notified polymer may be spilt. These spills will be contained, collected and treated by a licensed waste contractor and disposed of to landfill. Less than 1% of the notified polymer may remain as residues in product containers and these will be disposed of to landfill. It is expected that the transfer of the coating to the substrate by roller or brush will be very efficient. During application by spray $\leq 30\%$ of the notified polymer will be released as overspray, which will be collected on tarpaulins or plastic coverings and disposed of to landfill. Equipment used to apply the coating formulations may be rinsed with solvent. 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. 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 notified polymer will be applied to marine structures including hulls of ships, and hence there will be contact of the notified polymer with the marine environment. However, the notified polymer 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. Moreover, the coatings containing notified polymer will be overcoated with additional coatings and hence the exposure of the notified polymer to the marine environment is anticipated to be very low. 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. Bioaccumulation of the uncured polymer is unlikely due to its high molecular weight and limited potential for aquatic exposure. 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. A PEC has therefore 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 ($Q = \text{PEC}/\text{PNEC}$) 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.

8. CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to 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 safe work practices to minimise occupational exposure during handling of the notified polymer:
 - Avoid contact with skin and eyes

- Do not inhale vapours/mists
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
 - Respirators
 - Coveralls
 - Gloves
 - Goggles

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 *National Guidance Material for Spray Painting* [NOHSC (1999)] or relevant State and Territory Codes 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

- The notified chemical should be disposed of to landfill.

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 chemical 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 surface coatings for application to marine structures, or is likely to change significantly;
 - the amount of polymer being introduced has increased from 10 tonnes, 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 a product containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.

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