

File No PLC/552

April 2005

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

**FULL PUBLIC REPORT**

**Polymer in Rheovis 112 and 132**

This Self 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 environmental risk assessment is conducted by the Department of the Environment and Heritage. The data supporting this assessment will be subject to audit by NICNAS.

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**Director  
Chemicals Notification and Assessment**

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**FULL PUBLIC REPORT****Polymer in Rheovis 112 and 132****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

Ciba Specialty Chemicals (ABN 97 005 061 469)  
235 Settlement Road  
Thomastown, VIC 3082

## NOTIFICATION CATEGORY

Polymer of Low Concern

## EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication are:

- Chemical names
- Other names
- CAS Number
- 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
- Charge Density
- Polymer Constituents
- Residual monomers and impurities
- Reactive Functional Groups – include FGEW
- Import Volume
- Site of reformulation
- Purity

The above data items are claimed exempt from publication on the basis that their publication would be detrimental to the commercial interests of the applicant

## 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

A low volume exemption was filed in Japan (< 500 kg per annum, no MITI number assigned).  
A PMN has been submitted in the US.

**2. IDENTITY OF CHEMICAL**

## OTHER NAME(S)

Polyacrylate

## MARKETING NAME(S)

Rheovis 112 (contains <50% of the notified polymer)

Rheovis 132 (contains <50% of the notified polymer)

Note: The monomer constituents for Rheovis 112 and 132 are the same.

### 3. COMPOSITION

#### PLC CRITERIA JUSTIFICATION

<i>Criterion</i>	<i>Criterion met</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 polymers will not be manufactured in Australia. They will be imported as components of Rheovis 112 and Rheovis 132 as < 50% emulsions in water. The products will be formulated to produce water-based coatings, which contain less than 3% of the notified polymer.

#### 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>	9-10	9-10	9-10	9-10	9-10

#### USE

Used as an additive in water-based coatings.

### 5. PROCESS AND RELEASE INFORMATION

#### 5.1. Operation Description

Rheovis 112 and 132 containing the notified polymer at < 50% emulsion in water will be imported and stored in 25 kg pails and 200 kg steel drums. They will be transported from the wharf to the notifier's warehouse by truck before it is sold to paint manufacturers for formulation into paint products.

The liquid polymer will be formulated into paint products at the customer's paint manufacturing site. Formulation of the notified polymer into paint products will involve transfer of notified polymer by metered dosing to mixing vessel and mixing the notified polymer and other ingredients in a sealed vessel fitted with a high-speed mixer and local ventilation system. Each batch is to be quality checked and adjustments made as required. The resultant paint is filtered prior to being dispensed into 1 L, 4 L and 10 L steel paint cans and pails using automated filling machines. The resultant paint contains less than 3% of the notified polymer. The closed containers are manually put on pallets and then taken by forklift to the warehouse for storage and distribution.

The manufactured coatings containing the notified polymer will be available to both professional painting contractors and do-it-yourself (DIY) home painters. Coating application will generally be done by brush or roller. After application of the paint, it will cure and crosslink, encapsulating the notified polymer, which will no longer be separately available for exposure.

### 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 of the Rheovis 112 and 132 containing the notified polymer at < 50% as emulsion in water. Spills are cleaned up by absorbing with

liquid-binding material (sand, diatomite, acid binders, universal binders or sawdust) and recovered into containers for disposal in accordance with local government regulations. No controls are required. Gloves, coveralls and goggles are available if required.

*Paint formulation:*

*Paint make up* – Workers may be exposed to polymer via dermal and ocular exposure due to drips, spills and splashes during charging of mixer and blending. Workers will wear coveralls, goggles and impervious gloves. Aerosols may be released during blending, but inhalation exposure is low due to enclosed mixing and exhaust ventilation system.

*QC testing:* Dermal and ocular exposure is possible from drips, spills and splashes during batch adjustment and when taking and testing samples. Technicians wear laboratory coat, goggles and impervious gloves to minimise exposure.

*Filling into drums:* Dermal exposure may be possible due to drips and spills when connecting filling lines. The paint is filled into drums under local exhaust ventilation and workers wear overalls, goggles and impervious gloves. Therefore exposure is minimal.

*Maintenance workers:* There is possible of skin contact during equipment maintenance. Workers wear coveralls, goggles and gloves.

*End use:* Workers exposed to the formulated paint product will mostly consist of professional painters and domestic painters. Inhalation, dermal and ocular exposure may occur but is expected to be minimal.

## **6.2. Summary of Public Exposure**

It is expected that during transport, storage, paint manufacture, and most industrial use, exposure of the general public to the notified polymer will be minimal, except in the event of an accidental spill. Public exposure to surface coatings containing the notified polymer is expected to be widespread but intermittent. The likely route of exposure would be dermal, with the possibility of accidental oral and ocular exposure. Due to the wide range of applications in the domestic and industrial environment, public exposure via dermal contact with dried surface coating films containing the notified polymer is expected to be high.

## **6.3. Summary of Environmental Exposure**

### **6.3.1. Environmental Release**

*RELEASE OF CHEMICAL AT SITE:*

Release from the notifier's site to the environment may result from accidental spills. It is estimated that a maximum of 1% of the notified polymer (100 kg/year) would be lost during spillage. Spills are contained and soaked up with inert absorbent material (sand, diatomite, acid binders, universal binders or sawdust) and placed in a sealable container and disposed of to landfill.

*RELEASE OF CHEMICAL FROM USE*

*Paint Manufacturing Site*

The empty containers (25 kg and 200 kg) will be rinsed with solvent. The residue and the empty containers will be collected by licensed waste contractors. The containers will be disposed of to landfill. The total residues in the containers are expected to account for up to ~70 kg/year of the notified polymer based on the maximum imported volume.

At the paint manufacturing site, 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. Blending occurs in an enclosed system under exhaust ventilation and in a bunded area. The finished paint products will be packaged in 1 L, 4 L and 10 L steel cans and 200 L drums.

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

Residual notified polymer arising from the routine cleaning of mixing and filling equipment could account for up to 1% of the imported volume. This would be captured by conventional systems and disposed to landfill after solidifying.

### End-users of Finished Paint Product

Paint products will be used by professional painters and in the domestic environment. Empty cans and pails containing dry paint residue (~ 450 kg of the notified polymer per annum) will be consigned to landfills.

The table below provides an estimate of the residue of the notified substance in the empty paint containers and the disposal method in place.

<u>Paint Containers</u>					
<i>Type and size of container</i>	<i>Residue in empty container %</i>	<i>Percentage polymer %</i>	<i>Residue of notified polymer in container (kg)</i>	<i>Residue notified polymer in container per year (kg)</i>	<i>Disposal method</i>
1L steel can	5	< 3	0.001	10	Landfill
4L steel can	2	< 3	0.0016	16	Landfill
10L steel can	1	< 3	0.002	20	Landfill
200L drums	1	< 3	0.04	400	Landfill

Up to 200 kg of the notified polymer is expected to be disposed of to the sewer systems during the cleaning of application equipment, especially the brushes or rollers used by DIY home painters.

Once the paint is applied, it is expected to form an inert coating on the surface (e.g. internal walls) and the notified polymer will no longer be available for exposure. It will remain on the surface until it is gradually worn down. At the end of its useful life it will be removed and replaced by another coat of a similar product. The coating containing the notified polymer will be broken up into solid particulate matter in the sanding/removal process and most likely be disposed of to landfill.

### **6.3.2. Environmental Fate**

The notified polymer will be released into the aquatic environment during the normal course of use. The polymer is poorly soluble in water when the pH is below ~5, however, becomes increasingly soluble with pH above 5. The high molecular weight, however, indicates a low potential to bioaccumulate.

A large proportion of notified polymer will be disposed of to landfill in a dispersed manner. In landfill, solid wastes containing the polymer will be immobile and will not leach into the aquatic compartment, but should slowly degrade and become associated with the soil matrix. The notified polymer contains hydrolysable groups and this may occur to some extent, though hydrolysis will not occur in pH conditions below ~5 due to low its water solubility below this pH.

## **7. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance at 20°C and 101.3 kPa**  
**Melting Point/Glass Transition Temp**  
**Density**  
**Water Solubility**

White odourless emulsion  
 Approximately 100°C (aqueous emulsion)  
 1050 kg/m<sup>3</sup> at 20°C  
 The water solubility has not been determined, but from application of the notified polymer it is indicated that at:  
 pH 2-4: it is poorly soluble in water  
 pH 4-7: it is slightly soluble in water  
 pH > 7: it has good solubility in water, at least 5% by weight.

**Dissociation Constant**  
**Particle Size**  
**Reactivity**

Expected to have a pKa of 3-4.  
 Not applicable  
 Under normal conditions the polymer will not degrade or depolymerise.  
 Oxides of carbon

**Degradation Products**

## **8. HUMAN HEALTH IMPLICATIONS**

### **8.1. Toxicology**

No toxicological data are available.

## 8.2. Human Health Hazard Assessment

The notified polymer meets the PLC criteria and can therefore be considered to be of low hazard. Hazardous monomers are present only at low levels, well below the cut-off concentration for classification as a hazardous substance under the *NOHSC Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2002).

## 9. ENVIRONMENTAL HAZARDS

### 9.1. Ecotoxicology

No toxicological data were submitted.

### 9.2. Environmental Hazard Assessment

Anionic polymers are known to be moderately toxic to algae. The mode of toxic action is overchelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone and approaches the single figure mg/L values. This could apply to the notified polymer.

## 10. RISK ASSESSMENT

### 10.1. Environment

The products containing the notified polymer are likely to be used throughout Australia. The major environmental exposure is expected to be due to the disposal of waste to landfill from coatings manufacture and application. If spilt on land, the notified polymer is expected to be immobilised in the soil layer.

The waste polymer is discharged in domestic wash waters to waste water treatment systems through washing of brushes or other equipment. Assuming a worst case scenario of 5% of imported volume with no removal of the notified polymer in the sewage treatment plant, the resultant predicted environmental concentration (PEC) in sewage effluent nationwide, based on the following assumptions,:

Amount entering sewer annually	500 kg
Population of Australia	20.1 million
Amount of water used per person per day	200 L
Number of days in a year	365

is estimated to be 0.341 µg/L.

Based on dilution factors of 1 and 10 for inland and ocean discharges, the PECs of the notified polymer in freshwater and marine water may approximate 0.341 or 0.034 µg/L, respectively. Based on the proposed use pattern, the release of the notified polymer to the aquatic environment is expected to be low and dispersed and well below potential toxic levels.

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

Following application and curing, the notified polymer will be within an inert matrix and be unavailable to organisms.

No ecotoxicity data are available, however, based on the exposure levels and use pattern, the notified polymer is unlikely to pose an unacceptable risk to the environment.

### 10.2. Occupational Health and Safety

No toxicity data are available. Its absorption into the body is expected to be limited by its high molecular weight.

Rheovis 112 and 132 containing the notified polymer at < 50% will be imported and stored in 25kg pails and 200 kg steel drums. It will be transported from the wharf to Ciba Specialty Chemicals by truck for warehousing before it is sold to paint manufacturers for formulation into paint products.

The liquid polymer will be formulated into paint products at the customer's paint manufacturing site. During formulation workers may be exposed to polymer via dermal and ocular exposure due to drips,



spills and splashes during charging of mixer and blending. Workers will wear coveralls, goggles and impervious gloves. Aerosols may be released during blending, but inhalation exposure is low due to enclosed mixing and exhaust ventilation system. Laboratory technicians carrying out QC testing will wear laboratory coat, goggles and impervious gloves to minimise exposure.

Filling of finished coating containing < 3% of the notified polymer is carried out under local exhaust ventilation and workers wear overalls, goggles and impervious gloves. Therefore exposure is minimal.

Maintenance Workers also wear coveralls, goggles and gloves.

The manufactured coatings containing the notified polymer will be available to both professional painting contractors and do-it-yourself (DIY) home painters. Coating application will generally be done by brush or roller. After application of the paint, it will cure and crosslink, encapsulating the notified polymer, which will no longer be separately available for exposure.

On the basis of the above information, the OHS risk presented by the notified polymer is expected to be low. The control measures in place will ensure sufficient protection against the notified polymer.

### 10.3. Public Health

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

While dermal and possibly eye contact with the notified polymer may occur during application of the paints containing the polymer by the general public, the notified polymer is not expected to pose a significant hazard to public health when used in the proposed manner.

In dried paint films, the notified polymer will be encapsulated in an inert, very high molecular weight matrix, which will render it biologically unavailable. Consequently, the risk from public exposure to the notified polymer from dried paint films is considered to be 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 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

- Employers should implement the following isolation and engineering controls to minimise occupational exposure to the notified polymer:
  - Closed tanks and lines for formulation and filling of paint containing the notified polymer;

- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer;
  - Avoid splashing, spills and generation of aerosols during formulation and filling processes.
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
  - Protective gloves
  - Safety glasses or goggles
  - Overall during painting

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*

- The following control measures should be implemented by paint manufacturers 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.
- Use detergent in cleaning up.
- 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.