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

PUBLIC REPORT

Polymer in Efka 4050 and Efka 4055

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 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
LTD/1591	BASF Australia Ltd	Polymer in Efka 4050 and Efka 4055	ND*	≤ 10 tonnes per annum	A component of paints

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to 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 reported use pattern, the notified polymer is not considered to pose an unreasonable 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, as introduced:
 - Enclosed, automated processes, where possible
 - Ventilation system, including local exhaust ventilation
- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer:
 - Avoid contact with skin and eyes
 - Avoid inhalation of aerosols during spray application
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
 - Coveralls, impervious gloves, goggles
 - Respiratory protection during spray applications

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 *National Guidance Material for Spray Painting* (NOHSC, 1999) or relevant State and Territory Codes of Practice.
- A copy of the MSDS should be easily accessible to employees.

- 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 of to landfill. 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;
 - the concentration of the notified polymer exceeds or is intended to exceed 1% in coatings;or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from a component of paints, or is likely to change significantly;
 - the amount of polymer being introduced has increased from 10 tonnes per annum, 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 MSDS of a product containing 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.

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 Mn ≥ 1000 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, analytical data, degree of purity, polymer constituents, residual monomers, impurities, use details, import volume and identity of manufacturer/recipients.

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)

None

NOTIFICATION IN OTHER COUNTRIES

China, Japan, USA and Korea

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Efka 4050 (< 60% notified polymer)

Efka 4055 (< 60% notified polymer)

OTHER NAME(S)

Modified polyacrylate

MOLECULAR WEIGHT

> 1,000 Da

ANALYTICAL DATA

Reference IR and GPC spectra were provided.

3. COMPOSITION

DEGREE OF PURITY $\geq 90\%$

HAZARDOUS IMPURITIES/RESIDUAL MONOMERS Below classification cut-offs

NON HAZARDOUS IMPURITIES/RESIDUAL MONOMERS (>1% by weight) None

ADDITIVES/ADJUVANTS None

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

None expected under normal conditions of use.

DEGRADATION PRODUCTS

Not expected to degrade under normal conditions of use.

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: Yellow liquid (solution containing < 60% notified polymer)

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	Imported in solution
Boiling Point	~120 °C at 101.3 kPa*	MSDS
Density	990 – 1000 kg/m ³ at 20 °C*	MSDS
Vapour Pressure	< 1.3 × 10 ⁻⁹ kPa	Estimated based on the NAMW > 1,000 Da (US EPA, 2007)
Water Solubility	Not determined	Expected to have limited water solubility based on its predominantly hydrophobic structure
Hydrolysis as a Function of pH	Not determined	Contains hydrolysable functionality, however, due to its expected limited water solubility, it is expected to

Partition Coefficient (n-octanol/water)	Not determined	hydrolyse slowly under environmental conditions (pH 4-9, 25 °C) Expected to partition from water to n-octanol on the basis of its predominantly hydrophobic structure
Adsorption/Desorption	Not determined	Expected to adsorb to soil, sediment and sludge based on its high molecular weight and the presence of potentially cationic functionality
Dissociation Constant	Not determined	The notified polymer contains basic functionality which has the potential to be cationic under environmental conditions (pH 4-9)
Particle Size	Not determined	Imported in solution
Flash Point	Not determined	Introduced in flammable solvent. The notified polymer itself would be expected to have a high flash point based on the expected low vapour pressure.
Autoignition Temperature	315°C*	MSDS, the autoignition temperature of the notified polymer would be \geq this.
Explosive Properties	Not expected to be explosive	The structural formula contains no explosives.
Oxidising Properties	Not expected to be oxidising	Contains no functional groups that imply oxidative properties

* Solution containing < 60% notified polymer

DISCUSSION OF PROPERTIES

Reactivity

Expected to be stable under normal conditions of use. *Dangerous Goods classification*

Based on the estimated physical-chemical data in the above table the notified polymer is not classified according to the Australian Dangerous Goods Code (NTC, 2007). However, the data above do 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 be imported as a component of Efka 4055 and Efka 4050 at up to 60% concentration.

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>	1 – 10	1 – 10	1 – 10	1 – 10	1 – 10

PORT OF ENTRY

Melbourne

IDENTITY OF MANUFACTURER/RECIPIENTS

BASF Australia Ltd

TRANSPORTATION AND PACKAGING

The product containing the notified polymer (at up to 60%) will be imported in 25 and 190 kg steel drums. The imported product and reformulated end-use products containing < 1% notified polymer will be transported (in 1-10 L cans or 210 kg steel drums) within Australia by road.

USE

Dispersing agent in the manufacture of industrial and automotive paints. The end-use paints will contain < 1% notified polymer and will be applied to metal substrates.

OPERATION DESCRIPTION

At coating formulation sites, the imported product containing the notified polymer (at up to 60%) will be added, via a low-pressure transfer pump or gravity feed, to a mixer and blended with the other paint components for up to 24 hours. Following quality control analysis, the formulated paints (containing < 1% notified polymer) will be transferred via a gravity feed or low-pressure pump to containers for distribution to end-users. All processes will occur under exhaust ventilation.

In general, the end-use paint products containing the notified polymer (at up to 1%) will be used in industrial paint application facilities. The coating containing the notified polymer will be mixed with the other component of a 2-pack coating and will predominantly be applied to the metal substrates by spray, but brush and roller may also be used.

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
Paint formulation process operator	2.5	40
Quality control	0.5	40
Packaging	2	40
End-use	1	60

EXPOSURE DETAILS

Transport and storage workers may come into contact with the imported product containing the notified polymer (at up to 60%), only in the unlikely event of an accident.

During paint formulation processes, including transfer, quality control and cleaning and maintenance tasks, dermal and ocular exposure to the notified polymer may occur. Exposure is expected to be minimised through the use of ventilation and the use of personal protective equipment (PPE), including chemical goggles, impervious gloves and appropriate industrial clothing. Due to the nature of the processes and the expected low volatility of the notified polymer, inhalation exposure during reformulation is not anticipated. At end-use sites, dermal, ocular and/or inhalation exposure to the coatings containing the notified polymer (at < 1% concentration) may occur during transfer, application and cleaning processes. The potential for exposure would be minimised through the use of PPE (goggles, impervious gloves, appropriate clothing) by workers and use of respiratory protection during spray application. Once the paint is cured, the notified polymer is not expected to be bioavailable and further dermal contact should not lead to exposure.

6.1.2. Public Exposure

The formulated paints (containing < 1% notified polymer) may be sold to the general public, although given that the paints are intended for heavy-duty and industrial purposes, supply to the general public is expected to be limited to skilled users (< 0.1% of sales will be to the public). The paints are only sold through non-DIY distribution centres, and are not stocked in regular hardware stores and/or retail domestic paint stores. Users may encounter dermal, ocular and/or inhalation exposure to the notified polymer during application. The potential for exposure would be minimised through the use of PPE such as coveralls, gloves and goggles. Once the paint is cured, the notified polymer is not expected to be bioavailable and further dermal contact should not lead to exposure.

6.2. Human Health Effects Assessment

No toxicity data were submitted. Dermal absorption is expected to be limited by the high molecular weight (NAMW > 1000 Da) of the notified polymer.

The notified polymer contains functional groups that have been associated with skin sensitisation effects. The potential for these effects may be limited by the high molecular weight of the notified polymer and the low levels of low molecular weight species.

Health hazard classification

As no toxicity data were provided, the notified polymer cannot be classified according to the *Approved Criteria for Classifying Hazardous Substances* (NOHSC, 2004).

6.3. Human Health Risk Characterisation

6.3.1. Occupational Health and Safety

No toxicological data were provided for the notified polymer. However, sensitisation effects following exposure to the imported product ($\leq 60\%$ notified polymer) cannot be ruled out. Therefore, the use of automated processes, ventilated environments and the wearing of PPE are recommended during reformulation processes. Given the low proposed usage concentration in paints ($< 1\%$ notified polymer), corrosion and/or sensitisation effects are not expected following exposure to the notified polymer in end-use products. However, given the absence of supporting toxicity studies, steps should be taken to avoid exposure to the notified polymer, particularly via the inhalation route.

Therefore, provided that control measures are in place to minimise worker exposure, including the use of automated processes, ventilated environments and the wearing of suitable PPE (such as respiratory protection during spray application processes), the risk to the health of workers from use of the notified polymer is not considered to be unreasonable.

6.3.2. Public Health

The public (0.1% of sales) may be exposed to the notified polymer when applying the paint containing $< 1\%$ notified polymer; however, the paints are intended for heavy-duty and industrial purposes and will likely be used by experienced users only. It is expected that any occasional skilled DIY users will have access to MSDS, wear PPE to minimise exposure (gloves and coveralls) and work in a ventilated environment. The public may come into contact with products to which the paints containing the notified polymer have been applied and cured. However, the notified polymer will be unavailable for exposure. Therefore, when used in the proposed manner and provided that PPE is worn to minimise exposure, the risk to public health from the notified polymer 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; therefore, there will be no release from this activity. Environmental release during importation, transport and distribution may occur as a result of accidental spills. In the event of a spill, the notified polymer is expected to be contained and collected with an inert absorbent material and disposed of in accordance with local regulations.

Reformulation of the notified polymer occurs in a closed system and release to atmosphere is expected to be negligible. Solvent used for equipment washing containing residues of the notified polymer are expected to be recycled for reuse on site or disposed of via accredited waste disposal contractors. Wastes and spills (1% of annual import volume) during reformulation activities will be contained on-site and disposed of in accordance with local regulations. Residues in import containers will be disposed of via the trade waste stream of the formulator in accordance with local regulations.

RELEASE OF CHEMICAL FROM USE

The majority of paint products containing the notified polymer are expected to be available to automotive manufacturers and other industrial and protective coating paint facilities. Therefore, any losses from overspray (estimated at 30% of annual import volume) during industrial use are expected to be collected using standard engineering controls such as spray booths. These losses, together with other wastes generated during use, including residues in application equipment washings and empty paint containers (estimated at up to 5% and 2.5%, respectively, of the annual import volume), are expected to be disposed of in accordance with local regulations, namely to landfill. Less than 0.1% of paints containing the notified polymer are expected to be sold to the general public. Hence no ecotoxicologically relevant concentrations of the notified polymer are anticipated to be released to the environment from these users.

RELEASE OF CHEMICAL FROM DISPOSAL

The notified polymer in paints is expected to share the fate of metal structures to which it has been applied. The notified polymer is likely to be either thermally decomposed during metal reclamation processes or disposed of to landfill at the end of the useful life of the article to which it has been applied.

7.1.2. Environmental Fate

No environmental fate data were submitted. The majority of the notified polymer is expected to be bound within an inert matrix of cured paints as part of its normal use pattern as a component in industrial paints. The majority of notified polymer in wastes disposed of to landfill is expected to be in solid cured paint and it is not expected to be bioavailable, biodegradable nor mobile in this form. Based on the high molecular weight of the notified polymer, it is not likely to cross biological membranes, hence bioaccumulation is not expected. Furthermore, bioaccumulation of the notified polymer is unlikely due to limited bioavailability in its solid form in landfill and its limited release to surface waters during use. The notified polymer will eventually degrade in landfill, or by thermal decomposition during metal reclamation 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, based on its reported use pattern, ecotoxicologically significant quantities are not expected to be released to the aquatic environment.

7.2. Environmental Effects Assessment

No ecotoxicity data were submitted. The notified polymer contains basic functionality which has the potential to become cationic under environmental conditions (pH 4-9). The cationic charge density is < 5000 Da and thus the notified polymer has the potential to be toxic to aquatic life. However, significant exposure of the notified polymer to aquatic organisms is unlikely based on the reported use pattern and the expected limited water solubility. Furthermore, the majority of the notified polymer will be bound within the inert matrix of cured paints and is not expected to be bioavailable.

7.2.1. Predicted No-Effect Concentration

A predicted no-effect concentration (PNEC) has not been calculated for the notified polymer as, based on its reported 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 release to the aquatic environment in ecotoxicologically significant quantities is not expected, based on its reported use pattern as a component in industrial paints for use on metal substrates. The majority of the environmental release of the notified polymer will be disposal of the cured paints to landfill and by thermal decomposition during metal reclamation processes. In cured paints the notified polymer is bound within the inert paint matrix and is unlikely to leach or be bioavailable. Thermal decomposition of the notified polymer will produce water and oxides of carbon and nitrogen. On the basis of its limited aquatic exposure and assessed use pattern, the notified polymer is not expected to pose an unreasonable risk to the environment.

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