

File No: PLC/233

March 2001

**NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION  
AND ASSESSMENT SCHEME**

**FULL PUBLIC REPORT**

**Polymer in Morfree Coreactant OX-2**

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act* 1989 (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 National Occupational Health and Safety Commission which also conducts the occupational health & safety assessment. The assessment of environmental hazard is conducted by the Department of the Environment and the assessment of public health is conducted by the Department of Health and Aged Care.

For the purposes of subsection 78(1) of the Act, copies of this full public report may be inspected by the public at the Library, National Occupational Health and Safety Commission, 92-94 Parramatta Road, Camperdown NSW 2050, between the following hours:

Monday - Wednesday	8.30 am - 5.00 pm
Thursday	8.30 am - 8.00 pm
Friday	8.30 am - 5.00 pm

Copies of this full public report may also be requested, free of charge, by contacting the Administration Coordinator on the fax number below.

For enquiries please contact the Administration Coordinator at:

*Street Address:* 92 -94 Parramatta Rd CAMPERDOWN NSW 2050, AUSTRALIA  
*Postal Address:* GPO Box 58, SYDNEY NSW 2001, AUSTRALIA  
*Telephone:* (61) (02) 9577 9514 FAX (61) (02) 9577 9465

Director  
Chemicals Notification and Assessment

## TABLE OF CONTENTS

FULL PUBLIC REPORT .....	3
1. APPLICANT .....	3
2. IDENTITY OF THE CHEMICAL.....	3
3. POLYMER COMPOSITION AND PURITY .....	3
4. PLC JUSTIFICATION.....	3
5. PHYSICAL AND CHEMICAL PROPERTIES.....	3
6. USE, VOLUME AND FORMULATION.....	4
7. OCCUPATIONAL EXPOSURE .....	5
8. PUBLIC EXPOSURE .....	5
9. ENVIRONMENTAL EXPOSURE.....	6
9.1. Release .....	6
9.2. Fate.....	6
10. EVALUATION OF HEALTH EFFECTS DATA .....	7
11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA.....	7
12. ENVIRONMENTAL RISK ASSESSMENT.....	7
13. HEALTH AND SAFETY RISK ASSESSMENT.....	7
13.1. Hazard assessment.....	7
13.2. Occupational health and safety.....	8
13.3. Public health.....	8
14. MSDS AND LABEL ASSESSMENT .....	8
14.1. MSDS .....	8
14.2. Label.....	8
15. RECOMMENDATIONS .....	9
16. REQUIREMENTS FOR SECONDARY NOTIFICATION .....	9
17. REFERENCES.....	9

**FULL PUBLIC REPORT****Polymer in Morfree Coreactant OX-2****1. APPLICANT**

Rohm and Haas Australia Pty Ltd of 969 Burke Road Camberwell VIC 3124 (ACN 004 513 188) has submitted a notification statement in support of their application for an assessment certificate for the synthetic polymer of low concern (PLC) Polymer in Morfree Coreactant OX-2.

**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:** Morfree Coreactant OX-2

**3. POLYMER COMPOSITION AND PURITY**

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

**4. PLC JUSTIFICATION**

The notified polymer meets the PLC criteria.

**5. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Property</b>	<b>Result</b>	<b>Comments</b>
<b>Appearance</b>	clear viscous liquid	
<b>Boiling point</b>	not determined	
<b>Density</b>	> 1000 kg/m <sup>3</sup>	
<b>Water solubility</b>	< 63 mg/L	water solubility was determined <i>via</i> ASTM E 1148-87

<b>Particle size</b>	not determined	not applicable as the notified polymer is only imported in solution
<b>Flash point</b>	> 175°C	
<b>Autoignition temperature</b>	not determined	
<b>Explosive properties</b>	not explosive	
<b>Stability/reactivity</b>	stable under normal environmental conditions	
<b>Hydrolysis as function of pH</b>	not determined	the notified polymer contains linkages that could be expected to undergo hydrolysis at extreme pH; in the environmental pH range of 4 to 9, significant hydrolysis is unlikely to occur
<b>Partition coefficient</b>	not determined	the partition coefficient has not been determined due to the low water solubility of the notified polymer, and its likely hydrophobic nature, indicative of partitioning into the octanol phase
<b>Adsorption/desorption</b>	not determined	the notified polymer is expected to be immobile in soil due to its high molecular weight and low water solubility
<b>Dissociation constant</b>	no dissociable groups are present	

## 6. USE, VOLUME AND FORMULATION

### Use:

The notified polymer is used as one component of a two pack laminating adhesive for plastic and/or aluminium films used to package snack foods and in general packaging.

### Manufacture/Import volume:

The notified polymer will not be manufactured in Australia, but will be imported as a component in the product, Morfree Coreactant OX-2. The estimated import quantity of the notified polymer is 1 tonnes in the first year, increasing to 5 tonnes per annum after five years.

### Formulation details:

Morfree Coreactant OX-2 is a solution containing < 50 % notified polymer in a polyglycol derivative. This will be blended prior to use to produce an adhesive containing < 20 % notified polymer. The blended adhesive will be pumped mechanically from the mixing vessel

to a holding vessel (approx. 20 L capacity) on a laminating machine and then further pumped to its adhesive tray. The adhesive will be applied by a gravure coating process (adhesive applied to rollers) where two polymers and/or aluminium films are laminated together and the adhesive is sandwiched between the film.

Morfree Coreactant OX-2 will be imported in 200 L steel drums.

## 7. OCCUPATIONAL EXPOSURE

Exposure route	Exposure details	Controls indicated by notifier
<b><i>Transport</i></b>		
<i>Waterside (5 workers)</i>		
none	exposure is expected only in the event of an accident	none
<i>Transport and storage (5-10 workers)</i>		
none	exposure is expected only in the event of an accident	none
<b><i>End use</i></b>		
<i>Laminating machine (4-8 workers, 6-8 hours/day, 30 days/year)</i>		
dermal, < 50 % solution	workers may be exposed during connecting and disconnecting hoses	exhaust ventilation, safety glasses, impervious gloves, coveralls and safety boots
<i>Cleaning equipment</i>		
dermal, < 50 % solution	manual transfer of unused blended adhesive from laminating machine to a waste adhesive and solvent drum and wiping of adhesive residues from laminating machinery using rags	exhaust ventilation, impervious gloves, coveralls and goggles

## 8. PUBLIC EXPOSURE

The notified polymer is not available for sale to the public and will be used as an ingredient in laminating adhesive products for use in food and other packaging applications. The potential for public exposure to the notified polymer during transport, reformulation or disposal is assessed as negligible. Although members of the public will handle packaging and consume food contained in laminated packaging manufactured using the notified polymer, the notifier has stated that the notified polymer is unavailable since it is sandwiched between two impervious layers. Exposure is therefore unlikely.

## 9. ENVIRONMENTAL EXPOSURE

### 9.1. Release

During formulation of the adhesive and application, the notifier estimates at an usage rate of 5 tonnes per annum that up to 99.5 kg per annum of notified polymer waste will be generated. This will be derived from:

Spills:	~ 40 kg per annum
Residues in the import containers:	~ 10 kg per annum
Equipment cleaning:	~ 4.5 kg per annum
Unused blend:	~ 45 kg per annum

It is anticipated that spills of the polymer solution and blended polymer adhesive will be contained within the plant through the bunding systems in place. As the polymer solution will be used in small batch quantities, it is expected that any spills will be small in volume. Spills will be collected using absorbent material and removed by a licensed industrial waste contractor in a licensed waste landfill site.

Machinery will be manually cleaned with rags and solvent and waste from this process will be disposed of to landfill by licensed hazardous waste contractors.

It is expected that import drums containing residual polymer solution will be used to collect waste solvent and unused blended adhesive, and when finished with, collected by a licensed hazardous waste contractor. The liquid contents will be incinerated and the drums with any residual solid will be disposed of in a licensed waste landfill site.

The remainder of the notified polymer will be incorporated into snack food packaging and other general packaging.

### 9.2. Fate

Spills of polymer solution or blended laminating adhesive containing the notified polymer will be collected on absorbent material and disposed of in landfill. Waste generated from cleaning machinery with rags and solvent will also be disposed of in landfill. In landfill, the polymer is unlikely to separate from the absorbent material; any free polymer will have low water solubility and will associate with the soil matrix and not leach into the aquatic compartment.

Residual polymer solution and unused blended adhesive will be incinerated by licensed hazardous waste contractors, and the empty import drums with any remaining residual solid material will be disposed of in landfill. Incineration would be expected to produce water vapour and oxides of carbon. In landfill, the polymer would not be expected to escape from the drums; any free polymer will have low water solubility and will associate with the soil matrix and not leach into the aquatic compartment.

The majority of the notified polymer will follow the fate of the packaging in which it is incorporated. It is expected that the majority of packaging will be disposed of to domestic landfill. Upon eventual degradation of the packaging films between which the polymer is

sandwiched, the polymer would become part of the soil matrix and not leach from the soil due to its low water solubility.

The polymer is not expected to cross biological membranes, due to its high molecular weight and low water solubility, and should not bioaccumulate (Connell, 1990).

## **10. EVALUATION OF HEALTH EFFECTS DATA**

No toxicological data were submitted.

The notified polymer is not classified as a hazardous substance according to the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999). It contains low level of residual monomers. No hazardous impurities, additives and adjuvants are present at above the cutoffs for classification of the notified polymer as a hazardous substance.

## **11. EVALUATION OF ENVIRONMENTAL EFFECTS DATA**

No ecotoxicological data were submitted.

## **12. ENVIRONMENTAL RISK ASSESSMENT**

A small proportion of the notified polymer will be disposed of as waste to landfill by licensed waste contractors where it is expected to be immobile and not leach into the aquatic compartment. The majority of the waste polymer will be incinerated by licensed hazardous waste contractors and would be expected to produce water vapour and oxides of carbon.

The majority of the notified polymer will follow the fate of food packaging in which it is incorporated and be disposed of in landfill as domestic waste. Upon eventual degradation of the packaging films between which the polymer is sandwiched, it is expected that the polymer would become part of the soil matrix and would not be leached from the soil. There should be no release of the notified polymer to sewer.

The polymer is not expected to cross biological membranes, due to its high molecular weight and low water solubility, and should not bioaccumulate.

The low environmental exposure of the notified polymer as a result of the proposed manufacture and use indicates the overall environmental hazard should be low.

## **13. HEALTH AND SAFETY RISK ASSESSMENT**

### **13.1. Hazard assessment**

No toxicological information has been provided for the notified polymer and therefore the substance cannot be assessed against the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999). The notified polymer is of high molecular weight, and is not expected to be absorbed across skin or other biological membranes. It contains no moderate or high concern reactive functional groups. The polymer solution, Morfree

Coreactant OX-2, is not classified as a hazardous substance. The MSDS for the polymer solution lists a number of potential health effects, namely nausea, vomiting, diarrhoea, pain, upset stomach if swallowed, and slight to mild skin and eye irritation.

### **13.2. Occupational health and safety**

There is little potential for significant occupational exposure to the notified polymer in the transport and storage of the polymer solution other than in the event of an accidental spill.

During the reformulation processes (blending and transfer of adhesive) and cleaning equipment, the main exposure route for the notified polymer will be dermal. The high molecular weight of the polymer will preclude its absorption through the skin. Standard protective measures including local exhaust ventilation, coveralls, protective eyewear and impervious gloves used during reformulation and end use should provide sufficient protection against the notified polymer.

The final adhesive mix, containing the notified polymer, could contain a wide variety of additional ingredients, which may cause adverse health effects. Exhaust ventilation, personal protective equipment, such as safety glasses, impervious gloves, coveralls and safety boots should provide adequate protection to workers handling the adhesive mix.

The notified polymer per se presents a low hazard to human health, and the control measures required to prevent exposure to the hazardous components of the blended adhesive will ensure sufficient protection against the notified polymer itself.

### **13.3. Public health**

The notified polymer is not available for sale to the public. Although members of the public may handle packaging and consume food from laminated packages manufactured using the notified polymer, the risk to public health from the notified polymer is likely to be low because the notified polymer is sandwiched between two impermeable layers and is unlikely to be bioavailable.

## **14. MSDS AND LABEL ASSESSMENT**

### **14.1. MSDS**

The MSDS of the notified polymer solution 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 solution 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

To minimise occupational exposure to Polymer in Morfree Coreactant OX-2, the following guidelines and precautions should be observed:

- Safety glasses, impervious gloves, coveralls and safety footwear should be used during occupational use of the products containing the notified polymer; where engineering controls and work practices do not reduce vapour and particulate exposure to safe levels, an air fed respirator should also be used;
- Spillage of the notified chemical should be avoided. Spillages should be cleaned up promptly with absorbents which should then be put into containers for disposal;
- A copy of the MSDS should be easily accessible to employees.

If products containing the notified chemical are hazardous to health in accordance with the NOHSC *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 1999), workplace practices and control procedures consistent with State and Territory hazardous substances regulations must be in operation.

Guidance in selection of goggles may be obtained from Australian Standard (AS) 1336 (Standards Australia, 1994) and Australian/New Zealand Standard (AS/NZS) 1337 (Standards Australia/Standards New Zealand, 1992); for industrial clothing, guidance may be found in AS 2919 (Standards Australia, 1987) and AS 3765.2 (Standards Australia, 1990); for impermeable gloves or mittens, in AS 2161 (Standards Australia/ Standards New Zealand, 1998); for occupational footwear, in AS/NZS 2210 (Standards Australia/ Standards New Zealand, 1994a); for respirators, in AS/NZS 1715 (Standards Australia/ Standards New Zealand, 1994b) and AS/NZS 1716 (Standards Australia/ Standards New Zealand, 1994c) and other internationally acceptable standards.

## 16. REQUIREMENTS FOR SECONDARY NOTIFICATION

Secondary notification may be required if:

- (i) any of the circumstances stipulated under subsection 64(2) of the Act arise. If any importer or manufacturer of the notified polymer becomes aware of any of these circumstances, they must notify the Director within 28 days; or
- (ii) the notified polymer is introduced in a chemical form that does not meet the PLC criteria.

## 17. 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:1008(1994)]. Australian Government Publishing Service, Canberra.

Standards Australia (1990) Australian Standard 3765.2-1990, Clothing for Protection against Hazardous Chemicals Part 2 Limited protection against specific chemicals. Standards Association of Australia.

Standards Australia (1994) Australian Standard 1336-1994, Eye protection in the Industrial Environment. Standards Association of Australia.

Standards Australia/Standards New Zealand (1992) Australian/New Zealand Standard 1337-1992, Eye Protectors for Industrial Applications. Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1994a) Australian/New Zealand Standard 2210-1994, Occupational Protective Footwear. Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1994b) Australian/New Zealand Standard 1715-1994, Use and Maintenance of Respiratory Protective Devices. Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1994c) Australian/New Zealand Standard 1716-1994, Respiratory Protective Devices. Standards Association of Australia/Standards Association of New Zealand.

Standards Australia/Standards New Zealand (1998) Australian/New Zealand Standard 2161.2-1998, Occupational protective gloves, Part 2: General requirements. Standards Association of Australia/Standards Association of New Zealand.