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

FULL PUBLIC REPORT

LEXAN DMX2415/C891182

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**Director
NICNAS**

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FULL PUBLIC REPORT

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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)

General Electric Plastics (Australia) Pty Ltd (ABN 92 005 837 454) of 175 Hammond Road, DANDENONG VIC 3175.

NOTIFICATION CATEGORY

Polymer of Low Concern

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, Polymer Constituents, Residual Monomers/Impurities, Use Details and 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

Canada, Korea and USA (exempt, PLC)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

DMBPC-BPA copolymer

C891182 (Powder form)

LEXAN DMX 2415 (Pellet form)

MOLECULAR WEIGHT

> 10000

3. PLC CRITERIA JUSTIFICATION

Criterion

*Criterion met
(yes/no/not applicable)*

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

Melting Point

Density

Water Solubility

Plastic pellets or powdered form

The polymer does not exhibit a sharp melting point but softens gradually over a wide range of temperatures

1170 kg/m³ at 25°C

< 10 mg/L at 38°C

The water solubility testing was performed according to the METI test methodologies.

To the powdered test material was added purified water. The mixture was shaken in an incubator maintained at 40°C for 24 h and then equilibrated at 25°C for 24 h before analysis. The test substance was recovered from the flasks by filtering the contents through a glass crucible. The weight of the dried test substance and the crucible was determined and the water solubility of the test substance was calculated gravimetrically. The recovered filtrates were also analysed for the DOC content and found to have an average TOC of up to 0.0245 mg/L.

Dissociation Constant

Particle Size

Reactivity

Degradation Products

The notified polymer contains no dissociable groups

250-400 µm powder or 3-5 mm granules

Stable under normal environmental conditions

None under normal conditions of use. The test substance was found to be stable at pH 1.2, 4.0, 7.0 and 9.0 using standard METI test methodologies and testing by GPC

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>	10-30	30-100	100-300	100-300	100-300

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The notified polymer will be imported in both pellet (99%) and powder form (100%) in 20-25 kg polythene bags or 600-1000 kg tote bag/boxes in shipping containers and will be stored in industrial warehouses or industrial workplace storage areas.

Reformulation processes

During blending, the imported notified polymer powder will be extruded into pellets and the pellets will be moulded into thermoplastic articles/polycarbonate parts.

After opening the bag, the notified polymer will be weighed and transferred to a blending vessel either manually or mechanically. The mixer will be sealed during mixing and the mixture product containing up to 100% notified polymer will be discharged via a closed system for transfer to the hopper of the heat forming equipment. Dust extraction will be used in weighing and mixing areas. The powder will be extruded and cut into pellets and the pellet will be injection-moulded (thermo-formed) into shaped parts and cooled after discharge from the machine. The thermo-forming process is an automatic

process.

A laboratory technician will periodically test the imported product by scooping sample into a sample container. The sample will undergo to a series of quality control tests using standard laboratory procedures.

Use

Production of moulded or extruded articles, sheets or as a component of other industrial products.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

Transport and Storage

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

Reformulation

Dermal, ocular and inhalational exposure to dust and fumes of the notified polymer may occur during opening and closing of bags, weighing, mixing and blending of the notified polymer into a compounded polymer; during the extrusion and moulding of the notified polymer into plastic articles, during laboratory testing, and during routine maintenance. However, exposure to significant amounts of the notified polymer is limited because of engineering controls and the use of personal protective equipment (coveralls, gloves, safety boots, safety goggles and respirators conforming to Australian Standards where required) worn by workers.

End Use

Once blended into thermoplastic articles, the notified polymer will be bound within a plastic matrix, therefore exposure is expected to be negligible.

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 comprised wholly or partly of the notified polymer. However, the notified polymer will be bound within the polymer matrix and public exposure to the notified polymer itself is negligible.

6.2. Toxicological Hazard Characterisation

The following toxicological data were submitted for the notified polymer:

<i>Endpoint</i>	<i>Result</i>	<i>Classified?</i>	<i>Effects Observed?</i>	<i>Test Guideline</i>
<u>Bacterial reverse mutation</u> Salmonella strains (TA98 TA100, &A1535 and TA1537 E coli (WP2uvrA)	non mutagenic	no	no	OECD TG 471

The following toxicological data for an analogue polymer (not identical) has been noted in the MSDS:

Oral LD ₅₀ in rat	> 5 g/kg
Dermal LD50 in rabbit	> 2g/kg (estimated)
Skin irritation in rabbit	Non-irritating
Eye irritation in rabbit	Slight transient redness or discharge occurred
Skin sensitisation in Guinea pig	No evidence of sensitisation

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. This is supported by the available toxicological data.

The notified polymer however has a high molecular weight and limited solubility. The inhalation of particles of this class pf polymers has been linked with lung overloading, but only if the particles are of respirable size.

6.3. Human Health Risk Assessment

OCCUPATIONAL HEALTH AND SAFETY

The OHS risk presented by the notified polymer is expected to be low. The notified polymer may be present in formulations containing hazardous ingredients. If these formulations 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.

The level of atmospheric nuisance dust should be maintained as low as possible. The NOHSC exposure standard for atmospheric dust is 10 mg/m³. The particle size of the notified polymer is not expected to be in the respirable range.

PUBLIC HEALTH

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 wholly or partly of the notified polymer. However, exposure will be very low because the notified polymer is bound within matrix and unlikely to be bioavailable. As a result, the notified polymer is unlikely to pose any significant risk to public health.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

There will be no release in Australia due to manufacture as the notified polymer will not be manufactured here. Repackaging the pellet or powder is not expected before end-use.

Almost all the imported pellets will be extruded into thermoplastic articles. The polymer powder will be emptied into blenders and extruded into pellets. During the manufacture of the injection and extrusion moulded articles, the waste polymer from the moulding process is recyclable. The product is imported in either 20-25 kg bags, or 600-1000 kg tote bags/boxes and any spills from broken bags/boxes are easily swept up, washed, dried and reused. An estimate of up to 3% of the notified polymer may become waste. These wastes may come in the form of residues in imported bags/containers, accidental spills and production wastage. After moulding, at the end of life of the polymer, it may be re-melted and reprocessed for recycling operations. It may also be disposed to landfill as normal industrial waste through a licensed waste collector.

Some scrap plastic will be reprocessed and reused in commercial applications. During reprocessing, it is expected that the notified polymer will not undergo further chemical reactions as it will be bound within the polymer matrix and is unlikely to be separated during reprocessing. It is estimated that < 1% of the total plastic waste from commercial reprocessing would be released to the environment after recycling. It is expected to be disposed of to landfill as scrap plastic from recycling within five years from introduction. The notified polymer will generally have a similar fate to that of the waste article. Its application in automobile and electronic equipment will result in most of the polymer being burnt in a steel furnace at the end of its functional life with some being landfilled.

ENVIRONMENTAL FATE

The notified polymer is not expected to be released to the aquatic compartment.

Once incorporated into an article, the notified polymer will be immobilised in the polymer matrix and little release is expected. While many of the applications may be recyclable in the future, it is expected that the diverse uses of the notified polymer will result in most of the waste articles being incinerated or landfilled at the end of its functional life.

The polymer is expected to be non-biodegradable and hydrolytically stable in water on the basis of its hydrolysis test and structural formula. It is likely that in landfill the polymer matrix and the notified polymer would degrade slowly through biotic and abiotic processes. Incineration of the polymer will result in the formation of water vapour and oxides of carbon.

Due to its high molecular weight, the notified polymer is not expected to cross biological membranes and 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

During the production of the articles, it is expected that wastes generated will be approximately 3% of the total import amount which will be disposed of to landfill and eventually undergo degradation in situ. The majority of the polymer after its useful lifespan will be burnt with a small amount being landfilled. The notified polymer is considered to be water insoluble and is unlikely to be released to the aquatic environment in any significant quantities. Based on the proposed use pattern, the polymer is not expected to pose an unacceptable risk to the environment.

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

- 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.

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

- The level of atmospheric nuisance dust should be maintained as low as possible. The NOHSC exposure standard for atmospheric dust is 10 mg/m³.
- 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.

Environment

Disposal

- The notified polymer should be reused or recycled but otherwise can be disposed of to landfill or by incineration, if available.

Emergency procedures

- Spills and/or accidental release of the notified polymer should be handled by containment, collection by sweeping and then placed in a sealable container ready for washing and reuse, if possible, otherwise disposed of to landfill.

10.1. 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 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.