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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

7-Oxabicyclo[4.1.0]heptane-3-carboxylic acid, 7-oxabicyclo[4.1.0]hept-3-ylmethyl ester, polymer with ethenylbenzene and 2-propenenitrile

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Director
NICNAS

TABLE OF CONTENTS

FULL PUBLIC REPORT

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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
GE Advanced Materials Plastics 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:
Polymer Constituents, Residual Monomers/Impurities, Reactive functional groups, Import Volume, Charge density and site of manufacture.

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)
None

NOTIFICATION IN OTHER COUNTRIES
Korea, Japan, China, US

2. IDENTITY OF CHEMICAL

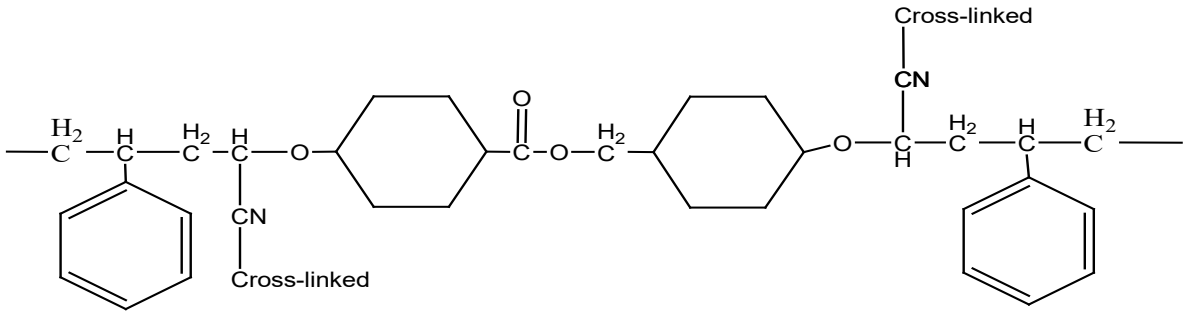
CHEMICAL NAME
7-Oxabicyclo[4.1.0]heptane-3-carboxylic acid, 7-oxabicyclo[4.1.0]hept-3-ylmethyl ester, polymer with ethenylbenzene and 2-propenenitrile

MARKETING NAME(S)
San – Gel

CAS NUMBER
145417-44-3

MOLECULAR FORMULA
$(C_{14}H_{20}O_4.C_8H_8.C_3H_3N)_x$

STRUCTURAL FORMULA



MOLECULAR WEIGHT

Number Average Molecular Weight (Mn)	> 32506
Weight Average Molecular Weight (Mw)	> 85690
Polydispersity Index (Mw/Mn)	2.636
% of Low MW Species < 1000	0.22
% of Low MW Species < 500	0.11

The molecular weight of the notified polymer was not determined due to solubility. The molecular weight of pre-polymer has been presented above. Molecular weight of notified polymer will be higher than the pre-polymer.

3. COMPOSITION

PLC CRITERIA JUSTIFICATION

Functional Group	Category	Equivalent Weight (FGEW)
None	Low Concern	

Criterion	*Criterion met*
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. INTRODUCTION AND USE INFORMATION

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

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	<1	<5	<15	<50	<75

USE
Polymer additive to modify surface appearance.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The notified polymer will be imported into Australia in 25 kg polyethylene bags, 1000 kg sacks and bulk containers through sea. From the docks the notified polymer is transported by road to compounding facility. The notified polymer will be compounded with other resins and additives in a melt processing operation to form molten plastic. These molten plastic will be injected into appropriate moulds to form plastic articles for automotive, building/construction and leisure applications.

6. EXPOSURE INFORMATION

6.1. Summary of Occupational Exposure

Workers may be exposed to dust particles generated from the compounding of the resin. Dermal exposure to the pellets may also occur. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

Occupational exposure to transport and storage workers is not expected except in the event of accidental spillage.

Plastic pellets are transferred from bags to moulding or extrusion machines manually. Exposure to the polymer pellets is possible during opening of bags and pouring the contents into the extruder hopper. Cleanup of spills may also result in exposure. Once in the extruder exposure to the notified polymer will not occur as the polymer is embedded and bound by heat within the polymer matrix and would not be bioavailable. Inhalation exposure to small amounts of hazardous decomposition gases and/or particulate matter may be possible during moulding.

Ventilation and good housekeeping control exposure to dusts. Safety glasses, body-covering clothing and gloves are standard protective equipment. Operators are trained in the operation of machines, and aware of high temperature hazards. Fumes produced during moulding or released when machinery is cleaned are trapped and removed by ventilation hoods. Finished products pose no significant exposure to workers.

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

6.2. Summary of 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, exposure will be low because the notified polymer is present at low concentrations (<15%).

6.3. Summary of Environmental Exposure

6.3.1. Environmental Release

Potential environmental release may occur during transport of notified polymer in bags to the compounding facility or through mishandling or accident. Any spilt notified polymer is expected to be physically contained, collected, and either reused or sent to landfill for disposal.

At the compounding facility, the notified polymer is combined and compounded with other resins and additives in a melt processing operation to form molten plastic, which is used for mould-injection to form plastic articles for automotive, building/construction and leisure applications. Potential environmental release of up to 1% of the total import volume of notified polymer may occur at the site of compounding and moulding. The majority of this would come from residual notified polymer in packaging, which will be disposed of to secure landfill. A large proportion of any spills will be recovered and used. A small proportion may be disposed of to landfill. It is not expected that notified polymer would be released into water.

6.3.2. Environmental Fate

As the notified polymer becomes an integral (<15% w/w) part of the moulded products, its fate is associated with that of the products. These have been identified as being used for automotive, building/construction and leisure applications. It is expected that these will eventually be disposed of to landfill. In landfill the notified polymer is not expected to biodegrade, hydrolyse or leach, and should remain in a stable inert form.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	White opaque pellets
Melting Point/Glass Transition Temp	108°C
Density	1070 kg/m^3 at 23°C
Water Solubility	0.003g/L at 40°C (Determined by semi-quantitative gravimetric test)
Dissociation Constant	No ionisable groups present
Particle Size	Not provided, pellets
Reactivity	Stable at pH of 1.2, 4.0, 7.0, and 9.0 using standard METI test methodology.

Degradation Products	None under normal conditions of use
Flammability Limits	Not applicable, percent volatiles negligible
Autoignition temperature	Not applicable, polymer melts over a wide temperature range.
Explosive properties	No chemical group present that would imply explosive properties.
Vapour pressure	Negligible

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology

No toxicological studies were submitted. MSDS provides summary of some endpoints.

Endpoint	*Result*	*Classified?*	*Effects Observed?*
Rat, acute oral LD50 >5000mg/kg bw	low toxicity	No	no
Rabbit, acute dermal LD50 > 2000mg/kg bw	low toxicity	no	no
Buehler Guinea Pig Sensitization test LD50 > 2g/kg (estimated)	No evidence	no	no

All results were indicative of low hazard.

8.2. Human Health Hazard Assessment

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

9. ENVIRONMENTAL HAZARDS

9.1. Ecotoxicology

No toxicological data were submitted.

9.2. Environmental Hazard Assessment

Nonionic polymers with a number average molecular weight greater than 1000 are not of environmental concern.

10. RISK ASSESSMENT

10.1. Environment

While environmental exposure is limited during manufacturing (<1% being disposed to landfill), the total import volume of the notified polymer will ultimately be disposed of in landfill. The widespread use pattern indicates that landfills throughout Australia would receive the notified polymer bound in the moulded plastic matrix of the end-use products.

The notified polymer is insoluble in water, and is therefore expected to be immobile and pose little risk to the environment when it is stored transported, used and disposed of in the proposed manner.

10.2. 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/m^3.

10.3. 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 bound within a matrix resistant to degradation and unlikely to be bioavailable.

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

11.1. Environmental Risk Assessment

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

11.2. Human Health Risk Assessment

11.2.1. Occupational health and safety

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

11.2.2. Public health

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

12. MATERIAL SAFETY DATA SHEET

12.1. 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.

13. 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.
- The level of atmospheric nuisance dust should be maintained as low as possible. The NOHSC exposure standard for atmospheric dust is 10 mg/m^3.
  - 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.

Environment

Disposal

- The notified polymer should be disposed of to landfill.

Emergency procedures

- Spills/release of the notified polymer should be handled by physical containment, collection and disposal to landfill.

13.1. 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.