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

**PUBLIC REPORT**

**Polymer in Enviroline 405HT Part A**

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 Department of Health, and conducts the risk assessment for public health and occupational health and safety. The assessment of environmental risk is conducted by the Department of the Environment.

This Public Report is available for viewing and downloading from the NICNAS website or available on request, free of charge, by contacting NICNAS. For requests and enquiries please contact the NICNAS Administration Coordinator at:

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**Director  
NICNAS**

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## SUMMARY

The following details will be published in the NICNAS *Chemical Gazette*:

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS CHEMICAL	INTRODUCTION VOLUME	USE
LTD/1905	Akzo Nobel Pty Ltd	Polymer in Enviroline 405HT Part A	ND*	< 0.5 tonne per annum	Component of industrial paints

\*ND = not determined

## CONCLUSIONS AND REGULATORY OBLIGATIONS

### **Hazard classification**

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System of Classification and Labelling of Chemicals* (GHS), as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

### **Human health risk assessment**

Under the conditions of the occupational settings described, the notified polymer is not considered to pose an unreasonable risk to the health of workers.

When used in the proposed manner, the notified polymer is not considered to pose an unreasonable risk to public health.

### **Environmental risk assessment**

On the basis of the reported use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

### **Recommendations**

#### **CONTROL MEASURES**

#### **Occupational Health and Safety**

- A person conducting a business or undertaking at a workplace should implement the following engineering controls to minimise occupational exposure to the notified polymer during paint application:
  - Use of spray booths where possible
  - Good ventilation, with local air extraction where possible
- A person conducting a business or undertaking at a workplace should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer:
  - Avoid contact with skin and eyes
  - Avoid inhalation during spray application
  - Clean up spills promptly
- A person conducting a business or undertaking at a workplace should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
  - Impervious gloves, goggles, coveralls
  - Respiratory protection if inhalation exposure may occur

Guidance in selection of personal protective equipment can be obtained from Australian, Australian/New Zealand or other approved standards.

- Spray applications should be carried out in accordance with the Safe Work Australia Code of Practice for *Spray Painting and Powder Coating* (SWA, 2015) or relevant State or Territory Code of Practice.
- A copy of the (M)SDS should be easily accessible to employees.
- If products and mixtures containing the notified polymer are classified as hazardous to health in accordance with the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)* as adopted for industrial chemicals in Australia, workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation should be in operation.

#### Disposal

- Where reuse or recycling are not appropriate, dispose of the notified polymer in an environmentally sound manner in accordance with relevant Commonwealth, state, territory and local government legislation.

#### Emergency procedures

- Spills or accidental release of the notified polymer should be handled by containment, physical collection and subsequent safe disposal.

### Regulatory Obligations

#### *Secondary Notification*

This risk assessment is based on the information available at the time of notification. The Director may call for the reassessment of the chemical under secondary notification provisions based on changes in certain circumstances. Under Section 64 of the *Industrial Chemicals (Notification and Assessment) Act (1989)* the notifier, as well as any other importer or manufacturer of the notified chemical, have post-assessment regulatory obligations to notify NICNAS when any of these circumstances change. These obligations apply even when the notified polymer is listed on the Australian Inventory of Chemical Substances (AICS).

Therefore, the Director of NICNAS must be notified in writing within 28 days by the notifier, other importer or manufacturer:

- (1) Under Section 64(1) of the Act; if
  - the polymer has a number-average molecular weight of less than 1000;

or

- (2) Under Section 64(2) of the Act; if
  - the function or use of the polymer has changed from component of industrial paints, or is likely to change significantly;
  - the amount of polymer being introduced has increased, or is likely to increase, significantly;
  - the polymer has begun to be manufactured in Australia;
  - additional information has become available to the person as to an adverse effect of the polymer on occupational health and safety, public health, or the environment.

The Director will then decide whether a reassessment (i.e. a secondary notification and assessment) is required.

#### *(Material) Safety Data Sheet*

The (M)SDS of a product containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the (M)SDS remains the responsibility of the applicant.

## ASSESSMENT DETAILS

### 1. APPLICANT AND NOTIFICATION DETAILS

#### APPLICANT

Akzo Nobel Pty Ltd (ABN: 59 000 119 424)  
51 McIntyre Road  
SUNSHINE NORTH VIC 3020

#### NOTIFICATION CATEGORY

Limited: Synthetic polymer with  $M_n \geq 1,000$  Da.

#### EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: chemical name, CAS number, molecular and structural formulae, molecular weight, analytical data, degree of purity, polymer constituents, residual monomers/impurities, use details, and import volume.

#### VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: density, dissociation constant, flash point and autoignition temperature.

#### PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

CEC/808, CER/48

#### NOTIFICATION IN OTHER COUNTRIES

Not known

### 2. IDENTITY OF CHEMICAL

#### MARKETING NAMES

Enviroline 405HT Part A (product containing the notified polymer)  
Hypox RF928

#### MOLECULAR WEIGHT

> 1,000 Da

#### ANALYTICAL DATA

Reference GPC and IR spectra were provided.

### 3. COMPOSITION

#### DEGREE OF PURITY

< 25%

### 4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: Clear viscous liquid

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	Polymer never isolated from solution
Boiling Point	Not determined	Polymer never isolated from solution
Density	1.1 kg/m <sup>3</sup>	Measured (tested in-house, study not provided)
Vapour Pressure	3×10 <sup>-6</sup> kPa at 25 °C	Measured
Water Solubility	18×10 <sup>-3</sup> g/L at 20 °C	Measured
Hydrolysis as a Function of pH	Hydrolytically unstable under acidic, neutral and basic conditions, with a half-life of ≤ 5 days.	Measured
Partition Coefficient (n-octanol/water)	log Pow = 1.9 – 4.9 at 20 °C	Measured

Adsorption/Desorption	log K <sub>oc</sub> = 3.0 – 5.3	Measured
Dissociation Constant	Not determined	The notified polymer does not contain any functional groups that are expected to dissociate in water.
Flash Point	Not determined	A similar polymer is reported to have a flash point of 149° C
Autoignition Temperature	Not determined	-
Explosive Properties	Not determined	No information was provided on the notified polymer, however, it contains epoxy groups that may have the potential for explosive properties.
Oxidising Properties	Not determined	Contains no functional groups that would imply oxidising properties

#### DISCUSSION OF PROPERTIES

For full details of tests on physical and chemical properties, refer to Appendix A.

#### Reactivity

The notified polymer is expected to react as part of its end-use, when it is mixed with Part B of the coating. The (M)SDS for the notified polymer states that exothermic reactions including polymerisation may occur in contact with amines, strong acids, strong bases, alcohols, strong oxidising agents and excessive heat.

#### Physical hazard classification

Based on the available information on physico-chemical properties, the notified polymer is not recommended for hazard classification according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia.

## 5. INTRODUCTION AND USE INFORMATION

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

The notified polymer will not be manufactured or reformulated in Australia. It will be imported in end-use paint products. It will be brought into Australia as a 2-component system to be mixed immediately before application.

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

Year	1	2	3	4	5
Tonnes	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

#### PORT OF ENTRY

Melbourne

#### TRANSPORTATION AND PACKAGING

The notified polymer will be imported in to Australia in component A of Enviroline 405HT paint in 10L steel containers. The formulated product will be imported by sea and transported to the warehouse by road for storage. From the storage, it will be distributed to customers by road.

#### USE

The notified polymer will be used as a resin component of paint formulations. The paints are for industrial use only and will not be sold to general public.

The notified polymer will be imported in to Australia in end-use 2-component system formulated paints. The notified polymer will be present in component A, which will be mixed with component B immediately before use. The final concentration of the notifier polymer in end use paint will be < 10%.

#### OPERATION DESCRIPTION

The notified polymer will be imported in end-use paints Enviroline 405HT and no reformulation and/or repackaging will occur in Australia.

The paints will be mainly used for on-site maintenance of structural steel. The application, usually by spray, will occur at certified paint sheds or in the open air or in large tanks, depending on the nature of the work being

carried out. At the sites of use, component A of the paint containing the notified polymer will be mixed with component B in a 2:1 ratio to generate the final paint. This is done by adding Part B to the Part A container. The final concentration of the notified polymer in mixed paint will be < 10%. Further additives including thinner may be added to the paint to facilitate application. The paint will be applied by professional painters only under industrial settings, mainly by spray application. The paints may sometimes be also applied by brush or roller.

When used in paint sheds, air extraction ventilation will be used. External sites may be sheeted to contain the overspray. Tanks being coated will have piped ventilation designed to move the fumes away from the workers' breathing zones. At the end of spraying operations the application equipment will be cleaned out using solvents which will be reused several times before disposal according to local regulations.

## 6. HUMAN HEALTH IMPLICATIONS

### 6.1. Exposure Assessment

#### 6.1.1. Occupational Exposure

##### CATEGORY OF WORKERS

<i>Category of Worker</i>	<i>Exposure Duration (hours/day)</i>	<i>Exposure Frequency (days/year)</i>
Transport and warehousing	Negligible	5
Unloading	Negligible	1
Sprayers	5	10
Potmen	5	10

##### EXPOSURE DETAILS

Transport and warehouse workers are not expected to be exposed to the notified polymer except in the unlikely event of an accident where the container is breached.

End use workers (sprayers and potmen) involved in mixing and spraying of paints containing the notified polymer may be exposed to the notified polymer at up to 10% concentration via the dermal, ocular and inhalation routes during paint preparation, the application process and cleaning and maintenance of spray equipment. The level of engineering controls (air extraction and sheeting to reduce overspray) will vary with the location and nature of the work. The notifier advised that the paint formulations contain other hazardous chemicals and all paint application workers are required to wear proper personal protective equipment (PPE) including coveralls, boots, impervious gloves, goggles or face shields and respiratory protection (either air fed hoods or cartridge type respirators) to reduce exposure to these other chemicals in paint. These precautions will also reduce exposure to the notified polymer.

Once the paint is dried and cured, it is not expected to be bioavailable.

#### 6.1.2. Public Exposure

The paint containing the notified polymer at < 10% concentration will be used in industrial settings only and will not be sold to the public. The public may come into contact with articles coated with paints containing the notified polymer. However, once the paint is dried and cured, the notified polymer will be bound into an inert matrix and will not be available for exposure.

### 6.2. Human Health Effects Assessment

No toxicity data were submitted. The high molecular weight of the notified polymer and low levels of low molecular weight species would reduce the potential for dermal absorption.

The notified polymer contains epoxy groups that are structural alerts for sensitisation (Barratt et al. 1994, Gerner et al. 2004). Species of low molecular weight (< 1,000 Da) have a higher sensitising potential compared with oligomers of higher molecular weight (HSE, 2003). The notified polymer contains very low levels (< 5%) of low molecular weight species and thus the probability of it causing sensitisation is low but cannot be entirely ruled out.

Epoxy groups are also a structural alert for cancer and reproductive effects (USEPA 2010). The likelihood of these adverse health effects is greatly reduced as they are expected to occur at lower molecular weights than the notified polymer.

#### **Health hazard classification**

As no toxicity data were provided, the notified polymer cannot be classified according to the *Globally Harmonised System of Classification and Labelling of Chemicals (GHS)*, as adopted for industrial chemicals in Australia, or the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

### **6.3. Human Health Risk Characterisation**

#### **6.3.1. Occupational Health and Safety**

Based on the structural alert (epoxy groups), the potential for adverse health effects cannot be ruled out. Dermal and accidental ocular exposure to the notified polymer may occur during the preparation and application of the paints. The potential for inhalation exposure will vary depending on the type of use and the presence of engineering controls. However the proposed use of PPE to prevent exposure to other hazardous chemicals in the paint product, including respiratory protection during application of paint, will reduce exposure to the notified polymer. Therefore, the risk to workers is not considered unreasonable.

#### **6.3.2. Public Health**

The notified polymer will not be available to the public, except after the product has been applied and cured and the notified polymer becomes bound within a polymer matrix. The notified polymer will not be available for exposure, hence the risk to the public is not considered unreasonable.

## **7. ENVIRONMENTAL IMPLICATIONS**

### **7.1. Environmental Exposure & Fate Assessment**

#### **7.1.1. Environmental Exposure**

##### **RELEASE OF CHEMICAL AT SITE**

No manufacturing or reformulation of the notified polymer will take place in Australia. Release of the notified polymer to the environment during importation, storage, and transport is unlikely. In the event of a spill, the notified polymer is expected to be contained and collected with an inert absorbent material and disposed of in accordance with local regulations.

##### **RELEASE OF CHEMICAL FROM USE**

The coatings containing the notified polymer will be used in industrial processes and applications and will not be made available to the public. The notified polymer will be used in one part of a two part epoxy coating system as a component of paint formulation. Therefore, at the end-use site the two parts of the coating system will be mixed prior to use. The coatings containing the notified polymer will be applied to the steel structure by professional spray paint operators in spray booths or on site at industrial sites. These industrial locations are designed to collect spills and prevent release into the aquatic environment. Release generated from washing spray equipment (up to 1% of the import volume) and spills from the spray application are expected to be collected and disposed of in accordance with local regulations.

##### **RELEASE OF CHEMICAL FROM DISPOSAL**

The majority of the notified polymer will be cured into an inert polymer matrix expected to be associated with steel structures after application. It is expected to share the fate of the structures to which it is applied and is disposed of to landfill or be subjected to metal recycling processes. Residual notified polymer in empty containers is expected to be disposed of to landfill in accordance with local regulations.

#### **7.1.2. Environmental Fate**

No environmental fate data were submitted. The captured overspray and the articles to which the notified polymer will be applied will be disposed of to landfill. The majority of the notified polymer is expected to be cured within an inert matrix adhering to articles, following its use in coating applications. In its cured form it is not expected to be mobile, bioavailable or biodegradable. The notified chemical is expected to eventually degrade via biotic and abiotic processes in landfill, or by thermal decomposition during metal reclamation processes, to form water and oxides of carbon.



A small fraction of the notified polymer may be released to the sewer due to the cleaning of reformulation and application equipment. In wastewater treatment processes in sewage treatment plants (STPs), most of the notified polymer is expected to partition to sludge due to its low water solubility and high molecular weight. The sludge from STPs is expected to be removed for disposal to landfill or used on land for soil remediation. The notified polymer is not expected to bioaccumulate based on its high molecular weight.

#### **7.1.3. Predicted Environmental Concentration (PEC)**

The predicted environmental concentration (PEC) has not been calculated as release of the notified polymer to the aquatic environment will be very limited based on its reported use pattern.

### **7.2. Environmental Effects Assessment**

No ecotoxicity data were submitted. Polymers without significant ionic functionality are generally of low concern to the environment.

#### **7.2.1. Predicted No-Effect Concentration**

A predicted no-effect concentration (PNEC) has been not calculated for the notified polymer as no ecotoxicity data were submitted. The release of the notified polymer to the aquatic environment will be very limited based on its reported use pattern.

### **7.3. Environmental Risk Assessment**

A risk quotient (PEC/PNEC) for the notified polymer was not calculated, as neither a PEC nor PNEC was derived. Release of the notified polymer to the aquatic environment in ecotoxicologically significant quantities is not expected based on its reported use pattern. The notified polymer is not expected to be bioaccumulative and is expected to slowly degrade in the environment. Based on the assessed use pattern of the notified polymer, it is not expected to pose an unreasonable risk to the environment.

**APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES****Vapour Pressure**  $3 \times 10^{-6}$  kPa at 25 °C

Method OECD TG 104 Vapour Pressure.  
Remarks Determined using vapour pressure balance. Two samples were tested.  
Test Facility Huntingdon (2015a)

**Water Solubility**  $18 \times 10^{-3}$  g/L at 20 °C

Method OECD TG 105 Water Solubility.  
Remarks Column Elution Method  
Test Facility Huntingdon (2015a)

**Hydrolysis as a Function of pH**

Method OECD TG 111 Hydrolysis as a Function of pH.  
EC Council Regulation No 440/2008 C.7 Degradation: Abiotic Degradation: Hydrolysis as a Function of pH.  
Remarks Test substance was determined to be hydrolytically unstable under acidic, neutral and basic conditions, with a half-life of 5 days or less. The preliminary study showed that at each of pH 4, pH 7 and pH 9 and  $50 \pm 0.5^\circ\text{C}$ , more than 10% hydrolysis had occurred after 120 hours (5 days), indicating an environmental (25°C) half-life ( $t_{e1/2}$ ) value of less than 1 year.  
Test Facility Huntingdon (2015b)

**Partition Coefficient (n-octanol/water)**  $\log P_{ow} = 1.9 - 4.9$  at 20 °C

Method OECD TG 117 Partition Coefficient (n-octanol/water).  
Remarks HPLC Method  
Test Facility Huntingdon (2015a)

**Adsorption/Desorption**  $\log K_{oc} = 3.0 - 5.3$ 

Method OECD TG 121 Estimation of the Adsorption Coefficient ( $K_{oc}$ ) on Soil and on Sewage Sludge using High Performance Liquid Chromatography (HPLC).  
Remarks HPLC Method  
Test Facility Huntingdon (2015a)

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