File No PLC/412

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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

2-Propenoic acid, butyl ester, polymer with 1,3-butadiene, ethenylbenzene and 2-propenenitrile

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 Heritage.

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Director
NICNAS

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FULL PUBLIC REPORT

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1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
Mitsubishi Australia Ltd of Level 36, 120 Collins Street, Melbourne, VIC 3000

NOTIFICATION CATEGORY
Synthetic Polymer of Low Concern

EXEMPT INFORMATION (SECTION 75 OF THE ACT)
Data items and details claimed exempt from publication:
Starting weight percentage of the Polymer Constituents.

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
No

2. IDENTITY OF CHEMICAL

CHEMICAL NAME
2-Propenoic acid, butyl ester, polymer with 1,3-butadiene, ethenylbenzene and 2-propenenitrile

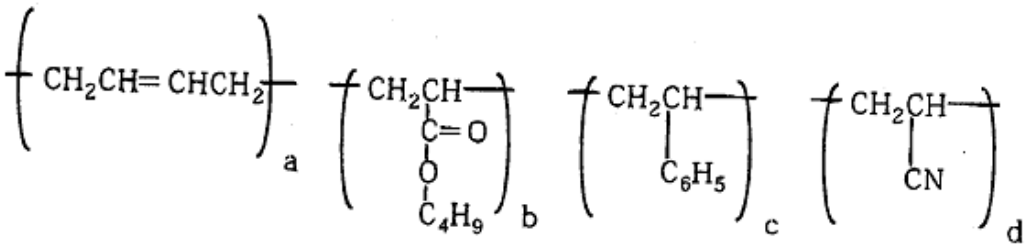
OTHER NAME(S)
Acrylonitrile-Butadiene-Butylacrylate-Styrene copolymer

MARKETING NAME: MUX-D

CAS NUMBER
26657-42-1

MOLECULAR FORMULA
$(C_8H_8.C_7H_{12}O_2.C_4H_6.C_3H_3N)_x$

STRUCTURAL FORMULA



a:b:c:d:=9.5:40.0:38.0:12.5 (by weight)

MOLECULAR WEIGHT (MW)

Number Average Molecular Weight (Mn)	59 000
Weight Average Molecular Weight (Mw)	110 000
Polydispersity Index (Mw/Mn)	1.8644
% of Low MW Species < 1000	0.44
% of Low MW Species < 500	0.17

Remarks: Notified polymer is cross-linked. NAMW determined for acetone-soluble portion only, therefore, NAMW of notified polymer would be greater.

3. COMPOSITION

POLYMER CONSTITUENTS

Chemical Name	*CAS No.*	*Weight % residual*
1,3-Butadiene	106-99-0	< 0.01
n-Butylacrylate	141-32-2	0.02
Styrene	100-42-5	0.1
Acrylonitrile	107-13-1	< 0.02

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
No Substantial Degradability	Yes
Not Water Absorbing	Yes
Low Concentrations of Residual Monomers	Yes
Not a Hazard Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria. The final polymer contains no reactive functional groups.

4. INTRODUCTION AND USE INFORMATION

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

Year	*1*	*2*	*3*	*4*	*5*
Tonnes	200	230	270	310	350

USE

The notified polymer will be used in the production of weatherable/outdoor polymer resins for use in items such as housing for roof top evaporative airconditioners, automotive grills and garnishings and advertising signage.

5. PROCESS AND RELEASE INFORMATION

5.1. Operation Description

The product containing the notified polymer will be imported by sea in 20 kg standard paper bags. After importation, it will be transported to warehouse premises in containers. Here, the container is opened and each bag will be stacked by hand onto pallets (40 bags per pallet), before being stretchwrapped in PE film and loaded by forklift into warehouse racking.

The polymer will be blended with other styrenic polymers, pigments, stabilisers, etc. and then melt extruded as strands and chopped into pellets for use by the customers.

6. EXPOSURE INFORMATION

6.1. Summary of Environmental Exposure

Release to the environment of the notified polymer as a result of manufacturing into articles is expected to be minimal. Manufacturing takes place in a closed system. The polymer will be fed automatically into extrusion and moulding machinery from a hopper. Scrap will be reground and reused. Contaminated polymer scraps will be deposited into municipal landfills or incinerated. Overall, such waste streams would account for at most 2% of the annual import of the polymer (i.e. a maximum of 7000 kg of waste polymer may be deposited in landfill at the maximum rate of import).

Residues remaining in the import containers will be disposed of with containers to landfill. The notifier has estimated that there will be no residue remaining in each container. A more realistic estimate may be 0.2% in the paper bags. At the maximum rate of import, this corresponds to a maximum of 700 kg per annum of polymer, which will be disposed of to landfill with packaging.

Used articles containing the polymer will also eventually be deposited in landfills or recycled.

6.2. Summary of Occupational Exposure

During transport and warehousing of the notified polymer, workers may be exposed to the notified polymer if packaging sacks (20 kg standard paper bags) containing the polymer are accidentally breached. Contact with the powder would be primarily dermal as the minimum particle size of the polymer is above the inspirable range (around 63 microns).

During the formulation process, skin and eye contact with the notified polymer (in powder form) may occur during cutting of the sacks and addition of the polymer to the hopper on the mixing vessel.

Machine operators and others nearby could be exposed to vapours if the material is overheated.

In the above cases, contact can be dermal and/or inhalation of dust or vapours. Ingestion is unlikely.

As the compounded resin is in pellet form, the risk of dust, ocular contact and potential persistent dermal contact is low.

Molten material can cause burns if skin contact occurs.

6.3. Summary of Public Exposure

The notified polymer will be used in the manufacture of finished articles, e.g. roof top evaporative airconditioners, automotive grills and garnishings and advertising signage where the polymer is bound with the resin matrix. The public will not be exposed to the notified polymer in its raw form.

7. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20°C and 101.3 kPa	White powder
Melting Point/Glass Transition Temp	N/A
Autoignition temperature	Over 500°C
Flammability Limits	N/A
Density	1.0g/cm^3
Water Solubility	Low
Dissociation Constant	Information not supplied. The notified polymer does not contain any functional groups which would be expected to dissociate under environmental conditions (pH 4-9).
Reactivity	None
Stability	Stable
Degradation Products	

8. HUMAN HEALTH IMPLICATIONS

8.1. Toxicology
No toxicological data were submitted.

The product MSDS provides the following information:
Oral LD50 in rat: > 5000 mg/kg

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 in excess of 1000 are generally of low concern for ecotoxicity because they often have negligible water solubility.

10. RISK ASSESSMENT

10.1. Environment
In the case of accidental spillage, pellets of the polymer are expected to remain where they are deposited. Due to the negligible solubility of the polymer, leaching from landfill is highly unlikely, and no movement from the landfill site is expected.

Any incineration of the notified polymer will result in the destruction of the polymer and produce oxides of carbon and nitrogen and water.

The majority of the polymer is not expected to be released to the environment until it has been moulded into articles. These end use products will either be deposited in landfill or recycled at the end of their useful life. Biodegradation is unlikely. Biological membranes are not permeable to polymers of very large molecular size and therefore bioaccumulation of the notified polymer is not expected.

10.2. Occupational Health and Safety
The OHS risk presented by the notified polymer is expected to be low due to its low toxicity and low potential for exposure during compounding and manufacture of the article. As the notified polymer is handled as a powder prior to manufacture, the level of total (nuisance) dust should be maintained as low as possible. The NOHSC exposure standard for atmospheric dust is 10 mg/m^3 TWA.

10.3. Public Health
The notified polymer will be used in an industrial setting only to form articles. The articles are relatively inert. Therefore, the health risk to the public from exposure to the notified polymer is considered very low.

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 for production of finished articles.

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.
  - 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

- The following control measures should be implemented by the manufacturers to minimise environmental exposure during manufacture and use of the notified polymer :
  - Do not release the polymer products to sewer. Do not allow polymer products or containers to contaminate drains or waterways.

Disposal

- The notified polymer should be recycled or disposed of by release to landfill or incineration.

Emergency procedures

Spills/release of the notified polymer should be handled using a dustless method such as vacuum and placed in proper container for disposal or recovery.

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.

The Director will then decide whether secondary notification is required.

No additional secondary notification conditions are stipulated.