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

PUBLIC REPORT

Polymer in Rheovis® PU 1191

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/1873	BASF Australia Ltd	Polymer in Rheovis® PU 1191	ND*	≤ 30 tonnes per annum	Component of coatings

*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 assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

Recommendations

CONTROL MEASURES

Occupational Health and Safety

- No specific engineering controls, work practices or personal protective equipment are required for the safe use of the notified polymer itself. However, these should be selected on the basis of all ingredients in the formulation.

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 for the 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 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 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 Da;

or

- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from component of coatings, 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 the 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(S)

BASF Australia Ltd (ABN: 62 008 437 867)
Level 12, 28 Freshwater Place
SOUTHBANK VIC 3006

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, other names, CAS number, molecular and structural formulae, molecular weight, degree of purity, polymer constituents, residual monomers, impurities, additives/adjuvants, 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: all physico-chemical endpoints

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

No

NOTIFICATION IN OTHER COUNTRIES

Canada (2005), Korea (2006)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Rheovis® PU 1191 (containing the notified polymer at < 20%)

MOLECULAR WEIGHT

> 10,000 Da

ANALYTICAL DATA

Reference IR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY

> 90%

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

No degradation, decomposition or depolymerisation of the notified polymer is expected to occur under normal conditions of use.

DEGRADATION PRODUCTS

Degradation products are expected to be oxides of nitrogen and carbon.

4. PHYSICAL AND CHEMICAL PROPERTIES

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

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	(M)SDS*
Boiling Point	Not determined	(M)SDS*
Density	1,020-1,040 kg/m ³ at 20 °C	(M)SDS*
Vapour Pressure	$< 1.3 \times 10^{-9}$ kPa	Estimated based on the NAMW > 1,000 Da (US EPA, 2013)
Water Solubility	Not determined	Expected to be water dispersible based on

Hydrolysis as a Function of pH	Not determined	the presence of hydrophilic functionality and its use in aqueous products. Contains hydrolysable functionalities. However, the notified polymer is not expected to be significantly hydrolysed under normal environmental condition (pH 4-9).
Partition Coefficient (n-octanol/water)	Not determined	The notified polymer is expected to partition to n-octanol based on its expected limited water solubility and high molecular weight.
Adsorption/Desorption	Not determined	The notified polymer is expected to sorb to sludge, soil and sediment based on its expected limited water solubility and high molecular weight.
Dissociation Constant	Not determined	The notified polymer does not contain ionisable functionalities.
Particle Size	Not determined	Liquid*
Flash Point	> 100 °C	(M)SDS*
Flammability	Not flammable	(M)SDS*
Autoignition Temperature	Not self-igniting	(M)SDS*
Explosive Properties	Not determined	Contains no explosives that would imply explosive properties.
Oxidising Properties	Not determined	Contains no functional groups that imply oxidative properties.

*Product (M)SDS for Rheovis® PU 1191 (containing the notified polymer at < 20%)

DISCUSSION OF PROPERTIES

Reactivity

The notified polymer is expected to be stable under normal conditions of use.

Physical hazard classification

Based on the submitted physico-chemical data depicted in the above table, 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 be imported at < 20% concentration.

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

Year	1	2	3	4	5
Tonnes	10-30	10-30	10-30	10-30	10-30

PORT OF ENTRY
Melbourne

IDENTITY OF RECIPIENTS
BASF Australia Ltd

TRANSPORTATION AND PACKAGING

The notified polymer will be imported in 220 kg plastic open head drums and 1,000 kg steel composite and plastic IBC (Intermediate Bulk Containers), and will be transported by road from the wharf to the contracted warehouse and then distributed by road to customers for reformulation.

The finished paints containing the notified polymer at < 1% will be transported in lined steel 1 L, 4 L and 10 L paint cans and 210 kg lined steel drums.

USE

Component of water based coatings at < 1%, for use in industrial, architectural and decorative situations.

OPERATION DESCRIPTION

After importation, the products containing the notified polymer (at < 20% concentration) will be reformulated into surface coatings. At the reformulation sites the contents of the imported drums will be transferred to a mixing vessel, using a gravity or low pressure pump, for blending with pigments and other ingredients to form the finished products. Following quality control analysis, the finished products (containing < 1% notified polymer) will be transferred (gravity feed or low-pressure pump) to various containers for distribution to end-users. Paint mixing and packaging will be conducted in under local exhaust ventilation. The paint manufacturing equipment will be cleaned by flushing with water, with the washings either recycled for reuse in the paint manufacturing facility or disposed of in accordance with local regulations.

Surface coatings containing the notified polymer may be applied by brush, roller or spray on a wide range of substrates by both commercial and domestic users.

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 storage	1	4
Warehouse	1	4
Process operator	2.5	40
Quality control	0.5	40
Packaging	2	40
End use	1	60

EXPOSURE DETAILS

Transport and storage workers are not expected to be exposed to the notified polymer (at < 20% concentration) except in the unlikely event of an accident.

Reformulation

Reformulation will be largely automated; however workers may be exposed (dermal and ocular) to the notified polymer at < 20% concentration when transferring the contents of the imported containers to the mixing equipment and during quality control testing. Dermal and ocular exposure to workers should be mitigated through the stated use by the notifier of personal protective equipment (PPE) including coveralls, gloves and goggles. Inhalation exposure is not expected given the low vapour pressure of the notified polymer.

Coating applications

Exposure to surface coatings containing the notified polymer (at < 1% concentration) may occur during transfer, application and cleaning processes. The potential for exposure should be minimised through the stated use by the notifier of PPE (goggles, gloves, coveralls) by workers, including the use of respiratory protection during spray application. Inhalation exposure may be further mitigated through the use of exhaust ventilation and spray booths, where possible.

Workers may come into contact with surface coatings containing the notified polymer after application to substrates. However, once the surface coatings have dried, the notified polymer will be bound within a polymer matrix and will not be bioavailable.

6.1.2. Public Exposure

Surface coatings containing the notified polymer (at < 1% concentration) will be available for use by the public. Exposure (dermal, ocular and inhalation) to the notified polymer may occur during use of the surface coatings. If

paints are used by the public it is expected to be on a less frequent basis than for professional users, although PPE may not be worn.

The public may come into contact with the surface coatings containing the notified polymer after application to substrates. However, once the surface coatings have dried, the notified polymer will be bound within a polymer matrix and will not be bioavailable.

6.2. Human Health Effects Assessment

No toxicity data were submitted.

The notified polymer has a high molecular weight ($> 1,000$ Da) and a low percentage ($< 1\%$) of low molecular weight species $< 1,000$ Da; hence absorption across biological membranes is expected to be limited.

The notified polymer does not contain any structural alerts of concern.

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

The notified polymer is expected to be of low hazard to human health based on the high molecular weight ($M_n > 1000$ Da) and absence of structural alerts of concern.

Workers may be exposed to the notified polymer at $< 20\%$ concentration during reformulation processes and at $< 1\%$ concentration during application of coating products. Exposure is expected to be limited by the use of engineering controls and appropriate PPE.

Once the surface coatings have dried, the notified polymer will be bound within an inert matrix and will not be bioavailable, thereby limiting any further potential for exposure.

Therefore, given the expected low hazardous nature of the notified polymer and the low exposure, the risk to workers from use of the notified polymer is not considered to be unreasonable.

6.3.2. Public Health

The public may experience dermal ocular or inhalation exposure to surface coating products containing the notified polymer at $< 1\%$ concentration. The public may also come into contact with the coatings containing the notified polymer, however, in such cases exposure is not expected as the notified polymer will be bound within the polymer matrix and will not be available for exposure.

Given the expected low hazardous nature of the notified polymer and the low exposure the risk to the public 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 notified polymer will be imported into Australia and reformulated into surface coatings. The mixing process is expected to be conducted within a closed system.

Potential releases from the reformulation process are expected to be negligible as the washed water from cleaning is expected to be contained in a closed system. Any significant spillage is expected to be contained on site and be disposed of according to local regulations. Empty containers containing the residues of the notified

polymer are expected to be disposed of in the trade waste of the paint manufacturer in accordance with regulations.

RELEASE OF CHEMICAL FROM USE

The notified polymer will be used as a component of paints. The major release of the notified polymer to the aquatic environment may come from the cleaning of application equipment, especially the brushes or rollers used by DIY users. It is expected that up to 5% of the imported quantity of notified polymer may be disposed of to sewers during the clean-up of paint application equipment. The residual paint remaining in empty containers is expected to be disposed of to landfill with the discarded containers.

RELEASE OF CHEMICAL FROM DISPOSAL

The disposal of the major fraction of the imported quantity of notified polymer will be linked to the ultimate disposal of the dried paint on building structures. As large portions of architectural paints are removed before repainting, it is expected that the majority of the notified polymer will ultimately be disposed of to landfill in the form of discarded paint chips or as coated articles.

7.1.2. Environmental Fate

No environmental fate data were submitted for the notified polymer. The notified polymer will become irreversibly bound to form part of an inert coating matrix when it is cured. The notified polymer will share the fate of the coated parts, which will involve eventual disposal to landfill. In its cured form, the notified polymer is not expected to be bioavailable or mobile in the environment. Bioaccumulation of the uncured polymer is unlikely as it is not expected to cross biological membranes due to its high molecular weight. If a small amount of uncured notified polymer is released to the sewer from DIY uses, up to 90% of the notified polymer is expected to be removed by adsorption to sludge during sewage treatment processes (Boethling & Nabholz, 1997). Sludge from treatment plants may be collected for disposal to landfill or used in soil remediation. The notified polymer released to the aquatic environment is expected to bind to sediments and suspended solids. Therefore, the notified polymer is expected to be significantly removed from receiving waters. The notified polymer will eventually degrade in landfill or water, by biotic and abiotic processes, to form water and oxides of carbon and nitrogen.

7.1.3. Predicted Environmental Concentration (PEC)

The predicted environmental concentration (PEC) has not been calculated for the notified polymer as ecotoxicologically significant quantities are not expected to be released to the aquatic environment based on its assessed use pattern.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted for the notified polymer. Polymers without significant ionic functionality are of low concern to the aquatic environment.

7.2.1. Predicted No-Effect Concentration

The Predicted No-Effect Concentration (PNEC) has not been calculated since no ecotoxicity data for the notified polymer was submitted. Therefore, the notified polymer has not been formally classified for its acute and long-term hazard under the *Globally Harmonised System of Classification and Labelling of Chemicals* (GHS, United Nations, 2009).

7.3. Environmental Risk Assessment

The risk quotient ($Q = \text{PEC}/\text{PNEC}$) for the notified polymer has not been calculated as ecotoxicologically significant concentrations are not expected to be reach the aquatic environment based on its assessed use pattern as a component of coatings. The notified polymer is not likely to be released into the aquatic environment in a bioavailable form as the notified polymer is in a coating matrix and is expected to adsorb to soil and sediment. Therefore, on the basis of the assessed use pattern, the notified polymer is not considered to pose an unreasonable risk to the environment.

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