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

FULL PUBLIC REPORT

Polymer in Nebores NBO 25-56M

This 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 assessment of environmental risk is conducted by the Department of Sustainability, Environment, Water, Population and Communities.

For the purposes of subsection 78(1) of the Act, this Full Public Report may be inspected at our NICNAS office by appointment only at Level 7, 260 Elizabeth Street, Surry Hills NSW 2010.

This Full Public Report is also 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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FULL PUBLIC REPORT**Polymer in Nebores NBO 25-56M****1. APPLICANT AND NOTIFICATION DETAILS**

APPLICANT(S)

PPG Industries Australia Pty Ltd (ABN 82 055 500 939)
McNaughton Road
CLAYTON VIC 3168

NOTIFICATION CATEGORY

Limited: Synthetic polymer with $M_n \geq 1000$ 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, polymer constituents, residual monomers, use details, import volume and identity of manufacturer.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed as follows: Melting point/Boiling point, Density, Vapour pressure, Water solubility, Hydrolysis as a function of pH, Partition co-efficient, Absorption/Desorption, Dissociation constant, Particle size, Flash point, Flammability limits, Autoignition temperature, Explosive properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Nebores NBO 25-56M (containing the notified polymer at <60% concentration)

MOLECULAR WEIGHT

$M_n > 1000$ Da.

ANALYTICAL DATA

Reference IR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY >99%

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

None

DEGRADATION PRODUCTS

None

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20°C AND 101.3 kPa: Orange liquid*

Property	Value	Data Source/Justification
Melting Point/Freezing Point	79°C	Estimated
Boiling Point	Decomposes at >200°C	Estimated based on molecular weight and structure
Density*	1040 kg/m ³ at 20°C	MSDS
Vapour Pressure	<10 ⁻² kPa at 25°C	Estimated based on molecular weight
Water Solubility	Not determined	The notified polymer is expected to have a low solubility in water based on its predominately hydrophobic structure
Hydrolysis as a Function of pH	Not determined	The notified polymer contains functional groups susceptible to hydrolysis. However, hydrolysis is expected to be slow at environmental pH (4-9).
Partition Coefficient (n-octanol/water)	Not determined	The notified polymer may partition from water into octanol based on its hydrophobicity.
Adsorption/Desorption	Not determined	Based on its presumed low solubility in water and potential cationic functionality, the notified polymer is expected to absorb to soil and sediment and have low mobility in soil.
Dissociation Constant	Not determined	The notified polymer will be ionised in the environmental pH range (4-9) based on the presence of acidic and basic functional groups in the polymer structure
Particle Size	Not determined	The notified polymer will only be introduced incorporated in liquid preparations.
Flash Point*	49°C	MSDS
Flammability *	Upper: 10.35% (V) Lower: 1.39% (V)	MSDS
Autoignition Temperature	>200°C	Estimated
Explosive Properties	Not expected to be explosive	Estimated based on structure

* Refers to Nebores NBO 25-56M containing the notified polymer at <60% concentration

DISCUSSION OF PROPERTIES

Reactivity

Stable under normal conditions of use.

Dangerous Goods classification

Based on the submitted physical-chemical data in the above table the notified polymer is not classified according to the Australian Dangerous Goods Code (NTC, 2007). However the data above do not address all Dangerous Goods endpoints. Therefore consideration of all endpoints should be undertaken before a final decision on the Dangerous Goods classification is made by the introducer of the polymer.

5. INTRODUCTION AND USE INFORMATION

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

The notified polymer will be imported as a component of colourant preparations at $\leq 30\%$ for reformulation into paints, or imported at $\leq 10\%$ in finished paint products.

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>	<1	<1	<1	<1	<1

PORT OF ENTRY

Melbourne, Sydney, Brisbane

IDENTITY OF RECIPIENTS

PPG Industries Australia Pty Ltd

TRANSPORTATION AND PACKAGING

The notified polymer will be imported by sea in 5 or 20 L pails as a component of colourant preparations or as a component of finished paint products and transported by road to a warehouse for storage before distribution by road to end users.

USE

The notified polymer will be used as a component of paints ($\leq 10\%$ concentration) applied to steel and concrete structures in industrial settings.

OPERATION DESCRIPTION

Colourant Preparations

Imported colourant preparations containing the notified polymer at $\leq 30\%$ will be transported by road to the point of sale where they will be poured into canisters and dispensed via valves into a dispensing machine. In this machine, defined quantities of the colourants will be added and mixed with other components of paints using a controlled, automated mechanism. The dispensing machine will be cleaned of spills, drips and splashes using rags.

Finished Paint Application

Paints containing the notified polymer at $\leq 10\%$ will be applied to steel and concrete structures by trained professionals in industrial settings. Spray application (air or airless) is expected to be the predominant form of application followed by brush and roller.

6. HUMAN HEALTH IMPLICATIONS

6.1 Exposure assessment

6.1.1 Occupational exposure

NUMBER AND CATEGORY OF WORKERS

<i>Category of Worker</i>	<i>Number</i>	<i>Exposure Duration (hours/day)</i>	<i>Exposure Frequency (days/year)</i>
Transport	6-8	2-3	10-15
Paint mixing	5	0-1	10
Application	50	8	260

EXPOSURE DETAILS

Colourant Preparations

Dermal and ocular exposure is possible when manually pouring colourant preparations containing the notified polymer at $\leq 30\%$ into a canister for controlled addition to a mixing machine via valves. There is also potential for dermal and possibly ocular exposure to spills, drips and splashes of paints containing the notified polymer at $\leq 10\%$ during cleaning of the dispensing machine. Exposure is expected to be minimised by the use of personal protective equipment (PPE) such as eye protection and protective clothing.

Paint Application

Professional tradesmen may experience dermal and ocular exposure to paints containing the notified polymer at $\leq 10\%$, during manual addition with other components to spray equipment. Inhalation exposure to aerosols of the notified polymer at $\leq 10\%$ is expected during spray application. Exposure is also possible during cleaning of application equipment and disposal of used paint containers. However, exposure during application, cleaning and disposal is expected to be minimised by the use of PPE such as eye protection, coveralls and respiratory protection if needed.

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

6.1.2. Public exposure

Colourant preparations and paints containing the notified polymer will be available only for industrial use and will not be sold to the public.

The general public may be exposed to substrates coated with paint containing the notified polymer at $\leq 10\%$. However, at this stage, the notified polymer is expected to be cured into an inert matrix and hence will be unavailable for exposure.

6.2. Human health effects assessment

No toxicological data on the notified polymer were submitted. The notified polymer is not expected to be absorbed across the gastrointestinal, respiratory and dermal membranes, due to a high molecular weight (>1000 Da.) and anticipated low water solubility.

The notified polymer contains an amino group which is a structural alert for corrosion (Huzelbos et al., 2005). However, given that the functional group equivalent weight is >2000 Da., the anticipated low water solubility and low percentage of low molecular weight species < 1000 Da. ($< 3\%$), the notified polymer is not considered likely to be corrosive or irritating.

Health hazard classification

As no toxicity data are provided, the notified polymer cannot be classified according to the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human health risk characterisation

6.3.1. Occupational health and safety

Based on its structure and physico-chemical properties, the notified polymer is not expected to be hazardous, however, the potential for corrosion/irritation cannot be totally ruled out. Exposure to the notified polymer present at $\leq 30\%$ in colourant preparations during mixing operations is not expected to be significant for workers given the use of PPE.

Inhalation is expected to be the main route of exposure during manual spray application of paints containing the notified polymer ($\leq 10\%$). Dermal and ocular exposure is also anticipated during application. However, this is expected to be minimised by the use of PPE. After application and once dried, the notified polymer will be trapped in an inert polymer matrix and will not be bioavailable.

The risk to workers during mixing of colourant preparations containing the notified polymer at $\leq 30\%$ and application of paints containing the notified polymer at $\leq 10\%$ is not expected to be unreasonable with the appropriate use of PPE.

6.3.2. Public health

Members of the public may occasionally come into contact with substrates coated with the notified polymer. However after the coating has been applied and dried, the notified polymer will be cured into an inert matrix and will not be available for exposure, therefore the risk to public health is not considered to be unreasonable.

7. ENVIRONMENTAL IMPLICATIONS

7.1. Environmental Exposure & Fate Assessment

7.1.1 Environmental Exposure

RELEASE OF CHEMICAL AT SITE

The release of the notified polymer to the environment during importation, storage, and transport is unlikely. The most likely source of a release to the environment during these activities will be a transport accident. However, the capacity and specifications of the import containers are likely to minimise the extent of any such releases. Releases that do occur as a result of accidents are expected to be physically contained, absorbed on inert material, and either reused or sent for safe disposal to landfill.

RELEASE OF CHEMICAL FROM USE

During industrial use of the notified polymer (mixing and transferring), it is estimated that up to 1% of the notified polymer may be spilt. These spills will be contained, collected and treated by a licensed waste contractor and disposed of to landfill. Less than 1% of the notified polymer may remain as residues in product containers and these will be disposed to landfill. Equipment used to mix preparations containing the notified polymer and paint base may be rinsed with solvent and it is estimated that 0.2% of the notified polymer (in solvent washings) will be collected, treated and disposed of by a licensed waste contractor. It is expected that the transfer of the coating to the substrate by roller or brush will be very efficient. During application by spray $\leq 20\%$ of the notified polymer will be released as overspray, which will be collected on tarpaulins or plastic coverings. As the coating is of high viscosity the material is applied in droplets and is not atomised to fine particles. Equipment used to apply the coating formulations may be rinsed with solvent. It is estimated that 1% of the notified polymer will be collected, treated and disposed of by a licensed waste contractor.

RELEASE OF CHEMICAL FROM DISPOSAL

The majority of the notified polymer will be cured into an inert matrix with other chemical substances as part of the coating process. In the case of coating applications, the notified polymer will be immobilised within a polymeric film on coated articles. The notified polymer will be disposed of predominantly to landfill.

The cured coating is expected to remain in place on the coated structure for its operational life unless damaged. The polymer incorporated in this coating will ultimately either be removed by abrasive blasting and hydroblasting or disposed of along with the surfaces, which will either go to metal recyclers or be disposed of to landfill. Abrasively removed coating will be collected and disposed of to landfill.

7.1.2 Environmental fate

No environmental fate data were submitted. The majority of the notified polymer is expected to be cured into a solid polymer matrix as part of its normal use pattern and is not therefore expected to be mobile, bioavailable nor biodegradable. The majority of the imported quantity of notified polymer is expected to be disposed of to landfill or thermally decomposed during recycling of metal structures to which it is applied. Bioaccumulation of the uncured polymer is unlikely due to its high molecular weight and limited potential for aquatic exposure. Notified polymer, both in the uncured and cured forms, that is disposed of to landfill is not expected to be mobile and will slowly degrade by abiotic and biotic processes to produce water and oxides of carbon, nitrogen and sulfur.

7.1.3 Predicted Environmental Concentration (PEC)

The notified polymer is not expected to be present at significant concentrations in the aquatic environment because of its anticipated low water solubility and very low potential for direct release to surface waters when used in surface coatings. A PEC has therefore not been calculated.

7.2. Environmental effects assessment

No ecotoxicity data were submitted. The notified polymer has functionality that has the potential to be toxic to aquatic life. However, no significant exposure of the notified polymer to aquatic organisms is expected. Furthermore, the majority of the notified polymer will be cured with other chemical substances as part of the coating process and is not expected to be bioavailable.

7.2.1 Predicted No-Effect Concentration

A Predicted No-Effect Concentration (PNEC) was not calculated as no ecotoxicological data were submitted and there will be very low potential for aquatic exposure.

7.3. Environmental risk assessment

A Risk Quotient was not quantified as a PEC and PNEC were not calculated. The reported use pattern of the notified polymer indicates that there is no significant anticipated aquatic release. Moreover, after curing, the majority of the imported quantity of notified polymer will be incorporated into an inert matrix with other chemicals and is not expected to be mobile, bioavailable nor biodegradable. Hence, the environmental exposure is expected to be minimal. On the basis of the reported use pattern, the notified polymer is not expected to pose an unreasonable risk to the environment.

8. CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

As no toxicity data are provided, the notified polymer cannot be classified according to 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

- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer:
 - Avoid contact with skin and eyes
 - Do not inhale vapours/mists
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
 - Overalls
 - Gloves
 - Goggles

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 *National Guidance Material for Spray Painting* [NOHSC (1999)] or relevant State and Territory Codes of Practice.
- 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 *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)] workplace practices and control procedures consistent with provisions of State and Territory hazardous substances legislation must be in operation.

Disposal

- The notified polymer should be disposed of to landfill.

Emergency procedures

- Spills or accidental release of the notified polymer should be handled by physical containment, 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 chemical 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 a component of surface coatings, or is likely to change significantly;
 - the amount of polymer being introduced has increased from 1 tonne, 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 MSDS of a product containing the notified polymer provided by the notifier was reviewed by NICNAS. The accuracy of the information on the MSDS remains the responsibility of the applicant.

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