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

**FULL PUBLIC REPORT**

**Disperbyk-2155**

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 the Environment, Water, Heritage and the Arts.

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 334-336 Illawarra Road, Marrickville NSW 2204.

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****Disperbyk-2155****1. APPLICANT AND NOTIFICATION DETAILS**

## APPLICANT(S)

Nuplex Industries (Aust) Pty Ltd ABN 25 000 045 572  
49-61 Stephen Road,  
BOTANY, NSW 2019

And

Akzo Nobel Pty Ltd ABN 59 000 119 424  
115 Hyde Road  
YERONGA, QLD 4104

And

IMCD Australia Limited ABN 44 000 005 578  
Level 1, 372 Wellington Road  
MULGRAVE, VIC 3170

## 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, Other names, Molecular formula, Structural formula, Molecular weight information, Spectral data, Methods of detection and determination, Introduction volume, Details of use, Monomer constituents and percentages.

## 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 Coefficient (n-octanol/water), Adsorption/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

United States of America (2007)

**2. IDENTITY OF CHEMICAL**

MARKETING NAME(S) DISPERBYK-  
2155

## ANALYTICAL DATA

Reference IR and GPC were provided.

## MOLECULAR WEIGHT

$M_n > 1000$  Da

### 3. COMPOSITION

DEGREE OF PURITY > 99.0%

#### HAZARDOUS IMPURITIES/RESIDUAL MONOMERS

All impurities are below the cut-off level for classification.

#### LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

Stable under normal conditions of use

#### DEGRADATION PRODUCTS

None under normal conditions of use

### 4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20°C AND 101.3 kPa: Light yellow liquid

Property	Value	Data Source/Justification
Melting Point/Freezing Point	< 20°C	Not determined. Notified polymer is a liquid at ambient temperature.
Boiling Point	> 100°C at 101.3 kPa	Estimated based on its high molecular weight
Density	1060 kg/m <sup>3</sup> at 20°C	MSDS
Vapour Pressure	< 10 <sup>-8</sup> kPa	Estimated based on the notified polymer's high molecular weight
Water Solubility	Not determined.	The notified polymer is expected to be insoluble in water based on its use as a dispersant in non-aqueous media and the presence of hydrophobic sub-units in the polymer structure
Hydrolysis as a Function of pH	Not determined.	The notified polymer contains groups which are susceptible to hydrolysis. However hydrolysis is expected to be slow at environmentally relevant pH (pH 4-9).
Partition Coefficient (n-octanol/water)	Not determined.	The notified polymer may partition from water into octanol based on its hydrophobicity. However, the high molecular weight of the notified polymer indicates that it will not cross biological membranes.
Adsorption/Desorption	Not determined.	Based on its ionic nature and low solubility in water, the notified polymer is expected to adsorb strongly to soil and sediment and have low mobility in the environment.
Dissociation Constant	Not determined.	The notified polymer will be ionised in the environmental pH range based on the presence of basic functions in the polymer structure
Particle Size	Not determined.	The notified polymer is a liquid at ambient temperatures.
Flash Point	> 110°C at 101.3 kPa	MSDS
Autoignition Temperature	>200°C	Calculated. The notified polymer is not expected to autoignite at ambient temperatures based on the experience in use.
Explosive Properties	Not expected to be explosive	The notified polymer is not expected to be explosive as it contains no explosive functional groups.
Viscosity (dynamic)	2500 mpa.s at 60°C	MSDS

**DISCUSSION OF PROPERTIES**

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

*Reactivity*

The notified polymer is stable under normal storage and handling conditions (MSDS).

*Dangerous Goods classification*

Based on the physical-chemical data provided, the notified polymer is not classified as a dangerous good according to the Australian Dangerous Goods Code (NTC,2007). However the data above does 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 not be manufactured in Australia. It will be imported into Australia as a polymeric dispersant and wetting agent product at a concentration of > 99% in sealed steel 25 kg or 200 kg drums for reformulation into coatings and pigment concentrates.

**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>	10-50	10-50	10-50	10-50	10-50

**PORT OF ENTRY**

MELBOURNE, SYDNEY, BRISBANE.

**IDENTITY OF MANUFACTURER/RECIPIENTS**

Nuplex Industries (Aust) Pty Ltd, Akzo Nobel Pty Ltd and IMCD Australia Limited

**TRANSPORTATION AND PACKAGING**

The notified polymer (at > 99%) will be imported and transported by road or rail in sealed 25 kg or 200 kg drums.

After formulation into coatings at < 75% of notified polymer, the coatings will be packaged, stored and transported in 1L, 4 L, 10L and 20L steel cans and pails.

**USE**

The notified polymer will be used as a polymeric wetting and dispersing agent or additive for solvent-borne and solvent-free coatings and pigment concentrates at a concentration of less than 75%.

## OPERATION DESCRIPTION

*Coating formulation*

At the coating manufacturing sites, the notified polymer will be manually weighed or metered directly from the storage drums into a stainless steel blending tank and mixed with pigments and resin to form the mill base. The mill base will then be pumped into a large mixing vessel to which the remaining additives and resin will be added to form the finished product (at < 75% of the notified polymer).

Coating product samples containing < 75% of notified polymer will be taken for quality control testing by laboratory technicians. Coating product will be fed into containers by gravity from the bottom of the mixing vessel through a filter and filling lines.

The coatings may be manufactured in batch mixers where addition of the notified polymer is semi-automated. This process will involve workers opening the pails or drums, weighing the required amount of notified polymer and manually charging the blending vessels.

All processes will occur under exhaust ventilation. All manufacturing and application equipment will be cleaned by rinsing with water. The washings will be treated prior to release to sewer treatment plants, resulting in the collection and disposal of the notified polymer to landfill.

*Coating application*

The industrial coatings (< 75% notified polymer) may be used for wood, furniture or automotive applications. They will be applied by spray (75%), brush (20%) or roller (5%). Prior to application, the paint will be manually stirred and poured into trays or into the spray guns. Spray applications will be conducted in spray booths at industrial sites.

The used drums will be cleaned by filling with an appropriate cleaning solvent and the contents pumped to pits for storage prior to disposal by a licensed waste management company

**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
Coating / Blending	4	8	50
Laboratory	2	1	20
Application	100	6	260

## EXPOSURE DETAILS

*Transport and storage*

Transport and storage workers are not expected to be exposed to the notified polymer except in the event of an accident as the imported notified polymer and the coatings will be transported and stored in sealed containers

*Coating formulation*

Dermal and ocular exposure to the notified polymer may occur when manually weighing, connecting and disconnecting pumps, charging the blending vessels and when taking coating samples at < 75% of notified polymer from the blending vessel by laboratory technicians. Similar exposure may also occur during routine cleaning and maintenance of equipment, and cleaning up of spills or leaks.

Inhalation exposure to vapours and aerosols is not likely to occur during blending due to the low vapour pressure of the notified polymer and the nature of the reformulation processes.

Personal protective equipment (PPE) such as coveralls, safety glasses, and gloves will be used by workers in order to minimise exposure to the notified polymer. Local exhaust ventilation will be employed in areas where weighing and charging of the blending vessels occur to limit inhalation exposure to the notified polymer.

#### *Application of coatings*

Dermal and ocular exposure to the notified polymer at < 75% may occur during the manual addition of coating to spray guns, spray application, brush and roller application and when cleaning up equipment. Inhalation exposure may also occur during spraying.

Exposure to the notified polymer will be minimized by the use of eye protection, coveralls, and gloves, and if necessary an air respirator. Furthermore, all spray applications will be conducted within spray booths with local exhaust/ventilation/extraction at industrial manufacturing facilities to minimise inhalation exposure.

Dermal exposure of workers to the notified polymer may also occur through contact with the dried substrate. However once it is dried, the coating formulation (at < 75% of notified polymer) will form an inert film and the notified polymer will not be bioavailable. Therefore exposure will be very low.

#### **6.1.2. Public exposure**

The notified polymer and coatings containing the notified polymer at < 75% will be available only for industrial use and will not be sold to the public.

The general public may only be exposed to the dry coating / substrate containing the notified polymer. However, following coating application, the notified polymer will be trapped within a dry and cured film and will not be bioavailable.

### **6.2. Human health effects assessment**

No toxicity data for the notified polymer were submitted. However, the notified polymer contains a functional group which has a structural alert for skin irritation. Dermal absorption across biological membranes would be limited by the high molecular weight of the polymer.

#### *Health hazard classification*

Based on the limited data provided, the notified chemical can not be classified using the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

### **6.3. Human health risk characterisation**

#### **6.3.1. Occupational health and safety**

Toxicological studies are not available for the notified polymer; however it may have irritating potential. Its potential to cause systemic effects after absorption would be limited by its high molecular weight and low level of low molecular weight species.

Dermal and ocular exposure to the notified polymer may occur especially during coating product formulation and during coating application. There is also potential for inhalation exposure during spraying.

However, the controls in place are expected to minimize exposure and the risk to workers from the use of the notified polymer is not expected to be unacceptable.

#### **6.3.2. Public health**

The public exposure to the notified polymer is considered to be negligible as the notified polymer and the coatings containing the notified polymer will not be sold to the public.

The risk from exposure to the notified polymer is considered not to be unacceptable.

## **7. ENVIRONMENTAL IMPLICATIONS**

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

#### **7.1.1 Environmental Exposure**

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

During blending of the coating formulations, an estimated 1% of the annual introduction volume of the notified polymer may be accidentally spilt. At most, 1% of the annual introduction volume of the notified polymer is anticipated to remain as residues in the storage containers. Spillages and storage containers containing residues will be disposed to landfill.

Manufacturing equipment will be rinsed with water. The washings will be treated prior to release to sewerage treatment plants, resulting in the collection and disposal of the notified polymer to landfill. It is expected that <1% of the annual introduction volume of the notified polymer will be lost to cleaning the manufacturing equipment.

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

The paint containing the notified polymer may be used to coat wood, furniture or in automotive applications. About 75% of the volume of notified polymer will be applied to substrates by spray, 20% by brushes and 5% by rollers. Mixing of the finished formulation and spray application will be conducted in spray booths located in industrial sites. The over spray, accounting for up to 25% of the applied coating, will be collected within the spray booth on protective materials (e.g. kraft paper or newspaper) and any volatile materials will be captured by the filtering systems. Rollers and brushes will be cleaned with an appropriate cleaning solvent and washings will be held in storage tanks prior to disposal.

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

Articles to which coating products have been applied will ultimately end up in landfill, where the notified polymer is expected to remain immobile.

#### **7.1.2 Environmental fate**

No environmental fate data were submitted. The small amount of notified polymer washed to the sewers will have low mobility as it is expected to be removed in sewage treatment plants by adsorption to solids. The majority of the notified polymer will be irreversibly combined with other chemical substances as part of the manufacture of articles or immobilised within a polymeric film on coated articles. The majority of the notified polymer will be disposed to landfill as a result of manufacturing, storage and use. In landfill, the notified polymer is not expected to be mobile and is expected to degrade slowly to water and oxides of carbon and nitrogen.

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

The concentration of the notified polymer in the aquatic environment is not expected to be of concern to aquatic organisms because of its anticipated low water solubility and low potential for direct release to surface waters. Moreover, partitioning of the notified polymer to solids by adsorption will further reduce its concentration in the aquatic environment.

### **7.2. Environmental effects assessment**

No ecotoxicity data were submitted. The notified polymer is potentially cationic in the environment and the calculated charge density of the polymer is nominally indicative of a toxic hazard to the aquatic environment. However, due to its low solubility and likelihood for adsorption to particulates, the notified polymer is not expected to be present in water at concentrations that are hazardous to aquatic organisms. The notified polymer is not anticipated to cross biological membranes due to its high molecular weight and is therefore not expected to bioaccumulate.



### 7.2.1 Predicted No-Effect Concentration

Since no ecotoxicity data were submitted the predicted no effect concentration (PNEC) could not be calculated.

### 7.3. Environmental risk assessment

The notified polymer is anticipated to be of concern to aquatic organisms due to its cationic functional groups. However, the potential for exposure of the notified polymer to the aquatic environment is low because the expectation is that there will be appropriate disposal of non-aqueous waste according to State/Territory regulations. The risk for harm to aquatic organisms due to washings to the sewer is mitigated by the notified polymer's insolubility in water and propensity to adsorb to particulate matter. Taking into account the low exposure to aquatic organisms, the notified polymer is therefore not expected to pose an unacceptable risk to the environment based on its proposed use pattern.

## 8. CONCLUSIONS AND REGULATORY OBLIGATIONS

### Hazard classification

Based on the limited data provided, the notified chemical can not be classified using the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(2004)].

### Human health risk assessment

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

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

### Environmental risk assessment

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

## Recommendations

### CONTROL MEASURES

#### Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer and products containing the notified polymer:
  - ☐ Exhaust ventilation where aerosols may be generated.
- Employers should implement the following safe work practices to minimise occupational exposure to the notified polymer:
  - ☐ Avoid contact to skin and eyes
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer and products containing the notified polymer (Disperbyk-2155):
  - ☐ Eye protection
  - ☐ Gloves
  - ☐ Coveralls
- Spray application should be carried out in accordance with the Safe Work Australia *National Guidance Materials for Spray Painting* [NOHSC (1999)]

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 chemical 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.

#### Environment

- The notified polymer and the products containing the notified polymer should be prevented from entering drains, sewers and watercourses.

#### Disposal

- The notified chemical should be disposed of to landfill.

#### Storage

- The following storage precautions should be taken by the users of the notified polymer and its coating products:  
Storage should occur:
  - \* in a bunded facility and in dry, cool, well-ventilated area
  - \* away from heat, sources of ignition, explosives, oxidizing agents and direct sunlight.
  - \* with containers kept closed when not in use.

#### 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 polymer, 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 ingredient of coatings and pigment concentrates for industrial use, or is likely to change significantly;
  - ☐ the amount of polymer being introduced has increased from 50 tonnes 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.

No additional secondary notification conditions are stipulated.

*Material Safety Data Sheet*

The MSDS of 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.

**APPENDIX A: PHYSICAL AND CHEMICAL PROPERTIES****Density** 1060 kg/m<sup>3</sup> at 20°C

Method	DIN EN ISO 2811-3
Remarks	Test report not available
Test Facility	MSDS

**Flash Point** > 110°C at 101.3 kPa

Method	DIN EN 2719, ISO 2719
Remarks	Test report not available.
Test Facility	MSDS

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NOHSC (1994) National Code of Practice for the Labelling of Workplace Substances [NOHSC:2012(1994)]. National Occupational Health and Safety Commission, Canberra, Australian Government Publishing Service.

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NTC (National Transport Commission) 2007 Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG code), 7th Edition, Commonwealth of Australia

United Nations (2009) Globally Harmonised System of Classification and Labelling of Chemicals (GHS), 3<sup>rd</sup> revised edition. United Nations Economic Commission for Europe (UN/ECE),  
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