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

FULL PUBLIC REPORT

Polymer in Xylex Resins

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**Director
Chemicals Notification and Assessment**

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FULL PUBLIC REPORT

Polymer in Xylex Resins

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

General Electric Plastics (Australia) Pty Ltd (ABN: 92 005 837 454), 175 Hammond Rd, Dandenong, Victoria, 3175.

NOTIFICATION CATEGORY

The notified polymer meets the PLC criteria.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: chemical name, trade name, CAS number, molecular and structural formulae, molecular weight, spectral data, composition.

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)

Not previously notified.

NOTIFICATION IN OTHER COUNTRIES

Japan, Korea (KECI No. 2001-3-1970) and USA (PMN No. P00-185).

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

The notified polymer is a component of Xylex resins, for example Xylex X7200 NA9A008.

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn)	> 10000
% of Low MW Species < 1000	< 5%
% of Low MW Species < 500	< 2%

SPECTRAL DATA An infrared (IR) spectrum was provided.

METHODS OF DETECTION AND DETERMINATION

IR spectroscopy.

3. COMPOSITION

HAZARDOUS IMPURITIES

None.

NON HAZARDOUS IMPURITIES (> 1% by weight)

None.

ADDITIVES/ADJUVANTS

None.

RESIDUAL MONOMERS

All residual monomers are below the relevant cut-offs for classification of the notified polymer as a hazardous

substance.

4. INTRODUCTION AND USE INFORMATION

MODE OF INTRODUCTION OF NOTIFIED CHEMICAL (100%) OVER NEXT 5 YEARS

Initially as formulated plastic pellets for moulding and subsequently as pure granules or pellets for compounding into Xylex resins.

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>	< 10	< 10	< 100	< 1000	< 1000

USE

Plastic component.

5. PROCESS AND RELEASE INFORMATION

5.1. Distribution, Transport and Storage

PORT OF ENTRY

Unknown.

IDENTITY OF MANUFACTURER/RECIPIENTS

The notifier and a range of end users.

TRANSPORTATION AND PACKAGING

The formulated polymer will be imported in ready to sell packages of the commercial form in 20 kg polythene bags or 500 kg bulk sacs, and the notified polymer itself will be imported in the same bags as well as 1 tonne octabins.

5.2. Operation Description

The notified polymer will be blended into compounded polymer granules prior to distribution to end user sites throughout Australia. The polymer granules/pellets will be weighed into a mixing vessel and blended with other ingredients to form the compounded polymer which is then extruded, pelletised and packaged for distribution. At the end user site the heated polymer will be moulded into automotive parts, electrical housings, transformer parts and leisure articles. The concentration of the notified polymer in the final products will be between 20 and 90%.

5.3. Occupational exposure

Number and Category of Workers

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration</i>	<i>Exposure Frequency</i>
Compounding			
Warehouse	2	Not provided.	Up to 200 days per year
Weigher/blender	1	“	“
Extrusion plant operator	1	“	“
Packer	1	“	“
Article forming			
Warehouse workers	2*	“	“
Moulding equipment operators	2*	“	“

* at up to 50 establishments

Exposure Details

For compounding, the polymer granules/pellets will be weighed and transferred to a blending vessel. Typically this is accomplished manually or with a variety of transfer aids. The container is fully

emptied by shaking or vacuuming into the vessel. After all components have been added to the blending vessel, melting and extrusion of the compound occurs. This produces long, thin, continuous strands of product and these are chopped automatically into small (0.5 – 1 mm diameter) pellets. The pellets are then automatically filled into bags for shipping. Typically pellets will be associated with polymer dust so that local exhaust ventilation is used at points where exposure to dust from blended ingredients or final product or fumes generated from heating of the blend is possible.

Moulding of the plastic pellets containing the notified polymer is accomplished by transfer to a moulding machine. Typically transfer to the hopper of the moulding machine can be manual or via some form of vacuum device and local exhaust ventilation is used to control exposure to dust or fumes from heating the plastic to 180 - 250°C. Once the plastic is transferred to the hopper the system of produced moulded articles is enclosed and worker exposure is unlikely.

5.4. Release

RELEASE OF CHEMICAL AT SITE

The notifier expects the approximately 1 % of the import volume per annum of the notified polymer will be released as a result of formulation and use. It is anticipated that the majority of the polymer from spills will be recovered. Therefore, the notifier expects that very little of the notified polymer will be released to landfill.

RELEASE OF CHEMICAL FROM USE

The majority of the notified polymer will be incorporated into articles such as automotive parts, electrical housings, transformer parts and leisure articles and release to the environment will occur when the articles are disposed of.

5.5. Disposal

Empty import bags and any residual polymer they contain will be disposed of to landfill.

Plastic end use articles will eventually be disposed of to landfill.

5.6. Public exposure

The public may infrequently be exposed to the notified polymer as imported pellets, contained in plastic pellets or in finished articles as a result of a transport accident.

When the polymer is incorporated into finished products public exposure can be widespread. After disposal of the polymer or finished products to landfill public exposure is unlikely.

6. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	Solid granules/pellets.
Melting Point	Approximately 221°C (gradual softening over a wide temperature range).
Density	> 1000 kg/m ³ at 25°C
Water Solubility	Approximately 1 mg/L
Remarks	The water solubility was determined on a pelletized sample of the notified polymer cryogenically ground to an average particle size of 250 micron. The polymer powder (0.2 and 1 g) was added to water (500 mL) and the resulting suspensions were stirred at 40°C for 2 h followed by 24 h at 25°C. After filtration, the filter cake was dried overnight and weighed and the supernatant was prepared for TOC and GC analysis.
Particle Size	Granules of approximately 1 mm.
Flammability	Appears to be able to be heated to high temperatures in the

course of normal use without combusting.

Explosive Properties

Not sensitive to friction shock or heat.

ADDITIONAL TESTS

Hydrolysis as a Function of pH

No hydrolysis observed at any pH.

Remarks The polymer powder (0.4 g) was added to pH 4, 7, and 9 buffer (400 mL) and the resulting suspensions were incubated at 40°C for 2 weeks. A flask containing the polymer in pH 1.2 buffer was also prepared 24 h prior to test completion. After filtration, the filter cake was dried overnight and weighed and the supernatant was prepared for FTIR, GPC and GC analysis.

Partition Coefficient (n-octanol/water)

Not determined.

Remarks Due to the notified polymer's expected low water solubility it is likely to partition into the organic phase.

Adsorption/Desorption

Not determined.

Remarks As a consequence of its expected hydrophobicity the notified polymer is likely to associate with the soil matrix and sediments and as such will be immobile in soil.

Dissociation Constant

Not determined.

Remarks The notified polymer does not contain any groups which are expected to dissociate in the environmental pH range of 4-9.

7. TOXICOLOGICAL INVESTIGATIONS

No toxicological data were submitted.

8. ENVIRONMENT

No ecotoxicological data were submitted.

9. RISK ASSESSMENT

9.1. Environment

9.1.1. Environment – exposure assessment

Approximately 1% of the import volume (maximum of 10 tonnes per annum by year 5) may be released to the environment in landfill as a result of disposal of polymer pellets either from disposal of containers in which the polymer is imported, from clean up of transport accidents or clean up of spills during compounding or article forming. The remaining volume of polymer will be released to the environment in landfill when articles have ended their useful life.

9.1.2. Environment – effects assessment

The notified polymer is not expected to cross biological membranes due to its high molecular weight and is therefore not expected to bioaccumulate. Ecotoxicity would not be expected.

9.1.3. Environment – risk characterisation

The majority of the notified polymer will follow the fate of the articles in which it is incorporated and eventually be disposed of to landfill as too will wastes containing the notified polymer from the manufacturing process. In landfill, the polymer is unlikely to be mobile due to its limited water solubility and is expected to associate with the soil matrix and eventually

degrade to water and gases such as carbon dioxide through abiotic and biotic processes.

The notified polymer is not likely to present a risk to the environment when it is stored, transported and used in the proposed manner.

9.2. Human health

9.2.1. Occupational health and safety – exposure assessment

Dust particles are formed when pellets (either pure polymer or compounded resins) are manufactured by chopping of strands. The use of local exhaust ventilation should minimise worker exposure but some minor exposure during transfer operations can be expected. Some dermal exposure to polymer pellets, compounded resin pellets and finished articles may be possible. Employers are responsible for maintaining the level of atmospheric nuisance dust below the NOHSC exposure standard of 10 mg/m³ (NOHSC, 1995). Personal protective equipment (impervious gloves, eye protection and protective clothing) supplied is required mainly for protection against hot processes.

9.2.2. Public health – exposure assessment

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 comprised partly of the notified polymer.

9.2.3. Human health - effects assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard.

Polymer particles may cause mechanical irritation to the eyes, and to the respiratory tract if inhaled.

9.2.4. Occupational health and safety – risk characterisation

The OHS risk presented by the notified polymer is expected to be low.

9.2.5. Public health – risk characterisation

Although widespread public contact with some of the end use articles can occur, the notified polymer contained therein should not be bioavailable and the public health risk is therefore low.

10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS

10.1. Hazard classification

Based on the available data the notified polymer is not classified as hazardous under the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999).

10.2. Environmental risk assessment

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

10.3. Human health risk assessment

10.3.1. Occupational health and safety

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

10.3.2. Public health

There is Negligible Concern to public health.

11. MATERIAL SAFETY DATA SHEET

11.1. Material Safety Data Sheet

The MSDS for the notified polymer and a typical resin containing the notified polymer provided by the notifier were in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a). They are published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicant.

11.2. Label

The label for the notified polymer and a typical resin containing the notified polymer provided by the notifier were in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the label remains the responsibility of the applicant.

12. RECOMMENDATIONS

CONTROL MEASURES

Occupational Health and Safety

- Local exhaust ventilation should be provided at points of atmospheric dust or fume generation during compounding of the notified polymer into plastic pellets or during moulding of plastic articles. A dust mask may be necessary if the level of atmospheric dust approaches the NOHSC exposure standard for nuisance dusts of 10 mg/m³ (NOHSC, 1995). Hot processes and equipment involving the notified polymer necessitate the use of overalls and heat resistant gloves.

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 NOHSC *Approved Criteria for Classifying Hazardous Substances*, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

12.1. Secondary notification

The Director of Chemicals Notification and Assessment 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.

(2) Under Section 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.

13. BIBLIOGRAPHY

National Occupational Health and Safety Commission (1994a) National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1994b) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1995) Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment, [NOHSC:1003(1995)]. In: Exposure Standards for Atmospheric Contaminants in the Occupational Environment: Guidance Note and National Exposure Standards. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1999) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1999)]. Australian Government Publishing Service, Canberra.