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

**FULL PUBLIC REPORT**

**Polyester Alkyd 25**

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**Director  
NICNAS**

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**FULL PUBLIC REPORT****Polyester Alkyd 25****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

Nuplex Industries (Aust) Pty Ltd (ACN 15 902 254 524)  
49-61 Stephen Road  
Botany NSW 2019

## NOTIFICATION CATEGORY

Synthetic Polymer of Low Concern

## EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

- Marketing Names (except published name)
- Chemical Identity information
- 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

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

Polyester Alkyd 25

**3. COMPOSITION**

## PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met (yes/no/not applicable)</i>
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 Hazardous Substance or Dangerous Good	Yes

The notified polymer meets the PLC criteria.

#### 4. INTRODUCTION AND USE INFORMATION

##### 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>	70-100	70-100	70-100	70-100	70-100

##### USE

The notified polymer will be blended with styrene and performance-enhancing additives to produce a resin binder suitable for use in fibre reinforced composite materials. The notified polymer solution will be used to fabricate composite articles such as underground tanks (used for storing fuels, organic and inorganic chemicals) and other associated items (eg. pipes).

The pure form of notified polymer will be site-limited, being manufactured solely for the purpose of dilution with styrene.

#### 5. PROCESS AND RELEASE INFORMATION

##### 5.1. Operation Description

The notified polymer will be manufactured in Australia from constituent monomers within an enclosed vessel under a nitrogen blanket. The notified polymer solution is formulated by the thinning of the resin intermediate into styrene and inhibitors (Cu and quinone based) under normal atmospheric conditions. The final resin solution is adjusted to specification, filtered and packed for shipping or further blending. Concentration of the notified polymer in the end-use commercial form solution is 63-67% w/w. The notified polymer solution is then transported, to fibreglass fabricators for use. The resin solution will be packaged in 1000 litre Hazacons IBCs, 205 litre metal drums, 23 kg metal pails, 4 kg metal tins, 2 kg metal tins, 1 kg metal tins and 500 g metal tins or transported in bulk road and rail tankers.

The notified polymer solution is reformulated in every case prior to end-use application. The concentration of the notified polymer in these end use applications will be in the range 45-55% w/w.

The finished styrene solution of the notified polymer will be mixed with organic peroxide catalyst (<5% v/w) and sprayed along with chopped glass filament onto a suitable mould. The resin/glass mixture will then be rolled with a view to removing entrapped air introduced by the application process. The composite article is then cured either at ambient temperature or elevated temperatures (80°C).

#### 6. EXPOSURE INFORMATION

##### 6.1. Summary of Environmental Exposure

###### *Release from site, reformulation and use*

During manufacturing of the notified polymer, limited release is anticipated since the synthesis is carried out in committed equipment, in closed vessels, and there is recycling of reactor washings into subsequent resin batches. The notifier estimates that up to 40% of the notified polymer produced may be exported to south east Asia.

###### *End-use (Article Fabrication)*

During the use of the polymer only small amounts of waste are anticipated since the majority of the polymer in the final product will be bound to composite articles and cured. The resin is applied by spraying and that resulting from curing the commercial form of the notified polymer is designed to be chemically resistant. As such, the release of the notified polymer, under normal use, to the environment would be low. Any residue remaining in drums (estimated to be 0.5-1%, or between 300-600 kg per annum of the notified polymer at maximum production allowing for 40% export) or from the cleaning of spray equipment or from scrubber apparatus, along with spillages as a result of formulation and use at the customer factories will be disposed off to landfill. The proportion of waste generated in the form

overspray, off cuts and equipment cleaning is expected to approximate 5%, or 3000 kg per annum of the notified polymer at maximum production allowing for 40% export. In landfill, waste polymer is expected to adsorb to or associate with soils/sediments based on the high molecular mass and low water solubility and is not expected to hydrolyse at environmental pH (despite having hydrolysable groups present).

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

## 6.2. Summary of Occupational Exposure

### *Manufacture and Formulation*

The notified polymer is synthesised from constituent monomers and thinned into styrene within an enclosed reactor. On completion of the reaction the styrene resin is pumped in to a holding tank where adjustments to final specifications are made. These processes take place within a sealed system and therefore, the likelihood of worker exposure to the notified polymer is minimal. The solution containing their notified polymer is then filtered through either a Cuno filter or through a Plate and Frame filter directly in to drums. The Cuno filter is a sealed system and the Plate and Frame filter is used under local exhaust ventilation. The likelihood of exposure to the 65% polymer solution during filtering is therefore unlikely, however, all workers wear eye protection, impermeable gloves, and protective clothing.

### *End-use (Article Fabrication)*

Reformulation of the resin solution to a final concentration of 45-55% takes place prior to application. Application of the styrene solution of the notified polymer with chopped glass filament to the mold is performed with the use of an automated spray system in a spray booth with dedicated fume extraction system and down draft ventilation. In addition to engineering controls, workers wear personal protective equipment consisting of overalls, goggles, and solvent resistant gloves.

## 6.3. Summary of Public Exposure

The notified polymer will not be available to the public. Although it is unlikely that members of the public may come into contact with fabricated products containing the notified polymer, the resin containing the notified polymer is cured into an inert matrix and is hence unavailable for exposure.

## 7. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance at 20°C and 101.3 kPa</b>	The product containing the notified polymer is a clear to hazy liquid.
<b>Melting Point/Glass Transition Temp</b>	Not applicable
<b>Density</b>	1229 kg/m <sup>3</sup> at 25°C (calculated)
<b>Water Solubility</b>	Water solubility was not determined, due to the presence of styrene in the polymer solution. Polyesters are known to be insoluble in water and there is no polar functionality present.
<b>Dissociation Constant</b>	Information not supplied. The notified polymer does not contain any functional groups which would be expected to dissociate under environmental conditions (pH 4-9).
<b>Reactivity</b>	Polymer is stable
<b>Degradation Products</b>	None expected

## 8. HUMAN HEALTH IMPLICATIONS

### 8.1. Toxicology

No toxicological data were submitted.

### 8.2. Human Health Hazard Assessment

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

MSDS for the product containing the notified polymer lists various potential adverse effects, which can be attributed to other components of the product that are known hazardous substances, for example, styrene.

## **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 final, cured form the product containing the notified polymer is relatively inert towards temperature and other environmental conditions, and is not expected to biodegrade or accumulate in the environment.

The main environmental hazard would arise through spillage in transport accidents that may release quantities of the uncured polymer to drains and waterways. In the event of an accidental spill of the notified polymer into waterways, the polymer is not expected to disperse in water but settle out into sediments. The hydrophobic nature of the notified polymer indicates that most would adsorb onto particles of sediment and sludge, and would therefore not remain in the water compartment and be available for assimilation by aquatic organisms. If the polymer is spilled on land it is expected that the polymer would become immobilised in, and slowly degrade, in the soil layer. Contaminated soil can then be collected and disposed of to landfill.

Given the above, environmental exposure and the overall environmental hazard is expected to be low.

### **10.2. Occupational health and safety**

During import and transport of the notified polymer, worker exposure is unlikely except in the event of a spill. Exposure after a spill would be controlled by use of the recommended practices for spillage clean up outlined in the MSDS supplied by the notifier.

Dermal and ocular exposure may occur during the manufacturing, formulation and fabrication processes. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers. The possibility of inhalation of the notified polymer is considered low given that the polymer is not volatile.

Due to its expected low toxicity and the engineering controls in place to minimise exposure to hazardous chemicals in the products containing the notified polymer, the risk to workers arising from exposure to the notified polymer is expected to be low.

### **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 and unlikely to be bioavailable. Therefore, the risk to public health from exposure to the notified polymer is considered 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 in the intended manner.

## 12. MATERIAL SAFETY DATA SHEET

### 12.1. Material Safety Data Sheet

The notifier has provided MSDS of the products containing the polymer 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.
- The use of the product containing the polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting* where appropriate.

#### 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 resin or polymer products to sewer. Do not allow resin, polymer products or containers to contaminate drains or waterways.

#### Disposal

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

#### Emergency procedures

- Spills/release of the notified polymer should be handled by containment, and adsorption with material such as sand. Contaminated material (including sand) should be collected, placed into sealable labelled container and disposed of to landfill. Do not allow to enter drains or watercourses.

**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.

No additional secondary notification conditions are stipulated.