

File No: LTD/2008

November 2017

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

PUBLIC REPORT

Polymer in Dispex[®] Ultra PA 4501

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:

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**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/2008	BASF Australia Ltd	Polymer in Dispex® Ultra PA 4501	ND*	≤ 1 tonne per annum	Additive in paints

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System of Classification and Labelling of Chemicals* (GHS), as adopted for industrial chemicals in Australia.

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 an unreasonable risk to the environment.

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, noting that the formulation may be classified because of hazardous impurities and residual monomers.

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 SDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer 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 polymer 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 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 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 polymer has a number-average molecular weight of less than 1,000 g/mol;or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from additive in paints, or is likely to change significantly;
 - the amount of polymer being introduced has increased, 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.

Safety Data Sheet

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

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT

BASF Australia Ltd (ABN: 62 008 437 867)
Level 12, 28 Freshwater Place
SOUTHBANK VIC 3006

NOTIFICATION CATEGORY

Limited: Synthetic polymer with $M_n \geq 1,000$ g/mol

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, import volume and site of manufacture/reformulation.

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

None

NOTIFICATION IN OTHER COUNTRIES

Canada, China, Korea, USA

2. IDENTITY OF CHEMICAL

MARKETING NAME

Dispex[®] Ultra PA 4501 (contains up to 100% notified polymer)

MOLECULAR WEIGHT

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

ANALYTICAL DATA

Reference SEC and IR spectra were provided.

3. COMPOSITION

DEGREE OF PURITY

$> 90\%$

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: yellow viscous liquid (SDS)*

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	The notified polymer is viscous liquid at room temperature. Thermal decomposition occurs at 350 °C (SDS)*.
Boiling Point	> 200 °C at 101.3 kPa*	SDS
Density	1,050 kg/m ³ at 20 °C*	SDS
Vapour Pressure	Not determined	Based on the high molecular weight of the notified polymer, the vapour pressure is expected to be low.
Water Solubility	Immiscible	SDS
Hydrolysis as a Function of pH	Not determined	The notified polymer has hydrolysable functionalities. However, it is not expected to hydrolyse under environmental conditions.

Property	Value	Data Source/Justification
Partition Coefficient (n-octanol/water)	Not determined	SDS. The notified polymer is immiscible in water.
Adsorption/Desorption	Not determined	Expected to adsorb to soil and sediment based on high molecular weight, low water solubility and ionic attraction.
Dissociation Constant	Not determined	Based on functional groups a pKa of between 4 and 5 is expected. Therefore, the notified polymer is expected to be ionised under environmental conditions (pH 4–9).
Flash Point	> 100 °C*	SDS
Flammability	Not determined	Not expected to be highly flammable based on the flash point*.
Autoignition Temperature	Not self-igniting*	SDS
Explosive Properties	Not determined	Contains no functional groups that would imply explosive properties.
Oxidising Properties	Not determined	Contains no functional groups that would imply oxidative properties.

* Properties of the imported product Dispex® Ultra PA 4501

DISCUSSION OF PROPERTIES

Reactivity

The notified polymer is expected to be stable under normal conditions of use.

Physical hazard classification

Based on the limited information on physico-chemical properties depicted in the above table, the notified polymer cannot be classified 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 polymer will not be manufactured in Australia. It will be imported as raw material or in paint formulation at up to 100% concentration for reformulation in to paints in Australia.

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

IDENTITY OF RECIPIENTS

BASF Australia Ltd

TRANSPORTATION AND PACKAGING

The notified polymer will not be manufactured in Australia. It will be imported by sea as a component of Dispex® Ultra PA 4501 at up to 100% concentration for reformulation into paints. The imported packages will be steel drums of sizes ranging from 25 kg to 190 kg and will be transported by road to the storage and reformulation sites. Finished paints containing < 20% notified polymer will be packed in 1–10 L steel cans and 210 L steel drums and will be transported by road.

USE

The notified polymer will be used as additive in paints. It functions as a dispersing agent. The final concentration of the notified polymer in paints will be < 20%.

OPERATION DESCRIPTION

The notified polymer will be imported at up to 100% concentration and will be reformulated in to paints at the notifier's industrial customer facilities.

Reformulation

At the site of reformulation the notified polymer will be transferred to a mixing tank via gravity or low pressure pump. It will be mixed with other ingredients to manufacture paints. Samples will be collected periodically for quality testing. The finished products will be transferred to steel lined containers of various sizes ranging from 1 to 10 L, or 210 kg. The blending equipment will be cleaned using water or solvent and the liquid waste will either be recycled or disposed. The final concentration of the notified polymer in paint products will be < 20%.

End use

The finished paints containing < 20% of the notified polymer will be applied by professionals on to various substrates (mainly metals). The paints will be applied by spray, brush or roller.

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	1	4–8
Process operator	2–3	40–50
Quality control	0.5	40–50
Packaging	2–3	40–50
End use	1	60–80

EXPOSURE DETAILS*Transport and storage*

Transport and storage workers are not expected to come in contact with the notified polymer except in the unlikely event of an accident or cleaning spills. Dermal and ocular contact may occur.

Reformulation

During paint formulation processes, including transfer, quality control and cleaning and maintenance tasks, dermal and ocular exposure to the notified polymer at up to 100% concentration may occur. Exposure is expected to be reduced through the use of enclosed systems with exhaust ventilation and personal protective equipment (PPE) such as impervious gloves, coveralls and safety glasses. Inhalation exposure is not expected due to the nature of the process and expected low vapour pressure of the notified polymer.

End use

Professional painters may experience dermal, ocular and inhalation exposure to the notified polymer at up to 20% concentration during paint application and cleaning of application equipment. The paints are expected to be applied using spray equipment, brush and rollers. Spray application will be carried out in purpose built spray booths. According to the notifier, PPE such as impervious gloves, coveralls, safety glasses and respiratory protection, if required, will be used to reduce worker exposure.

6.1.2. Public Exposure

The paint products are intended for industrial use only. The public may come in contact with the surfaces on which the notified polymer containing paints are applied. By this time the polymer will be cured in the paint matrix and is not expected to be bioavailable.

6.2. Human Health Effects Assessment

No toxicity data were submitted. The notified polymer is of high molecular weight (> 1,000 g/mol) with low percentage of low molecular weight species; hence, it is not expected to cross biological membranes. The notified polymer does not contain any structural alerts of concern and is, therefore, expected to be of low hazard to human health.

Although not considered in this risk assessment, NICNAS notes that the notified polymer contains residual monomers that are classified as hazardous according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia. The concentrations of these residual monomers are low (< 1%).

Health hazard classification

As no health hazard data were available, the notified polymer cannot be classified according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia.

6.3. Human Health Risk Characterisation

The notified polymer is of high molecular weight and contains no structural alerts of concern and therefore, is expected to be of low hazard to human health.

6.3.1. Occupational Health and Safety

Workers may be exposed to the notified polymer at up to 100% concentration during reformulation process and at < 20% concentration during application of paints. Exposure is expected to be limited by the expected use of engineering controls and PPE.

Therefore, under the conditions of the occupational settings described, the notified polymer is not considered to pose an unreasonable risk to the health of workers.

6.3.2. Public Health

The paint products containing the notified polymer are for industrial use only. The public may come in contact with surfaces coated with notified polymer containing paints. However, once cured, the notified polymer will be trapped in the paint matrix and is not expected to be available for exposure.

Therefore, when used in the proposed manner, the notified polymer is not considered to pose an unreasonable risk to public health.

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 in Australia, and hence there will be no release of the notified polymer from this activity. Reformulation will occur within Australia, but within a closed system. Equipment washing residues of the notified polymer are expected to be recycled for reuse on site, to the extent practicable or disposed of. The notifier estimated that wastes and spills from reformulation will constitute 1% of annual import volume, and it is expected that these wastes and spills will be contained on-site and disposed of to landfill according to local regulations.

Environmental release during transport and storage of the notified polymer are only likely during leaks and accidental spills. In these cases, the notified polymer is expected to be contained, absorbed with an inert material and disposed of to landfill in accordance with local regulations.

Residues in import containers are expected to be disposed of to landfill as trade waste in accordance with local regulations.

RELEASE OF CHEMICAL FROM USE

Products containing the notified polymer are primarily intended for use as metal coatings, and will be used in an industrial setting only (i.e., protective and industrial coating facilities). No DIY use of products containing the notified polymer has been proposed. The notifier has estimated that 30% of the annual import volume will be lost to overspray, which is expected to be captured and collected using standard engineering controls (e.g., spray booths). Other wastes generated during use include residues in application equipment washings (estimated at ≤ 5% annual import volume) and empty paint containers (estimated at ≤ 2.5% annual import volume). Overspray losses, and other wastes generated during use are expected to be disposed of to landfill. There will be no DIY use of products containing the notified polymer.

RELEASE OF CHEMICAL FROM DISPOSAL

The notified polymer is likely to be either thermally decomposed during metal reclamation processes or disposed of to landfill at the end of the useful life of the article to which it has been applied.

7.1.2. Environmental Fate

No environmental fate data were submitted. The majority of the notified polymer is expected to be present within an inert cured coating matrix, and is expected to share the fate of the metal to which it has been applied. Coated metals will eventually be recycled or disposed of to landfill at the end of their useful life. The notified polymer is also expected to enter landfill as collected wastes and residues from reformulation and use.

The notified polymer is unlikely to be bioavailable prior to curing of the coating due to its high molecular weight. The notified polymer is not expected to be mobile in the environment, due to immiscibility with water, and its potential to adsorb to soil and sediment based on its hydrophobic and anionic properties. In surface waters and in landfill, the notified polymer is expected to eventually degrade via biotic and abiotic processes to form water and oxides of carbon. The notified polymer is expected to thermally degrade during metal recycling.

7.1.3. Predicted Environmental Concentration (PEC)

The predicted environmental concentration (PEC) has not been calculated for the notified polymer as, based on its reported use pattern, ecotoxicologically significant quantities are not expected to be released to the aquatic environment.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted. The notified polymer has ionic functionality that has the potential to be toxic to aquatic life, particularly algae, but based on its structure this is unlikely to be significant. Polymers without significant ionic functionality are generally considered not to be harmful to aquatic organisms.

7.3. Environmental Risk Assessment

The risk quotient ($Q = \text{PEC}/\text{PNEC}$) for the notified polymer has not been calculated as release to the aquatic environment in ecotoxicologically significant quantities is not expected based on its reported use pattern as a component of metal coatings to be applied in an industrial setting. The majority of the environmental release of the notified polymer will be disposal of the cured paints to landfill and by thermal decomposition during metal reclamation processes. The notified polymer will be bound within the inert coating matrix and is unlikely to leach or be bioavailable. On the basis of its limited aquatic exposure and assessed use pattern, the notified polymer is not expected to pose an unreasonable risk to the environment.

BIBLIOGRAPHY

SWA (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>.