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

PUBLIC REPORT

Polymer 2 in FoamStar ED 2522

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.

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 CHEMICAL	INTRODUCTION VOLUME	USE
LTD/1800	BASF Australia Ltd	Polymer 2 in FoamStar ED 2522	ND*	< 1 tonne 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 for the 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 assumed low hazard and 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, 2012) 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, import volume and identity of recipients.

VARIATION OF DATA REQUIREMENTS (SECTION 24 OF THE ACT)

Variation to the schedule of data requirements is claimed for all physico-chemical endpoints

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

Japan, Taiwan, Canada

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

FoamStar ED 2522 (containing the notified polymer at < 1%)

MOLECULAR WEIGHT

> 1,000 Da

ANALYTICAL DATA

Reference GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY

> 95%

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: white emulsion*

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	Decomposes
Boiling Point	Not determined	Decomposes
Density	950-1,050 kg/m ³ at 25 °C	SDS*
Vapour Pressure	1×10^{-7} kPa at 20 °C	Estimated based on its high molecular weight
Water Solubility	Not determined	The notified polymer is expected to be

Hydrolysis as a Function of pH	Not determined	water dispersible based on its amphiphilic structure and use as an emulsifier. 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 an emulsifier and will tend to accumulate at the phase interface of octanol and water and/or form emulsions.
Adsorption/Desorption	Not determined	The notified polymer is expected to partition to surfaces from water in the environment based on its surface activity.
Dissociation Constant	Not determined	The notified polymer contains no dissociable functions.
Particle Size	Not determined	Emulsion*
Flash Point	> 100 °C	SDS*
Flammability	Not flammable	SDS*
Autoignition Temperature	Not self-igniting	SDS*
Explosive Properties	Not explosive	Contains no explosives that would imply explosive properties.
Oxidising Properties	Not oxidising	Contains no functional groups that imply oxidative properties.

*Product SDS for FoamStar ED 2522 (containing the notified polymer at < 1%)

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 for the 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 < 1% concentration.

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

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

PORT OF ENTRY

Sydney

IDENTITY OF RECIPIENTS

BASF Australia Ltd

TRANSPORTATION AND PACKAGING

The notified polymer will be imported in 200 kg plastic open head drums and composite steel and plastic IBC (Intermediate Bulk Containers) filled to 950 kg, 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 < 0.01% will be transported in plastic 300 mL, 450 mL containers, plastic or steel 1 L, 4 L, 10 L paint cans and 15 kg steel and plastic drums.

USE

Component of coatings at < 0.01%

OPERATION DESCRIPTION

After importation, the notified polymer (at < 1% concentration) will be reformulated into surface coatings. At the reformulation sites the contents of the imported drums containing the notified polymer will be transferred to a mixing vessel, using a gravity or lower pressure pump transfer into a large mixer (1,000 to 50,000 L), for blending with pigments and other ingredients to form the finished products. Following quality control analysis, the finished products (containing < 0.01% notified polymer) will be transferred (gravity feed or low-pressure pump) to various containers for distribution to end-users.

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	5-10
Warehouse	1	5-10
Process operator	2-3	50
Quality control	0-1	50
Packaging	2	50
End use	1	5-10

EXPOSURE DETAILS

Transport and storage workers are not expected to be exposed to the notified polymer (at < 1% 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 <1% 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 should 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 < 0.01% 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.

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 ($< 7\%$) 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 for the 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

During reformulation, exposure to notified polymer is expected to be low given the proposed low concentration ($< 1\%$), use of PPE and the largely enclosed, automated processes.

During end use, workers will be exposed to surface coatings containing the notified polymer at concentrations of $< 0.01\%$. Given the very low end use concentration, high molecular weight and low percentage of low molecular weight species, the potential risk posed by the notified polymer is expected to be low. Furthermore, exposure to the notified polymer during end use 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 proposed use of PPE and engineering controls in place to limit exposure during reformulation, and very low end use concentration, the risk to workers from use of the notified polymer is not considered to be unreasonable.

6.3.2. Public Health

Given the very low end use concentration ($< 0.01\%$), high molecular weight and low percentage of low molecular weight species, the potential risk posed by the notified polymer to the public is not expected to be unreasonable.

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.

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. Notified polymer released to sewers is expected to be treated at the wastewater treatment facility during the waste water treatment processes. 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. In sewage treatment plants, most of the notified polymer is expected to partition to sludge and sediment as it has high molecular weight and surfactant properties. 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 for the notified polymer were submitted. The notified polymer is a non-ionic polymer which is generally of low concern to the environment. The notified polymer is not expected to be bioaccumulative, due to its high molecular weight, nor readily bioavailable to aquatic organisms due to its dispersibility in water. 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).

7.2.1. Predicted No-Effect Concentration

The predicted no-effect concentration (PNEC) has not been calculated for the notified polymer as no ecotoxicity data were submitted, based on its assessed use pattern, ecotoxicologically significant quantities are not expected to be released to the aquatic environment.

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 reached 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 irreversibly combined in a coating matrix and is expected to adsorb to soil and sediment. Therefore, the risk of the notified polymer to the environment is not expected to be unreasonable based on its assessed use pattern.

BIBLIOGRAPHY

NOHSC (2004) Approved Criteria for Classifying Hazardous Substances, 3rd edition [NOHSC:1008(2004)]. National Occupational Health and Safety Commission, Canberra, AusInfo.

SWA (2012) Code of Practice: Spray Painting and Powder Coating, Safe Work Australia, <http://www.safeworkaustralia.gov.au/sites/swa/about/publications/pages/spray-painting-and-powder-coating>.

United Nations (2009) Globally Harmonised System of Classification and Labelling of Chemicals (GHS), 3rd revised edition. United Nations Economic Commission for Europe (UN/ECE), <http://www.unece.org/trans/danger/publi/ghs/ghs_rev03/03files_e.html>.