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

**FULL PUBLIC REPORT**

**811-S Polyester Alkyd Resin**

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**Director  
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**FULL PUBLIC REPORT****811-S Polyester Alkyd Resin****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

Degussa Coatings & Colorants Pty Ltd of 30 Commercial Drive Dandenong VIC 3175. (ABN 16 079 823 313)

## NOTIFICATION CATEGORY

The notified polymer meets the PLC criteria.

## EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication:

Chemical name, CAS number, molecular weight details, polymer constituents, manufacture/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)

## NOTIFICATION IN OTHER COUNTRIES

TSCA (USA), DSL (Canada) SEPA (China), KECL (Korea).

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

811-S

## OTHER NAME(S)

Polyester alkyd resin

**3. COMPOSITION**

## DEGREE OF PURITY

100%

**4. INTRODUCTION AND USE INFORMATION**

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

Import.

## 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>	<30	<30	<30	<30	<30

## USE

The notified polymer is intended to be used as a binder vehicle in the manufacture of solvent based

pigment dispersions, which are incorporated into coloured paints. The concentration of notified polymer in the paint is expected to be 0.1-0.6%.

## 5. PROCESS AND RELEASE INFORMATION

### 5.1. Distribution, Transport and Storage

#### PORT OF ENTRY

Melbourne

#### IDENTITY OF MANUFACTURER/RECIPIENTS

The 811-S polymer will not be manufactured in Australia, but imported from the USA via Degussa Corp, Coatings & Colorants, USA.

#### TRANSPORTATION AND PACKAGING

The notified polymer will be imported in 181 kg drums, and the reformulated paint product will be packaged into consumer-sized cans containing 1 or 4 L of paint. It is indicated that the majority of the pigment dispersions incorporating the 811-S will be exported. Australia use will take approximately 30% in year 1, 25% in year 2, 20% in year 3 and 15% in year 4 and 5.

### 5.2. Operation Description

The notified polymer will be used by Degussa Coatings & Colorants Pty Ltd only, at the Dandenong site for manufacturing alkyd resin solvent based pigment dispersions. The amount of the notified polymer in these dispersion colorants will be 2-20%.

### 5.3. Occupational exposure

#### Exposure Details

#### Transport and Storage

No exposure is expected to occur during transport and warehousing of the notified polymer unless the packaging is accidentally breached.

#### Pigment manufacture

During the weighing of ingredients and charging of the mixing vessel, process operators may be exposed to the notified polymer. Exposure is unlikely to occur during the processing, milling and filling operations as these are automated. During the cleaning of the mixing vessel and filling lines, operators may be exposed to the diluted polymer in the alkyd resin solvent based pigment dispersion (2-20% notified polymer). Exposure is likely to be dermal and/or ocular, resulting from splashes of the liquid pigment dispersion, or the pigment paste. Inhalation exposure is unlikely to occur as the notified polymer is not volatile.

#### Paint Manufacture

Process workers may be exposed to the pigment containing the notified polymer during weighing of the ingredients charging of the reaction vessel. Exposure to the paint product, containing <1% notified polymer may occur during testing and adjusting of the batch.

#### Retail

Retail workers may be exposed to the pigment when charging the volumetric dispenser. Exposure to the paint may occur when the pigment and paint are mixed prior to sale.

#### End Use

Dermal and ocular exposure to the notified polymer may result from drips and splashes during application of the paint by brush or roller. Inhalation exposure may occur during spray painting

### 5.4. Release

#### RELEASE OF CHEMICAL AT SITE

#### Release during manufacture of pigment dispersions

Up to 1.2 tonnes (including up to 300 kg remaining in empty import containers and up to 900 kg

resulting from cleaning of equipment and filling lines) of the notified polymer will be released during the manufacture of pigment colorant.

Only 15-25% of the manufactured pigment dispersions is expected to be used in Australia. The following estimates are based on an assumption of 15% use within Australia.

In-house and point of sale tinting of paint

Less than 75 kg of the notified polymer (45 kg during cleaning of equipment with solvent and 30 kg as residues in emptied cans) will be released during in-house tinting by paint companies. The amount released at “point of sale” outlets (mainly as residue in empty cans) is expected to be less than 12 kg.

RELEASE OF CHEMICAL FROM USE

It is estimated that approximately 40% of the tinted paint will be applied by spray application and the remainder by brush or roller. The majority of spray-painting will be industry based and conducted in correctly designed spray booths with approximately 60% efficiency. During spray application, a loss of the notified polymer of less than 700 kg (including the losses due to cleaning of equipment and residue in empty cans) could occur.

The losses of the notified polymer during brush/roller application are estimated to be less than 63 kg (25 kg as residue in emptied cans and 38 kg due to cleaning of painting equipment). Accordingly, less than 2.0 tonnes of the notified polymer will be released to the environment.

**5.5. Disposal**

The contaminated solvent containing the notified polymer resulting from cleaning of equipment and filling lines during pigment manufacture and in-house tinting of paint will be incinerated. The empty containers resulting from all processes are crushed and sent to landfill. The overspray filtered out in spray booth filter pads and residual solids including the notified polymer would be disposed of to landfill. The solvents used for cleaning the painting equipment could be sent for incineration or, where DIY painters are involved, flushed into sewer or storm water drains. The latter is expected to involve only small volumes.

The MSDS recommends that spills and leaks of the notified polymer to be contained by absorbing with inert material. The waste material should be collected and placed in secure closed containers and treated or disposed of in accordance with all local, state/provincial and national requirements.

**5.6. Public exposure**

Household users of the paint may be exposed to drips and splashes of the paint. Members of the public may be exposed to the cured paint on the surface of objects.

**6. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance at 20°C and 101.3 kPa** Clear, amber coloured liquid

**Melting Point/Freezing Point** Not determined

Remarks

**Density** 1060 kg/m<sup>3</sup>

Remarks

**Water Solubility** Not determined.

Remarks The solubility of the notified polymer is expected to reflect the solubility of high molecular weight carboxylic acids. As the hydrocarbon length within a series increases, the non-polar (van der Waals) interactions between molecules increase. The water solubility of carboxylic acids therefore, decreases with the increase in molecular weight. Previous experience has also shown that such polyester alkyl

resins are insoluble.

**Hydrolysis as a function of pH** Not determined.

Remarks The polymer contains ester linkages that could be expected to undergo hydrolysis under extreme pH conditions. However, due to the expected low water solubility, this is unlikely in the environmental pH range of between 4 and 9.

**Partition coefficient** Not determined.

Remarks Due to its low water solubility, the polymer is expected to become associated with the octanol phase.

**Adsorption/desorption** Not determined.

Remarks The notified polymer is expected to be immobile in soil due to its low water solubility and to become associated with the soils and sediments.

**Dissociation constant** Not determined.

Remarks The notified polymer contains carboxylic acid and hydroxyl groups. Any free carboxylic acids should have typical acidity.

**Particle Size** Not applicable

**7. TOXICOLOGICAL INVESTIGATIONS**

No toxicological data were submitted.

**8. ENVIRONMENT**

No ecotoxicological data were submitted.

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## **9. RISK ASSESSMENT**

### **9.1. Environment**

#### **9.1.1. Environment – exposure assessment**

A total of < 2.0 tonnes of the notified polymer is expected to be released with approximately equal amounts incinerated and disposed of to landfill. When incinerated, the notified polymer will be converted to water vapour and oxides of carbon. Dry solid waste from spray painting and in empty cans containing the notified polymer is expected to remain associated with the soils and sediments in landfill. Leaching from landfill sites is unlikely, given the expected low solubility and high molecular weight of the notified polymer. Under these conditions the notified polymer waste would very slowly degrade into gases such as carbon dioxide via the abiotic and bacteriological processes. The solvents used for cleaning the brush/roller painting equipment could be sent for incineration or flushed into the sewer or storm water drains where DIY painters are involved.

Once applied, the paint coating is expected to dry to form a solid inert film that will share the fate of the substrate onto which the paint is applied. These substrates have an expected life span ranging from 5 to 50 years. Any fragments, chips or flakes of the paint will be of little concern as they are expected to be inert and not present a significant hazard. When bound into the paint matrix, the notified polymer is not expected to leach into the aquatic environment.

The notified polymer is not expected to cross biological membranes, due to the expected low solubility, high molecular weight and strong adsorption to soil, and as such should not bioaccumulate (Connell 1989).

#### **9.1.2. Environment – effects assessment**

No ecotoxicological data were submitted.

#### **9.1.3. Environment – risk characterisation**

The major environmental exposure to the notified polymer arises from the disposal of the waste to landfill. In the event of accidental spillage of paint into waterways, the polymer is not expected to disperse into the water, but settle out onto sediments. If the polymer is spilt on land, either during usage or transport, it is expected that to become immobilised in the soil. Contaminated soil can then be collected and disposed to landfill. The small container sizes would also limit the level of the hazard in the event of a spill.

Minor amounts (< 100 kg) of the notified polymer flushed into the sewer or storm water drains are expected to settle out onto sediments rather than disperse in water. Further, with the low potential to bioaccumulate, the risk to aquatic environment can be considered to be low. The notifier does not expect any other of exposure of the notified polymer to the aquatic environment.

Given the above, the level of environmental exposure and the overall environmental risk is expected to be low.

### **9.2. Human health**

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

Dermal and ocular exposure can occur during pigment dispersion formulation and paint manufacturing, for example, during the weighing of the polymer prior to addition to the mixing vessel. However, exposure to significant amounts of the notified polymer is limited because of the engineering controls and personal protective equipment worn by workers.

Personal protection equipment worn by of end-users during the application of the paint with brush or rollers is likely to be minimal, however, the concentration of the notified polymer in the paint is low (< 1%).



After application and once dried, the paint containing the notified polymer is cured into an inert matrix and is hence unavailable to exposure.

#### **9.2.2. Public health – exposure assessment**

Exposure of the general public as a result of reformulation, transport and disposal of the product containing the notified polymer is assessed as being negligible. However, products containing the notified polymer are available for use by the general public. Dermal and ocular exposure to the notified polymer is expected during application of paints and accidental oral exposure may also occur in children. It is expected that people will be exposed to only small amounts of paints, containing < 1% notified polymer and exposure is expected to be intermittent. Dermal exposure to cured paint films containing the notified polymer will also occur. However, at this stage, the polymer is embedded within the paint matrix and is not bioavailable.

#### **9.2.3. Human health - effects assessment**

The notified polymer meets the PLC criteria and therefore low hazard is expected due to the lack of reactive groups and the inability of the polymer to penetrate biological membranes.

#### **9.2.4. Occupational health and safety – risk characterisation**

Due to the expected low toxicity of the notified polymer and the low potential for exposure, the OHS risk presented by the notified polymer is expected to be low. The notified polymer may be present in formulations containing hazardous ingredients.

#### **9.2.5. Public health – risk characterisation**

As the concentration of the notified polymer in the paint is low, and exposure to the uncured paint is expected to be limited, the risk to the public is expected to be low.

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

#### **10.1. Hazard classification**

Based on the available data the notified polymer is not classified as hazardous under the *Approved Criteria for Classifying Hazardous Substances* (NOHSC 1999).

#### **10.2. Environmental risk assessment**

The polymer is not considered to pose a risk to the environment based on its reported use pattern.

#### **10.3. Human health risk assessment**

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

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

##### **10.3.2. Public health**

There is Negligible Concern to public health.

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

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

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

## 11.2. Label

The label for the notified polymer and products containing the polymer provided by the notifier 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 label remains the responsibility of the applicant.

## 12. 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

- Wastes generated during industrial application should be disposed of through a licensed waste contractor. Wastes generated during domestic use should be disposed of according to the following instructions: “Do not pour unwanted paint down the drain. Keep unwanted paint in sealed containers for disposal via special chemical waste collections. Empty paint containers should be left open in a well-ventilated area to dry out. When dry, recycle steel containers via steel can recycling programs. Disposal of empty paint containers via domestic recycling programs may differ between local authorities. Check with your local council first.”

#### Emergency procedures

- Spills and leaks of the notified polymer should be contained by absorbing with inert material.
- Collect and place waste material in secure closed container and treat or dispose of in accordance with all local, state/provincial and national requirements.

## 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 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.

### **13. BIBLIOGRAPHY**

Connell DW (1989) General characteristics of organic compounds which exhibit bioaccumulation. In: Connell DW ed. Bioaccumulation of xenobiotic compounds. Boca Raton, USA, CRC Press, pp 47-57.

NOHSC (1994a) National Code of Practice for the Preparation of Material Safety Data Sheets [NOHSC:2011(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

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

NOHSC (1999b) Approved Criteria for Classifying Hazardous Substances [NOHSC:1008(1999)]. National Occupational Health and Safety Commission, Canberra, AusInfo.