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

PUBLIC REPORT

Polymer in Foamaster MO 2111 & Foamaster MO NXZ

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 and Energy.

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/2012	BASF Australia Ltd	Polymer in Foamaster MO 2111 & Foamaster MO NXZ	No	≤ 20 tonnes per annum	Component of paints and inks

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.

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

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.

Recommendations

CONTROL MEASURES

- 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.

- A copy of the 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 of 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 g/mol;or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from component of paints and inks, 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.

Safety Data Sheet

The SDS of products containing the notified polymer provided by the notifier were reviewed by NICNAS. The accuracy of the information on the 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 Number Average Molecular Weight (M_n) $\geq 1,000$ g/mol

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, analytical data, degree of purity, use details, polymer constituents, residual monomers, impurities, additives/adjuvants, import volume and site of reformulation.

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

None

NOTIFICATION IN OTHER COUNTRIES

China (2013)

Korea (2013)

USA (2014)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Foamaster MO 2111 (product containing the notified polymer at $< 20\%$ concentration)

Foamaster MO NXZ (product containing the notified polymer at $< 20\%$ concentration)

MOLECULAR WEIGHT

M_n is $> 1,000$ g/mol

ANALYTICAL DATA

Reference FTIR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY

$> 95\%$

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20°C AND 101.3 kPa: Amber liquid

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	Introduced in organic solvent
Boiling Point	Not determined	Introduced in organic solvent
Density	$850 - 910 \text{ kg/m}^3$ at 20°C $840 - 930 \text{ kg/m}^3$ at 25°C	SDS (Foamaster MO 2111) SDS (Foamaster MO NXZ)
Vapour Pressure	Not determined	Based on the high molecular weight of the notified polymer, the vapour pressure is expected to be low
Water Solubility	Not determined	The notified polymer is expected to have limited water solubility, but is expected to

Property	Value	Data Source/Justification
Hydrolysis as a Function of pH	Not determined	be emulsifiable Hydrolysable functional groups, but the notified polymer is not expected to be hydrolysable under environmental conditions (pH 4-9)
Partition Coefficient (n-octanol/water)	Not determined	The partition coefficient would be difficult to determine (unmeasurable) as the notified polymer is expected to form an emulsion in n-octanol/water
Adsorption/Desorption	Not determined	Based on its expected low water solubility, the notified polymer is expected to adsorb strongly to soil, sediment and sludge
Dissociation Constant	Not determined	The notified polymer does not contain dissociable functional groups
Flash Point	> 100 °C	SDS (Foamaster MO 2111)
Flammability	171 °C	SDS (Foamaster MO NXZ)
Autoignition Temperature	Not flammable	SDS (Foamaster MO 2111 and Foamaster MO NXZ)
Explosive Properties	Not self-igniting	SDS (Foamaster MO 2111 and Foamaster MO NXZ)
Oxidising Properties	Not determined	The notified polymer contains no functional groups that would imply explosive properties
		The notified polymer contains no functional groups that would imply oxidising properties

DISCUSSION OF PROPERTIES

Reactivity

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

Physical hazard classification

As no physico-chemical 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.

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 at < 20% concentration for reformulation into paints and inks. The notified polymer will also be imported as a component of finished paints and inks at < 1% concentration.

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

Year	1	2	3	4	5
Tonnes	< 20	< 20	< 20	< 20	≤ 20

PORT OF ENTRY

Melbourne

TRANSPORTATION AND PACKAGING

The notified polymer will be imported at < 20% concentration in 180 kg lined steel drums and 900 kg intermediate bulk containers.

Finished products containing the notified polymer at < 1% concentration will be imported in 1 L, 4 L and 10 L lined steel cans and 210 L drums.

USE

The notified polymer will be used as a component of paints and inks at < 1% concentration. The paints and inks will be applied to a variety of substrates including metal and cardboard.

OPERATION DESCRIPTION*Reformulation*

The imported products containing the notified polymer at < 20% concentration will be transferred to the mixing vessel by gravity feed or low pressure pumps where it will be blended with other ingredients in the presence of local exhaust ventilation. Following blending, samples of the finished products will be taken for quality control testing. The finished paints and inks containing the notified polymer at < 1% concentration will be filled into containers through gravity feed or low pressure pumps.

End Use

Paints containing the notified polymer at < 1% concentration will mainly be applied by spray in purpose-built industrial spray facilities. These products may also be applied with brush or roller.

Ink bottles containing the notified polymer at < 1% concentration will be manually connected to industrial printing machines. The printing process will be largely enclosed and automated. After printing, the ink containing the notified polymer at < 1% concentration will be UV-cured with the other ink components into the substrate matrix.

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	40 - 50
Quality control	0.5	40 - 50
Packaging	2	40 - 50
End use (painters, printer operators)	8	200 - 240

EXPOSURE DETAILS

Transport and storage workers are not expected to be exposed to the notified polymer except in the unlikely event of an accident.

Reformulation processes

Dermal and ocular exposure to the notified polymer at < 20% concentration may occur when connecting or disconnecting transfer hoses, cleaning or maintaining equipment and testing for quality control. Inhalation exposure to the notified polymer may also occur if aerosols are formed. Exposure should be minimised through the use of enclosed and automated systems, local exhaust ventilation and personal protective equipment (PPE: goggles, impervious gloves, coveralls and respirators as anticipated by the notifier).

End-use

Dermal, ocular and inhalation exposure to the notified polymer at < 1% concentration may occur during application of the finished paints. Paint application will be primarily by spray, but potentially with brush and roller. The potential for exposure should be minimised through the anticipated use by the notifier of PPE (goggles, impervious 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. Once the paint is dried, the notified polymer will be bound into an inert solid matrix within the substrate and will not be available for exposure.

Dermal and ocular exposure to the notified polymer at < 1% concentration in inks may occur during replacement of ink bottles and when cleaning residual ink from printers. Inhalation exposure to the notified polymer is not expected given the low vapour pressure of the polymer and the low likelihood of aerosols being released during printing. In addition, local exhaust ventilation is expected to be employed in areas surrounding the printing machines. After printing, the notified polymer will be fixed (UV-cured) with the other ink components into the substrate matrix and will not be available for exposure.

6.1.2. Public Exposure

Finished paints containing the notified polymer at < 1% concentration may be used by the public. It is expected that < 1% of sales of finished paints will be to the general public due to the high levels of equipment and skill required for the application of these products to a professional standard. Dermal and ocular exposure to the notified polymer at < 1% concentration may occur during paint application. Inhalation exposure to the notified polymer at < 1% concentration is also possible if spray application is used. However, the exposure is expected to be of low frequency and small scale.

Once the paint has dried, the notified polymer will be bound into an inert solid matrix within the substrate and will not be available for exposure.

6.2. Human Health Effects Assessment

No toxicity data were submitted. The notified polymer is a non-ionic surfactant with a high molecular weight (> 1000 g/mol) and a low percentage (< 7%) of low molecular weight species (< 500 g/mol), therefore the potential for the notified polymer to cross biological membranes is expected to be limited.

The notified polymer meets the polymer of low concern (PLC) criteria with the exception of its potential for biodegradation and is therefore expected to be of low hazard to human health.

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.

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety

The notified polymer meets the PLC criteria for human health and is therefore expected to be of low hazard. Furthermore, any potential risk will be further reduced by the use of enclosed and automated processes during reformulation, expected use of PPE by all workers and low end-use concentration.

Therefore based on the expected low hazard of the notified polymer and assessed use pattern, the risk to workers from use of the notified polymer is not considered to be unreasonable.

6.3.2. Public Health

Paint products containing the notified polymer (at < 1% concentration) may be used by the public on an infrequent basis and widespread use of the paint products by the public is not expected. The paint products will be applied by brush, roller and perhaps also by spray.

Given the low end use concentration, infrequent use and expected low hazard, the potential risk posed by the notified polymer 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 not be manufactured in Australia, and hence release from this process does not need to be evaluated. The notified polymer will be imported into Australia as a component of Foamaster MO 2111 or Foamaster MO NXZ. Foamaster MO 2111 or Foamaster MO NXZ will be stored in concrete banded warehouses, thus containing leaks and spills during storage and reducing likelihood of environmental release.

Reformulation of the notified polymer into water-based inks and paints will occur in a closed system and water used in cleaning will be contained, thus reducing the likelihood of release to the environment. Waste washings will be disposed of by accredited third party organisations. Therefore, no release of waste waters to the sewer is expected.

Leaks and spills of the products containing the notified polymer during transport and storage are expected to be contained, collected by suitable absorbents, and disposed of in accordance with local government regulations.

RELEASE OF CHEMICAL FROM USE

Application of the paints containing the notified polymer will generally be carried out within industrial purpose built spray application facilities. It is expected that paints containing the notified polymer will be applied by spray for more than 50% of the time, and the rest by brush and roller before being cured. Inks containing the notified polymer (at up to 30%) will be applied automatically by industrial printers to a variety of substrates as large format images. Inks will be UV-cured once printing is completed. Waste (including water used for equipment cleaning) that may contain the notified polymer generated at these application sites is expected to be disposed of in accordance with environmental regulations. Therefore, negligible release of the polymer during paint application is expected.

RELEASE OF CHEMICAL FROM DISPOSAL

Most of the notified polymer is expected to share the fate of the substrate to which it has been applied, and be disposed of to landfill or recycled.

Some of the notified polymer (notifier estimated < 1% of the total import volume) will be applied with inks to cardboard boxes. It is estimated that 76% of these boxes will be recycled thus potentially releasing the notified polymer to sewers. Any environmental release to the aquatic environment is expected to be insignificant (< 152 kg of the total annual import volume). This will result in a concentration of 0.12 µg/L (river) and 0.012 µg/L (ocean), based on (a) 152 kg/year release of the notified polymer to the sewer, (b) release on 260 recycling business operation days/year (resulting in 0.58 kg/day daily release of the notified polymer), (c) water use of 200 L/person/day, (d) a population of 24.386 million people, and (e) no removal of the notified polymer in the STP.

Empty containers of Foamaster MO 2111 or Foamaster MO NXZ will be flushed with water prior to their expected disposal as trade waste to landfill. Therefore, these containers are expected to contain insignificant residues of the notified polymer when disposed of.

7.1.2. Environmental Fate

No environmental fate data were submitted. Most of the notified polymer is expected to share the fate of the substrate to which it has been applied, to be either disposed of to landfill or recycled. In landfill, the notified polymer will be present as cured solids and will be neither bioavailable nor mobile. The notified polymer is expected to thermally degrade during metal recycling.

A small proportion of the notified polymer is expected to be released to sewers as a result of ink labelled cardboard recycling. The notified polymer is not likely to be hydrolysable under environmental conditions (pH 4-9), and is expected to form an emulsion with water and organic matter.

In landfill, metal recycling and the aquatic environment, the notified polymer is expected to eventually degrade via biotic and abiotic processes to form water and oxides of carbon.

7.2. Environmental Effects Assessment

No ecotoxicological data were submitted. Polymers without significant ionic functionality are generally considered not to be harmful to aquatic organisms.

7.3. Environmental Risk Assessment

The risk quotient ($Q = PEC/PNEC$) for the notified polymer has not been calculated as release to the aquatic environment in ecotoxicologically significant quantities is not expected based on its reported use pattern as a defoamer in metal coatings to be applied in an industrial setting. The majority of the environmental release of the notified polymer will be disposal to landfill and by thermal decomposition during metal reclamation processes. As a component of metal coatings the notified polymer will be bound within an inert matrix and is unlikely to leach or be bioavailable. There may be release to sewers, and hence aquatic environments from recycling of ink labelled cardboard boxes. However, polymers without significant ionic functionality are generally of low

concern to the environment, particularly at such low release rates ($PEC_{river} \leq 0.12 \mu\text{g/L}$). Therefore, on the basis of its assessed use pattern, the limited expected aquatic exposure and low toxicity, the notified polymer is not expected to pose an unreasonable risk to the environment.