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

**FULL PUBLIC REPORT**

**Component in PR-1826 Adhesion Promoter**

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 the Environment and Water Resources.

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 334-336 Illawarra Road, Marrickville NSW 2204.

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**

<b>Component in PR-1826 Adhesion Promoter</b>
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### **1. APPLICANT AND NOTIFICATION DETAILS**

#### APPLICANT(S)

PPG Industries Pty Ltd (ABN 82 055 500 939)  
21-23 Ovata Drive  
Tullamarine, VIC 3043

#### NOTIFICATION CATEGORY

Limited-small volume: Synthetic polymer with NAMW < 1000 (1 tonne or less per year).

#### EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: Chemical name, other names, CAS number, molecular formula, structural formula, import volume, spectral data, identity of recipients, molecular weight distribution, polymer constituents, impurities, residual monomers and additives and adjuvants, notification in other countries.

#### VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: Melting point, boiling point, vapour pressure, density, water solubility, partition coefficient, hydrolysis as a function of pH, soil adsorption/desorption, dissociation constant, flash point, flammability limits, explosive limits, auto-ignition temperature and particle size.

#### PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

#### NOTIFICATION IN OTHER COUNTRIES

Canada (2006)

### **2. IDENTITY OF CHEMICAL**

#### MARKETING NAME(S)

PR-1826 Adhesion Promoter (The notified polymer is a component in this product)

#### ANALYTICAL DATA

Reference IR and GPC spectra were provided.

#### MOLECULAR WEIGHT

< 1000

### **3. COMPOSITION**

#### DEGREE OF PURITY

The polymer is manufactured in solution and makes up < 10 % of that solution.

#### HAZARDOUS IMPURITIES/RESIDUAL MONOMERS

Contains a hazardous impurity.

#### ADDITIVES/ADJUVANTS

Some additives and adjuvants present are classified as irritants.

#### LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

The notified polymer will be cured to form a hard film with losses due to volatility, exudation and leaching not expected to occur after this time.

#### 4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20°C AND 101.3 kPa

Clear liquid

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	Polymer is present in a solution.
Boiling Point	Not determined	Polymer is present in a solution.
Density	820 kg/m <sup>3</sup>	MSDS, temperature of measurement not stated
Vapour Pressure	Not determined	Not expected to be high, as the molecular weight of the polymer is above 200. However, some components of the polymer may have a lower molecular weight and may be more volatile.
Water Solubility	Not determined	The notified polymer is expected to undergo hydrolysis readily with water and therefore a test to determine the water solubility could not be conducted.
Hydrolysis as a Function of pH	Not determined	A functional group in the polymer is expected to undergo hydrolysis readily with water.
Partition Coefficient (n-octanol/water)	Not determined	The notified polymer is expected to undergo hydrolysis readily with water and therefore a test to determine the partition coefficient could not be conducted.
Adsorption/Desorption	Not determined	The notified polymer is expected to adsorb to soil due to the presence of potentially cationic and other functional groups in the structure and therefore is not expected to be mobile in these media.
Dissociation Constant	Not determined	The notified chemical is expected to be cationic in at least part of the environmental pH range of 4-9.
Particle Size	Not determined	The notified polymer is a present in solution and is a liquid.
Flash Point	Not determined	The polymer is present in a solution containing flammable liquids.
Flammability	Not determined	The notified polymer reacts with water to release flammable liquids/gases.
Autoignition Temperature	Not determined	The polymer is present in a solution containing flammable liquids.
Explosive Properties	Not determined	Based on the molecular structure the notified polymer is not expected to be explosive.

#### DISCUSSION OF PROPERTIES

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

#### *Reactivity*

The notified polymer is a liquid primer, which reacts readily with the substrate material removing absorbed water and reducing surface energy. Therefore, the notified polymer is expected to hydrolyse readily in the presence of water releasing flammable gases. Although no information is available on the speed of hydrolysis, the half lives of chemicals from the same class range from several hours to several minutes.

#### *Dangerous Goods classification*

Based on the available data the notified polymer is classified as follows according to the Australian Dangerous Goods Code (FORS, 1998): Class 4.3.3 – substances that in contact with water emit flammable gases. The packing group for this class is III. However, it is noted that the imported product contains the notified polymer in class 3 flammable liquid.

## **5. INTRODUCTION AND USE INFORMATION**

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

The notified polymer is imported in concentrations <10 % as part of a solution used as an adhesion promoter in the aerospace industry.

### 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

Importer and repacker: PPG industries, 21-23 Ovata Drive, Tullamarine, VIC 3043.

Recipients: Aerospace industry, throughout Australia.

### TRANSPORTATION AND PACKAGING

The solution containing < 10 % of the notified substance will be transported from the port by road in sealed drums (200 L or 20 L). After repackaging it will be transported in small plastic vials of capacity <10 mL. The vials are placed in Mylar satchels with containers of the sealant component. Air is extracted from the bag, nitrogen is added and the boxes are packed prior to storage and transportation to end-use sites by road or air.

### USE

The notified polymer is to be used as an adhesion promoter prior to the use of sealants in the aerospace industry.

### OPERATION DESCRIPTION

The notified polymer will be imported in solution at a concentration of <10 % in 20 L or 200 L drums. This solution is not reformulated within Australia. The products containing the notified polymer will be transferred by road to the site where it is repackaged.

*Repackaging:*

The solution containing the notified polymer will be repacked into plastic vials of <10 mL capacity at the notifier's facility. Either a drum pump is used to fill the hoppers from the 200 L containers or for 20L containers a drum lift is used and the material is poured into the hopper of the single head filling machine. The solution containing the notified polymer is then filled into the plastic vials. Some samples are used for quality control testing for shelf life. These tests are performed in a laboratory environment under exhaust ventilation. The repackaged vials containing the notified polymer are then transported by road or air to the end use sites with the sealant components.

*Application:*

At the end-use sites in the aerospace industry, the solution containing the notified polymer is applied to aircraft components as an adhesion promoter, prior to applying sealant to those components. The application is performed at numerous sites housing both small and large operators of aircraft. The adhesion promoter is applied to a clean surface from the vials, using a brush, which is part of the vial. The total contents of the vial are used during application. After the adhesion promoter has dried, sealant is applied to the surface, over the layer of adhesion promoter.

## 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</i>	<i>Exposure Frequency</i>
Transport and Warehousing personnel	5	2 hours / day	200 days / year
Repackaging and cleaning workers	5	8 hours / day	250 days / year
QC technicians	1	8 hours / day	250 days / year
Workers applying the adhesion promoter	500	6 hours / day	10 days / year

##### EXPOSURE DETAILS

Transport and warehouse workers are not expected to be exposed to the solution containing < 10% of the notified polymer, except in the case of accidental spillage and breach of the packaging.

During repackaging workers may be exposed via dermal exposure during the manual loading, filling and packaging. Repackaging and all quality control testing is performed under natural or exhaust ventilation wearing appropriate PPE that includes gloves, coveralls and safety glasses that will minimize the dermal application. The notified polymer is not expected to have a high vapour pressure therefore exposure via inhalation will be low unless aerosols are generated during the filling process. However some low molecular weight species in the notified polymer may have higher volatility. It is possible that during the manual process a splash could result in ocular exposure, however this is minimized by the use of safety glasses.

During application of the adhesion promoter to aircraft component surfaces, the worker may come in contact with the product containing the notified polymer during the manual application process. This potential exposure is predominantly dermal however there is a possibility of ocular and inhalation exposure. The exposure would be minimized by the small size of the application vials and their enclosed nature, use of appropriate PPE (gloves, coveralls and safety glasses) and the use of safe handling procedures. As part of its action, flammable and hazardous gas will be released from the notified polymer during and after application. (However it is noted that the solution containing the notified polymer is itself flammable). In some circumstances the application may take place in confined spaces where ventilation is minimal. For application occurring in confined spaces the worker wears a full oxygen mask.

#### 6.1.2. Public exposure

The notified polymer is not for public usage. It is for use in industry and the public will only come in contact with the substance as the result of a spill during transportation. The public may also come in contact with the polymer following application in its final use as an adhesion promoter on aircraft components. However in this form the polymer will not be available for exposure as it will be bound to the substrate and would usually be covered by the sealant.

## **6.2. Human health effects assessment**

No toxicity data were submitted for the notified polymer. Based on its functional groups, it may cause lung damage from repeated inhalation exposure. The reactivity of the notified polymer indicates that it may also be an irritant to the skin, eyes and the respiratory system. The applicant classified the notified polymer as R48/20 based on the presence of functional groups of concern.

## **6.3. Human health risk characterisation**

### **6.3.1. Occupational health and safety**

No toxicology data is available for the notified substance. Based on its functional groups, it may cause lung damage from repeated inhalation exposure and skin, eye and respiratory irritation.

During end-use, the notified chemical will react, releasing flammable and hazardous gases.

The notified polymer will be repacked and used in industrial facilities. Repacking will be carried out at a single site, with appropriate controls in place to prevent worker exposure. During end-use the notified substance will be applied to surfaces using an automated process from a sealed container, using small quantities at any one time, thus reducing potential exposure. Personal protective equipment, including gloves, half face masks with the appropriate cartridges and coveralls will be available. Under these conditions it is expected that the level of exposure will be low, therefore the overall risk will be low.

The extent of exposure to flammable and hazardous gases released during end-use will vary with the quantity of product used and the level of ventilation. Good ventilation should be provided, to eliminate the risk of health effects. The gases released from the notified polymer are unlikely to add to the flammability risk, as the product contains other flammable solvents.

### **6.3.2. Public health**

The notified substance is to be used in an industrial environment. The public will only be exposed to it in the event of a spill during transport. Public contact with articles treated with the notified substance is unlikely, and in this form it would be bound to the substrate under the adhesive. Therefore exposure and risk to the public is expected to be very low.

## **7. ENVIRONMENTAL IMPLICATIONS**

### **7.1. Environmental Exposure & Fate Assessment**

#### **7.1.1 Environmental Exposure**

##### **RELEASE OF CHEMICAL AT SITE**

The notified chemical will not be manufactured or reformulated within Australia, but will be repackaged.

##### **RELEASE OF CHEMICAL FROM USE**

The notified chemical will be imported and therefore, environmental release will not occur from manufacturing. Residual notified chemical within import containers is expected to account for <1% of the total annual imported volume and is expected to be allowed to cure prior to being disposed of to landfill. A further 1% may be released from the cleaning of repacking equipment, which is again, expected to be disposed of to landfill after being allowed to cure.

The notified substance is not expected to enter waterways within the course of its use. It is to be used in industrial environments by brushing small quantities onto aircraft parts where any spills are contained within physical bunding, collected and disposed of to licensed waste contractors to landfill. Consequently it is expected that the level of exposure to the aquatic environment is low.

#### RELEASE OF CHEMICAL FROM DISPOSAL

Residual notified polymer within application equipment is expected to be disposed of to landfill. Empty vials are expected to be landfilled. The fate of the majority of the notified polymer is the same as the material to which it is applied and will predominantly end up in landfill where it should slowly decompose. Metal substrate to which the notified polymer has been applied may be recycled, and it is expected that during the metal reclamation process, the notified polymer will be thermally decomposed to form oxides of carbon and nitrogen and water.

### 7.1.2 Environmental fate

No environmental fate data were submitted. In landfill, the notified chemical is expected to be reacted or entrapped within a cured adhesive matrix, and should associate with soil and sediment. Any free notified chemical is expected to hydrolyse in water to form simple organic, silicon and nitrogen based degradates. Similarly, over time the cured notified chemical is expected degrade to form simple organic, silicon and nitrogen compounds. Bioaccumulation is not expected given the notified chemical's instability in water, and the lack of aquatic exposure.

### 7.2. Environmental effects assessment

No ecotoxicity data were submitted. Based on the chemical structure of the notified chemical, it is expected to be highly toxic to algae and moderately toxic to aquatic invertebrates since it is potentially cationic and has other reactive functionality.

### 7.3. Environmental risk assessment

While the notified chemical is expected to be highly toxic to the aquatic environment, release to the aquatic environment is not expected at any time during its lifecycle. Therefore, based on the low expected exposure the risk to the aquatic environment from the proposed use is considered acceptable.

## 8. CONCLUSIONS AND REGULATORY OBLIGATIONS

### Hazard classification

No toxicological data was available and hence the notified polymer cannot be classified as hazardous under the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)].

However, based on available information the following classification and labelling details should be used:

- R48/20 Danger of serious damage to health by prolonged exposure.

### Human health risk assessment

Under the conditions of the occupational settings described, the risk to workers is considered to be acceptable.

When used in the proposed manner the risk to the public is considered to be acceptable.

### Environmental risk assessment

The chemical is not considered to pose a risk to the environment based on its reported use pattern.

### Recommendations



## REGULATORY CONTROLS

### Hazard Classification and Labelling

- The following risk phrases for products/mixtures containing  $\geq 10\%$  of the notified chemical should be used:
  - R48/20: Harmful: danger of serious damage to health by prolonged exposure through inhalation.
- The notified chemical should be classified as follows under the ADG Code:
  - Class 4.3: Substance that in contact with water emits flammable gases.However the notified polymer will be imported in a mixture that is a Class 3: Flammable liquid.

## CONTROL MEASURES

### Occupational Health and Safety

- Employers should implement the following isolation and engineering controls to minimise occupational exposure to the notified chemical as introduced:
  - Use in well ventilated areas
- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified chemical as introduced:
  - Avoid contact with skin and eyes
  - Avoid formation of aerosols or mists during repacking;
  - During end-use, do not use in confined spaces.
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified chemical as introduced, in the product PR-1826:
  - Gloves
  - Safety goggles
  - Protective clothing
  - Respiratory protection during end-use application.

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- A copy of the MSDS should be easily accessible to employees.
- If products and mixtures containing the notified chemical 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.

### Environment

#### Disposal

- The notified chemical should be disposed of to landfill.

#### Storage

- The following precautions should be taken regarding storage of the notified chemical:
  - Store in sealed containers.

### Emergency procedures

- Spills or accidental release of the notified chemical 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 importation volume exceeds one tonne per annum notified chemical; or
- (2) Under Section 64(2) of the Act; if
  - the function or use of the chemical has changed from an adhesion promoter prior to the use of sealants in the aerospace industry, or is likely to change significantly;
  - if the chemical has begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the chemical 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.

If the notified polymer is reassessed as a secondary notification, data on the rate of abiotic degradation (hydrolysis) is required.

#### *Material Safety Data Sheet*

The MSDS of the products containing the notified chemical provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.