

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

POLYMER OF LOW CONCERN PUBLIC REPORT

Acrylic Polymer in WC-19-6703

This Self Assessment has been compiled by the applicant and adopted by NICNAS 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), administered by the Department of Health and the Department of the Environment and Energy, has screened this assessment report. The data supporting this assessment will be subject to audit by NICNAS.

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:

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**Director
NICNAS**

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Table of Contents

SUMMARY:	2
CONCLUSIONS AND REGULATORY OBLIGATIONS.....	2
ASSESSMENT DETAILS.....	4
1. APPLICANT AND NOTIFICATION DETAILS.....	4
2. IDENTITY OF POLYMER	4
3. PLC CRITERIA JUSTIFICATION	4
4. PHYSICAL AND CHEMICAL PROPERTIES.....	4
5. INTRODUCTION AND USE INFORMATION	4
6. HUMAN HEALTH RISK ASSESSMENT.....	5
7. ENVIRONMENTAL RISK ASSESSMENT	6
BIBLIOGRAPHY	7

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
SAPLC/206	PPG Industries Australia Pty Ltd	Acrylic Polymer in WC-19-6703	No	< 100 tonnes per annum	Component of industrial and automotive water- based paints and coatings

CONCLUSIONS AND REGULATORY OBLIGATIONS**Human Health Risk Assessment**

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the health of workers and the public.

Environmental Risk Assessment

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Health and Safety Recommendations

- If aerosols or vapours are formed during the use of the notified polymer, engineering controls and respiratory protection should be used to prevent inhalation exposure.

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

- A copy of the SDS should be easily accessible to employees.
- Spray applications should be carried out in accordance with the Safe Work Australia Code of Practice for *Spray Painting and Powder Coating* (Safe Work Australia, 2012) or relevant State or Territory Code of Practice.
- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the *Globally Harmonised System for the 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 polymer in an environmentally sound manner in accordance with relevant Commonwealth, state, territory and local government legislation.

Storage

- The following precautions should be taken by workers regarding storage of the notified polymer:
 - Store in a segregated and approved area.

Emergency

- Procedures
 - Spills and/or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

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 polymer 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 polymer, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer 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 notified polymer is introduced in a chemical form that does not meet the PLC criteria;
 - the polymer is intended to be used in products available to the public.

or

- (2) Under Section 64(2) of the Act; if
 - the function or use of the notified polymer has changed from component of industrial and automotive water-based paints and coatings, or is likely to change significantly;
 - the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
 - the notified polymer has begun to be manufactured in Australia;
 - additional information has become available to the person as to an adverse effect of the notified 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.

Safety Data Sheet

The SDS of the notified polymer was provided by the applicant. The accuracy of the information on the SDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

Applicants

PPG Industries Australia Pty Ltd (ABN: 82 055 500 939)
14 – 20 McNaughton Road
CLAYTON VIC 3168

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, polymer constituents, residual monomers/impurities, use details and import volume.

2. IDENTITY OF POLYMER

Marketing Name(s)

WC-19-6703 (containing the notified polymer at $\leq 30\%$)

Molecular Weight

Number Average Molecular Weight (Mn) is $> 1,000$ g/mol

3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</i>
Molecular Weight Requirements	Yes
Functional Group Equivalent Weight (FGEW) Requirements	Yes
Low Charge Density	Yes
Approved Elements Only	Yes
Stable Under Normal Conditions of Use	Yes
Not Water Absorbing	Not applicable
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

4. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20 °C and 101.3 kPa	Colourless liquid*
Melting Point/Glass Transition Temp	Not determined. Notified polymer is not isolated from solution.
Density	1,000 kg/m ³ at 20 °C*
Water Solubility	70.4 g/L at 20 °C*
Dissociation Constant	Not determined. The notified polymer is a salt and is expected to dissociate in the environmental pH of 4 – 9.
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use
* Properties of the product WC-19-6703 that contains the notified polymer at concentrations of $\leq 30\%$.	

Comments:

The notified polymer is never isolated from solution.

5. INTRODUCTION AND USE INFORMATION

The notified polymer will not be manufactured in Australia. The notified polymer will be imported as a component of the product WC-19-6703 at concentrations of $\leq 30\%$. WC-19-6703 will be used in the formulation of industrial and automotive water-based paints and coatings.

The paint/coating products containing the notified polymer will be imported in 250 mL to 20 L containers, stored at the notifier's warehouse and distributed to end use customers without further reformulation.

Maximum Introduction Volume of Notified Chemical (100%) Over Next 5 Years

Year	1	2	3	4	5
Tonnes	< 100	< 100	< 100	< 100	< 100

Use

The notified polymer will be used as a component of formulated industrial and automotive water-based paints and coatings, at concentrations of $\leq 30\%$. At end user facilities, the imported paint/coating products will be mixed with other paint products to produce finished paints and coatings containing the notified polymer at $\leq 20\%$.

The finished paints and coatings will be used by professional and industrial users for applications to automobiles in smash repair shops. The finished paints and coatings can also be used in general industrial applications. Finished paints and coatings containing the notified polymer will not be available to the public.

6. HUMAN HEALTH RISK ASSESSMENT

No toxicological data were available. The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

However, the notified polymer contains ethanol, 2-(dimethylamino)- (CAS No. 108-01-0) as the counter ion at $> 1\%$ concentration that may be released into the air during drying process. Ethanol, 2-(dimethylamino)- is listed by Safe Work Australia in the *Hazardous Chemical Information System (HCIS)* with the following hazard information:

Flammable liquid (Category 3)	H226: Flammable liquid and vapour
Acute toxicity (Category 4)	H302: Harmful if swallowed
Acute toxicity (Category 4)	H312: Harmful in contact with skin
Acute toxicity (Category 4)	H332: Harmful if inhaled
Skin corrosion (Category 1)	H314: Causes severe skin burns and eye damage
Skin sensitisation (Category 1)	H317: May cause an allergic skin reaction

Ethanol, 2-(dimethylamino)- has an Australian exposure standard for the workplace of 7.4 mg/m^3 (2 ppm) time weighted average (TWA) and 22 mg/m^3 (6 ppm) short-term exposure limit (STEL) (Safe Work Australia, 2013).

Based on the proposed maximum use concentration of the notified polymer in paints, in a worst case scenario, the maximum amount of ethanol, 2-(dimethylamino)- liberated during drying would be $1,675 \text{ mg/m}^2$ of painted surface, based on two coats of formulated waterborne paint being used, and typical coverage rates of $16 \text{ m}^2/\text{L}/\text{coat}$. The concentration of the released chemical in air may vary depending on the volume, air flow and rate of emission from the paint film and it may exceed the Australian exposure standard in many use scenarios, especially when painting occurs indoors. Use of engineering controls, safe work practices and personal protective equipment (PPE) is expected to mitigate the exposure and risk to workers. In particular the paint application process should be carried out in well ventilated spaces, and mechanical ventilation should be used if possible. Dermal and ocular exposure is expected to be reduced by PPE such as gloves, coveralls and eye protection. Where ventilation is not adequate, respiratory protection should be used to reduce the potential for inhalation exposure.

Provided that the control measures are used to minimise the exposure to ethanol, 2-(dimethylamino)- during drying process, the risk of the notified polymer to occupational and public health is not considered to be unreasonable.

7. ENVIRONMENTAL RISK ASSESSMENT

7.1. Exposure Assessment

Environmental Release

Release to the environment during shipping, transport and warehousing will only occur through accidental spills or leaks of the 250 mL to 20 L packages of the imported water-based paint/coating products containing the notified polymer.

There is the potential for release during application. Professional spray painters will mix the imported paint/coating products containing the notified polymer with other water-based polymer systems prior to spray painting on automobiles in smash repair shops and on various substrates including light industrial applications using combination of spray/oven booths with exhaust equipment. These spray/oven booths comply with Australian Standards and are fitted with environmental control measures. A dry filter medium will collect excess spray. The coatings are either air-dried or oven-baked at 60 °C to form a stable inert film.

There is potential for release of the imported water-based paint/coating products containing the notified polymer during mixing, spray-gun loading, spraying and equipment cleaning. Release will also occur from container residues and in the event of an accidental spill. Up to about 30% of the notified polymer could be released through overspray within spray booths. This will be captured by standard engineering controls, treated and disposed of to landfill as solid waste. An estimated up to about 0.3% of the notified polymer will remain as residues in containers, which will be cured and hardened before disposal to landfill. Less than about 0.15% of the waste of the notified polymer will be generated from cleaning the application. Therefore, the total waste would consist of up to about 35% of the notified polymer at market maturity. It is expected that no waste notified polymer would enter the sewerage system or natural waterways.

The remainder of the notified polymer will be bound in the paint matrix and not be available for direct release to the environment. Disposal of the coated articles containing the notified polymer such as automobiles may be through landfill or recycling, and the fate of the paint will be related to that of the coated products.

Environmental Fate

The notified polymer is expected to be thermally decomposed during the recycling of the metal substrates. In landfill, the notified polymer will be present as cured solids that will be neither bioavailable nor mobile. Based on its high molecular weight, the notified polymer is not expected to cross biological membranes, and is therefore unlikely to bioaccumulate. The notified polymer is expected to eventually degrade to form oxides of carbon, nitrogen and water vapour by thermal decomposition or by abiotic and biotic processes.

7.2. Environmental Hazard Characterisation

No ecotoxicological data were available. Anionic polymers are generally of low toxicity to fish and daphnia, however they are known to be moderately toxic to algae. The mode of toxic action is over-chelation of the nutrient needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. This is unlikely to apply to the notified polymer, and it is therefore, not considered to be an over-chelation hazard to algae.

7.3. Environmental Risk Assessment

No aquatic exposure is anticipated during end use of the notified polymer. It is expected that practically all of the waste generated from end users (about 30% of the notified polymer as overspray) will be disposed of in approved landfills as inert solid waste. In landfill, the notified polymer is expected to be immobile, and eventually will degrade through biotic and abiotic processes, and consequently, should not pose a significant risk to the environment.

Spills of notified polymer to the environment are expected to associate with sludge and soil, and slowly degrade to simple carbon and nitrogen compounds, and are highly unlikely to desorb and leach into aquifers. If spilt to water, it is expected to dissolve but will precipitate in contact with calcium ions and settle to sediment. It is not expected to be readily biodegradable. Due to its high molecular weight, it is also not expected to bioaccumulate. Incineration of the notified polymer will result in the formation of water vapour and oxides of carbon and nitrogen.

Most of the notified polymer used in automotive and light industrial finishes will eventually be incorporated in metal recycling programs or sent to landfill for disposal following its lifecycle. During reclamation, the notified polymer would be destroyed in furnaces and converted to water vapour and oxides of carbon and nitrogen.

Based on its assumed low hazard and assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

BIBLIOGRAPHY

Safe Work Australia (2015) Code of Practice: Spray Painting and Powder Coating, Safe Work Australia, <https://www.safeworkaustralia.gov.au/doc/model-code-practice-spray-painting-and-powder-coating>.