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

PUBLIC REPORT

MO 381

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (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 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 Energy.

This Public Report is 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**

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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 CHEMICAL	INTRODUCTION VOLUME	USE
LTD/1919	PPG Industries Australia Pty Ltd	MO 381	ND*	≤ 1 tonne per annum	A component of industrial coatings

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

As no toxicity data were provided, the notified chemical cannot be classified according to the *Globally Harmonised System of Classification and Labelling of Chemicals* (GHS), as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

Human health risk assessment

Under the conditions of the occupational settings described, the notified chemical is not considered to pose an unreasonable risk to the health of workers.

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

Environmental risk assessment

On the basis of the reported use pattern, the notified chemical is not considered to pose an unreasonable risk to the environment.

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- A person conducting a business or undertaking at a workplace should implement the following engineering controls to minimise occupational exposure to the notified chemical as introduced in the product:
 - Exhaust ventilation
 - Spray booth during spray applications
- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure during handling of the notified chemical:
 - Avoid contact with skin and eyes
 - Avoid inhalation during spray application
- A person conducting a business or undertaking at a workplace 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:
 - Eye protection
 - Chemical resistant gloves
 - Respirator
 - Protective clothing

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 Code of Practice for Spray Painting and Powder Coating (SWA, 2015) or relevant State or Territory Code of Practice.
- A copy of the (M)SDS should be easily accessible to employees.
- If products and mixtures containing the notified chemical are classified as hazardous to health in accordance with the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)* as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should be in operation.

Disposal

- Where reuse or recycling are not appropriate, dispose of the notified chemical in an environmentally sound manner in accordance with relevant Commonwealth, state, territory and local government legislation.

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;
 - further information becomes available on the health effects potential of the notified chemical in particular on the potential for genotoxic effects.
- or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the chemical has changed from a component of industrial coatings, or is likely to change significantly;
 - the amount of chemical being introduced has increased, or is likely to increase, significantly;
 - 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.

(Material) Safety Data Sheet

The (M)SDS of the product containing the notified chemical provided by the notifier was reviewed by NICNAS. The accuracy of the information on the (M)SDS 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)
23 Ovata Drive,
TULLAMARINE VIC 3043

NOTIFICATION CATEGORY

Limited-small volume: Chemical other than polymer (1 tonne or less per year).

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: chemical name, CAS number, molecular and structural formulae, molecular weight, analytical data, degree of purity, impurities, additives/adjuvants, and use details.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: Vapour pressure, hydrolysis as a function of pH, partition co-efficient, absorption/desorption, dissociation constant, particle size, flash point, flammability limits, autoignition temperature and explosive and oxidising properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

MO 381 (product containing the notified chemical at > 90%)
44GN098 (product containing the notified chemical at < 30%)

MOLECULAR WEIGHT

< 500 Da

ANALYTICAL DATA

Reference XRPD spectra was provided.

3. COMPOSITION

DEGREE OF PURITY

> 90%

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: Yellow-green amorphous solid

Property	Value	Data Source/Justification
Melting Point/Freezing Point	> 1,500 °C	Measured, converts to another substance at ~ 275 °C
Boiling Point	> 1,500 °C	Measured
Density	6900 kg/m ³	Measured
Vapour Pressure	Not determined	The notified chemical can be heated to at least 1,500°C without volatilising
Water Solubility	< 0.075 × 10 ⁻³ g/L after 7 days at pH = 7 1.2 × 10 ⁻³ g/L after 28 days at pH = 7	Measured
Hydrolysis as a Function of	Stable, t _{1/2} > 1 year at 25°C	Estimated

pH		
Partition Coefficient (n-octanol/water)	Not determined	The notified inorganic chemical is insoluble in water and it is expected to be insoluble in octanol.
Adsorption/Desorption	Not determined	Based on its expected low solubility in water, the notified chemical is expected to settle to sediment and sludge.
Dissociation Constant	Not determined	Does not contain dissociable functionalities
Particle Size	Not determined	The notified chemical is imported only as a component of liquid formulations
Flash Point	Not determined	The notified chemical is solid and not volatile substance
Flammability	Not determined	The notified chemical can be heated to at least 1,500°C without combustion occurring
Autoignition Temperature	Not determined	The notified chemical can be heated to at least 1,500°C without ignition occurring
Explosive Properties	Not determined	The notified chemical contains no functional groups that would imply explosive properties.
Oxidising Properties	Not determined	The notified chemical is in its most stable oxidation state.

DISCUSSION OF PROPERTIES

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

Reactivity

The notified chemical is expected to slowly react with water or air. However, it is expected to be stable under normal conditions of use.

Physical hazard classification

Based on the submitted physico-chemical data depicted in the above table, the notified chemical is not recommended for hazard classification according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia.

5. INTRODUCTION AND USE INFORMATION

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

The notified chemical will not be manufactured, reformulated or repackaged in Australia. The notified chemical will be imported into Australia at concentrations < 30%.

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

Year	1	2	3	4	5
Tonnes	1	1	1	1	1

PORT OF ENTRY

Melbourne and Sydney

IDENTITY OF MANUFACTURER/RECIPIENTS

PPG Industries Australia Pty Limited

TRANSPORTATION AND PACKAGING

The notified chemical will be imported in 1 gallon (~3.79 L), 1 quart (~0.95 L) or 1 pint (~0.47 L) metal cans at < 30% concentration and transported within Australia by road.

USE

The notified chemical will be used as a corrosion inhibitor in two-part surface coating formulations for the aerospace industry.

OPERATION DESCRIPTION

The notified chemical will not be manufactured, reformulated or repackaged in Australia. At customer sites, the imported product containing the notified chemical at < 30% will be mixed with the curing component and thinner if required and applied by spray. The spray applications will occur in spray booths or aircraft hangars.

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
Spray application	6	260

EXPOSURE DETAILS

It is anticipated that transport and storage workers would only be exposed to the notified chemical (at a concentration of < 30%) in the event of an accident.

At end-use sites, dermal, ocular and/or inhalation exposure to the paint containing the notified chemical (at < 30% concentration) may occur during transfer, mixing, spray applications and cleaning processes. The potential for exposure is expected to be minimised through the use of PPE (goggles, impervious gloves, appropriate industrial clothing and respirators during spray operations) and engineering controls such as spray booths if present. Once the coating has cured, the notified chemical will be contained within the coating matrix and will not be bioavailable.

6.1.2. Public Exposure

The notified chemical is intended for industrial use only, and will not be available to the public. However, the public may come into contact to coated articles containing the notified chemical; once the coating is cured, the notified chemical is considered to be contained within the coating matrix, therefore, public exposure from articles to which the coating has been applied is not expected.

6.2. Human Health Effects Assessment

No toxicity data were submitted for the notified chemical.

No information on the toxicokinetics of the notified chemical was provided. Solid and insoluble substances are not favourable for dermal absorption (ECHA, 2014). The notified chemical is an inorganic solid with negligible water solubility (1.2×10^{-3} g/L), and hence absorption through the skin is unlikely.

There is limited information in the literature regarding the hazardous status of the metal component of the notified chemical (Reference 5)*. Analogues of the notified chemical showed limited systemic toxicity (Reference 2 & 5) but evidence of chromosomal aberrations following both *in vitro* and *in vivo* exposure has been reported (Reference 4 & 5)*. According to the European Chemical Agency (ECHA) classification and labelling inventory, the notified chemical is classified by industry as a skin, eye and respiratory irritant (H315, H319 and H335).

Health hazard classification

As no toxicity data were provided, the notified chemical cannot be classified according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety

No toxicity data were submitted for the notified chemical. However, studies on analogues and hazard classification information suggest the notified chemical may potentially be a skin, eye and respiratory irritant and genotoxic effects were seen in an analogous chemical.

Occupational exposure to the notified chemical is expected to be minimised by the use of engineering controls (exhaust ventilation, spray booth), and the use of PPE (goggles, impervious gloves, appropriate industrial clothing and respirators during spray operations).

Overall, under the condition of the occupational settings described, in the presence of engineering controls and PPE described above, the notified chemical is not considered to pose an unreasonable risk to occupational health.

6.3.2. Public Health

Coatings containing the notified chemical will be used in industrial settings only and will not be sold to the public. The public may come into contact with surfaces coated with products containing the notified chemical. However, once the coatings have cured, the notified chemical will be trapped within the coating 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 notified chemical will not be manufactured or reformulated in Australia. Therefore, no releases from these activities are expected. Release of the notified chemical 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 on inert material and sent for disposal in accordance with local regulations.

RELEASE OF CHEMICAL FROM USE

The notified chemical is a component of a product used in two-pack coatings in the aerospace industry for use by professional applicators only. The two products are mixed together immediately prior to use and transferred to spray equipment for application to metal substrates. During industrial use of the notified chemical, application is expected to occur in spray booths with typical industrial controls to collect overspray or, where this is not practical, application will take place in aircraft hangers with overspray to be collected on plastic coverings or kraft paper. Collected overspray is expected to be disposed of via a licensed waste collector in accordance with local regulations.

Solvent-based equipment washings containing the notified chemical are expected to be collected and disposed of via a licensed waste collector in accordance with local regulations. Up to 1% of the annual import volume of notified chemical is expected to be released to sewers as residues in equipment washings.

RELEASE OF CHEMICAL FROM DISPOSAL

Any residues in the end use empty containers are expected to be disposed of to landfill with the containers. The notified chemical is expected to share the fate of articles to which it has been applied and, at the end of the coated articles useful life, is therefore expected to be disposed of to landfill or thermally decomposed during metals reclamation processes.

7.1.2. Environmental Fate

There are no environmental fate data for the notified chemical. Majority of the annual import volume of notified chemical is expected to be applied to aerospace articles with a substantial part of the remainder expected to be collected as overspray. Therefore, the majority of the imported quantity of notified chemical is expected to be ultimately disposed of to landfill in articles at the end of their useful life or thermally decomposed during metal recycling. When disposed of to landfill, the majority of the notified chemical is expected to be held within a cured coating matrix and is not expected to be mobile, bioavailable nor biodegradable in this form. In the unlikely event the notified chemical is released to surface waters, it is not soluble in water and is not expected to hydrolyse.

7.1.3. Predicted Environmental Concentration (PEC)

The predicted environmental concentration (PEC) was not calculated since no significant release to the aquatic environment is expected based on the reported use pattern.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted. Based on the Categorization Results from the Canadian Domestic Substance List for the notified chemical (Reference 3), it is expected to be very toxic to aquatic organisms. However, the notified chemical is not expected to be bioavailable based on its use and being cross-linked into a cured and inert coating matrix.

7.2.1. Predicted No-Effect Concentration

A Predicted No-Effect Concentration (PNEC) has not been calculated for the notified chemical as, based on its reported use pattern, ecotoxicologically significant quantities are not expected to be released to the aquatic environment.

7.3. Environmental Risk Assessment

A Risk Quotient is unable to be quantified as a PEC and PNEC were not calculated. The notified chemical is a component of coatings used in the aerospace industry. The majority of the notified chemical is expected to be disposed of to landfill bound within the inert coating matrix of coating adhering to articles or physical barriers that captured overspray during application, and is not expected to be mobile, bioavailable or biodegradable in this form.

Therefore, on the basis of the assessed use pattern, the notified chemical is not expected to pose an unreasonable risk to the environment.

APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES

Water Solubility $< 0.075 \times 10^{-3}$ g/L after 7 days at pH = 7
 1.2×10^{-3} g/L after 28 days at pH = 7

Method Internal Method

Remarks A transformation/dissolution study was conducted on the notified chemical, in which 100 mg/L loadings were extracted into water at three different pH values for either 7 days or for 28 days, and the amount of active ingredient extracted into the solutions was measured by ICP-AES (Zhang and Stapleton, 2015).

Test Facility Intertek

Hydrolysis as a Function of pH Stable, $t_{1/2} > 1$ year at 25°C

Method OECD TG 111 Hydrolysis as a Function of pH.

<i>pH</i>	<i>t_{1/2} days</i>
6.18 (7 days)	5.1 years
(28 days)	4.1 years
6.80 (7 days)	> 13.0 years
(28 days)	3.3 years
7.88 (7 days)	> 16.4 years
(28 days)	> 65.6 years

Remarks According to test guidelines, a finding in the preliminary test of $t_{1/2} > 1$ year at 25°C indicated that the substance is hydrolytically stable.

Test Facility Intertek

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ECHA (2014) Guidance on Information Requirements and Chemical Safety Assessment Chapter R.7c: Endpoint specific guidance, November 2014, version 2.0. European Chemicals Agency, http://echa.europa.eu/documents/10162/13632/information_requirements_r7c_en.pdf.

Intertek, Method Variations to support Australian Notification for MO 381 (Unpublished report submitted by the notifier).

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

*Reference 2, 3, 4, and 5 are stated in the Exempt information report of this assessment.

SWA (2015) Code of Practice: Spray Painting and Powder Coating, Safe Work Australia, <http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/spray-painting-and-powder-coating>.

SWA (2012) Code of Practice: Managing Risks of Hazardous Chemicals in the Workplace, Safe Work Australia, <http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/managing-risks-of-hazardous-chemicals-in-the-workplace>.

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