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

**FULL PUBLIC REPORT**

**Polymer in DYNOADD F-102**

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**Director  
Chemicals Notification and Assessment**

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**FULL PUBLIC REPORT****Polymer in DYNODD F-102****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

Cytec Australia Holdings Pty Ltd (ABN 45 081 148 629)  
Suite 1, Level 1 Norwest Quay  
21 Solent Circuit  
Norwest Business Park  
Baulkham Hills NSW 2153

Dynea WA Pty Ltd (ABN: 62 009 111 264)  
7 Moore Road  
Dardanup WA 6236

## 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
- Molecular formula
- Structural formula
- Means of identification
- Number average molecular weight
- Weight-average molecular weight
- Weight percentage of polymer species with MW < 1000 and MW < 500
- Polymer Constituents
- Residual Monomers and impurities
- Reactive Functional Groups
- Import Volume
- Site of manufacture and or reformulation
- Purity

## 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

US EPA (EPA Case No: P-03-0809, data was submitted August 26, 2003)

**2. IDENTITY OF CHEMICAL**

## MARKETING NAME(S)

<90% component of DYNODD® F-102

### 3. COMPOSITION

<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
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. INTRODUCTION AND USE INFORMATION

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

The notified chemical will be imported in 200 kg net polyethylene drums as < 90% solution.

#### 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>	4-5	4-5	4-5	4-5	4-5

#### USE

Used as an additive for coatings in the automotive industry.

### 5. PROCESS AND RELEASE INFORMATION

#### 5.1. Operation Description

The product containing the notified polymer will be transported by truck from the wharf to a distribution centre for warehousing, where it will be stored before being sold to customers for formulation into end-use products, before it is on sold to the automotive industry. The notified polymer may also be transported from the wharf directly to the customers.

The polymer solution will be reformulated into paint products at the paint manufacturing site. Formulation of the notified polymer into paint products will involve transfer of notified polymer by metered dosing to a mixing vessel and mixing polymer solution and other ingredients in a sealed vessel fitted with a high speed mixer and local ventilation system. Each batch will be quality checked and adjustments made as required. The resultant paint will be filtered prior to being dispensed into 1 L, 4 L and 10 L steel paint cans and pails using automated filling machines under exhaust ventilation. The finished paint contains < 1% notified polymer. Paint products containing the notified polymer will be warehoused at the customer's site prior to distribution to end-users.

At the end user sites the paint containing the notified polymer will used in the automotive industry, for both original equipment manufacture (OEM) and refinishing of components. At the customer sites the paint will be stirred and diluted then placed in a spray gun. The object to be primed with the paint will be sprayed in a spray booth then heat cured, resulting in the painted article.

## 6. EXPOSURE INFORMATION

### 6.1. Summary of Occupational Exposure

#### *Transport and storage*

Waterfront, transport and warehouse workers are not expected to be exposed to the notified polymer except in the case of an accident involving spillage or when packaging is accidentally breached. Spills are cleaned up by absorbing with suitable absorbent material and recovered into containers for disposal in accordance with local government regulations.

#### *Paint formulation*

During paint formulation there is possible dermal and ocular exposure of workers to drips, spills and splashes of DYNODD®F-102 or of formulated paint containing < 1% of the notified polymer. Such exposure could occur during charging of the mixing tank, taking QC testing samples and when plant and equipment is cleaned or maintained. Engineering controls such as metered dosing and enclosed mixing tanks are expected to be in place to minimise dermal/ocular exposure. Personal protective equipment (PPE) is expected to be worn by workers during this process - coveralls, goggles and impervious gloves.

During filling of cans, possible dermal/ocular exposure to paint containing < 1% of the notified polymer may result from drips and spills when connecting filling lines, or during equipment malfunction. Workers wear coveralls, goggles and impervious gloves.

Maintenance workers and laboratory staff may also encounter dermal/ocular exposure during equipment maintenance and testing processes. To minimise exposure, coveralls, goggles and gloves are worn.

Inhalation exposure during formulation or filling of paint is unlikely as aerosols are not expected to be formed and exhaust ventilation systems are in place to control exposure to other components of the paints.

#### *End-use of paints in spray painting*

Workers exposed during end-use of the formulated paints will mostly consist of spray painters preparing and applying the formulated paint coatings to surfaces (e.g. automotive parts), and cleaning equipment after use. The spraying of automotive parts will take place in a spray booth. The paints are to be used in both OEM and refinish operations. The final concentration of the notified polymer in paints will be < 1%, reducing the potential for worker exposure. Dermal exposure is possible during preparation of paint, which involves stirring and transfer steps. Aerosols may be formed during spray application and therefore inhalation exposure may be possible. To minimise exposure during end use, the paint is applied in a well ventilated, down draft spray booth with an effective fume extraction system. Workers also wear anti-static footwear and flame retardant overalls, impervious gloves, eye protection and an air fed breathing mask or respirator if local exhaust ventilation is inadequate.

Worker exposure to the notified polymer in dried paints is likely to be minimal, as the polymer will be encapsulated as part of the cured paint film.

### 6.2. Summary of Public Exposure

The general public is not expected to come into contact with the notified polymer or products containing it, except in the case of transport accidents where the packaging was breached. The notified polymer is intended only for use in industry.

Once the paint containing the notified polymer is applied to the substrate in the automotive industry, the notified polymer is bound in an insoluble polymeric matrix and is not bioavailable.

### 6.3. Summary of Environmental Exposure

#### 6.3.1. Environmental Release

##### *Release of chemical at site*

Local operations will include transport and storage, formulation, filling and packaging and application by end-users using spray gun.

During storage and paint manufacture the notified polymer will be released in the following ways:

Spills	up to 1%	up to 50 kg annually to landfill
Import container residue	less than 2%	up to 100 kg annually to waste contractor
During paint formulation	up to 1%	up to 50 kg generally to next batch

During paint formulation, it is anticipated that there will be minimal release of the notified polymer during manual transfer from the storage containers to the mixers and during filling of paint into containers or during blending since it is undertaken in enclosed systems under exhaust ventilation and in a bunded area. Spills will be within bunded areas and collected with inert absorbent material and placed in a sealable container ready for disposal.

The process equipment, blending tanks and mixers will be cleaned with suitable solvent which is collected and used in the next batch, if possible, otherwise it will be disposed off-site.

Import containers will be rinsed, with the rinsate being re-used in the paint formulation and the rinsed containers will be disposed of off-site.

##### *Release of chemical from use*

Release of the notified polymer to the environment as a result of its use in car manufacturing industry is expected to be minimal, unless an accidental spillage occurs.

##### Accidental spills

If accidental spillage occurs during normal operating procedures, it will be contained and soaked up with inert absorbent material and placed in a sealable container for disposal. Waste material is disposed of to landfill.

##### Residues in empty containers

The finished paint products will be packaged in 1L, 4L and 10L steel cans. The steel cans will be disposed of to landfill. The residues in the containers are expected to account for up to 2.5 % of the import volume (up to 125 kg per year of the notified polymer).

##### Overspray

A loss of 30% of the ready-for use material is achieved by the use of HVLP spray guns and slightly higher loss with the more outdated high pressure guns. The engineering controls for over-spray are typically spray booth filters and water scrubbers. The spray booth filters are usually renewed every 2-4 months. The filters are disposed of to landfill. Based on 30% over-spray losses during application procedures it is expected that up to 1500kg of notified polymer per annum would be lost via overspray. The small amount of waste generated in the application of the coating will be disposed to landfill.

##### Cleaning of equipment

Based on 5% losses from cleaning of spray equipment after application procedures, a level of < 1% notified polymer in paint mixtures and an annual import volume of up to 5000 kg, it is expected that approximately 250 kg of notified polymer per annum would be lost via cleaning of equipment.

The equipment is cleaned using water or suitable solvent. The solvents are sent offsite for disposal.

#### 6.3.2. Environmental Fate

No environmental fate data were provided.

While the notified polymer contains functional groups that are susceptible to hydrolysis, it is expected that it will be hydrolytically stable due to its low water solubility. The notified polymer is not expected to be readily biodegradable. Due to its hydrophobic nature it is expected that the notified polymer will

associate with sediment and organic phases of soils and not be mobile. Over time the polymer will slowly degrade to simple carbon compounds. During automobile recycling the polymer will be destroyed.

The notified polymer is not expected to cross biological membranes due to its high molecular weight, and as such should not bioaccumulate

## 7. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance at 20°C and 101.3 kPa</b>	Clear to light yellow, viscous fluid
<b>Boiling point</b>	150°C
<b>Density</b>	1040 kg/m <sup>3</sup>
<b>Water Solubility</b>	Low solubility, based on the hydrophobic structure.
<b>Dissociation Constant</b>	Not determined. The notified polymer contains no functional groups which would be expected to dissociate.
<b>pH</b>	4-5
<b>Reactivity</b>	Stable under normal conditions. The notified polymer is not expected to polymerise.
<b>Degradation Products</b>	Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide and/or nitrogen oxides.

## 8. HUMAN HEALTH IMPLICATIONS

### 8.1. Toxicology

The following toxicological studies were submitted:

<i>Endpoint</i>	<i>Result</i>	<i>Classified?</i>	<i>Effects Observed?</i>
Rat, acute oral	LD50 > 2000 mg/kg bw	no	no
Rat, acute dermal	LD50 > 2000 mg/kg bw	no	no
Rabbit, skin irritation	Mild irritant	yes	yes
Rabbit, eye irritation	Mild irritant	yes	yes
Genotoxicity - bacterial reverse mutation	Non mutagenic	no	no

All results were indicative of low hazard.

#### 8.1.1. Discussion of observed effects

For Acute Dermal Irritation in the Rabbit – A single 4-hour, semi-occluded application of the test material to the intact skin of 3 rabbits produced very slight erythema at two treated skin sites. One treated skin site appeared normal throughout the study and the remaining two treated skin sites appeared normal at the 72-hour observation. The notified polymer produced a primary irritation index of 0.3 and was classified as a mild irritant to rabbit skin according to the Draize classification scheme. No corrosive effects were noted.

For Acute Eye Irritation in the Rabbit – A single application of the test material to the non-irrigated eye of three rabbits produced minimal conjunctival irritation. Treated eyes appeared normal at the 24, 48 or 72-hour observations. The notified polymer produced a maximum group mean score of 4.0 and was classified as a mild irritant (Class 4 on a 1 to 8 scale) to the rabbit eye according to a modified Kay and Calandra classification system.

Based on the toxicological studies provided, the notified polymer causes slight eye and skin irritation and is not classified as hazardous in accordance with the NOHSC Approved Criteria for Classifying Hazardous Substances. The observed skin and eye irritation is consistent with a pH value of 4-5.

## 8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. This low hazard is supported by tests demonstrating low acute oral and dermal toxicity, slight irritation to skin and eyes and no evidence of mutagenicity in an Ames Assay.

## 9. ENVIRONMENTAL HAZARDS

### 9.1. Ecotoxicology

No toxicological data were submitted.

### 9.2. Environmental Hazard Assessment

No ecotoxicity data were provided for the notified polymer. Nonionic polymers that have molecular weights greater than 1000 are of low concern.

The notified polymer meets the PLC criteria and is not expected to be of significant ecotoxicological concern.

## 10. RISK ASSESSMENT

### 10.1. Environment

Exposure will only occur due to reformulation or use of the notified polymer, as it will not be manufactured in Australia. It will be reformulated into paints that will be used across Australia by professional trades people in the automotive industries, i.e. will not be available for general consumer use. The proposed use pattern and waste management results in a low potential for environmental release of the notified polymer. Solid wastes resulting from the paint manufacture and paint use will be collected and sent to landfill or incineration.

Liquid effluents produced from paint formulation and use will be sent to liquid waste plants, including solvent recovery, where, due to its hydrophobic nature, the notified polymer will end up in any resultant sludge which will be disposed of to landfill. A small amount of the notified polymer may be present in effluent discharged to sewer, which is expected to undergo further treatment prior to eventual discharge to the aquatic environment.

Following application and curing, the notified polymer is likely to be tightly cross-linked within an inert matrix. Due to its high molecular weight, the potential for bioaccumulation is very low.

Most of the notified polymer used in automotive finishes will eventually be incorporated in metal recycling programs or sent to landfill for disposal following its lifecycle. During reclamation, the notified polymer would be destroyed in furnaces and converted to water vapour and oxides of carbon.

### 10.2. Occupational Health and Safety

During transport and storage, worker exposure to the notified polymer is expected to be very low, and would only occur if accidental spillage of the materials occurred.

During processing of DYNODADD®F-102 into paint formulations there is potential for dermal/ocular exposure of workers. However standard engineering controls for formulation, eg enclosure and local exhaust ventilation, would limit this to incidental exposure. Exposure at this stage could occur to DYNODADD®F-102 containing < 90% of the notified polymer, or to paint formulations containing <1 % of the notified polymer.

Potential for exposure occurs at the end-use stage, when paint formulations containing < 1% of the notified polymer are prepared for application and sprayed onto automotive components. Dermal/ocular exposure is possible during cleaning of the equipment and during the small-scale preparation for spraying, which may involve stirring the paint, diluting with solvent, and transfer



to the spray gun. During the spraying process itself, inhalation and possibly ingestion exposure is possible, because aerosols containing the notified polymer would be formed during atomisation of the paint. The extent of dermal/ocular and inhalation exposure will be limited by the controls in place, including PPE and engineering measures. It is estimated that workers will carry out spray painting using formulations containing the notified polymer. Some of this will occur at large facilities manufacturing new automotive components. Some will occur as refinishing at crash repairer shops which may vary in the type and effectiveness of spray booths or other equipment.

Worker exposure to the notified polymer in dried paints is likely to be minimal, as the polymer will be encapsulated as part of the cured paint film.

The notified polymer may be present in formulations containing hazardous ingredients. If these formulations 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.

### **10.3. Public Health**

Once the paint containing the notified polymer is applied to the substrate in the automotive industry, the notified polymer is bound in an insoluble polymeric matrix and is not bioavailable. Therefore no significant dermal or inhalation exposure to the public is expected.

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.

## **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 No 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 proposed manner.

## **12. MATERIAL SAFETY DATA SHEET**

### **12.1. Material Safety Data Sheet**

The notifier has provided MSDS in accordance with the schedule item B 12 of the *ICNA Act*. 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.

- Personal protective equipment required during paint formulation are:
  - Industrial clothing and footwear
  - Eye protection (safety glasses or goggles)
  - Impervious gloves
  - Respiratory protection if ventilation is insufficient
- The use of the product containing the polymer should be in accordance with the NOHSC *National Guidance Material for Spray Painting* where appropriate.
- 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*

- The following control measures should be implemented by paint manufactures and warehouse sites to minimise environmental exposure during paint formulation and storage of the notified polymer:
  - All process equipment and storage areas should be bunded.

##### *Disposal*

- The notified polymer should be disposed of to landfill for solids and to licensed waste contractors for liquids.

##### *Emergency procedures*

- Spills/release of the notified polymer should be contained by soaking up with inert absorbent material and dispose of as special waste in compliance with local and State regulations as recommended in the MSDS.
  - Prevent product from entering drains.

#### 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.

