

File No PLC/732

20 November 2007

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

FULL PUBLIC REPORT

Polymer in AQA Gloss DS 6272

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:

Street Address:	334 - 336 Illawarra Road MARRICKVILLE NSW 2204, 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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FULL PUBLIC REPORT**Polymer in AQA Gloss DS 6272****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

BASF Australia Pty Ltd (ABN 62 008 473 867)
Kororoit Creek Road
Altona VIC 3018

NOTIFICATION CATEGORY

Polymer of Low Concern

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, Polymer Constituents, Residual Monomers/Impurities, Use Details, Import Volume, Concentration of the notified polymer in the final product and Site of Reformulation

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows:

Melting Point / Glass Transition Temperature, Density, Water Solubility, Dissociation Constant and Particle Size Distribution.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

Europe

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Polymer in AQA Gloss DS 6272

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) >1000

Reactive Functional Groups

The notified polymer contains only low concern functional groups.

3. PLC CRITERIA JUSTIFICATION

Criterion	Criterion met
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	Yes
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:	White Liquid
Melting Point/Glass	Not Applicable polymer is a liquid and in solution.
Transition Temp	
Density	1040 kg/m ³ (for the solution containing the polymer).
Water Solubility	The notified polymer is dispersible in water but not soluble, in line with its largely hydrophobic nature.
Dissociation Constant	The notified polymer contains carboxylic acid functional groups, which are expected to display a typical acidity.
Reactivity	Undergoes oxidative drying, cross-linking the molecules together upon exposure to the atmosphere.
Degradation Products	None under normal conditions of use. The notified polymer contains potentially hydrolysable groups but that is unlikely to occur under abiotic ambient environmental condition (pH 4-9).

5. INTRODUCTION AND USE INFORMATION

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

Year	1	2	3	4	5
Tonnes	30-50	50-70	70-80	80-100	100-120

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer will be imported as a component of AQA Gloss DS 6272 at a concentration of <10% w/w in 1 tonne intermediate bulk containers. AQA Gloss DS 6272 will be imported by sea freight through the port of Melbourne before transfer to the reformulation site by road.

Reformulation processes

At the reformulation site the notified polymer will be metered directly from the supplied BASF containers by pipeline to the industrial mixer where it is combined with the other paint ingredients. The blended product may be sampled for laboratory analysis. The final blended coating product (containing the notified polymer at concentrations of <5%) is then filtered before filling into 10-15L steel containers.

Use

Water based paint additive.

The paint containing the notified polymer will be applied by both professional painters and domestic users. Paint containing the notified polymer is likely to be applied through spray painting, brushes and rollers.

6. HUMAN HEALTH IMPLICATIONS

Exposure Assessment

OCCUPATIONAL EXPOSURE

Number and Category of workers

Category of workers	Number	Exposure Duration	Exposure Frequency
Dockside workers	3	1 hour / day	10 days / year
Transport workers	2	10 hours / day	10 days / year
Storage	4	2 hours / day	40 days / year
Paint manufacture	40	0.5 hours / day	40 days / year

Transport and storage

Approximately 3 dockside workers and 2 drivers will be involved in handling the AQA Gloss 6272 after it arrives at Melbourne wharf and transporting it to the reformulation site. Up to four workers will be involved with the storage of the notified polymer at the reformulation site. Workers will be wearing PPE and are not expected to have any contact with the notified polymer except in the case of an accident causing a puncture of the intermediate bulk containers.

Reformulation

During reformulation the maximum concentration of the notified polymer that workers will be exposed to is <10%. There is potential for dermal and ocular exposure of the notified polymer to workers through spill and drips during the mixing process. However, exposure should be minimised through the automation of the process and the use of PPE.

Spray paint testing will be carried out in a ventilated spray paint booth with workers wearing a face mask minimising the inhalation of aerosols.

End Use

Dermal, ocular or inhalation exposure of professional painters to the notified polymer (<10%) may occur during application of the paint by roller, brush or spray painting. Exposure is expected to be reduced by workers wearing personal protective equipment during all types of application, including coveralls and impervious gloves. For brush and roller application, performing operations in a well-ventilated area should further reduce exposure. Respirators may be worn during spray application.

After the applied coating has cured, the notified polymer is not expected to be available for exposure due to it being trapped in an inert matrix.

PUBLIC EXPOSURE

Dermal, ocular or inhalation exposure of domestic painters to the notified polymer (<10%) may occur during application of the paint by roller, brush or spray painting. It is expected that directions for use would recommend avoidance of exposure and use of protective clothing.

After the applied coating has cured, the notified polymer is not expected to be available for exposure due to it being trapped in an inert matrix.

Hazard Characterisation

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

Occupational Health and Safety Risk Assessment

Dermal and ocular exposure may potentially occur during reformulation processes involving the notified polymer. However, exposure to significant amounts of the notified polymer is limited because of the fully automated processes, engineering controls and personal protective equipment worn by workers.

Professional painters may come into contact with the notified polymer through dermal, inhalation and ocular routes. The risk of exposure, however, would be reduced by the use of PPE, including respiratory protection during spray application. After application and once dried, the paint containing the notified polymer is cured into an inert matrix and the polymer is hence unavailable to exposure.

Overall the risk to workers is considered low, based on low hazard and low exposure.

Public Health Risk Assessment

The notified polymer will be contained in water-based paints at concentrations <5% that are intended for use by

the public.

The risk to the public is expected to be low, based on the low hazard of the polymer and the expected low exposure.

7. ENVIRONMENTAL IMPLICATIONS

Hazard Characterisation

Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is overchelation of nutrient elements 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. The toxicity to algae is likely to be further reduced due to the presence of calcium ions, which will bind to the functional groups. This is supported by environmental endpoints for aquatic invertebrates and micro-organisms reported in the BASF safety data sheet for AQAGloss DS 6272 X containing 9.6% of the notified polymer.

<i>Endpoint</i>	<i>Result</i>	<i>Effects Observed?</i>	<i>Test Guideline</i>
Daphnia Toxicity	EC50 (48 h) >100 mg/L	no	OECD TG 202
Activated sludge	EC20 (0.5 h) >1,000 mg/L	no	OECD TG 209 (aerobic)

All results were indicative of low hazard.

Environmental Risk Assessment

Environmental Release

Manufacture of the notified polymer will not lead to any exposure of the Australian environment as it will occur overseas. A maximum of 2 tonnes of waste polymer latex is estimated to be generated per annum from filtration, filling, cleaning operation and through minor spillage during the reformulation process. In the case of spillage the notified polymer will be contained on-site by bunding or absorbed using inert material such as sand. The customer has an onsite effluent treatment plant where the waste production is treated by flocculating out the solids which is sent to prescribed waste contractors for disposal via approved landfill. A maximum of 2% is released to the wastewater which is disposed of through a licensed waste disposal contractor. It is estimated that <0.1% of the notified polymer will remain as residues in IBC containers.

The notified polymer is also released to the environment through washings of paint application equipment and disposal of empty cans during end-use by domestic and professional painters. It is estimated up to 5 tonnes could be generated during the end-use process. This includes overspray, brushes and roller washings, corresponding to 5, 35 and 60%, respectively, of this amount. It is expected that waste from overspray will be landfilled and the washings will be disposed of to sewer. It is estimated that 3% of the notified polymer per annum, which include disposal of empty used cans, would be sent to landfill and 4% of the notified polymer per annum will be discharged to sewer.

Environmental Fate

The notified polymer will cross-link when exposed to the atmosphere, further increasing its molecular weight and hydrophobicity. The cured polymer is expected to be insoluble in water, hydrolytically stable and to not be readily biodegradable (<10% BOD of the THOD during the 28 days exposure [OECD 301B]). Due to its hydrophobic nature, it is expected that the cured polymer in landfill will associate with organic phases of soil and sediments, and slowly degrade to simple carbon compounds. Similarly, in sewage treatment plants, the cured polymer is expected to precipitate from water and be adsorbed by organic phases in sediments.

Environmental Risk

It is envisaged up to approximately 7% waste would be generated from the application and disposal processes. The majority of this waste would be cured and solidified before being disposed of to landfill. In landfill, the solid wastes will not be mobile and will degrade slowly by biotic and abiotic processes. Most waste in its cured form from the applied articles at the end of its useful life is likely to be landfilled. Up to approximately 4% of waste will reach the sewer via washing of application equipment by domestic users. However, domestic use will be dispersed throughout Australia and therefore the concentration of the notified polymer in fresh water reaching sewage treatment plants would be a maximum of 3.2 µg/L on a nation wide basis [4.75 tonnes / (21 million × 200 L per person × 365 days)]. Based on the toxicological endpoint of 48 h EC50 >100 mg/L for *Daphnia magna* and the available data for only one trophic level, the PNEC is determined to be <100 µg/L with a safety factor of 1000. Therefore, the Q value (3.2/<100) is determined to be <1, indicative of acceptable risk in the aquatic compartment.

In sewage treatment plants, the cured polymer is expected to precipitate from water and be adsorbed by organic phases in sediments. Furthermore, the notified polymer is unlikely to pose an environmental risk in the aquatic compartment and is unlikely to be bioaccumulative due to its high molecular weight.

Based on the above, the notified polymer is not expected to pose a significant risk to the environment.

8. CONCLUSIONS AND RECOMMENDATIONS

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

CONTROL MEASURES

Occupational Health and Safety

- No specific engineering controls, work practices or personal protective equipment are required for the safe use of the notified polymer itself, however, these should be selected on the basis of all ingredients in the formulation. In general, respiratory protection should be worn during spray 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 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.

Disposal

- The notified polymer should be disposed of by landfill

Emergency procedures

- Spills and/or accidental release of the notified polymer should be handled by using absorbent material (e.g. sand, sawdust, general-purpose binder, kieselguhr). Dispose of absorbed material in accordance with regulations.

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 notified polymer is introduced in a chemical form that does not meet the PLC criteria.or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the chemical has changed from water based paint additive, or is likely to change significantly;
 - the amount of chemical being introduced has increased from 120 tonnes, or is likely to increase, 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.

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.