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

**PUBLIC REPORT**

**Polymer in GP SHP 60 PLUS**

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 Sustainability, Environment, Water, Population and Communities.

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:

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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/1636	Dow Corning Australia Pty Ltd	Polymer in GP SHP 60 PLUS	ND*	≤ 40 tonnes per annum	Additive for construction materials

\*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 for the 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 implement the following engineering controls to minimise occupational exposure to products containing the notified polymer (in powder form):
  - Exhaust ventilation or good general ventilation
  - Enclosed, automated processes (where possible) during reformulation
- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure during handling of products containing the notified polymer (in powder form):
  - Low dust handling techniques
  - Clean spills immediately, taking care to avoid inhalation
- 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 products containing the notified polymer:
  - Gloves and appropriate industrial clothing
  - Respiratory protection, if dusts are being generated

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 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

- The notified polymer should be disposed of to landfill.

#### 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;
  - information becomes available on the particle size distribution of the notified polymer (powder form), which indicates the presence of a significant proportion ( $\geq 10\%$ ) in the respirable range ( $< 10 \mu\text{m}$  diameter);

or

- (2) Under Section 64(2) of the Act; if
  - the function or use of the polymer has changed from additive for construction materials, or is likely to change significantly;
  - the amount of polymer being introduced has increased from 40 tonnes per annum, 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 polymer 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)

Dow Corning Australia Pty Ltd (ABN: 36 008 444 166)  
Darling Park, Tower 2, Level 20, 201 Sussex Street  
Sydney, NSW 2000

## NOTIFICATION CATEGORY

Limited: Synthetic polymer with Mn  $\geq$  1000 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, analytical data, degree of purity, polymer constituents, residual monomers, impurities, additives/adjuvants, import volume and use details

## 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(S)

None

## NOTIFICATION IN OTHER COUNTRIES

USA

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

GP SHP 60 PLUS (< 20% notified polymer)

## MOLECULAR WEIGHT

> 1,000 Da

## ANALYTICAL DATA

Reference FTIR and GPC spectra were provided.

**3. COMPOSITION**

DEGREE OF PURITY > 90%

**4. PHYSICAL AND CHEMICAL PROPERTIES**

APPEARANCE AT 20 °C AND 101.3 kPa: liquid (imported product containing notified polymer at < 20% is a fine powder)

Property	Value	Data Source/Justification
Boiling Point	Not determined	Imported in a formulated product.
Density	980 kg/m <sup>3</sup> at 25 °C	Estimated
Vapour Pressure	Not determined	Based on the high molecular weight, vapour pressure is expected to be low.
Water Solubility	Not determined	Expected to be low based on the predominantly hydrophobic structure of the notified polymer
Hydrolysis as a Function of pH	Not determined	The notified polymer contains hydrolysable functionalities. However, no significant hydrolysis is expected due to its limited water solubility.
Partition Coefficient (n-octanol/water)	Not determined	Expected to partition to the n-octanol phase based on its low water solubility and structure.
Adsorption/Desorption	Not determined	Expected to have reduced mobility in soils and sediment.
Dissociation Constant	Not determined	Does not contain dissociable functionality.
Particle Size*	Mean particle size: 300 µm (90% < 500 µm)	Product information sheet
Flash Point	100 °C at 100 kPa	Measured (test report was not provided)

Autoignition Temperature	Not determined	Imported in a formulated product.
Explosive Properties	Not determined	Contains no functional groups that imply explosive properties.
Oxidising Properties	Not determined	Contains no functional groups that imply oxidative properties.

\*Imported product containing the notified polymer at < 20%

#### DISCUSSION OF PROPERTIES

##### *Reactivity*

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

##### **Physical hazard classification**

Based on the limited submitted physico-chemical data depicted in the above table, the notified polymer is not recommended for hazard classification according to the *Globally Harmonised System for the 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 a component of a formulated product at < 20%.

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

<i>Year</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Tonnes</i>	1-15	10-20	10-30	20-40	20-40

#### PORT OF ENTRY

Sydney

#### IDENTITY OF RECIPIENTS

Dow Corning Australia Pty Ltd

#### TRANSPORTATION AND PACKAGING

The imported product containing the notified polymer will be packed, stored and transported in 330 g bottles or 10 kg/1000 kg bags. It will be transported by road from the notifier's warehouse to the customer reformulation sites.

#### USE

Waterproofing additive (at < 1%) for construction materials, such as mortar, concrete, grouts.

#### OPERATION DESCRIPTION

At the customer reformulation plants, the imported product (in powder form) containing the notified polymer at < 20% will be metered and mixed with other dry ingredients (e.g. sand, cement and gypsum) to produce the reformulated product containing the notified polymer at < 1%.

The reformulated product (containing < 1% notified polymer) will be used at various construction sites in industrial settings. The reformulated product will be mixed with water (e.g. in a drum or bucket) prior to application.

## 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	≤ 5	≤ 10

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Reformulation	8	72
Application	8	72

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#### EXPOSURE DETAILS

##### *Transport and Warehousing*

During transport and warehousing, workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

##### *Reformulation*

During reformulation, workers may be exposed to the notified polymer (< 20%; powder form) via the dermal, ocular and inhalation routes during transfer and mixing of the imported product with other construction additives. Exposure may also occur during cleaning (dry cleaning process) of the mixing equipment after formulation (< 1% notified polymer). Exposure to significant amounts of the notified polymer is expected to be limited because of the engineering controls, including either local exhaust ventilation, good general ventilation or forced mechanical ventilation, largely automated nature of the processes, and the personal protective equipment (PPE) that is expected to be worn by workers, such as safety glasses, gloves and coveralls (and respiratory protection).

##### *Application*

During application, the main route of exposure to the notified polymer at < 1% (powder form) is expected to be dermal during application of the construction mixture to various surfaces (accidental ocular and/or inhalation exposure to the product containing the polymer in the powder form could also occur). Exposure during application-related tasks may be minimised by the use of PPE, including safety glasses, gloves, appropriate industrial clothing and mixing/application in ventilated areas.

Once the construction mixture containing the notified polymer at < 1% is dried (by air), the notified polymer will be cured into an inert matrix and will not be available for exposure.

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

The notified polymer and products containing the notified polymer will not be available for use by the general public. The public may have dermal exposure to articles constructed containing the notified polymer; however the notified polymer will be part of an inert matrix and is not expected to be bioavailable.

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

No toxicity data were submitted for the notified polymer.

Based on the high molecular weight (> 1000 Da) of the notified polymer, the potential of the notified polymer to cross the gastrointestinal (GI) tract by passive diffusion or to be dermally absorbed after exposure is expected to be limited. However, the polymer contains a proportion of low molecular weight species (< 1000 Da) that may be absorbed. In addition, the notified polymer may be absorbed across the respiratory tract.

The notified polymer contains a structural alert for systemic toxicity (US EPA, 2010), with the relevant functional group presenting a concern for lung toxicity from inhalation of vapours or aerosols. No study is available for the notified polymer on this endpoint (or for similar polymers that have been administered via the inhalation route). Therefore, the potential for systemic toxicity of the notified polymer via the inhalation route cannot be ruled out.

##### ***Health hazard classification***

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System for the 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**

The routes of exposure of workers to the notified polymer in powder form (< 20% concentration) are expected to be dermal, inhalation and ocular during reformulation tasks. There is also potential for dermal, accidental ocular and inhalation exposure during mixing/application of the construction mixture containing the notified polymer at < 1%. Once the applied product is dried, the notified polymer will be unavailable for exposure.

The primary concern associated with use of the notified polymer relates to inhalation exposure, as the potential for systemic toxicity via the inhalation route cannot be ruled out. While the notified polymer is a liquid, it will be introduced (at < 20%) and used (at < 1%) in a powder form. The imported product containing the notified polymer is a powder with 90% of particles < 500 µm (proportion of particles in the inhalable/respirable range is not specified, but the mean particle size is 300 µm). The notifier indicated that the imported product is not expected to be broken into a finer powder (smaller particle sizes) during the dry reformulation processes (e.g. through abrasion). The notified polymer is expected to have a low vapour pressure and is not expected to be aerosolised during use, therefore any inhalation is only expected from inhalation of the powder. At reformulation sites, exposure of workers to the notified polymer (at < 20%) is expected to be limited by the largely automated nature of the processes, the use of exhaust or other ventilation, and the use of PPE by workers (e.g. gloves, coveralls and respiratory protection if dusts are being generated). At end-use sites, exposure of workers is expected to be limited by the low concentration of the notified polymer (< 1%) in the reformulated construction mixture and the expected use of powdered products in ventilated areas. Workers may also use some PPE (e.g. gloves, protective clothing and respiratory protection if dusts are being generated) and good hygiene practices are expected to be in place.

Overall, given the proposed controls to minimise exposure of workers during reformulation activities (e.g. use of PPE and engineering controls) and the low concentration of the notified polymer in end-use products, the risk to workers from use of the notified polymer is not considered to be unreasonable.

### 6.3.2. Public Health

The notified polymer will not be available to the public, except in a form whereby the notified polymer will be bound within a matrix and the notified polymer will not be bioavailable. Therefore, when used in the proposed manner, the risk to the public 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 as dry cleaning is expected to take place and waste residues are expected to be sent to landfill.

##### RELEASE OF CHEMICAL FROM USE

The notified polymer will be incorporated into construction materials such as mortar, concrete and grout where it will become part of a solid matrix. During use, the notified polymer may be released to sewer as a result of cleaning application equipment. It is expected that < 50 kg/yr will be released to sewer during use at construction sites nationwide.

##### RELEASE OF CHEMICAL FROM DISPOSAL

The notified polymer is expected to share the fate of the construction materials 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.

#### 7.1.2. Environmental Fate

No environmental fate data were submitted. The majority of the notified polymer is expected to eventually be disposed of to landfill fixed in a solid matrix. Any notified polymer that is not bound within the solid matrix is not expected to be mobile, based on its low water solubility and expected high adsorption/desorption coefficient. Therefore, limited aquatic exposure to the notified polymer is expected, when it is used as proposed in construction materials. A small amount of the notified polymer may be released to sewer during cleaning activities nationwide.



The notified polymer is not expected to be biodegradable. It is expected to persist in the environment; however it is not expected to be bioavailable. The notified polymer contains hydrolysable functionality and may hydrolyse under environmental conditions (pH 4-9). However, the majority of the notified polymer is not expected to hydrolyse based on its low water solubility and limited aquatic exposure. The notified polymer is not expected to be bioaccumulative based on its high molecular weight and limited aquatic exposure. Ultimately, the notified polymer is likely to degrade to form water and oxides of carbon and silicon.

#### **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. The notified polymer is not expected to be harmful to aquatic life based on its limited aquatic exposure. Its high molecular weight means it is unlikely to cross biological membranes. Therefore, the notified polymer cannot be classified under the Globally Harmonised System of Classification and Labelling of Chemicals (GHS; United Nations, 2009).

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

Since there is expected to be very little exposure of the notified polymer to the water compartment, the predicted no-effect concentration (PNEC) was not calculated.

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

The majority of the notified polymer will remain fixed in construction materials and is not expected to be exposed to the aquatic environment or to be bioavailable. Since there is expected to be very limited exposure to aquatic organisms, the notified polymer is not expected to pose an unreasonable risk to the environment based on its assessed use pattern.

**BIBLIOGRAPHY**

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