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1 November 2004

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

FULL PUBLIC REPORT

PCTA 21427

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**Director
NICNAS**

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FULL PUBLIC REPORT

PCTA 21427

1. APPLICANT

Original Holder of Assessment Certificate (First Applicant)

An Assessment Certificate for the notified polymer known by the name PCTA 21427 was granted to Eastman Chemical Limited (ACN 72 001 313 417) of Level 8, 15 Talavera Road North Ryde NSW 2113.

The Assessment Report for PCTA 21427 is identified by the sequence number PLC/298 (Synthetic Polymer of Low Concern Notification).

Second Applicant

Since granting of the abovementioned Assessment Certificate, DuPont (Australia) Ltd (ABN 59 000 716 469) of 168 Walker Street NORTH SYDNEY NSW 2164, has submitted a notification statement in support of their application for an extension of the original Assessment Certificate for PCTA 21427 (THERMX 13319) Eastman Chemical Limited has agreed to this extension.

Information submitted by DuPont (Australia) Ltd pertains to the introduction of the notified polymer as a distributor in Australia. No increase in volume was forecast.

2. IDENTITY OF THE CHEMICAL

The chemical name, CAS number, molecular and structural formulae, molecular weight, spectral data and details of the polymer composition have been exempted from publication in the Full Public Report.

Marketing names: THERMX 13319, PCTA 21427

3. POLYMER COMPOSITION AND PURITY

Details of the polymer composition have been exempted from publication in the Full Public Report.

Hazardous impurities (other than residual monomers and reactants): None

4. PLC JUSTIFICATION

The notified polymer meets the PLC criteria.

5. PHYSICAL AND CHEMICAL PROPERTIES

Property	Result	Comments
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Appearance	Solid pellet, colourless, odourless.	
Melting point	235°C	
Density	>1000 kg/m ³	
Water solubility	A variation to the data requirements has been granted for water solubility ^a .	
Particle size	A variation to the data requirements has been granted for particle size ^b .	
Flammability	A variation to the data requirements has been granted for flammability and autoignition temperature ^c .	
Autoignition temperature		
Explosive properties	A variation to the data requirements has been granted for explosive properties ^d .	
Stability/reactivity	A variation to the data requirements has been granted for stability/reactivity ^e .	
Hydrolysis as function of pH	N/A	The notified polymer contains ester linkages which are not expected to hydrolyse in the environmental pH range of 4-9 due to low water solubility.
Partition coefficient	Not determined ^f	Due to the notified polymer's low water solubility, it is likely to partition into the organic phase.
Adsorption/desorption	Not determined	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	The notified polymer does not contain any groups which are capable of dissociation at environmental pH of 4-9.

5.1 Comments on physical and chemical properties

(a) The notified polymer is insoluble in water, so a water extractability test was performed. The notified polymer was extracted with distilled water at reflux temperature for 2 hours. The total extractives were approximately 0.004%.

(b) The notified polymer is manufactured and supplied as 1/8 inch (≈3mm) pellets.

(c) The notified polymer is a solid, which, on heating, will melt and then thermally decompose before boiling. The gaseous thermal decomposition products are expected to burn, and on this basis the notified polymer is considered to be a combustible solid. The main thermal decomposition products are expected to be CO, CO₂ and H₂O. The very low concentration of sulphur and nitrogen may give rise to trace amounts of NO_x and SO_x.

(d) The main functional groups present in the notified polymer are ester linkages in the backbone and aliphatic hydroxyl terminal groups. Other functional groups are present in minute quantities. None of these functional groups are expected to cause or enhance explosibility.

(e) The notified polymer is not designed, or expected, to be reactive in use. It contains no highly electronegative halogens. Oxygen, where present is bound to carbon and/or hydrogen atoms, except in trace amounts which are bound to sulphur atoms. The polymer is also not designed to substantially degrade, decompose or depolymerise after manufacture or use.

(f) Also not extractable in ethanol, or HB 307 oil.

6. USE, VOLUME AND FORMULATION

Use:

PCTA 21427 (THERMX 13319) will be sold and distributed to customers in the plastic industry for use in the production of end-use products such as packaging articles, injection-moulded parts and fibres.

Manufacture/Import volume:

Estimated import volume is 20 tonnes/year for five years.

Formulation details:

The notified polymer will be imported as 100% pure polymer pellets, or as pellets containing a mould-release agent, in 1000 kg or 850 kg supersacks with polyethylene liners, or in 499 kg boxes or 25 kg fibre drums with polyethylene liners.

At the customers' facilities, the PCTA 21427 (THERMX 13319) co-polyester pellets will be mixed with (or without) other ingredients before being mechanically lifted or conveyed to a hopper, or released directly into the melt processing equipment. The mixture (up to 100% of the notified substance) will be either injection moulded to create articles or extruded into sheeting, which can be formed and trimmed as required. Typically, manufacturers involved in the use of the PCTA 21427 (THERMX 13319) co-polyester pellets will be major firms with large-scale modern production applications, where the majority of the formulation and application processes will be automated. Spills at the production stage (~3%), being solid and in pellet form, will typically be collected with a broom, bagged and reintroduced into the extrusion process or disposed of.

7. OCCUPATIONAL EXPOSURE

Exposure route	Exposure details	Controls indicated by notifier
Manufacture		
The notified polymer will not be manufactured in Australia.		
Formulation		

At 2-6 sites, 20-80 workers.

Dermal	Possible contact with polymer during loading of plant for extrusion or injection moulding, cleaning of equipment, or cleaning up spills.	Most sites will have automated production facilities. The use of PPE including safety glasses with side shields or goggles, gloves, boots, dust masks and protective work clothing such as overalls or laboratory coats is recommended.
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TRANSPORT AND STORAGE

The notified polymer will be shipped by commercial carrier directly to the customer.

Exposure is unlikely, except in case of accidental spill.	Packaging is shrink wrapped and strapped onto wooden pallets.
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DISPOSAL

Empty containers are recycled and reused by the notifier.

Once the polymer has undergone melt processing, it will be unavailable for further exposure.

8. PUBLIC EXPOSURE

The notified polymer is used in the production of end-use products such as packaging articles, injection-moulded parts and fibres. The public will have frequent dermal contact with the plastic products containing the notified substance. Since the notified substance is encapsulated within the plastic products and is not expected to leach from the products, public exposure is considered to be negligible.

9. ENVIRONMENTAL EXPOSURE

9.1. Release

During production it is estimated that up to 600 kg per annum of waste notified polymer will be generated from cleaning up minor spills and during the production of end-use products. The majority of these wastes will be recycled into the process and as such only approximately 200 kg per annum of the notified polymer will be disposed of in landfill. It is further estimated that 400 kg per annum will remain in the empty import containers, which will be reused by the notifier. However, these will eventually be disposed of in landfill.

The majority of the notified polymer will follow the fate of the products in which it is incorporated and be disposed of in landfill as domestic waste or incinerated.

9.2. Fate

Eventually all of the notified polymer will be disposed of in landfill as domestic waste or incinerated. As a consequence of its hydrophobic nature, the notified polymer is expected to associate with the soil matrix and sediments and not be mobile in landfill where it will slowly degrade. Incineration of the notified polymer will produce water vapour and oxides of carbon and nitrogen and sulphur. Empty import containers will also eventually be disposed of in landfill.

The notified polymer is not expected to cross biological membranes due to its high molecular weight and is therefore not expected to bioaccumulate (Connell 1990).

10. EVALUATION OF HEALTH EFFECTS DATA

No toxicology data on the notified polymer has been submitted by the notifier, and no health hazard information is present in the supplied MSDS. The notified substance is an insoluble thermoplastic polymer with a melting point of 235°C. Its high molecular weight and water insolubility are likely to limit its absorption across biological membranes.

The notified polymer contains no hazardous impurities, additives or adjuvants.

11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA

No ecotoxicological data were provided.

12. ENVIRONMENTAL RISK ASSESSMENT

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

13. HEALTH AND SAFETY RISK ASSESSMENT

13.1. Hazard assessment

The notified polymer meets the PLC criteria and is therefore unlikely to be a hazardous substance in accordance with the *Approved Criteria for Classifying Hazardous Substances* (NOHSC:1999). Excessive heat and degradation of the polymer could cause odours and fumes in the workplace. However, as this would also result in loss of usable product it is not expected to be a common occurrence. There have been no reports of health conditions associated with exposure to this polymer.

13.2. Occupational health and safety

Due to its low hazard and low potential for exposure during processing into plastic materials, Polymer THERMX 13319 (PCTA 21427) is of low risk to human health and safety and no specific risk reduction measures are necessary.

13.3. Public health

In view of its high molecular weight, physical and chemical properties, and its use pattern, the notified polymer is unlikely to pose a significant risk to public health.

14. MSDS AND LABEL ASSESSMENT

14.1. MSDS

The MSDS of the notified polymer provided by the notifier was in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets*

(NOHSC, 1994a). It is published here as part of the assessment report. The accuracy of the information on the MSDS remains the responsibility of the applicant.

14.2. Label

The label for the notified polymer provided by the notifier was 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.

15. RECOMMENDATIONS

CONTROL MEASURES

No special control measures are required for the notified polymer, however, in the interest of good occupational health and safety, the following measures are recommended:

Occupational Health and Safety

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer as introduced:
 - The use of PPE including safety glasses with side shields or goggles, gloves, boots, dust masks and protective work clothing such as overalls or laboratory coats is recommended

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.

Secondary notification

The Director of Chemicals Notification and Assessment must be notified in writing within 28 days by the notifier, other importer or manufacturer:

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.

16. REFERENCES

Connell D. W. (1990) General characteristics of organic compounds which exhibit bioaccumulation. In Connell D. W., (Ed) *Bioaccumulation of Xenobiotic Compounds*. CRC Press, Boca Raton, USA.

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 (1999) Approved Criteria for Classifying Hazardous Substances [NOHSC:2012(1994)]. Australian Government Publishing Service, Canberra.