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

PUBLIC REPORT

Polymer in Efka® 4009, Efka® 4046 and Efka® 4047

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/1571	BASF Australia Ltd	Polymer in Efka® 4009, Efka® 4046 and Efka® 4047	ND	≤ 10 tonnes per annum	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 its limited aquatic exposure and assessed 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
- Employers should implement the following safe work practices to minimise occupational exposure during handling of the notified polymer as introduced:
 - Avoid skin contact
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer as introduced:
 - Coveralls, impervious gloves, goggles

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 concentration of the notified polymer exceeds or is intended to exceed 1% in coatings;
 - the polymer has a number-average molecular weight of less than 1000.

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 the 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 3001

NOTIFICATION CATEGORY

Limited: Synthetic polymer with $M_n \geq 1000$ Da.

EXEMPT INFORMATION (SECTION 75 OF THE ACT)

Data items and details claimed exempt from publication: chemical name, CAS number, molecular and structural formulae, molecular weight, analytical data, 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 physicochemical properties.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

China (2011)
USA (2011)

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Efka® 4009 (< 30% notified polymer)
Efka® 4046 (< 50% notified polymer)
Efka® 4047 (< 50% notified polymer)

OTHER NAME(S)

Efka®-K- 4046

3. COMPOSITION

DEGREE OF PURITY > 99%

4. PHYSICAL AND CHEMICAL PROPERTIES

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

Property	Value	Data Source/Justification
Melting Point/Freezing Point	Not determined	Will only be introduced as a solvent solution.
Boiling Point	Not determined	Polymer with NAMW > 1,000 Da.
Density*	980-1010 kg/m ³ at 20 °C	MSDS
Vapour Pressure	< 1.3x10 ⁻⁹ kPa	Estimated based on high molecular weight (US EPA, 2010).
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 hydrolyse slowly under environmental conditions (pH 4-9, 25 °C)
Partition Coefficient (n-octanol/water)	Not determined	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 (pKa ~ 7) which has the potential to be cationic under environmental conditions (pH 4-9)
Particle Size	Not determined	Will only be introduced as a solvent solution.
Flash Point	Not determined	Polymer with NAMW > 1,000 Da.
Flammability	Not determined	Not expected to be flammable.
Autoignition Temperature	Not determined	Not expected to autoignite.
Explosive Properties	Not predicted to be explosive	Estimated based on chemical structure.

*For imported products containing the notified polymer in solvent solution up to 50% concentration.

DISCUSSION OF PROPERTIES

Reactivity

The notified polymer is expected to be stable under normal conditions of use. The MSDS of the imported product (< 50% notified polymer) notes that strong acids, bases and oxidising agents should be avoided.

Dangerous Goods classification

Based on the submitted 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 solvent solution as a component of Efka® 4009 (at < 30% concentration), Efka® 4046 (at < 50% concentration) and Efka® 4047 (at < 50% concentration).

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

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

PORT OF ENTRY
Melbourne, by wharf

IDENTITY OF MANUFACTURER/RECIPIENTS
BASF Australia Ltd

TRANSPORTATION AND PACKAGING

The products containing the notified polymer (< 50% concentration) will be imported in 18Kg and 190Kg steel drums. The finished paints containing the notified polymer (at < 1% concentration) will be stored and transported within Australia by road.

USE

The imported products containing the notified polymer (at up to 50%) will be used as a dispersing agent in the manufacture of industrial and heavy duty 2-pack paints. The end-use paints will contain < 1% notified polymer and will be applied to metal substrates.

OPERATION DESCRIPTION

Formulation of paints

The imported products containing the notified polymer (at concentrations up to 50%) will be added by gravity feed and low pressure pump to a paint mixer and combined with resin, solvent and pigments. Once mixing is complete, samples will be taken for quality control testing and the finished paint product will be transferred to steel containers by a gravity feed and low pressure pump. The finished paints containing < 1% of the notified polymer will then be stored at the paint manufacturer's warehouse and then distributed to end users. Paint mixing and packaging will be conducted in a ventilated room under local exhaust ventilation.

The paint manufacturing equipment will be cleaned by flushing with hydrocarbon solvents. The washings will be either recycled for reuse in the paint manufacturing facility or disposed of in accordance with local regulations.

End use

The finished paints containing the notified polymer at concentrations < 1% will be applied by brush, roller and spray in predominantly industrial areas. Application equipment will be cleaned with hydrocarbon solvents and washings will be disposed of in accordance with local regulations.

6. HUMAN HEALTH IMPLICATIONS

6.1. Exposure Assessment

<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 may come into contact with the imported product containing the notified polymer (at up to 50%), 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 should be minimised through the use of PPE (goggles, impervious gloves, appropriate clothing) by workers

and use of respiratory protection during spray application. Once 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 to the public). Users may encounter dermal, ocular and/or inhalation exposure to the notified polymer during application. The potential for exposure may be minimised through the use of PPE such as coveralls, gloves and goggles. In addition, the use of formulated paints by members of the general public is only expected to be at most occasional, due to the heavy-duty nature of these products. Once 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 was submitted.

The notified polymer is of high molecular weight ($M_n \geq 1000$ Da) with only a low percentage of low molecular weight species (i.e. < 4% < 1000 Da) present. In addition it is expected based on its structure to have low water solubility; hence absorption across biological membranes and potential systemic toxicity is not expected.

The notified polymer contains a functional group that is associated with skin sensitisation effects. However, the potential for these effects is expected to be limited by the high molecular weight of the notified polymer and low percentage 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

Based on structural alerts the notified polymer may have the potential for skin sensitisation. However, although it cannot be totally ruled out, the risk of sensitisation effects from exposure to the notified polymer is expected to be limited by the high molecular weight (> 1,000 Da) and low percentage of low molecular weight species.

Therefore, the use of automated processes and the wearing of PPE are recommended when handling the notified polymer at high concentrations as introduced in the imported product.

Given the low proposed usage concentration in paints (< 1% notified polymer), sensitisation effects are not expected following exposure to the notified polymer in end-use products.

Therefore, provided that control measures are in place to minimise worker exposure when handling the notified polymer as introduced, including the use of automated processes and the wearing of suitable PPE, 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 may be exposed to the notified polymer via the dermal, ocular and/or inhalation routes when applying the paint (<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 such users will wear PPE to minimise exposure. Paint uses (<1% notified polymer) by members of the general public is only expected to be at most occasional. Given the low proposed usage concentration in paints (<1% notified polymer), any such use is not expected to lead to adverse effects, particularly if steps are taken to avoid direct inhalation of paint when applied by spray. In addition, as noted above, sensitisation effects following exposure to the notified polymer are not expected at the proposed usage concentration.

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, 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

Paint products containing the notified polymer are expected to only be available to industrial users including automotive manufacturers and repairers, coil coating facilities 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.

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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