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

**PUBLIC REPORT**

**PAE 312**

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.

For the purposes of subsection 78(1) of the Act, this Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This 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:	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:	<a href="http://www.nicnas.gov.au">www.nicnas.gov.au</a>

**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/1825	BASF Australia Ltd	PAE 312	ND*	<500 tonnes per annum	Additive in concrete

\*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, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

### **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 assessed use pattern, the notified polymer 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 ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer as introduced:
  - gloves and goggles

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

- A copy of the (M)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 1000 Da;or
- (2) Under Section 64(2) of the Act; if
  - the function or use of the polymer has changed from additive in concrete, 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.

### *(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)**

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

**NOTIFICATION CATEGORY**

Limited: Synthetic polymer with  $M_n \geq 1,000$  Da.

**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, degree of purity, polymer constituents, residual monomers, impurities, additives/adjuvants, and import volume.

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

Variation to the schedule of data requirements is claimed for all physico-chemical endpoints.

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

None

**NOTIFICATION IN OTHER COUNTRIES**

China, 2012

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

**MARKETING NAME(S)**

PAE 312 33% (product containing the notified polymer)

**MOLECULAR WEIGHT**

> 10,000 Da

**ANALYTICAL DATA**

Reference GPC spectra was provided.

### **3. COMPOSITION**

**DEGREE OF PURITY**

>95%

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

There were no losses by volatilisation, exudation or leaching are expected from the notified polymer under the normal conditions of use.

**DEGRADATION PRODUCTS**

No degradation, decomposition or depolymerisation of the notified polymer is expected to occur under normal conditions of use.

### **4. PHYSICAL AND CHEMICAL PROPERTIES**

APPEARANCE AT 20 °C AND 101.3 kPa: Light yellow to brownish liquid with characteristic odour (product)

Property	Value	Data Source/Justification
Melting Point/Freezing Point	0 °C	(M)SDS (product)
Boiling Point	100 °C at 101.3 kPa	(M)SDS (product)

Density	1000-1200 kg/m <sup>3</sup> at 20 °C	(M)SDS (product)
Vapour Pressure	Not determined	-
Water Solubility	Not determined	The notified polymer is expected to be at least water dispersible based on its hydrophilic functionalities
Hydrolysis as a Function of pH	Not determined	Does not contain hydrolysable functionality
Partition Coefficient (n-octanol/water)	Not determined	Expected not to significantly partition in n-octanol on the basis of its assumed water dispersibility
Adsorption/Desorption	Not determined	Expected to partially adsorb to soil, sediment and sludge based on its high molecular weight and potential anionicity
Dissociation Constant	Not determined	The notified polymer will be ionised in the environmental pH range (4 – 9)
Particle Size	Not determined	Imported in aqueous solution. Not separated from water.
Flash Point	Not determined	Imported in aqueous solution. Not separated from water.
Autoignition Temperature	Not determined	Imported in aqueous solution. Not separated from water.
Explosive Properties	Not explosive	Based on the structure, the notified polymer is not expected to be explosive.
Oxidising Properties	Not determined	Based on the structure, the notified polymer is not expected to have oxidising Properties.

#### Reactivity

The notified polymer 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 polymer 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 polymer will be imported as an aqueous solution at <60% concentration.

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

Year	1	2	3	4	5
Tonnes	300-500	300-500	300-500	300-500	300-500

#### PORT OF ENTRY

Sydney

#### IDENTITY OF MANUFACTURER/RECIPIENTS

BASF Australia Ltd

#### TRANSPORTATION AND PACKAGING

The notified polymer (at <60% concentration in aqueous solution) will be imported in 1000 L pallecons (intermediate bulk containers) or in 200 L drums. The imported solution containing the notified polymer will be transported to the notifier's admixture plants by road.

**USE**

The notified polymer will be used as an additive in the preparation of concrete admixtures which will be used in ready-mix concrete preparation and pre-cast moulded concrete. The final concrete will contain <0.1% of the notified polymer.

**OPERATION DESCRIPTION**

The notified polymer will not be manufactured in Australia. It will be imported in solution at <60% and delivered to concrete admixture plants for reformulation. The solution containing the notified polymer will be pumped from the containers into a storage tank, then blended with other admixture components to produce a concrete admixture product containing <20% of notified polymer.

Empty containers, pipeline and hoses will be rinsed after production and the water will be collected for re-use. The admixtures will be repackaged into 1000 L bulk containers, 200 L drums or 20 L cubes and sold to concrete manufacturers.

At the concrete production plant, the admixtures will be pumped from the containers into a storage tank then automatically dosed into a concrete mixer with other ingredients. The final concrete product will contain <0.1% of the notified polymer which will be fed into ready-mix concrete trucks for transport to construction sites or into pre-cast concrete moulds.

**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>
Transportation and storage	2	4-6
Production operators	0.5	90-100
Bulk transport loading/unloading	2-3	90-100
Concrete manufacturing	8	220

**EXPOSURE DETAILS***Transport and storage*

Dermal and ocular exposure of transport and storage workers to the notified polymer at <60% is not expected except in the event of accidental spill or breach of packaging.

*Concrete admixture formulation*

Dermal and ocular exposure to the notified polymer at <60% may occur during pumping, blending and rinsing stages of the admixture formulation. However, exposure to the notified polymer will be minimised as workers are expected to wear personal protective equipment (PPE) including gloves and goggles. Inhalation exposure to the notified polymer is not expected as the notified polymer is not volatile and aerosols are not expected to be generated.

*Concrete manufacturing*

Dermal and ocular exposure to the notified polymer at up to 20% may occur during pumping, mixing and equipment cleaning stages of the concrete manufacturing. However, exposure will be mitigated by the lack of direct handling of the notified polymer (use of pump and automated dosing and mixing) together with the use of PPE by the workers.

*Construction Workers*

During construction, workers may be exposed to the concrete mixtures containing the notified polymer at <0.1% via dermal and ocular routes. However, exposure to the notified polymer would be limited due to its low concentration in concrete and the use of PPE by the workers. Construction workers may also experience

extensive exposure to solidified concrete or cement; however, in this state the notified polymer will be bound within the hardened matrix of the concrete and is not expected to be available for exposure.

#### **6.1.2. Public Exposure**

The notified polymer will only be for industrial use and not be sold to the public. Though public exposure to solidified concrete or cement containing the notified polymer at <0.1% is likely to occur, the notified polymer will be bound within the hardened matrix of concrete and is not expected to be bioavailable.

### **6.2. Human Health Effects Assessment**

No toxicity data were submitted.

Based on the high molecular weight (>10,000 Da) of the notified polymer and low levels of low molecular weight species < 1000, the potential for the notified polymer to cross the gastrointestinal (GI) tract by passive diffusion or to be dermally absorbed after exposure is limited. Although chemicals with similar functional groups have been reported to have corrosive/irritation properties, potential for these effects is expected to be reduced by the high molecular weight of the notified polymer.

#### **Health 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, 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 provided for the notified polymer. However the high molecular weight is expected to reduce absorption and the potential for corrosion/irritation.

Limited exposure to the notified polymer at different concentrations may occur during transport, storage, concrete admixture formulation, concrete manufacturing, construction work and cleaning processes involving the notified polymer. This is likely to be further reduced due to the use of enclosed systems and the expected use of personal protective equipment (PPE) when handling the notified polymer during these processes.

Given the expected use of controls to reduce worker exposure, the risk to workers using the notified polymer is not considered to be unreasonable.

#### **6.3.2. Public Health**

Given that the notified polymer is for industrial use only and will not be sold to the general public, and that the general public will not be exposed to the notified polymer in a bioavailable form, 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 polymer will not be manufactured in Australia. The release of the notified polymer to the environment during importation, storage, and transport is expected to be limited to accidental spills. If a spill occurs during storage or transportation, products containing the notified polymer are expected to be collected into suitable containers for disposal to landfill.

During reformulation processes the notified chemical may be released to the environment from equipment cleaning processes. However, release is expected to be limited (< 0.1% of the total import volume) and is expected to be released to sewer.

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



During use, a limited amount of the notified polymer may be released to sewer as a result of cleaning application equipment. The washings containing the notified polymer from delivery trucks are expected to be contained in a holding tank, most of which is expected to be recycled for future concrete manufacture. Any excess concrete (waste) is expected to be transferred to dumpsters where the concrete is allowed to cure with subsequent disposal in authorised landfill.

#### RELEASE OF CHEMICAL FROM DISPOSAL

The notified polymer is expected to share the fate of the construction material and is expected to be disposed of to landfill at the end of its useful life. Residues in empty import containers and bags are expected to be disposed of to landfill. The notified polymer will be bound in concrete matrix and will not be released to the environment.

#### **7.1.2. Environmental Fate**

No environmental fate data were submitted. The vast majority of the notified polymer will be bound in the concrete matrix and will not be released to the environment in any significant quantity. A small amount of the notified polymer may be released to sewer during cleaning activities nationwide. Bioaccumulation is not likely based on the notified polymer's high molecular weight and the use pattern of entrapment in concrete solids after application. In landfill, leaching of the notified polymer is not expected given it is bound within the concrete matrix. Ultimately, the notified polymer will be degraded via abiotic or biotic pathways into water, oxides of carbon.

#### **7.1.3. Predicted Environmental Concentration (PEC)**

A predicted environmental concentration was not determined because very limited aquatic exposure to the notified polymer is expected when the notified polymer is used as proposed in construction materials. The notified polymer will be fixed in a solid matrix and will not be available to the environment.

#### **7.2. Environmental Effects Assessment**

No ecotoxicity data were submitted for the notified polymer. Anionic polymers are known to be moderately toxic to algae and show low toxicity to fish and daphnids. The mode of toxic action is over-chelation 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 anionic component of the notified polymer and, therefore, it is not considered to be an over-chelation hazard to algae. Furthermore, the notified polymer is not expected to bioaccumulate based on its high molecular weight.

#### **7.2.1. Predicted No-Effect Concentration**

The Predicted No-Effect Concentration (PNEC) has not been calculated since no ecotoxicity data for the notified polymer was submitted.

#### **7.3. Environmental Risk Assessment**

The Risk Quotient (PEC/PNEC) is unable to be quantified as the PNEC has not been calculated. Although small amounts of the notified polymer may be released to aquatic compartment during its use, it is an anionic polymer and is assumed to be of low hazard to aquatic organisms. The majority of the imported quantity of the notified polymer will be bound in the concrete matrix and, therefore is not expected to be mobile, bioavailable nor bioaccumulative. Therefore, on the basis of the assessed use pattern and the assumed low hazard, the notified polymer is not expected to pose an unreasonable risk to the environment.

**BIBLIOGRAPHY**

NOHSC (2004) Approved Criteria for Classifying Hazardous Substances, 3rd edition [NOHSC:1008(2004)]. National Occupational Health and Safety Commission, Canberra, AusInfo.

United Nations (2009) Globally Harmonised System of Classification and Labelling of Chemicals (GHS), 3rd revised edition. United Nations Economic Commission for Europe (UN/ECE), <[http://www.unece.org/trans/danger/publi/ghs/ghs\\_rev03/03files\\_e.html](http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html)>.