

File No: LTD/1545

December 2011

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

PUBLIC REPORT

Polymer in KZ-525 Hardener

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:

Street Address:	Level 7, 260 Elizabeth Street, SURRY HILLS NSW 2010, AUSTRALIA.
Postal Address:	GPO Box 58, SYDNEY NSW 2001, AUSTRALIA.
TEL: + 61 2 8577 8800	
FAX: + 61 2 8577 8888	
Website:	www.nicnas.gov.au

**Director
NICNAS**

TABLE OF CONTENTS

SUMMARY	3
CONCLUSIONS AND REGULATORY OBLIGATIONS	3
ASSESSMENT DETAILS	4
1. APPLICANT AND NOTIFICATION DETAILS	4
2. IDENTITY OF CHEMICAL.....	5
3. COMPOSITION.....	5
4. PHYSICAL AND CHEMICAL PROPERTIES	5
5. INTRODUCTION AND USE INFORMATION	6
6. HUMAN HEALTH IMPLICATIONS	6
6.1. Exposure Assessment.....	6
6.1.1. Occupational Exposure.....	6
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	9
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
<u>APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES</u>	<u>10</u>
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/1545	PPG INDUSTRIES AUSTRALIA PTY LTD	Polymer in KZ-525 Hardener	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, 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 a 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
 - 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:
 - 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.

Material Safety Data Sheet

The MSDS provided by the notifier should be amended as follows:

- MSDS for products containing the notified polymer should contain reference to Polymer in KZ-525 Hardener in the list of ingredients, in order to provide a link for workers to the NICNAS assessment.
- 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.

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 coatings for structural steel, or is likely to change significantly;
 - the amount of polymer being introduced has increased from 1 tonne, 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)
McNaughton Road
Clayton, VIC 3168

NOTIFICATION CATEGORY

Limited: Synthetic polymer with Mn \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 as follows: 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-525 (containing <50% notified polymer)

MOLECULAR WEIGHT

>1,000 Da

ANALYTICAL DATA

Reference GPC spectrum was provided.

3. COMPOSITION

DEGREE OF PURITY >90%

4. PHYSICAL AND CHEMICAL PROPERTIES

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

Property	Value	Data Source/Justification
Boiling Point	Expected to decompose at >200 °C	Estimated
Density	920 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 be water dispersible based on measured data of an analogue
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	A low partition coefficient is likely on the basis of the water dispersibility of the notified polymer
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	Not determined	Not expected to autoignite
Explosive Properties	Not determined	Contains no functional groups that would imply explosive properties.

*For the imported product containing <50% notified polymer.

**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

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 as a component of a solvent solution at <50% 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 will be supplied in 1, 4 and 5 L sealed steel drums. The drums will then be transported within Australia by road or rail.

USE

The notified polymer will be used as a component of 2-part coatings for application to structural steel which may have contact with the marine environment (end-use coatings will contain <20% notified polymer).

OPERATION DESCRIPTION

At end use sites, following decanting and blending with other components, the coating containing the notified polymer will be applied mainly by airless spray, but potentially also by roller and brush, 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

Transport and storage workers may come into contact with the notified polymer (at <50% concentration) only in the event of accidental rupture of containers.

Dermal or ocular exposure of workers to the notified polymer (at <50% concentration) may occur during transfer processes, mixing, application, cleaning and maintenance tasks. In addition, inhalation exposure to the notified polymer may occur during spray application processes. Exposure will be minimised by the use of personal protective equipment (PPE: chemical goggles, impervious gloves, appropriate industrial clothing and respirators). Once the paint is cured, the notified polymer is not expected to be bioavailable and further dermal contact should not lead to exposure.

6.1.2. Public Exposure

The notified polymer is intended for industrial use only. Therefore, the public may be exposed to the notified polymer (at <50% concentration) only in the event of a transport accident. Members of the public are unlikely to come into contact with surfaces that have been coated with coatings containing the notified polymer. Furthermore, once the material is cured, it will be unavailable for exposure.

6.2. Human Health Effects Assessment

No toxicity data were submitted.

Toxicokinetics, metabolism and distribution.

Based on the high molecular weight (>1000 Da) of the notified polymer, the potential of the notified polymer to cross the gastrointestinal (GI) tract by passive diffusion or to be dermally absorbed after exposure is limited. However, the polymer contains a proportion (<25%) of low molecular weight species (<1000 Da) that may be absorbed.

Acute toxicity

A significant proportion of low molecular weight species (<1000 Da) in the notified polymer suggests that acute toxicity may occur. Acute toxicity effects are likely to be similar to the monomer constituents. However, these monomers are not listed as hazardous substances, which suggests the acute toxicity has either not been extensively examined, or that it is low. This does not enable an accurate estimation of the acute toxicity potential of the notified polymer.

Irritation.

The notified polymer contains functional groups of concern for irritation/corrosion. There is a significant percentage of low molecular weight species (<1000 Da), therefore the potential for irritation/corrosion on contact with the notified polymer cannot be ruled out.

Sensitisation

The notified polymer belongs to a class of chemicals with potential for skin or respiratory sensitisation. However this effect may be mitigated by the structure of the notified polymer.

Health hazard classification

As no toxicity data were provided for the notified polymer, it 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 based on structural alerts and the risk of skin or respiratory sensitisation cannot be excluded.

The highest risk to workers is likely to occur at end-use sites where the notified polymer is applied by airless sprayer, and on occasion by brush or roller. PPE will be available at these sites to reduce exposure. Only natural ventilation is expected to be available at these sites.

The product containing the notified polymer is a hazardous substance according to the MSDS, and the precautions used to reduce exposure to these chemicals may reduce exposure and risk from the notified polymer. 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 application of products containing the notified polymer is not expected to be unreasonable given the appropriate use of workplace controls to minimise exposure.

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. However, as the notified polymer will be cured and likely beneath additional top-coating layers, it will be unavailable 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 notified polymer will not be manufactured or reformulated in Australia; therefore, there are no releases from these activities. 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 disposed of in accordance with local regulations, namely 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. 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 notified polymer 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 amount notified polymer (<1%) may be released to onsite sewage treatment where it is expected to be removed via partitioning to solids, and subsequently disposed to landfill. During application by spray up to 30% of the notified polymer 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 quantity of the notified polymer. Washings are expected to 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 structures which may have contact with the marine environment. However, the notified polymer is expected to be cured into a solid polymer matrix as part of its reported 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 is unable to be quantified as a PEC and PNEC were not calculated. There is no significant aquatic release of the notified polymer anticipated based on the reported use pattern. Moreover, after curing, the majority of the imported quantity of notified polymer will be irreversibly incorporated into an inert matrix and is not expected to be mobile, bioavailable nor biodegradable. On the basis of the assessed use pattern, the notified polymer is 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 analogue polymer formed a dispersion in water but the water soluble fraction could not be separated by filtration or centrifuging. Therefore, the solubility of the analogue polymer in water could not be measured due to interference of suspended material. Due to common structural features and high molecular weight, the analogue solubility data was considered suitable to support the expected solubility of the notified polymer based on structural considerations. The analogue polymer, and by inference the notified polymer, is considered water dispersible.

Test Facility	Analytical Service Centre Amsterdam (2010)
---------------	--

BIBLIOGRAPHY

- 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>.