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NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

FULL PUBLIC REPORT

DuPont ETPV

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Director
NICNAS

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FULL PUBLIC REPORT

DuPont ETPV

1. APPLICANT AND NOTIFICATION DETAILS

APPLICANT(S)
DuPont (Australia) Ltd (ABN 59 000 716 469)
168 Walker Street
NORTH SYDNEY NSW 2060

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, 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
Korea 2004, Canada 2002

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)
DuPont ETPV

MOLECULAR WEIGHT (MW)
Number Average Molecular Weight (Mn) >10000

REACTIVE FUNCTIONAL GROUPS
The notified polymer contains only low concern functional groups.

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	Transparent flexible solid pellets
Melting Point/Glass Transition Temp	-33°C
Density	1045 ± 1 kg/m^3 (temperature unspecified) (for precursor to DuPont ETPV).
Water Solubility	< 5 × 10^{-3} g/L (testing of a lower molecular weight analogue of DuPont ETPV at unspecified temperature)
Dissociation Constant	No acidic or basic groups are present
Particle Size	Massive form, non-particulate
Reactivity	Stable under normal environmental conditions. The analogue polymer was stable (GPC) to hydrolysis at pH 1.2, 4, 7 and 9 for 1-14 days.
Degradation Products	None under normal conditions of use

5. INTRODUCTION AND USE INFORMATION

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

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

USE AND MODE OF INTRODUCTION AND DISPOSAL

Mode of Introduction

The polymer will be imported as a 25% through to 55% component of a resin mixture. All of these materials are capable of thermoplastic moulding by extrusion or injection.

Reformulation/manufacture processes

End use is by blow moulding, injection/extrusion of machine parts for automotive and general use. The resin is handled similar to many other resin used for extrusion and go through the following processes:

The 25 kg polybags of DuPont ETPV pellets are supplied in a moisture proof poly lined bag and while ready for use the notifier recommends drying. Bags opened for greater than 24 hours must be dried before use by being placed in a drying oven at minimum 60ºC for 8 hours.

Extruders with a conditioned holding tank will allow DuPont ETPV to be stored and dried before use as the holding tank functions as a drying chamber. A vacuum hose or gravity feed then transports the DuPont ETPV compound to the extruder preheating chamber set at 180ºC to 240ºC depending on the grade. After preheating the polymer enters the extruder barrel where the screw creates forces that may be from 10 to 100 tonnes to force the polymer through the heating chamber to the extrusion head into the mould.

The design of the extrusion and injection moulding machines are conceptually the same with machines pre-heating chamber thence screw fed into the heating chamber immediately prior to extrusion or injection moulding. The difference is that injection moulding uses a hydraulic ram in place of a screw drive to force the polymer into the mould for the final product. The product is then released from the mould and allowed to cool before being handled for packing. Blow moulding is different in that the molten form (of polymer) is placed on the end of a blowing tip where high-pressure air is forced into the preform. The preform expands to fill the shape of the mould cavity before being released as the moulded article.

Use

Thermoplastic moulding of high compression parts for general machinery and automobiles.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

OCCUPATIONAL EXPOSURE

Dermal and ocular exposure may potentially occur during certain processes involving the notified polymer. However, exposure to significant amounts of the notified polymer is limited because of the fully automated processes, and the engineering controls and personal protective equipment worn by workers.

PUBLIC EXPOSURE

The notified polymer will not be sold to the public except in the form of finished articles. There is potential for small amount of public exposure to articles such as automotive engine and mechanical parts comprised wholly or partly of the notified polymer. Blooming/leeching of the notified polymer from the articles is not expected and hence exposure will be low.

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.

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 chemically stable.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Exposure Assessment

ENVIRONMENTAL RELEASE

During the manufacture of the injection and extrusion moulded articles, the waste polymer from the moulding process is recyclable. Unused material is readily ground and recycled. The product is imported in 25 kg poly bags and any spills from broken bags are easily swept up, washed, dried and reused. It is estimated that < 50 kg per annum will be landfilled from residues remaining in the bags. Release to the environment from the cleaning of the extruder is estimated to be < 25 kg per annum. Thus the total waste that will be landfilled from the manufacturing process would be < 75 kg per annum. The high level of application in automobile and heavy machinery will result in most of the elastomer being burnt in a steel furnance at the end of its functional life with a small percentage being landfilled.

ENVIRONMENTAL FATE

The notified polymer contains groups that are hydrolysable but is expected to be stable under normal environmental conditions. Due to its low water solubility, the notified polymer is expected to remain bound within the soils and sediments of landfill and eventually degrade through biotic and abiotic processes. It is not expected to be readily biodegradable or to bioaccumulate due to its high molecular weight. Incineration of the polymer will result in the formation of water vapour and oxides of carbon.

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

The polymer will be imported as pellets which are injection and extrusion moulded into a variety of plastic articles for use mainly in automobile and heavy machinery. During the production of the

articles, it is expected that wastes generated will be approximately 0.15% 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. 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.

- 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 by landfill and incineration.

Emergency procedures

- Spills and/or accidental release of the notified polymer should be cleaned up promptly by sweeping or vacuum and collect in suitable container for disposal.

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.