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

PUBLIC REPORT

Polymer in KA-96-2508

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 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 SUBSTANCE	INTRODUCTION VOLUME	USE
LTD/1593	PPG Industries Australia Pty Ltd	Polymer in KA-96-2508	ND*	< 1 tonne per annum	A component of coatings for structural steel

*ND = not determined

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:1008(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 reported 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
 - Avoid inhalation of aerosols during spray application
 - Avoid contact with uncured coatings or overspray
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
 - Eye protection
 - Impervious gloves
 - Coveralls
 - Organic vapour respirator

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.
- As the notified polymer is a potential sensitiser, employers should carry out health surveillance for any worker who has been identified in the workplace risk assessment as having a significant risk of sensitisation.

- A copy of the MSDS should be easily accessible to employees.
- Where not already contained in the MSDS for products containing the notified polymer, appropriate engineering controls, safe work practices and personal protective equipment to reduce exposure should be recommended on the product MSDS.
- 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 polymer 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 coatings at < 2% for structural steel in industrial settings, or is likely to change significantly;
 - the amount of polymer being introduced has increased from 1 tonne 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 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.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
PPG Industries Australia Pty Ltd (ABN 82 055 500 939)
Mc Naughton 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, residual monomers, impurities, additives/adjuvants, use details, and import volume.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed for all physico-chemical properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

KA-96-2508 (contains < 10% notified polymer)

MOLECULAR WEIGHT (MW)

$M_n > 1,000$ Da

ANALYTICAL DATA

Reference GPC spectrum was provided.

3. COMPOSITION

DEGREE OF PURITY > 95 %

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: The notified polymer will be imported as a clear viscous liquid as a solvent solution at < 10% concentration. The notified polymer will not be isolated from solution. The physico-chemical properties reported in the following table are for the imported product.

Property	Value	Data Source/Justification
Boiling Point	Expected to decompose at >200 °C	Estimated
Density	980 kg/m ³ at 20 °C	MSDS
Vapour Pressure	Not determined	Based on the high molecular weight, vapour pressure is expected to be low.
Water Solubility	Not determined	The notified polymer is expected to have low solubility in water based on its predominately hydrophobic structure and its use in solvent-borne coatings. However, it may be dispersible based on the results for an analogue polymer.
Hydrolysis as a Function of pH	Not determined	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

Dissociation Constant	Not determined	expected to absorb to soil and sediment and have low mobility in soil. Not expected to dissociate, however, it does contain functionality that may become cationic in the environmental pH (4-9). MSDS
Flash Point*	> 80 °C	MSDS
Flammability*	Upper: 13% Lower: 1.3%	MSDS
Autoignition Temperature	> 380 °C	MSDS
Explosive Properties	Not determined	The notified polymer contains no functional groups that would imply explosive properties.
Oxidising Properties	Not determined	The notified polymer contains no functional groups that would imply oxidising properties.

* Note: these properties indicate that the solution containing the notified polymer is a combustible liquid. The flammability is due to the presence of other components apart from the notified polymer.

DISCUSSION OF PROPERTIES

Reactivity

The notified polymer is expected to be stable under normal conditions of use.

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 into Australia as a solvent solution at < 10% concentration.

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>	< 1	< 1	< 1	< 1	< 1

PORT OF ENTRY

Melbourne

IDENTITY OF MANUFACTURER/RECIPIENTS

PPG Industries Australia Pty Ltd

TRANSPORTATION AND PACKAGING

The notified polymer (at < 10%) will be imported in 1, 4 and 5 Litre sealed cans and transported by road or rail to the notifier's warehouse.

USE

The notified polymer will be used as a component (< 2%) of two part protective coatings for application to structural steel, which may have contact with the marine environment.

OPERATION DESCRIPTION

At the end-use sites, the imported product containing the notified polymer (at < 10%) will be decanted and mixed with other paint components. The final coating containing the notified polymer (at < 2%) will be applied mainly by spray, but potentially also by brush and roller, in industrial settings.

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 Storage	2-3	10-15
Coating Application	6	260

EXPOSURE DETAILS

Exposure of workers to the notified polymer during transport and storage is not expected except in the unlikely event of an accident involving a breach of the sealed cans.

Dermal and ocular exposure of workers to the notified polymer may occur during decanting and mixing the imported product containing the notified polymer (at < 10% concentration) during application and cleaning and maintenance tasks. In addition, inhalation exposure to the notified polymer (< 2%) may occur during spray application. The use of personal protective equipment (PPE) such as respirators, impervious gloves, goggles and coveralls should minimise exposure.

After application and once cured, the notified polymer is not expected to be bioavailable, and further dermal contact should not lead to exposure.

6.1.2. Public Exposure

Coatings containing the notified polymer at < 2% 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 steel structures coated with coatings containing the notified polymer. Furthermore, once the coatings have cured, the notified polymer will be unavailable for exposure.

6.2. Human Health Effects Assessment

No toxicity data were submitted.

The notified polymer is not expected to be significantly absorbed across biological membranes, based on the high number average molecular weight (> 1000 Da), small amount (< 1%) of low molecular weight species < 500 Da and low water solubility. However, given the notified polymer contains a large proportion of low molecular weight species < 1000 Da, absorption across biological membranes cannot be totally ruled out.

The notified polymer belongs to a class of chemicals with potential for irritation/corrosion and sensitisation. Furthermore, the notified polymer contains a structural alert for irritation/corrosion and sensitisation. Given there is only a low percentage (< 1%) of low molecular weight species < 500 Da, the risk of irritation/corrosion is expected to be low. However, the potential for sensitisation on contact with the notified polymer cannot be ruled out.

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

Based on structural considerations, the notified polymer may present as an irritant and a sensitiser. However, given the low percentage (< 1%) of low molecular weight species < 500 Da, the risk of irritation is expected to be low.

Application workers may be exposed to the notified polymer when mixing the imported product containing the notified polymer (at < 10%) to form the finished coatings and during application of the coatings containing the notified polymer (at < 2%) by brush, roller and spray. However, exposure is expected to be low given the proposed use of PPE by these workers including coveralls, impervious gloves, eye protection and organic vapour respirators, particularly during spray application, and the conducting of spray operations in well-ventilated areas.

Furthermore, the measures in place to minimise risks involved in handling the hazardous substances present in the formulation containing the notified polymer should reduce the risk associated with handling the notified polymer.

Overall, the risk to workers from use of the notified polymer is not considered unreasonable assuming that the stated safe work practices and appropriate PPE to minimise exposure are used.

6.3.2. Public Health

The notified polymer is intended for use in industrial applications by qualified operators. The public may come into contact with manufactured products containing the cured coating. The notified polymer will be reacted into the coating matrix and unlikely to be available for exposure. Therefore, when used in the proposed manner, the risk to public health from the notified polymer 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. 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 will be spilt. These spills will be contained, collected 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, it is expected that up to 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 from cleaning of equipment 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, and hence there may be contact of the notified polymer with the marine environment. The notified polymer will be reacted into the coating matrix as part of its normal use pattern and is therefore not expected to be mobile, bioavailable nor biodegradable. Moreover, additional coatings will be applied onto the coatings containing the notified polymer 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 predicted environmental concentration (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 into the coating matrix 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 or 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.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES**Water Solubility**

Water dispersible (analogue of notified polymer)

Method	OECD TG 105 Water Solubility.
Remarks	The analogue polymer formed a dispersion in water but the water soluble fraction could not be separated by filtration or centrifuging. The solubility of the analogue polymer in water could not be measured due to interference of suspended material, and therefore the analogue polymer is considered water dispersible. Due to common structural features, the analogue solubility data indicates the notified polymer is potentially water dispersible.
Test Facility	Analytical Service Centre Amsterdam (2010)

BIBLIOGRAPHY

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