

File No: LTD/1585 and LTD/1586

May 2012

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

**LTD/1585: Polymer in KZ - 205
LTD/1586: Polymer in KZ - 401**

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**

TABLE OF CONTENTS

SUMMARY	3
CONCLUSIONS AND REGULATORY OBLIGATIONS	3
ASSESSMENT DETAILS	5
1. APPLICANT AND NOTIFICATION DETAILS	5
2. IDENTITY OF CHEMICAL.....	5
3. COMPOSITION.....	5
4. PHYSICAL AND CHEMICAL PROPERTIES	5
5. INTRODUCTION AND USE INFORMATION	6
6. HUMAN HEALTH IMPLICATIONS	7
6.1. Exposure Assessment.....	7
6.1.1. Occupational Exposure.....	7
6.1.2. Public Exposure.....	7
6.2. Human Health Effects Assessment	7
6.3. Human Health Risk Characterisation	7
6.3.1. Occupational Health and Safety	7
6.3.2. Public Health	8
7. ENVIRONMENTAL IMPLICATIONS.....	8
7.1. Environmental Exposure & Fate Assessment	8
7.1.1. Environmental Exposure	8
7.1.2. Environmental Fate	8
7.1.3. Predicted Environmental Concentration (PEC).....	9
7.2. Environmental Effects Assessment.....	9
7.2.1. Predicted No-Effect Concentration	9
7.3. Environmental Risk Assessment	9
Appendix A: Physical and Chemical Properties	10
BIBLIOGRAPHY	11

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/1585 LTD/1586	PPG Industries Australia Pty Ltd	Polymer in KZ-205 Polymer in KZ-401	ND*	< 2 tonne per annum < 1 tonne per annum	Component of coatings for structural steel

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

As no toxicity data were submitted, the notified polymers cannot be classified as hazardous 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 polymers are not considered to pose an unreasonable risk to the health of workers.

When used in the proposed manner, the notified polymers are not considered to pose an unreasonable risk to public health.

Environmental risk assessment

On the basis of the assessed use pattern, the notified polymers are 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 polymers:
 - Avoid skin and eye contact
 - Avoid breathing spray
 - 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 polymers:
 - 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 polymers are potential sensitisers, 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 polymers 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 polymers should be disposed of to landfill. Emergency procedures
- Spills or accidental release of the notified polymers should be handled by 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 polymers are 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 polymers has changed from a component of coatings for structural steel in industrial settings or is likely to change significantly;
 - the amount of polymer being introduced has increased from 2 tonnes per annum (LTD/1585) and 1 tonne per annum (LTD/1586), or is likely to increase, significantly;
 - the polymers have begun to be manufactured in Australia;
 - additional information has become available to the person as to an adverse effect of the polymers 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 the products containing the notified polymers 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)
McNaughton Road
CLAYTON VIC 3168

NOTIFICATION CATEGORY

LTD/1585: Limited: Synthetic polymer with $M_n \geq 1000$ Da.

LTD/1586: Limited (reduced fee notification): Synthetic polymer with $M_n \geq 1000$ Da. Chemical is being notified at the same time as a chemical which is similar.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: chemical name, other names, molecular and structural formulae, molecular weight, spectral 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 endpoints.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

KZ-205 (LTD/1585) (contains the notified polymer at < 70%)

KZ-401 (LTD/1586) (contains the notified polymer at < 70%)

3. COMPOSITION

DEGREE OF PURITY > 95%

4.

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: The notified polymers will be imported as clear liquids as a solvent solution at < 70% concentration. The notified polymers will not be isolated from solution. The physico-chemical properties reported in the following table are for the imported products.

Property	Value	Data Source/Justification
Boiling Point	Not determined	Estimated to be high based on the molecular weight of the notified polymers.
Density	950 kg/m ³ at 20°C (LTD/1585) 910 kg/ m ³ at 20°C (LTD/1586)	MSDS MSDS
Vapour Pressure	< 1.3×10 ⁻⁹ kPa	Estimated based on the NAMW > 1000 Da (US EPA, 2010)
Water Solubility	Water dispersible	Measured
Hydrolysis as a Function of pH	Not determined	Contains functionality that hydrolyses very slowly in environmentally relevant pH (4-9)
Partition Coefficient (n-octanol/water)	Not determined	A low partition coefficient is likely on the basis of the water dispersibility of the notified polymers.
Adsorption/Desorption	Not determined	Expected to adsorb to soil, sediment

Dissociation Constant	Not determined	and sludge based on their high molecular weights and the presence of potentially cationic functional groups. Both notified polymers contain basic functionality with a pKa ~ 10 and are expected to be ionised in the environment.
Particle Size	Not determined	Not isolated from solvent solution.
Flash Point*	29.3 °C at 101.3 kPa (LTD/1585) 20 °C at 101.3 kPa (LTD/1586)	MSDS MSDS
Flammability*	Upper: 8.64% (LTD/1585) Lower: 1.14% Upper: 8.44% (LTD/1586) Lower: 1.13%	MSDS MSDS

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

DISCUSSION OF PROPERTIES

Reactivity

Stable under normal conditions. No oxidising properties were observed.

Dangerous Goods classification

Based on the submitted physical-chemical data in the above table the notified polymers are 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 polymers.

5. INTRODUCTION AND USE INFORMATION

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

The notified polymers will be imported as a solvent solution at < 70% concentration.

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

Year	1	2	3	4	5
LTD/1585 Tonnes	< 1	< 2	< 2	< 2	< 2
LTD/1586 Tonnes	< 1	< 1	< 1	< 1	< 1

PORT OF ENTRY

Melbourne

IDENTITY OF MANUFACTURER/RECIPIENTS

PPG Industries, Australia

TRANSPORTATION AND PACKAGING

The notified polymers will be transported by road or rail to the notifier's warehouse in sealed 1, 4 and 5 L cans.

USE

Component of two-pack protective coatings for structural steel including the hull of ships.

OPERATION DESCRIPTION

At end user sites, the imported products containing the notified polymer at < 70% concentration will be decanted and mixed manually with the other component of the two-pack coating system to form the finished coatings containing the notified polymer at < 35% concentration that will be applied by brush and roller (10%) or spray (90%).

The finished coatings will be applied to the hull of ships in dry dock or to structural steel in blast and coating yards by professional applicators.

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	6-8	2-3
Coating Application	100	6

EXPOSURE DETAILS

Exposure of workers to the notified polymers 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 polymers (at < 70% concentration) during application and cleaning and maintenance tasks. In addition, inhalation exposure to the notified polymer (at < 35%) 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 polymers are not expected to be bioavailable, and further dermal contact should not lead to exposure.

6.1.2. Public Exposure

Coatings containing the notified polymers 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 polymers. Furthermore, once the coatings have cured, the notified polymers will be unavailable for exposure.

6.2. Human Health Effects Assessment

No toxicity data were submitted.

The notified polymers are not expected to be significantly absorbed across biological membranes, based on the high number average molecular weight (>1000 Da) and low water solubility. However, some absorption may occur as the notified polymers contain a significant proportion of low molecular weight species (< 1000 Da).

The notified polymers belong to a class of chemicals with potential for irritation/corrosion and sensitisation. Furthermore, the notified polymers contain structural alerts for irritation/corrosion and sensitisation. There is a significant percentage of low molecular weight species (<1000 Da), therefore the potential for irritation/corrosion and sensitisation on contact with the notified polymers 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 and presence of a significant proportion of low molecular weight species, the notified polymers may be irritating to the eye and skin, and may also act as a sensitiser.

The highest risk to workers is likely to occur at end-use sites where coatings containing the notified polymers at concentrations up to 35% are applied by spray, and on occasion by brush or roller. However, the potential for exposure to the notified polymers, and hence the risk, should be minimised through the expected use of PPE 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 formulations containing the notified polymers should reduce the risk associated with handling the notified polymers.

Overall, the risk to workers from use of the notified polymers 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 polymers are intended for use in industrial applications by qualified operators. The public may be exposed to the notified polymers after the coatings have been applied and cured. Once dried and cured, the notified polymers will not be bioavailable and hence the risk to the public from the notified polymers under the proposed use 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 polymers will not be manufactured or reformulated in Australia; therefore, there will be no release from these activities. Environmental release during importation, transport and distribution may occur as a result of accidental spills. In the event of a spill, the notified polymers should be contained and collected with an inert absorbent material and disposed of in accordance with local regulations, namely to landfill.

RELEASE OF CHEMICAL FROM USE

During industrial use of the notified polymers it is estimated that up to 1% of the import volume may be spilt. Spills are expected to be contained, collected and treated by a licensed waste contractor and disposed of in accordance with local regulations. Less than 1% of the import volume may remain as residues in import containers and these are expected to be disposed of to landfill. However, it is possible for the drums to be recycled and small amounts of the notified polymers (<1%) may be released to onsite sewage treatment where they are expected to be removed via partitioning to solids, and subsequently disposed to landfill. During application by spray up to 30% of the import volume of the notified polymers may be released as overspray, which will be collected on tarpaulins or plastic coverings and disposed of to landfill. Solvent washings from application equipment are estimated to contain up to 1% of the total import volume. Washings containing the notified polymers are expected to be collected, treated and disposed of by a licensed waste contractor.

RELEASE OF CHEMICAL FROM DISPOSAL

The majority of the notified polymers 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 notified polymers incorporated in the coating will be disposed of along with the coated articles, at the end of their useful life, and will either be disposed of to landfill or metals recycling.

7.1.2. Environmental Fate

No environmental fate data were submitted. The majority of the two notified polymers will be applied to structures which may have contact with the marine environment. However, they are expected to be cured into a solid polymer matrix coating articles as part of their reported use pattern. The notified polymers are not expected to be mobile, bioavailable nor biodegradable in their cured form. The majority of the imported volume is expected to be ultimately disposed of to landfill or thermally decomposed during recycling of metal structures. Bioaccumulation of the uncured polymers is unlikely due to their high molecular weight and limited potential for aquatic exposure based on the reported use pattern. The notified polymers, both in their uncured and cured forms, that are disposed of to landfill are 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 polymers are 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 polymers contain functionality that has the potential to be toxic to aquatic life. However, no significant exposure to aquatic organisms is expected based on the reported use pattern. Furthermore, the majority of the two notified polymers will be cured with other chemical substances as part of the coating process and are 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 is unable to be quantified as a PEC and PNEC were not calculated. There is no significant aquatic release of the two notified polymers anticipated based on their reported use pattern. Moreover, after curing, the majority of the imported quantity of the notified polymers will be irreversibly incorporated into an inert matrix and they are not expected to be mobile, bioavailable nor biodegradable. On the basis of the assessed use pattern, the notified polymers are not expected to pose an unreasonable risk to the environment.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES

Water Solubility

Water dispersible

Method	OECD TG 120 Solution/Extraction Behaviour of Polymers in Water
Remarks	Modified OECD TG 105 Water Solubility: Flask method.

The notified polymer in LTD 1586 is considered a suitable analogue for demonstrating the solubility characteristics of the notified polymer in LTD 1585 due to its structural similarity (contains common functional groups and high molecular weight).

The notified polymer in LTD 1586 formed a dispersion in water but the water soluble fraction could not be separated by filtration or centrifuging. Therefore, the solubility of in water could not be measured due to interference of suspended material. It is noted that this OCED method is not applicable to liquid polymers. However, based on the results, the notified polymer in LTD 1586, and by inference the notified polymer in LTD 1585, is considered water dispersible.

Test Facility	Analytical Service Centre Amsterdam (2010)
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BIBLIOGRAPHY

- Analytical Service Centre Amsterdam (2010) Water Solubility [LTD 1586] for registration in Australia (Study Number AMAN22614, 7 December 2010). Analytical Service Centre Amsterdam, The Netherlands (unpublished report submitted by the notifier).
- NOHSC (1994) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.
- NOHSC (2003) National Code of Practice for the Preparation of Material Safety Data Sheets, 2nd edition [NOHSC:2011(2003)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.
- NOHSC (2004) Approved Criteria for Classifying Hazardous Substances, 3rd edition [NOHSC:1008(2004)]. National Occupational Health and Safety Commission, Canberra, AusInfo.
- NTC (National Transport Commission) 2007 Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG code), 7th Edition, Commonwealth of Australia
- United Nations (2009) Globally Harmonised System of Classification and Labelling of Chemicals (GHS), 3rd revised edition. United Nations Economic Commission for Europe (UN/ECE), <http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html>.
- US EPA (2010) Interpretive Assistance Document for Assessment of Polymers. US EPA Sustainable Futures Assessment Summary Updated April 2010. www.epa.gov/oppt/sf/pubs/iad_polymers_042010.pdf. Last accessed 2 April 2012.