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

PUBLIC REPORT

Polymer in Efka® 4330

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/1570 | BASF Australia Ltd | Polymer in Efka® 4330 | ND* | ≤ 10 tonnes per annum | Component of industrial paints |

*ND = not determined

CONCLUSIONS AND REGULATORY OBLIGATIONS

Hazard classification

Based on the available data the notified polymer cannot be classified as hazardous according to the *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(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 limited aquatic exposure and assessed use pattern, the notified polymer is not expected to pose an unreasonable risk to the environment.

Recommendations

REGULATORY CONTROLS

Health Surveillance

- As the notified polymer is a potential skin sensitiser, employers should carry out health surveillance for any worker who has been identified in the workplace risk assessment as having a significant risk of skin sensitisation.

CONTROL MEASURES

Occupational Health and Safety

- Employers should implement the following engineering controls to minimise occupational exposure to the notified polymer during spray painting:
 - Spray booths
- Employers should implement the following safe work practices to minimise occupational exposure during handling of products containing the notified polymer:
 - Avoid skin and eye contact
- Employers should ensure that the following personal protective equipment is used by workers to minimise occupational exposure to the notified polymer:
 - Safety goggles or face shield, gloves and protective clothing
 - Respiratory protection (when spray painting or when aerosols may be generated)

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;or
- (2) Under Section 64(2) of the Act; if
 - the function or use of the polymer has changed from being a component of paint for industrial use, 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, Victoria 3006

NOTIFICATION CATEGORY

Limited: Synthetic polymer with Mn \geq 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, additives/adjuvants, 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: melting point/boiling point, vapour pressure, specific gravity/density, water solubility, hydrolysis as a function of pH, partition coefficient, adsorption/desorption, dissociation constant, particle size, flash point, autoignition temperature, explosive properties, and reactivity.

PREVIOUS NOTIFICATION IN AUSTRALIA BY APPLICANT(S)

None

NOTIFICATION IN OTHER COUNTRIES

None

2. IDENTITY OF CHEMICAL

MARKETING NAME(S)

Efka® 4330 (product containing the notified polymer at a concentration of < 60%).

MOLECULAR WEIGHT

Mn > 1,000 Da

ANALYTICAL DATA

Reference IR and GPC data were provided.

3. COMPOSITION

LOSS OF MONOMERS, OTHER REACTANTS, ADDITIVES, IMPURITIES

No losses by volatilisation, exudation or leaching are expected from the new polymer.

DEGRADATION PRODUCTS

No degradation, decomposition or depolymerisation of the notified polymer is expected to occur under normal conditions of use. Thermal decomposition may release toxic fumes containing products of combustion such as oxides of carbon and nitrogen.

4. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AT 20 °C AND 101.3 kPa: Brownish liquid (product containing the notified polymer)

| Property | Value | Data Source/Justification |
|------------------------------|---------------------------------|-------------------------------|
| Melting Point/Freezing Point | Not determined | Imported in solution |
| Boiling Point | Approx. 146 °C at 101.3 kPa* | MSDS |
| Density | 1030 kg/m ³ at 20°C* | MSDS |
| Vapour Pressure | 340 Pa at 20 °C* | MSDS. The notified polymer as |

| | | |
|---|------------------------------|--|
| Water Solubility | Not determined | introduced is not isolated from solution. The polymer has high molecular weight and is expected to have low volatility. |
| Hydrolysis as a Function of pH | Not determined | Expected to be water dispersible based on structural considerations and its function during use which indicate that it is surface active |
| Partition Coefficient (n-octanol/water) | Not determined | Contains functionality that hydrolyses slowly under environmental conditions (pH 4-9, 25 °C) |
| Adsorption/Desorption | Not determined | The notified polymer is surface active and will tend to accumulate at the phase interface of octanol and water |
| Dissociation Constant | Not determined | Expected to partition to surfaces from water in the environment based on its surface activity |
| Particle Size | Not determined | The notified polymer is a salt with the potential to dissociate under environmental conditions |
| Flash Point | Not determined | Notified polymer will be imported in solution. |
| Autoignition Temperature | Not determined | The notified polymer will be imported in a flammable solvent solution. |
| Explosive Properties | Not expected to be explosive | The notified polymer will be imported in a flammable solvent solution. |
| | | The structural formula contains no explosives. |

*** Value for the imported product that contains < 60% notified polymer.**

DISCUSSION OF PROPERTIES

Reactivity

Stable under normal conditions of use. The notified polymer is marketed in a solvent solution and is not expected to show oxidizing properties. Incompatible substances are likely to be strong oxidizing agents, strong acids and strong bases. The decomposition products are not known but are likely to be oxides of carbon and some oxides of nitrogen.

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 in Australia by sea as a component of Efka® 4330 at a concentration of < 60%.

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

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

PORT OF ENTRY

Melbourne, by wharf

IDENTITY OF MANUFACTURER/RECIPIENTS

BASF Australia Ltd

TRANSPORTATION AND PACKAGING

The notified polymer will be imported by sea as a component (< 60%) of Efka® 4330 in 20 kg and 200 kg UN approved steel drums. These steel drums will be packed on wooden pallets and bound with a plastic shrink wrap. The plastic shrink wrapped pallets holding the containers of the imported product will be transported by road to the third party warehouse for storage and to reformulation sites.

USE

The notified polymer will be used as a component of automotive refinish paints and industrial paints at a concentration of < 5%.

OPERATION DESCRIPTION

At the reformulation site, Efka® 4330, which contains the notified polymer at a concentration of up to 60%, will be mixed with a range of inorganic and organic pigments. Efka® 4330 will be added to other paint components into a paint mixer using a gravity or low pressure pump transfer. Reformulation processes will occur under exhaust ventilation. The formulation of the final paint product, which contains the notified polymer at up to 5%, may take up to 24 hours. The paint will be sold and distributed, after QC testing, in steel containers. The end-use paint products containing the notified polymer (at up to 5%) will be used at automotive refinish sites. Application of the automotive paints to vehicles will be predominantly by spray painting conducted in a dedicated spray booth with downdraft ventilation. Small amounts of touch-up painting may also be conducted by brush.

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

It is anticipated that transport and warehouse/store personnel would only be exposed to the notified polymer in the event of an accident.

Reformulation

During reformulation, dermal and ocular exposure of workers to the product containing the notified polymer (at < 60%) may occur during connection of pipes for transfer of the imported product to the mixing tank. It is expected that there will be a low potential for exposure during the automated and closed blending process. Workers involved in the reformulation process are expected to wear impermeable gloves, chemical goggles and protective clothing to further minimise exposure. Exposure to the notified polymer at concentrations < 5% during transfer of the formulated product to steel containers is expected to be low due to the largely automated processes and the PPE used.

Inhalation exposure, during reformulation, is expected to be negligible given the very low estimated vapour pressure of the notified polymer. In addition, blending and packaging facilities are expected to use local exhaust ventilation that would reduce exposure to any aerosols formed.

End-use

Dermal and ocular exposure to the notified polymer (< 5%) may occur during transfer of the paint to spray equipment and during spray application of the paint. Inhalation exposure may also occur during spray application although exposure is expected to be reduced through the use of dedicated spray booth with downdraft ventilation and the use of PPE such as full protective clothing and an air-fed respirator. After the paint has dried the notified polymer (< 5%) will be bound within the paint matrix and hence will not be available for exposure.

6.1.2. Public Exposure

The notified polymer is intended for industrial use only; therefore the public may be exposed to the imported product (< 60% notified polymer) only in the event of an accident during transportation. The public may come into contact with automobiles or other articles/structures to which paint containing the notified polymer has been applied. However, exposure is not expected as the notified polymer (< 5%) will be bound within the paint matrix and hence will not be available for exposure.

6.2. Human Health Effects Assessment

No toxicity data were submitted

Toxicokinetics, metabolism and distribution.

The notified polymer is not expected to be dermally absorbed, based on the high molecular weight ($M_n > 1,000$ Da.), however it contains a high level of low molecular weight (<500 Da) species that may be absorbed. *Irritation*

The notified polymer contains a functional group which is a structural alert for corrosion and sensitisation.

Health hazard classification

Since no toxicity data were submitted, 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

The notified polymer has the potential to be an irritant and a sensitiser. The risk of irritation and sensitisation effects from exposure to the notified polymer may be somewhat reduced by the high molecular weight (> 1,000 Da), however the polymer has a high level of low molecular weight species. During reformulation workers will handle the notified polymer at concentrations of < 60%; however exposure is expected to be low given the proposed use of PPE and largely enclosed, automated processes. During end use workers will be exposed to automobile or industrial paints containing the notified polymer at concentrations < 5%. Exposure to the notified polymer during end use is also expected to be low due to the reduced concentration and the use of engineering controls and appropriate PPE. Given the expected low potential hazard, the proposed use of PPE and the engineering controls in place, the risk to workers of the notified polymer is not considered to be unreasonable.

6.3.2. Public Health

Paint products containing the notified polymer will not be sold to the public. The public may experience dermal exposure to automobiles to which paint containing the notified polymer has been applied. However, exposure is not expected as the notified polymer (< 5%) will be bound within the paint. Therefore the risk to the public 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 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 only available to industrial users including automotive manufacturers and repairers, and other industrial and protective paint facilities. 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 and plastic substrates 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 as part of its normal use pattern as a component in automotive refinish paints and industrial paints. The notified polymer bound within the paint matrix is not expected to be bioavailable or biodegradable. 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 water dispersible or mobile in this form. Based on the expected surface activity 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. 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 has the potential to dissociate under environmental conditions. The anionic component of the notified polymer is expected to be surface active based on its structure and has the potential to show the aquatic toxicity of its surfactant class. The cationic component of the notified polymer has a cationic charge density of <5000 Da and thus 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. 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 automotive refinish paints and industrial paints for use on metal and plastic 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 the 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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