

File No PLC/715

August 2007

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

FULL PUBLIC REPORT

PrimoSpire

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:

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**Director
NICNAS**

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FULL PUBLIC REPORT**PrimoSpire****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

Polymers International Australia Pty Ltd (ABN 92 069 883 825)

17-19 Endeavour Way

BRAESIDE VIC 3195

NOTIFICATION CATEGORY

Polymer of Low Concern

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, Import Volume

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

No variation to the schedule of data requirements is claimed.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

No

NOTIFICATION IN OTHER COUNTRIES

EU (2007), China (2006), Japan (2006), Korea, USA

2. IDENTITY OF CHEMICAL

OTHER NAME(S)

Polyphenylene

MARKETING NAME(S)

PrimoSpire

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn) > 10000 Da

% of Low MW Species < 1000 < 1%

% of Low MW Species < 500 < 1%

POLYMER CONSTITUENTS

The notified polymer contains only low concern functional groups.

3. PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</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	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	Off-white, black pellets or powder
Melting Point – Softening Point	155 - 359°C
Decomposition Temperature	450°C
Density	1230 kg/m ³ at 20°C
Water Solubility	< 0.1% as total carbon which is consistent with the polymer structure.
Particle Size	29.8% < 100 µm (sieve method) 13.8% < 10.2 µm (cascade impactor method) 3.73% < 5.4 µm (cascade impactor method)
Reactivity	Stable under normal environmental conditions. The notified polymer did not hydrolyse after 24 h at pH 1.2 or after 2 weeks at pH 4, 7 and 9, both at 40°C.
Degradation Products	None under normal conditions of use

5. INTRODUCTION AND USE INFORMATION

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>	0-1	1-3	3-10	3-10	3-10

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer is imported in the form of pellets and powder in packaging of a plastic pail of 3.8, 7.6, 11.3 L in size, 25 kg bag. The concentration of the polymer in formulations could range from 50-99%. The remaining constituents would be additives and/or colourants, such as glass fibre, carbon fibre, titanium dioxide, carbon black, or another polymer etc.

Reformulation/manufacture processes

The notified polymer will be imported as solid pellets or powder ready for moulding and injection into end use products. There will be no reformulation or repackaging of the notified polymer. For manufacturing injection moulded articles, typically the content of imported bags or pails is automatically transferred to a hopper equipped with dust extractors. The resin is dried into the hopper and automatically conveyed to the injection machine where it is melted and injected into shapes. The moulded articles are cooled and automatically discharged from the machine. They are then warehoused and subsequently assembled into finished consumer products. Rejected parts are collected and sent to grinding machines for re-use.

Use

Injection moulded parts for use in coatings, military applications, electrical/electronic industry, possible food contact and medical applications.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

Dermal and ocular exposure may potentially occur during certain processes involving the notified polymer, such as injection moulding. However, exposure to significant amounts of the notified polymer is limited because of the largely automated processes, and the engineering controls and personal protective equipment worn by workers. Workers will make dermal contact with pellets/powder containing the notified polymer (up to 100%). However, the notified polymer is cured into an inert matrix and is hence unavailable for exposure.

A significant proportion (approximately 14%) of the polymer dust generated during injection moulding is respirable (mean particle size $< 10 \mu\text{m}$). Inhalation exposure to the fine powder during injection moulding is expected to be controlled by Local Exhaust Ventilation (LEV) and a dust mask or respirator if necessary. Dermal and occasional ocular exposure is expected to be controlled by the use of gloves and safety goggles. Because the injection moulding is expected to be automated, the concentration of dust in the workplace should be minimised by the use of LEV. The most likely exposure scenarios involve cleaning up dust residues with an industrial vacuum cleaner and its emptying and cleaning. There is a possibility of dust generation requiring the use of a mask or respirator to control inhalation exposure while cleaning.

The Australian recommended exposure standard for nuisance dust is 10 mg/m^3 [NOHSC 3008:(1995)], but a recommended exposure limit of 3 mg/m^3 has been suggested by the American Conference of Governmental Industrial Hygienists (ACGIH) for “respirable (insoluble) particulates (not otherwise regulated)”. There may be some potential for exposure while cleaning up dust residues but as this should be conducted using an industrial vacuum cleaner the majority of the dust should be collected into the vacuum cleaner itself and there should be little atmospheric dust generated.

PUBLIC EXPOSURE

The notified polymer will not be sold to the public except in the form of finished articles. There is potential for extensive public exposure to articles such as electronic items comprised wholly or partly of the notified polymer. Blooming/leaching of the notified polymer from the articles is not expected and hence exposure will be low.

Members of the public may make dermal contact with articles containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is bound within a matrix, resistant to degradation and unlikely to be bioavailable.

6.2. Toxicological Hazard Characterisation

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

6.3. Human Health Risk Assessment

OCCUPATIONAL HEALTH AND SAFETY

The OHS risk presented by the notified polymer is expected to be low, based on the minimal exposure to workers and the low intrinsic hazard of the polymer.

Polymer with molecular weight $> 10,000$ are generally of concern for lung effects. Workers will need to have adequate protection to protect inhalation of articles.

PUBLIC HEALTH

The notified polymer will not be available to the public. Members of the public may make dermal contact with products containing the notified polymer. However, the risk to public health will be negligible because the notified polymer is of low hazard, and is not bioavailable.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

Estimated environmental release of the notified polymer is summarised in the following table.

Source of release	% Volume	Released to
Residual notified polymer within import containers	< 0.5%	Landfill
Accidental spills and equipment cleaning	< 1.0%	Landfill
End-of-useful-life disposal of finished articles	> 98.5%	Landfill

ENVIRONMENTAL FATE

Notified polymer that is disposed to landfill is expected to be immobile, due to its low solubility in water. Eventually, the notified polymer is expected to degrade via biotic and abiotic mechanisms to simple organic compounds and water. Due to the large molecular weight and low water solubility, the notified polymer is not expected to bioaccumulate.

7.2. Environmental Hazard Characterisation

No ecotoxicological data were submitted. PLCs without significant ionic functionality are of low concern to the aquatic environment.

7.3. Environmental Risk Assessment

Based on the proposed use pattern, the release of the notified polymer to the environment is expected to be very low. The use pattern of the notified polymer in injection moulded parts will result in limited if any exposure to the aquatic environment. While no ecotoxicity data are available, due to limited release to water it is unlikely that the polymer would exist at levels which could pose a risk to aquatic organisms. The high molecular weight indicates a low potential for bioaccumulation.

Based on the reported exposure levels and use pattern, the polymer is not considered to pose a risk to the environment when it is stored, transported and used in the proposed manner.

8. CONCLUSIONS

8.1. Level of Concern for Occupational Health and Safety

There is Low Concern to occupational health and safety under the conditions of the occupational settings described.

8.2. Level of Concern for Public Health

There is Negligible Concern to public health when used in the proposed manner.

8.3. Level of Concern for the Environment

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

9. MATERIAL SAFETY DATA SHEET

9.1. Material Safety Data Sheet

The notifier has provided MSDS as part of the notification statement. The accuracy of the information on the MSDS remains the responsibility of the applicant.

10. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer during certain processes where dust may be generated:
 - Use of Local Exhaust Ventilation if necessary when handling the notified polymer in powder form
 - Avoid the formation of airborne dusts

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer during certain processes where dust may be generated:
 - Use of a dust mask or respirator (adequate for respirable particle sizes) if necessary when handling notified polymer in powder form
 - Use of a mask or respirator (adequate for respirable particle sizes) while cleaning up dust residues with an industrial vacuum cleaner and emptying and cleaning of the industrial vacuum cleaner
 - Use of gloves, safety goggles and overalls
- In the interest of occupational health and safety, the following guidelines and precautions should be observed for use of the notified polymer as introduced in powder form
 - The level of atmospheric nuisance dust should be maintained as low as possible. The ASCC exposure standard for atmospheric dust is 10 mg/m³ but a recommended exposure limit of 3 mg/m³ has been suggested by the American Conference of Governmental Industrial Hygienists (ACGIH) for “respirable (insoluble) particulates (not otherwise regulated)”.

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.

Environment

Disposal

- The notified polymer should be disposed of to landfill.

Emergency procedures

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

10.1. Secondary Notification

The Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under subsection 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 subsection 64(2) of the Act:
 - if any of the circumstances listed in the subsection arise.

The Director will then decide whether secondary notification is required.