

NATIONAL INDUSTRIAL CHEMICALS NOTIFICATION AND ASSESSMENT SCHEME (NICNAS)

POLYMER OF LOW CONCERN PUBLIC REPORT

Taurus Plus

This Assessment has been compiled in accordance with the provisions of the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) (the Act) and Regulations. The National Industrial Chemicals Notification and Assessment Scheme (NICNAS) is administered by the Australian Government 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 Australian Government Department of Sustainability, Environment, Water, Population and Communities.

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

This 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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SUMMARY

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

ASSESSMENT REFERENCE	APPLICANT(S)	CHEMICAL OR TRADE NAME	HAZARDOUS SUBSTANCE	INTRODUCTION VOLUME	USE
PLC/1025	i) DuluxGroup (Australia) Pty Ltd ii) Nuplex Industries (Aust) Pty Ltd	Taurus Plus	No	≤2500 tonnes per annum	Component of paints

CONCLUSIONS AND REGULATORY OBLIGATIONS

Human Health Risk Assessment

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the health of workers and the public, provided that appropriate PPE is used by workers during spray application.

Environmental Risk Assessment

Based on the assumed low hazard and the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Health and Safety Recommendations

- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
 - Respiratory protection during spray applications

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.
- Spray application should be carried out in accordance with the Safe Work Australia *National Guidance Material for Spray Painting* [NOHSC (1999)].
- 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 to landfill.

Emergency Procedures

- Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.
- Spills and/or accidental release of the notified polymer should be handled by physical containment, collection and subsequent safe disposal.

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 polymer 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 notified polymer is introduced in a chemical form that does not meet the PLC criteria.

or

- (2) Under Section 64(2) of the Act; if
 - the function or use of the notified polymer has changed from a component of paints, or is likely to change significantly;
 - the amount of notified polymer being introduced has increased, or is likely to increase, significantly;
 - the method of manufacture of the notified polymer in Australia has changed, or is likely to change, in a way that may result in an increased risk of an adverse effect of the notified polymer on occupational health and safety, public health, or the environment;
 - additional information has become available to the person as to an adverse effect of the notified 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 was provided by the applicant. The accuracy of the information on the MSDS remains the responsibility of the applicant.

ASSESSMENT DETAILS

1. APPLICANT AND NOTIFICATION DETAILS

Applicants

DuluxGroup (Australia) Pty Ltd (ABN: 67 000 049 427)
1956 Dandenong Road
Clayton, VIC 3168

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

Exempt Information (Section 75 of the Act)

Data items and details claimed exempt from publication: chemical name, other names, CAS number, molecular and structural formulae, molecular weight, polymer constituents, residual monomers/impurities, use details and manufacture volume.

2. IDENTITY OF POLYMER

Marketing Name(s)

Taurus Plus

Molecular Weight

Number Average Molecular Weight (Mn) is >10,000 Da

Reactive Functional Groups

The notified polymer contains only low concern functional groups.

3. 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. PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 20 °C and 101.3 kPa	Opaque white liquid*
Melting Point/Glass Transition Temp	15 °C (estimated)
Density	1115 kg/m ³ at 25 °C
Water Solubility	Expected to have low water solubility based on the predominantly hydrophobic structure and high molecular weight.
Dissociation Constant	The notified polymer contains functionality that is expected to be ionised in the environment (pka ~ 4-7). However, this functionality is a minor component of the notified polymer.
Particle Size	128 nm (light scattering)
Reactivity	Stable under normal environmental conditions
Degradation Products	None under normal conditions of use
*Formulation containing 30-60% notified polymer. The polymer is dispersed in aqueous solution (emulsion polymer).	

5. INTRODUCTION AND USE INFORMATION

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>
Tonnes	≤600	≤1000	≤1500	≤2000	≤2500

Use

The notified polymer will be manufactured and reformulated in Australia. The notified polymer will be used as a component of paints at <40% concentration. The paints will be used by both DIY and professional painters and may be applied by brush, roller or spray. Spray application techniques will mainly be used by professional painters, rather than by DIY users.

6. HUMAN HEALTH RISK ASSESSMENT

No toxicological data were submitted. The notified polymer meets the PLC criteria and is therefore assumed to be of low hazard.

The notified polymer has a high molecular weight ($M_n > 10,000$ Da) and expected low water solubility and will be manufactured as an aqueous dispersion. As such, the notified polymer may present a concern for potential lung damage following respiration of particles. Delivery in the nanoform through biological membranes is not expected as the notified polymer will lose its nanostructure upon contact and collapse into a film.

Inhalation exposure of workers to the notified polymer may occur during spray application of paints containing the notified polymer. However, such exposure is expected to be lowered by the use of personal protective equipment (PPE). DIY painters are not expected to experience significant levels of inhalation exposure to the notified polymer, as use will be infrequent and roller and brush will be the main methods of application.

Provided that appropriate PPE is used by workers during spray application, the risk of the notified polymer to occupational and public health is not considered to be unreasonable given the assumed low hazard and the assessed use pattern.

7. ENVIRONMENTAL RISK ASSESSMENT

No ecotoxicological data were submitted. Anionic polymers are generally of low toxicity to fish and daphnia, however they are known to be moderately toxic to algae. The mode of toxic action is over-chelation of nutrient elements needed by algae for growth. The highest toxicity is when the acid is on alternating carbons of the polymer backbone. This is unlikely to apply to the notified polymer. Additionally, the toxicity to algae is likely to be further reduced due to the presence of calcium ions in the aquatic compartment which will bind to the acid functional groups.

Release of the notified polymer to the sewer is estimated to be up to 1% of the annual introduction volume due to polymer manufacture, transport and paint reformulation processes. During use, a minor amount (0.5%) of notified polymer is expected to be washed to sewer during the cleaning of application equipment. A predicted environmental concentration in rivers (PEC_{river}) for a worst case scenario can be calculated on the assumptions that 5% of the total annual introduction volume is released to sewer nationwide from the cleaning of manufacture and application equipment and that none of the notified polymer is removed by sewage treatment plant (STP) processes. The PEC_{river} is 75.72 $\mu\text{g/L}$ if the daily chemical release ($342.47 \text{ kg}/365 = 0.938 \text{ kg}$) is diluted by the daily effluent production ($200 \text{ L/person/day} \times 22.613 \text{ million people} = 4,523 \text{ ML}$). The PEC is below the EC50 for algae of the most toxic anionic polymers ($EC50 = 1 \text{ mg/L}$). Bioaccumulation of the notified polymer is not likely as it is not expected to cross biological membranes based on its high molecular weight.

Once cured, the coatings containing the notified polymer will form an inert polymer matrix, and the incorporated notified polymer will be neither bioavailable nor mobile. In landfill, cured notified polymer contained in solid waste, residues in empty containers, or on discarded coated articles is expected to eventually degrade via abiotic or biotic processes to form water and oxides of carbon and nitrogen. Therefore, based on its assumed low hazard and reported use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.