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

**FULL PUBLIC REPORT**

**DP7007**

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  
Chemicals Notification and Assessment**

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**FULL PUBLIC REPORT****DP7007****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT

DuPont (Australia) Ltd (ABN 59 000 716 469)  
168 Walker Street North Sydney NSW 2060

OEM Nu Tech Pty Ltd (ABN 26 105 880 279)  
29 Charles Street South Perth Western Australia 6151

## NOTIFICATION CATEGORY

Limited: Polymer with NAMW  $\geq 1000$  (greater than 1 tonne per year).

## EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

[Identity of Chemical](#)

Composition

## 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

USA (Notice of Commencement submitted on 2001)

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

DP7007

**3. COMPOSITION**

## DEGREE OF PURITY

[High](#)

## DEGRADATION PRODUCTS

None

## LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

None

**4. INTRODUCTION AND USE INFORMATION**

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

The notified polymer will not be manufactured in Australia. It will be imported as a component of a powder-coating product, at 60% (wt/wt) concentration.

## 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>	360	450	540	717	717

## USE

The notified polymer will be used in speciality ultraviolet cured powder coatings for industrial products, such as wood panels and metal surfaces, and certain types of heat sensitive plastics.

## 5. PROCESS AND RELEASE INFORMATION

### 5.1. Distribution, Transport and Storage

## PORT OF ENTRY

Not stated.

## IDENTITY OF RECIPIENTS

DuPont (Australia) Ltd; and

OEM Nu Tech Pty Ltd

## TRANSPORTATION AND PACKAGING

The coating products containing the notified polymer will be imported in 20 kg bags contained in boxes with plastic liners. The imported product will be stored and distributed by road from the notifier's site to various coating industry Australia-wide.

### 5.2. Operation Description

The coating powders containing the notified polymer are typically produced by blending and extruding the resins, curing agents, pigments and additives using enclosed and automated systems. The resulting matrix is ground into a fine powder measuring approximately 90µm. The powder is stored in automatically sealed bags for use as required.

Quality control personnel will collect samples of the flakes or finely milled powder. Flakes are milled into fine powder and sprayed onto test panels for curing and evaluation.

Maintenance workers are required to service the machinery periodically.

At the application facility, bags are opened and either emptied into a hopper with an automatic feeder to the production line, or the spray gun is connected directly from the bag. The coating powder is applied by automated or manual systems, with the work piece or substrate transported through a spray zone containing a number of spray guns and into an oven via an overhead conveyor for curing. The application of the powder is by electrostatic spray within a totally enclosed applications unit. The operator has the job of inspecting the coating and ensuring powder is continuously supplied to the sealed automatic applicator unit.

Some 3% of items require manual powder coat application, either to touch up or to achieve full spray with powder coat. Manual spraying is undertaken in a separate manual spray booth.

### 5.3. Occupational exposure

#### *Number and Category of Workers*

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration</i>	<i>Exposure Frequency</i>
Applicator operator	2	8 hours/day	
Shift supervisor	1	8 hours/day	

#### *Exposure Details*

Warehousing and distribution of the notified polymer involves loading, moving and storing of

packaged products containing the notified polymer. No exposure is expected except in the case of accident.

The possibility of inhalation, dermal and ocular exposure to the notified polymer exists when opening the bags containing the notified polymer, loading of powder coating into a hopper and application of powder coating and disposal of empty containers.

Over 97% of the powder coating is applied automatically and the rest is applied manually. Exposure to the notified polymer may occur when manually spraying coated articles to achieve a complete coating. Both manual and automated booths have cyclone extraction fans to pull all residual airborne powder into capture filters. The equipment used is self-cleaning, minimising worker exposure. Personal protective equipment used when handling uncured coated articles or spraying powder includes anti-static overalls, non-insulating gloves, anti-static footwear, and respirators or air fed respiratory equipment.

Upon curing, the polymer becomes an integral part of the article being produced. Excess coating powder is removed by exhaust extraction and collected for re-use or disposal.

#### 5.4. Release

##### RELEASE OF CHEMICAL AT SITE

The notified polymer will not be manufactured into Australia. Release of the notified polymer at the customer site is expected to be minimal because any excess powder coating is normally collected and recycled. In the event of transport accident, any spilled material not reused would be collected for disposal.

##### RELEASE OF CHEMICAL FROM USE

Release of the notified polymer to the environment during application of the powder coating is not expected. In industrial applications, spraying systems are closed systems designed to minimise the amount of overspray. The application of the powder coatings to substrates is generally carried out in spray booths with exhaust extraction systems designed to trap excess dust and coating powder in collector systems. In most industrial coating operations, all excess powder is recovered and re-used. Equipment cleaning is done with dust-tight vacuum cleaners and this material is also collected for re-use or disposal.

The notifier estimates that 1-5% of powder may be collected during application and equipment cleaning. The amount of notified polymer ranges from 60 to 99% of the powder coat product. Consequently, at the maximum import volume of 717 tonnes, up to 35.5 tonnes of the notified polymer could be generated each year for disposal or re-use.

No release of the notified polymer is expected once the coatings are applied and cured. Upon curing the polymer is incorporated into the polymer matrix where it will become inert.

#### 5.5. Disposal

All wastes generated during application, which are not reused, are expected to be incinerated. Container residues will be incinerated along with the import containers.

All waste powder collected is placed in a receptacle and irradiated to cross-link into a solid reacted mass which can safely be disposed into non-hazardous waste.

#### 5.6. Public exposure

The coating product containing the notified polymer will not be available to the public as the application is solely for industrial coatings application. The general public may have dermal contact to coated articles. However, at this stage the notified polymer will form part of the cured coating and will not be available for exposure.

The potential for exposure of the public to the notified polymer during normal industrial storage, handling and transportation is low. The coating products will be packaged in bags contained in cartons. This packaging will protect the contents from being released during normal handling.

**6. PHYSICAL AND CHEMICAL PROPERTIES**

APPEARANCE AT 20°C AND 101.3 kPa	Solid pale granules or flakes
MELTING POINT/FREEZING POINT	Not determined. Glass transition temperature: T <sub>g</sub> = 54°C
Remarks	Test report not provided.
DENSITY	1300 – 1400 kg/m <sup>3</sup>
Remarks	Test report not provided.
VAPOUR PRESSURE	Not determined.
Remarks	The substance is a non-volatile solid.
WATER SOLUBILITY	< 1 mg/L at 20°C
METHOD	OECD TG 105 Water Solubility.
Remarks	The notified polymer is not soluble in water. A GPC column elution method was used to determine the water solubility of the notified polymer. This involved comparing the solubility of the notified substance with that of 3 known polyester standards using RI detection.
TEST FACILITY	Not reported.
HYDROLYSIS AS A FUNCTION OF pH	Not determined.
Remarks	The polymer contains ester groups, which are amenable to hydrolysis, but is not soluble in water and should not hydrolyse in the environmental pH range (4-9).
PARTITION COEFFICIENT (n-octanol/water)	Not determined.
Remarks	The notified polymer is not soluble in water or n-octanol.
ADSORPTION/DESORPTION	Not determined.
Remarks	The polymer is a water insoluble solid and is expected to adsorb or associate with the organic matter of soils and sediments.
DISSOCIATION CONSTANT	Not determined.
Remarks	The polymer does not contain any groups able to dissociate.
PARTICLE SIZE	
Remarks	The notified polymer is in the form of flakes measuring about 0.5 to 2 cm in diameter. The fraction of powder <75 µm is <0.5% w/w. The powder coating will be a fine powder with average diameter 90 µm.
FLASH POINT	>200°C (Cleveland open cup)
Remarks	Test report not provided. Information obtained from MSDS.
FLAMMABILITY LIMITS	Not determined

AUTOIGNITION TEMPERATURE	Not determined
EXPLOSIVE PROPERTIES	Minimal explosion limit: 20 g/m <sup>3</sup> Maximum explosion pressure: 8.7 bar
Remarks	The reported explosion characteristics were obtained from a sample which is an analogue of the product containing the notified polymer.
REACTIVITY	Not determined
Remarks	The polymer itself is stable under normal conditions of use.

## 7. TOXICOLOGICAL INVESTIGATIONS

No toxicity data for the notified polymer were submitted. Toxicological endpoints obtained from polymers which are chemically related to the notified polymer were provided for the assessment of the potential health effects of the notified polymer. By analogy, the notified polymer has low acute oral toxicity (LD<sub>50</sub> rat >2000 mg/kg). There was no evidence of skin and eye irritation reported in rabbits.

## 8. ENVIRONMENT

### 8.1. Environmental fate

No environmental fate data were submitted.

### 8.2. Ecotoxicological investigations

No ecotoxicity data were submitted.

## 9. RISK ASSESSMENT

### 9.1. Environment

#### 9.1.1. Environment – exposure assessment

No environmental exposure of the notified polymer is expected under normal usage as the polymer is not expected to enter soil or aquatic compartments. Most of the polymer will be incorporated into the polymer matrix of coatings, which upon curing become inert. Once incorporated into the coating formulation, the notified polymer is expected to be immobile in the environment. At the end of their useful life, the substrates coated with the polymer are likely to be either recycled, incinerated or placed into landfill.

Some of the notified polymer in waste from spills and equipment cleaning may need to be destroyed by incineration. As a worse case scenario, up to 27 tonnes of notified substance could be generated for disposal each year in waste from spills and equipment cleaning. However, in most industrial coating operations, it is expected that all excess powder will be recovered and re-used.

Incineration will destroy the polymer and convert it to water vapour and oxides of carbon. The polymer is not water soluble and not volatile, hence, if placed in landfill, the polymer is expected to be immobile and to only slowly degrade along with the substrates onto which it is deposited.

#### 9.1.2. Environment – effects assessment

No ecotoxicological data were provided. No release of the notified polymer into the aquatic environment is expected either during formulation or application. Should the notified polymer enter the aquatic environment through accidental spills, it is not expected to cross biological



membranes due to its high molecular weight and is therefore not expected to bioaccumulate.

### 9.1.3. Environment – risk characterisation

The notified polymer is not expected to pose a significant hazard to the environment. The usage patterns indicate that the levels of release of the polymer to the environment will be low. Under normal usage there will be no release into the aquatic or soil environments. The majority of the notified polymer will be combined with other coating components to form a very high molecular weight and stable coating which will be inert.

## 9.2. Human health

### 9.2.1. Occupational health and safety – exposure assessment

#### *Transport and Storage*

Transport and storage workers will handle sealed bags containing the notified polymer. Workers are unlikely to be exposed to the notified polymer except when packaging is accidentally breached.

#### *Coating application*

The potential for inhalation, dermal and ocular exposure to the notified polymer exists when opening the bags containing the notified polymer, loading of powder coating into a hopper and application of powder coating and disposal of empty containers. All spraying is performed in a spray booth fitted with local exhaust and dust extraction system to prevent dust build-up. Where manual application is in use, the direction of airflow comes from behind the operator. Application plant operators will wear similar protective equipment (anti-static overalls, non-insulating gloves, anti-static footwear, and respirators or air fed respiratory equipment) to those required during formulation of powder coatings.

Upon curing, the notified polymer is incorporated into the polymer matrix and becomes inaccessible for exposure.

### 9.2.2. Public health – exposure assessment

There are no consumer uses for the notified polymer and therefore, it is not available to the public. The notified polymer becomes cross-linked and immobilised on the surface of the coated article. Therefore, the distribution of coated articles is not expected to cause adverse health effects to the public. Members of the public are unlikely to be in contact with the notified polymer and the potential for public exposure is minimal.

Public exposure to the notified polymer during storage and transport is expected to be low.

### 9.2.3. Human health - effects assessment

The notified polymer has high molecular weight, which indicates that it would be unlikely to cross biological membranes readily. Based on the limited toxicological endpoints provided, and considering the high molecular weight and low levels of residual monomers present, the notified polymer would not be classified as a hazardous substance according to the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2002).

### 9.2.4. Occupational Health and Safety – risk characterisation

#### *Transport and storage*

Except in the event of accident, the risk of adverse health effects during transport and storage is limited, since workers are only expected to handle sealed bags containing the notified polymer.

#### *Coating application*

Applicators will potentially be exposed to the notified polymer in the coating product when manually loading the hoppers, which automatically feed the spray gun, on disposal of empty bags and when collecting oversprayed coating. However, exhaust ventilation is used in the loading area, and oversprayed powder is collected using dust-tight vacuum cleaners. All coating application is carried in spray booths with exhaust extraction system. In addition,

workers involved in manual spraying will be clad with anti-static overalls, non-insulating gloves, anti-static footwear, and respirators or air fed respiratory equipment to minimise exposure to the notified polymer. Adequate ventilation systems are in place to maintain exposure levels below the relevant occupational exposure standards.

The largely enclosed and automated operations involved, and the use of personal protective equipment when handling the coating products, would ensure that the occupational risk posed by the notified polymer is low when used as specified in the notification.

#### **9.2.5 Public Health – risk characterisation**

There are no consumer uses for the coating product containing the notified polymer and it is not available to the public. The spray operation ensures that the sprayed-on powder layer becomes an integral part of the coated article. After curing, the notified polymer becomes unavailable to human exposure. The public health risk posed by the notified polymer is expected to be low because the notified polymer is bound within a cured paint, from which it is unlikely to be bioavailable.

### **10. CONCLUSIONS – ASSESSMENT LEVEL OF CONCERN FOR THE ENVIRONMENT AND HUMANS**

#### **10.1. Environment**

On the basis of the low environmental exposure and low environmental hazard, the notified polymer is not considered to pose a risk to the environment based on its reported use pattern.

#### **10.2. Health hazard**

Based on the available data the notified polymer is not classified as hazardous under the NOHSC Approved Criteria for Classifying Hazardous Substances.

#### **10.3. Human health**

##### **10.3.1. Human health – Occupational health and safety**

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

##### **10.3.2. Human health – public**

There is Negligible Concern to public health when used as a component of spray-on powder coatings.

### **11. MATERIAL SAFETY DATA SHEET**

#### **11.1. Material Safety Data Sheet**

The MSDS of the notified chemical provided by the notifier and by the extension applicant were in accordance with the NOHSC *National Code of Practice for the Preparation of Material Safety Data Sheets* (NOHSC, 1994a NOHSC, 2003). The MSDS provided by the extension applicant is published here as a matter of public record. The accuracy of the information on the MSDS remains the responsibility of the applicants.

#### **11.2. Label**

The labels for the notified chemical provided by the notifier and by the extension applicant were in accordance with the NOHSC *National Code of Practice for the Labelling of Workplace Substances* (NOHSC, 1994b). The accuracy of the information on the labels remains the responsibility of the applicants.

### **12. RECOMMENDATIONS**

CONTROL MEASURES  
Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer when used in powder coatings:
  - Local exhaust ventilation during spraying, filling of hoppers, reclaiming powder and clean-up.
  - Enclosed and automated spray application.
  - Spray painting booths and equipment should be in accordance with Australian Standard AS3754-1990, *Safe Application of Powder Coatings by Electrostatic Spraying*.
- Employers should implement the following safe work practices to minimise occupational exposure to the notified polymer when used in powder coatings:
  - Avoid generating dusts, when opening powder coating packages, loading hoppers, reclaiming powder and cleaning equipment.
  - Precautions must be taken to avoid sources of ignition, e.g. use of earthing leads.
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer when used in powder coatings:
  - anti-static overalls
  - non-insulating gloves
  - anti-static footwear
  - dust respirators or air fed respiratory equipment

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.

#### Disposal

- The notified polymer should be disposed of by controlled incineration or landfill in accordance with local jurisdiction waste management regulations.

#### Storage

- Store and handle in accordance with recommendation in the MSDS.

#### Emergency procedures

- Spills/release of the notified polymer should be contained and placed in suitable containers for disposal.

### 12.1. 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 Section 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.

No additional secondary notification conditions are stipulated.

**13. BIBLIOGRAPHY**

National Occupational Health and Safety Commission (2003) 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 (1999) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1999)]. Australian Government Publishing Service, Canberra.

National Occupational Health and Safety Commission (1994) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. Australian Government Publishing Service, Canberra.